QAnywhere™

Contents

About this book

This book describes QAnywhere, which is a messaging platform for mobile, wireless, desktop, and laptop clients.

About the SQL Anywhere documentation

The complete SQL Anywhere documentation is available in four formats:

- **DocCommentXchange** DocCommentXchange is a community for accessing and discussing SQL Anywhere documentation on the web.

  To access the documentation, go to http://dcx.sybase.com.

- **HTML Help** On Windows platforms, the HTML Help contains the complete SQL Anywhere documentation, including the books and the context-sensitive help for SQL Anywhere tools.

  To access the documentation, choose **Start** » **Programs** » **SQL Anywhere 12** » **Documentation** » **HTML Help (English)**.

- **Eclipse** On Unix platforms, the complete Help is provided in Eclipse format. To access the documentation, run *sadoc* from the *bin32* or *bin64* directory of your SQL Anywhere installation.

- **PDF** The complete set of SQL Anywhere books is provided as a set of Portable Document Format (PDF) files. You must have a PDF reader to view information.

  To access the PDF documentation on Windows operating systems, choose **Start** » **Programs** » **SQL Anywhere 12** » **Documentation** » **PDF (English)**.

  To access the PDF documentation on Unix operating systems, use a web browser to open */documentation/en/pdf/index.html* under the SQL Anywhere installation directory.

Documentation conventions

This section lists the conventions used in this documentation.

Operating systems

SQL Anywhere runs on a variety of platforms. Typically, the behavior of the software is the same on all platforms, but there are variations or limitations. These are commonly based on the underlying operating system (Windows, Unix), and seldom on the particular variant (IBM AIX, Windows Mobile) or version.

To simplify references to operating systems, the documentation groups the supported operating systems as follows:

- **Windows** The Microsoft Windows family includes platforms that are used primarily on server, desktop, and laptop computers, as well as platforms used on mobile devices. Unless otherwise specified, when the documentation refers to Windows, it refers to all supported Windows-based platforms, including Windows Mobile.

  Windows Mobile is based on the Windows CE operating system, which is also used to build a variety of platforms other than Windows Mobile. Unless otherwise specified, when the documentation refers to Windows Mobile, it refers to all supported platforms built using Windows CE.

- **Unix** Unless otherwise specified, when the documentation refers to Unix, it refers to all supported Unix-based platforms, including Linux and Mac OS X.

For the complete list of platforms supported by SQL Anywhere, see "Supported platforms" [*SQL Anywhere 12 - Introduction*].

Directory and file names

Usually references to directory and file names are similar on all supported platforms, with simple transformations between the various forms. In these cases, Windows conventions are used. Where the details are more complex, the documentation shows all relevant forms.

These are the conventions used to simplify the documentation of directory and file names:

- **Uppercase and lowercase directory names** On Windows and Unix, directory and file names may contain uppercase and lowercase letters. When directories and files are created, the file system preserves letter case.

  On Windows, references to directories and files are *not* case sensitive. Mixed case directory and file names are common, but it is common to refer to them using all lowercase letters. The SQL Anywhere installation contains directories such as *Bin32* and *Documentation*.

  On Unix, references to directories and files *are* case sensitive. Mixed case directory and file names are not common. Most use all lowercase letters. The SQL Anywhere installation contains directories such as *bin32* and *documentation*.

  The documentation uses the Windows forms of directory names. You can usually convert a mixed case directory name to lowercase for the equivalent directory name on Unix.

- **Slashes separating directory and file names** The documentation uses backslashes as the directory separator. For example, the PDF form of the documentation is found in *install-dir\Documentation\en\PDF* (Windows form).

  On Unix, replace the backslash with the forward slash. The PDF documentation is found in *install-dir/documentation/en/pdf*.

- **Executable files** The documentation shows executable file names using Windows conventions, with a suffix such as *.exe* or *.bat*. On Unix, executable file names have no suffix.

  For example, on Windows, the network database server is *dbsrv12.exe*. On Unix, it is *dbsrv12*.

- ***install-dir*** During the installation process, you choose where to install SQL Anywhere. The environment variable SQLANY12 is created and refers to this location. The documentation refers to this location as *install-dir*.

  For example, the documentation may refer to the file *install-dir/readme.txt*. On Windows, this is equivalent to *%SQLANY12%\readme.txt*. On Unix, this is equivalent to *$SQLANY12/readme.txt* or *${SQLANY12}/readme.txt*.

  For more information about the default location of *install-dir*, see "SQLANY12 environment variable" [*SQL Anywhere Server - Database Administration*].

- ***samples-dir*** During the installation process, you choose where to install the samples included with SQL Anywhere. The environment variable SQLANYSAMP12 is created and refers to this location. The documentation refers to this location as *samples-dir*.

  To open a Windows Explorer window in *samples-dir*, choose **Start** » **Programs** » **SQL Anywhere 12** » **Sample Applications And Projects**.

  For more information about the default location of *samples-dir*, see "SQLANYSAMP12 environment variable" [*SQL Anywhere Server - Database Administration*].

Command prompts and command shell syntax

Most operating systems provide one or more methods of entering commands and parameters using a command shell or command prompt. Windows command prompts include Command Prompt (DOS prompt) and 4NT. Unix command shells include Korn shell and bash. Each shell has features that extend its capabilities beyond simple commands. These features are driven by special characters. The special characters and features vary from one shell to another. Incorrect use of these special characters often results in syntax errors or unexpected behavior.

The documentation provides command line examples in a generic form. If these examples contain characters that the shell considers special, the command may require modification for the specific shell. The modifications are beyond the scope of this documentation, but generally, use quotes around the parameters containing those characters or use an escape character before the special characters.

These are some examples of command line syntax that may vary between platforms:

- **Parentheses and curly braces** Some command line options require a parameter that accepts detailed value specifications in a list. The list is usually enclosed with parentheses or curly braces. The documentation uses parentheses. For example:

  ```
  -x tcpip(host=127.0.0.1)
  ```

  Where parentheses cause syntax problems, substitute curly braces:

  ```
  -x tcpip{host=127.0.0.1}
  ```

  If both forms result in syntax problems, the entire parameter should be enclosed in quotes as required by the shell:

  ```
  -x "tcpip(host=127.0.0.1)"
  ```

- **Semicolons** On Unix, semicolons should be enclosed in quotes.
- **Quotes** If you must specify quotes in a parameter value, the quotes may conflict with the traditional use of quotes to enclose the parameter. For example, to specify an encryption key whose value contains double-quotes, you might have to enclose the key in quotes and then escape the embedded quote:

  ```
  -ek "my \"secret\" key"
  ```

  In many shells, the value of the key would be `my "secret" key`.
- **Environment variables** The documentation refers to setting environment variables. In Windows shells, environment variables are specified using the syntax *%ENVVAR%*. In Unix shells, environment variables are specified using the syntax *$ENVVAR* or *${ENVVAR}*.

Contacting the documentation team

We would like to receive your opinions, suggestions, and feedback on this Help.

You can leave comments directly on help topics using DocCommentXchange. DocCommentXchange (DCX) is a community for accessing and discussing SQL Anywhere documentation. Use DocCommentXchange to:

- View documentation
- Check for clarifications users have made to sections of documentation
- Provide suggestions and corrections to improve documentation for all users in future releases

Go to http://dcx.sybase.com.

Finding out more and requesting technical support

Newsgroups

If you have questions or need help, you can post messages to the Sybase iAnywhere newsgroups listed below.

When you write to one of these newsgroups, always provide details about your problem, including the build number of your version of SQL Anywhere. You can find this information by running the following command: **dbeng12 -v**.

The newsgroups are located on the *forums.sybase.com* news server.

The newsgroups include the following:

- sybase.public.sqlanywhere.general
- sybase.public.sqlanywhere.linux
- sybase.public.sqlanywhere.mobilink
- sybase.public.sqlanywhere.product_futures_discussion
- sybase.public.sqlanywhere.replication
- sybase.public.sqlanywhere.ultralite
- ianywhere.public.sqlanywhere.qanywhere

For web development issues, see http://groups.google.com/group/sql-anywhere-web-development.

Newsgroup disclaimer
iAnywhere Solutions has no obligation to provide solutions, information, or ideas on its newsgroups, nor is iAnywhere Solutions obliged to provide anything other than a systems operator to monitor the service and ensure its operation and availability.

iAnywhere Technical Advisors, and other staff, assist on the newsgroup service when they have time. They offer their help on a volunteer basis and may not be available regularly to provide solutions and information. Their ability to help is based on their workload.

Developer Centers

The **SQL Anywhere Tech Corner** gives developers easy access to product technical documentation. You can browse technical white papers, FAQs, tech notes, downloads, techcasts and more to find answers to your questions as well as solutions to many common issues. See http://www.sybase.com/developer/library/sql-anywhere-techcorner.

The following table contains a list of the developer centers available for use on the SQL Anywhere Tech Corner:

Name	URL	Description
SQL Anywhere .NET Developer Center	www.sybase.com/developer/library/sql-anywhere-techcorner/microsoft-net	Get started and get answers to specific questions regarding SQL Anywhere and .NET development.
PHP Developer Center	www.sybase.com/developer/library/sql-anywhere-techcorner/php	An introduction to using the PHP (PHP Hypertext Preprocessor) scripting language to query your SQL Anywhere database.

Name	URL	Description
SQL Anywhere Windows Mobile Developer Center	www.sybase.com/developer/library/sql-anywhere-techcorner/windows-mobile	Get started and get answers to specific questions regarding SQL Anywhere and Windows Mobile development.

Introducing QAnywhere technology

QAnywhere helps you develop application-to-application messaging for mobile devices. Application-to-application messaging permits communication between custom programs running on mobile or wireless devices and a centrally-located server application.

Using store-and-forward technology, QAnywhere provides secure, assured message delivery for remote and mobile applications. Because QAnywhere automatically handles the challenges of slow and unreliable networks, you can concentrate on application functionality instead of issues surrounding connectivity, communication, and security. QAnywhere store-and-forward technology ensures that your applications are always available, even when a network connection is not.

QAnywhere provides communication in occasionally-connected environments. It handles the challenges of wireless networks, such as slow speed, spotty geographic coverage, and dropped network connections. The store-and-forward nature of QAnywhere messaging means that messages can be constructed even when the destination application is not reachable over the network; the message is delivered when the network becomes available.

QAnywhere messages are exchanged via a central server, so that the sender and recipient of a message never have to be connected to the network at the same time.

QAnywhere has the following additional features:

- QAnywhere can protect proprietary or sensitive information by encrypting all messages sent over public networks.
- You can customize the delivery of messages using transmission rules so that, for example, large low-priority messages are transmitted during off-peak hours.
- QAnywhere messages can be transported over TCP/IP, HTTP, or HTTPS protocols. They can also be delivered from a Windows Mobile handheld device by Microsoft ActiveSync. The message itself is independent of the network protocol, and can be received by an application that communicates over a different network.
- QAnywhere compresses data sent between mobile applications and enterprise servers.
- QAnywhere provides a C++, Java, .NET, and SQL API to provide solutions to developers with different skill sets.
- QAnywhere permits seamless communication with other messaging systems that have a JMS interface. This allows integration with Java EE applications.
- QAnywhere includes a mobile web services interface that helps you create reliable mobile applications based on enterprise web services.

QAnywhere is built on MobiLink synchronization technology.

What QAnywhere does

QAnywhere provides the following application-to-application features and components.

- **QAnywhere API** The object-oriented QAnywhere API provides the infrastructure to build messaging applications for Windows desktop and Windows Mobile devices. The QAnywhere API is available in Java, C++, .NET, and SQL.
- **Store-and-forward** QAnywhere applications store messages locally until a connection between the client and the server is available for data transmission.
- **Complements data synchronization** QAnywhere applications use relational databases as a temporary message store. The relational database ensures that the message store has security, transaction-based computing, and the other benefits of relational databases.

  The use of SQL Anywhere relational databases as message stores makes it easy to use QAnywhere together with a data synchronization solution. Both use MobiLink synchronization as the underlying mechanism for exchanging information between client and server.
- **Integration with external messaging systems** In addition to exchanging messages among QAnywhere applications, you can integrate QAnywhere clients into external messaging systems that support a JMS interface.
- **Encryption** Messages can be sent encrypted using transport-layer security. In addition, message stores can be encrypted using simple encryption or any FIPS-approved AES algorithm.
- **Compression** Message content can be stored compressed using the popular ZLIB compression library.
- **Authentication** You can authenticate QAnywhere clients using a built-in facility or through custom authentication scripts (including existing authentication services used in your organization).
- **Multiple networks** QAnywhere works over any wired or wireless network that supports TCP/IP or HTTP.
- **Failover** You can run multiple MobiLink servers so that there are alternate servers if one fails.
- **Administration** A QAnywhere application can browse and manipulate messages on the client and server side.
- **Multiple queues** Support for multiple arbitrarily-named queues on client devices permits multiple client applications to coexist on a single device. Applications can send and receive on any number of queues. Messages can be sent between applications that are coexisting on the same device and between applications on different devices.
- **Server-initiated send and receive** QAnywhere can push messages to client devices, allowing client applications to implement message-driven logic.
- **Transmission rules** You can create rules that specify when message transmission should occur.

- **Resumable downloads** Large messages or groups of messages are sent to QAnywhere clients in piecemeal fashion to minimize the retransmission of data during network failures.
- **Guaranteed delivery** QAnywhere guarantees the delivery of messages.
- **Mobile web services** Mobile web services help the transport of web service requests and responses over QAnywhere.

QAnywhere architecture

This section explains the architecture of QAnywhere messaging applications. The discussion begins with a simple messaging scenario and then progresses to more advanced scenarios.

Client applications send and receive messages using the QAnywhere API. Messages are queued in the client message store. Message transmission is the exchange of messages between client message stores through a central QAnywhere server message store.

The following typical messaging scenarios are supported by QAnywhere:

- **Local application-to-application messaging** For exchanging messages between applications using a SQL Anywhere database as the local message store. Messages are transmitted between applications via their connection to the database.

  See

  See "Simple messaging scenario" on page 5.

- **Simple client/server messaging** For exchanging messages among QAnywhere clients. Client applications control when to transmit messages between the client and server message stores.

  See "Simple messaging scenario" on page 5.

- **Client/server messaging with push notifications** For exchanging messages among QAnywhere clients. In this scenario, the MobiLink server can initiate message transmission between clients. This is done by exchanging messages between client and server message stores.

  See "Scenario for messaging with push notifications" on page 6.

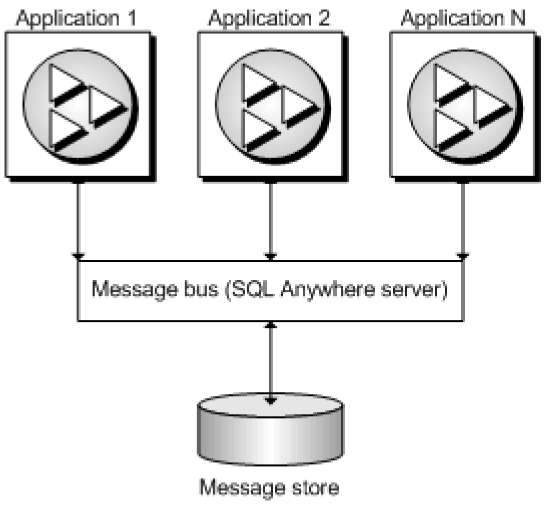
- **Client/server messaging with external messaging systems** For exchanging messages among QAnywhere clients over an external system that supplies a JMS provider, such as BEA WebLogic or Sybase EAServer.

  See "Scenario for messaging with external messaging systems" on page 7.

Push notifications and external messaging systems can be used together, providing the most general solution.

Application-to-application messaging scenario

Application-to-application messaging consists of applications transmitting messages via a SQL Anywhere database acting as a local message store. The messages are transmitted between applications through their connection to the database. The following diagram illustrates a typical scenario where two applications use a local message store to transmit messages between them.



This setup includes the following components:

- **Local message store** Messages are stored in the SQL Anywhere database. The database must be set up as a local message store.
- **QAnywhere Agent** The QAnywhere Agent manages the transmission of messages. This process is independent of QAnywhere applications.

  See "Starting the QAnywhere agent" on page 44.
- **QAnywhere application** An application written using the QAnywhere C++, Java, or .NET API makes method calls to send and receive messages. The basic object used by the client application is the QAManager.

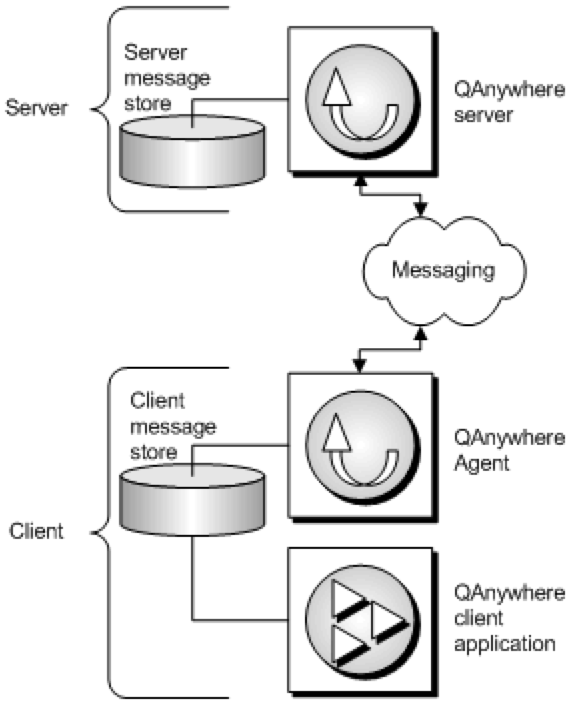
  See "Writing QAnywhere client applications" on page 49.

Messages are sent and received by QAnywhere applications connected to the SQL Anywhere database. Messages are not picked up until an application initiates a message transmission. QAnywhere applications use **policies** to determine when to perform a message transmission. Policies include on-demand, automatic, scheduled, and custom. The on-demand policy permits the user to control message transmission. The automatic policy initiates a message transmission whenever a message to or from the client is ready for delivery. The custom policy uses transmission rules to add further control over message transmission.

See .

Simple messaging scenario

A simple QAnywhere messaging setup is illustrated in the following diagram. For simplicity, only a single client is shown. However, a typical scenario has multiple clients with the server message store existing to transmit messages between them.



This setup includes the following components:

- **Server message store** At the server, the messages are stored in a relational database. The database must be set up as a MobiLink consolidated database, and may be any supported consolidated database.
- **Client message store** The messages at each client are stored in a relational database. QAnywhere supports SQL Anywhere and UltraLite databases. SQL Anywhere databases are recommended for data synchronization applications. UltraLite databases are recommended for applications used exclusively for storing and forwarding messages.
- **QAnywhere server** The QAnywhere server is a MobiLink server that is enabled for messaging. MobiLink synchronization provides the transport for transmitting and tracking messages between QAnywhere clients and the server. MobiLink provides security, authentication, encryption, and flexibility. It also allows messaging to be combined with data synchronization.

To start the QAnywhere server, start the MobiLink server with the -m option. See "Starting QAnywhere with MobiLink enabled" on page 29.

- **QAnywhere Agent** The QAnywhere Agent manages the transmission of messages on the client side. This process is independent of QAnywhere client applications.

  See "Starting the QAnywhere agent" on page 44.

- **QAnywhere client application** An application written using the QAnywhere C++, Java, or .NET API makes method calls to send and receive messages. The basic object used by the client application is the QAManager.

  See "Writing QAnywhere client applications" on page 49.

Messages are sent and received by QAnywhere clients. Messages at the server are not picked up until the client initiates a message transmission. QAnywhere clients use **policies** to determine when to perform a message transmission. Policies include on demand, automatic, scheduled, and custom. The on demand policy permits the user to control message transmission. The automatic policy initiates a message transmission whenever a message to or from the client is ready for delivery. The custom policy uses transmission rules to add further control over message transmission.

See "Determining when message transmission should occur on the client" on page 46.

Scenario for messaging with push notifications

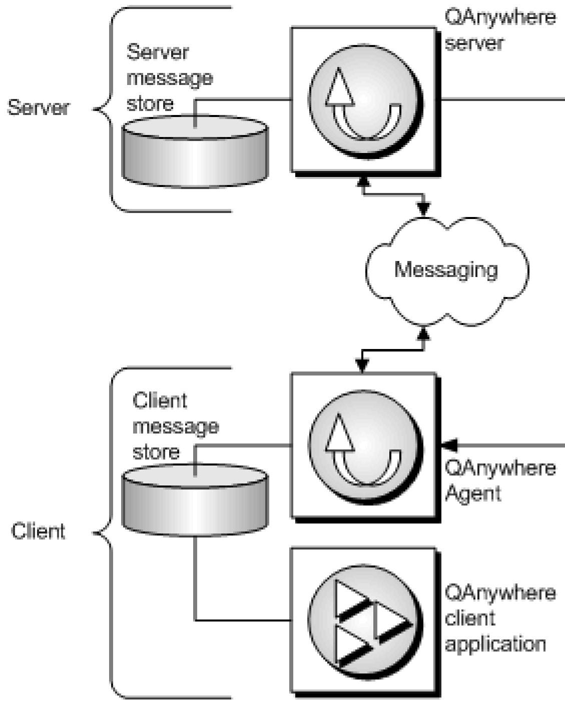
A push notification is a special message delivered from the server to a QAnywhere client. The push notification occurs when a message arrives at the server message store. The messaging server automatically notifies the recipient client Listener of the push request. The client initiates message transmission to receive messages waiting at the server or takes a custom action.

For more information about the client's response to a push notification, see "Determining when message transmission should occur on the client" on page 46.

Push notifications introduce two extra components to the QAnywhere architecture. At the server, a QAnywhere Notifier sends push notifications. At the client, a QAnywhere Listener receives these push notifications and passes them on to the QAnywhere Agent.

If you do not use push notifications, messages are still transmitted from the server message store to the client message store, but the transmission must be initiated at the client, such as by using a scheduled transmission policy.

The architecture for messaging with push notifications is an extension of that described in "Simple messaging scenario" on page 5. The following diagram shows this architecture:



The following components are added to the simple messaging scenario to enable push notification:

- **QAnywhere Notifier** The Notifier is the component of the MobiLink server that is used to deliver push notifications.

  The QAnywhere Notifier is a specially configured instance of the Notifier that sends push notifications when a message is ready for delivery.

- **Listener** The Listener is a separate process that runs at the client. It receives push notifications and passes them on to the QAnywhere Agent. QAnywhere Agent policies determine if push notifications automatically cause message transmission.

  See "Determining when message transmission should occur on the client" on page 46.

See also

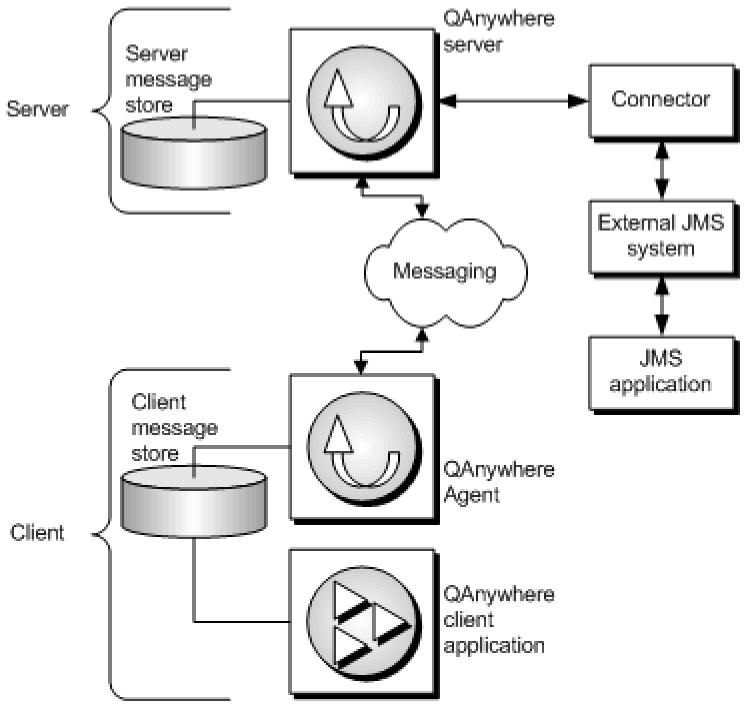
- "Using push notifications" on page 32
- "Receiving messages asynchronously" on page 70
- "Introduction to server-initiated synchronization" [*MobiLink - Server-Initiated Synchronization*]

Scenario for messaging with external messaging systems

In addition to exchanging messages among QAnywhere applications, you can exchange messages with systems that have a JMS interface using a specially configured client known as a connector. JMS is the Java Message Service API for adding messaging capabilities to Java applications.

The external messaging system is set up to act like a special client. It has its own address and configuration.

The architecture for messaging with external messaging systems is an extension of the architecture described in "Simple messaging scenario" on page 5. The following diagram shows this architecture:



The component that is added to the simple messaging scenario to enable messaging with an external messaging system is as follows:

- **QAnywhere JMS Connector** The JMS Connector provides an interface between QAnywhere and the external messaging system.

  The JMS Connector is a special QAnywhere client that moves messages between QAnywhere and the external JMS system.

See also

- "Connectors" on page 129
- "Tutorial: Using JMS connectors" on page 140

QAnywhere message delivery

Messages are sent from a client message store to a server message store, and then on to another client message store. QAnywhere does this via queues: a message is put on a queue in the client message store; when it is received by the server message store, it is put on a queue for delivery to one or more client message stores; and when it is received by a client message store, it is put on a queue for pickup.

Once a message is sent, it gets delivered unless one of the following occurs:

- The message expires (only if an expiration is specified).
- The message is canceled via Sybase Central or via the cancelMessage API call.
- The device from which the message is sent is lost irretrievably before it can synchronize with the server message store (or for some other reason, synchronization is impossible).

A message does not get delivered more than once. If an application successfully acknowledges or commits the receipt of a message, then the same message is not delivered again. There is a possible exception with JMS servers: in the event of the MobiLink server or JMS server crashing, there is a possibility that a message could get delivered twice.

Deciding between SQL Anywhere and UltraLite

QAnywhere client applications can now use an UltraLite database as the client message store. This provides a lighter-weight solution for pure messaging applications on mobile devices. A pure messaging application means an application that uses store and forward messaging, but not data synchronization.

Some of the key advantages of UltraLite are:

- It has a smaller application footprint and does not require full SQL Anywhere installation.
- It has a smaller process footprint. QAnywhere Agent requires only 3 processes instead of 4 (uleng12, dblsn, and qauagent instead of dbeng12, dbmlsync, dblsn, and qaagent).

UltraLite limitations

Keep in mind the following limitations of UltraLite when deciding between SQL Anywhere and UltraLite:

- There is no support for "ESCAPE" keyword in transmission rule condition syntax.
- There is limited support for property attributes. You can only use property attribute functionality with the predefined property ias_Network. See “Custom client message store properties” on page 719.

Recommendation

UltraLite should always be used instead of SQL Anywhere when SQL Anywhere is not already installed. SQL Anywhere is available for circumstances where you want to add messaging along side an already implemented SQL Anywhere data synchronization solution. However, UltraLite is recommended in all pure messaging environments.

QAnywhere 12 plug-in

The Sybase Central QAnywhere 12 plug-in helps you create and administer your QAnywhere application. With the plug-in, you can:

- Create client and server message stores.

- Create and maintain configuration files for the QAnywhere Agent.
- Browse QAnywhere Agent log files.
- Create or modify destination aliases.
- Create JMS connectors and web service connectors.
- Create and maintain transmission rules files.
- Browse message stores remotely.
- Track messages.

To start the QAnywhere 12 plug-in

1. Start Sybase Central:

   Choose **Start** » **Programs** » **SQL Anywhere 12** » **Administration Tools** » **Sybase Central**.

2. Choose **Connections** » **Connect With QAnywhere 12**.
3. Specify an **ODBC Data Source Name** or **ODBC Data Source File**, and the **User ID** and **Password** if required.
4. Click **OK**.

Quick start to QAnywhere

The following steps provide an overview of the tasks required to set up and run QAnywhere messaging.

To set up and run QAnywhere messaging

1. Set up a local application-to-application message store.

   See

   OR

   Set up a server message store or use an existing MobiLink consolidated database.

   See "Setting up the server message store" on page 22.

2. Start the MobiLink server with the -m option and a connection to the server message store.

   See "Starting QAnywhere with MobiLink enabled" on page 29.

3. Set up client message stores. These are SQL Anywhere or UltraLite databases that are used to temporarily store messages.

See “Setting up the client message store” on page 23.

4. For each client, write a messaging application.

   See “Writing QAnywhere client applications” on page 49.

5. If you want to integrate with an external JMS messaging system, set up JMS messaging for QAnywhere.

   See “Connectors” on page 129.

6. For each client, start the QAnywhere Agent with a connection to the local client message store.

   See “Starting the QAnywhere agent” on page 44.

For information about setting up mobile web services, see “Mobile web services” on page 91.

Other resources for getting started

- “Tutorial: Exploring TestMessage” on page 169
- “Tutorial: Using JMS connectors” on page 140
- Sample applications are installed to *samples-dir**QAnywhere*. (For information about *samples-dir*, see “Samples directory” [*SQL Anywhere Server - Database Administration*].)
- You can post questions on the QAnywhere newsgroup: ianywhere.public.sqlanywhere.qanywhere

QAnywhere messages

QAnywhere messages consist of the following parts:

- headers
- properties
- content

Message properties can be referenced in transmission rules and delete rules or in your application.

The following sections describe message headers and properties, and how you can set them in QAnywhere messages.

Notes

- Message headers, message properties, and message content cannot be altered after the message is sent.
- You can read message headers, message properties, and message content after a message is received. If you are using the QAnywhere SQL API, these become unreadable after a commit or rollback occurs.
- The content is unreadable after acknowledgement or commit in all APIs.

Message headers

All QAnywhere messages support the same set of header fields. Header fields contain values that are used by both clients and providers to identify and route messages. How you use the headers depends on the type of client application you have.

QAnywhere supports the following predefined message headers:

- Message ID
- Message creation timestamp
- Reply-to address
- Message address
- Redelivered state of message
- Expiration of message
- Priority of message
- Message ID of a message for which this message is a reply

For details about message headers, see "Message headers" on page 656.

Message properties

Each message contains a built-in facility for supporting application-defined property values. These message properties allow you to implement application-defined message filtering.

Message properties are name-value pairs that you can optionally insert into messages to provide structure. For example, in the .NET API the predefined message property ias_Originator, identified by the constant

MessageProperties.ORIGINATOR, provides the message store ID that sent the message. Message properties can be used in transmission rules to determine the suitability of a message for transmission.

There are two types of message property:

- **Predefined message properties** These message properties are always prefixed with ias_ or IAS_. See "Predefined message properties" on page 659.
- **Custom message properties** These are message properties that you defined. You cannot prefix them with ias_ or IAS_. See "Custom message properties" on page 661.

In either case, you access message store properties using get and set methods and pass the name of the predefined or custom property as the first parameter. See "Managing message properties" on page 662.

Predefined message properties

Some message properties have been predefined for your convenience. Predefined properties can be read but should not be set. The predefined message properties are:

- ias_Adapters
- ias_DeliveryCount
- ias_MessageType
- ias_RASNames
- ias_NetworkStatus
- ias_Originator
- ias_Status
- ias_StatusTime

For details about message properties, see "Message properties" on page 659.

Understanding destinations

With QAnywhere, messages are addressed to a destination. A destination always consists of an identifier and a queue name, separated by a backslash (\). For example:

```
ianywhere.connector.tibco\SomeQueue
 DEV007\app_queue1
 SalesTeam\queue1
```

The meaning of the identifier before the backslash depends on whether the message is addressed to a JMS application, destination alias, or a mobile application.

The first example illustrates the case where the message is addressed to a JMS application. In this case the identifier is the ID of a JMS connector running in the MobiLink server. See "JMS connectors" on page 129.

The second example illustrates the case where the message is addressed to a mobile application. In this case, the identifier is a message store ID of a QAnywhere message store. See "Setting up the client message store" on page 23 and "-id qaagent option" on page 679.

The third example illustrates the case where the message is addressed to a destination alias. In this case, the identifier is a destination alias name. See "Destination aliases" on page 127.

The queue name in a destination refers to a queue defined in the JMS system when the identifier is a JMS connector ID, and refers to a QAnywhere application queue when the identifier is either a message store ID or a destination alias.

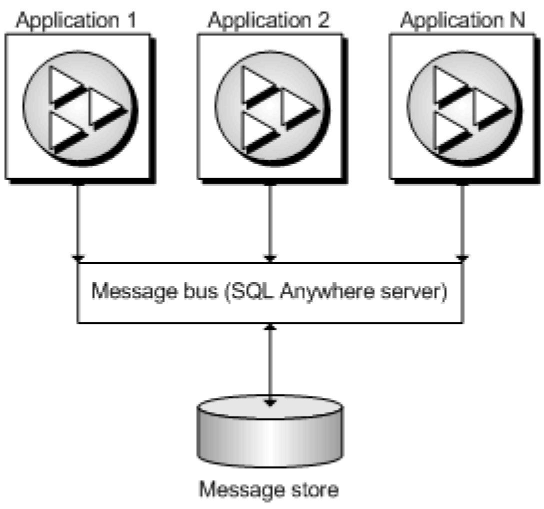
Note
QAnywhere destinations should always be specified using EN characters.

For more information on destinations and sending QAnywhere messages, see:

- "Sending QAnywhere messages" on page 61
- "Determining when message transmission should occur on the client" on page 46

QAnywhere message stores

A QAnywhere message store is a repository where message are temporarily stored. Messages can be temporarily stored on the server in a **server message store**, on the client in a **client message store**, or on the server in an **archive message store**, where they can be saved for a specified period of time.



For more information on message stores, see:

- "Server message stores" on page 21
- "Client message stores" on page 23

Local message stores

In a local message store configuration, applications are connected to a SQL Anywhere database acting as a local message bus and messages are transmitted between applications via their connection to the database.

Setting up the local message store

The local message store requires that you install QAnywhere. QAnywhere is located under the Synchronization and Messaging feature in the SQL Anywhere install program. In order to enable messaging in your SQL Anywhere database, you must install the QAnywhere schema into your SQL Anywhere database so that it can be used as a local message store. This is accomplished using the **-sil** option of the QAnywhere Agent for SQL Anywhere. The **-sil** option instructs the Agent to initialize the database as a local message store. The agent is simply used to initialize a local message store and is not needed any further. All QAnywhere objects created in the database belong to the **ml_qa_message_group** owner. Once your SQL Anywhere database has been initialized as a local message store, applications can use the QAnywhere client API to exchange messages.

To create a local message store (.NET example)

1. Create a SQL Anywhere database. You can omit this step if you are going to use an existing SQL Anywhere database.

   ```
   dbinit localmsgstore.db
   ```

2. Install the QAnywhere schema into the SQL Anywhere database so that it can be used as a local message bus:

   ```
   qaagent -sil -c "dbf=localmsgstore.db;uid=dba;pwd=sql"
   ```

3. Create a sender application to put messages in the message store. For information on using the .NET version of the QAnywhere client API, see "QAnywhere .NET API reference for clients" on page 179.

   ```
   using System;
   using System.IO;
   using iAnywhere.QAnywhere.Client;
   namespace sender
   {
   class sender
       {
           public static void Main() {
               try {
                   // QAnywhere initialization
                   QAManager mgr =
   QAManagerFactory.Instance.CreateQAManager();
                   // Be sure to set the DATABASE_TYPE property
                   mgr.SetProperty( "DATABASE_TYPE", "sqlanywhere" );
                   mgr.SetProperty( "CONNECT_PARAMS",
   "dbf=localmsgstore.db;uid=dba;pwd=sql" );
                   mgr.Open( AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT );
                   mgr.Start();
                   // Create a text message
                   QATextMessage msg = mgr.CreateTextMessage();
                   msg.Text = "Sample text";
                   // Queue the message
                   mgr.PutMessage( "dbqueue", msg );
                   // QAnywhere finalization
                   mgr.Stop();
                   mgr.Close();
                   } catch( Exception exc ) {
                   Console.WriteLine( exc.Message );
               }
           }
       }
   }
   ```

4. Compile the program using the following command line. You must have Visual Studio installed on your machine.

   ```
   csc /reference:"%SQLANY12%\Assembly\v2\iAnywhere.QAnywhere.Client.dll"
   sender.cs
   ```

5. Create a receiver application to retrieve messages from the message store. For information on using the .NET version of the QAnywhere client API, see "QAnywhere .NET API reference for clients" on page 179.

   ```
   using System;
   using System.IO;
   ```

```
using iAnywhere.QAnywhere.Client;
namespace receiver
{
class receiver
{
public static void Main() {
try {
// QAnywhere initialization
QAManager mgr = QAManagerFactory.Instance.CreateQAManager();
// Be sure to set the DATABASE_TYPE property
mgr.SetProperty( "DATABASE_TYPE", "sqlanywhere" );
mgr.SetProperty( "CONNECT_PARAMS",
"dbf=localmsgstore.db;uid=dba;pwd=sql" );
mgr.Open( AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT );
mgr.Start();
// Get the message
QATextMessage msg = (QATextMessage)mgr.GetMessage( "dbqueue" );
// Display the text
Console.WriteLine( msg.Text );
// QAnywhere finalization
mgr.Stop();
mgr.Close();
} catch( Exception exc ) {
Console.WriteLine( exc.Message );
}
}
}
}
```

6. Compile the program using the following command line. You must have Visual Studio installed on your machine.

   ```
   csc /reference:"%SQLANY12%\Assembly\v2\iAnywhere.QAnywhere.Client.dll"
   receiver.cs
   ```

7. Start the SQL Anywhere database:

   ```
   dbsrv12 localmsgstore.db
   ```

8. Run the sender application:

   ```
   sender
   ```

9. Run the receiver application:

   ```
   receiver
   ```

   The string *"Sample Text"* is displayed.

To create a local message store (Java example)

1. Create a SQL Anywhere database. You can omit this step if you are going to use an existing SQL Anywhere database.

   ```
   dbinit localmsgstore.db
   ```

2. Install the QAnywhere schema into the SQL Anywhere database so that it can be used as a message bus.

   ```
   qaagent -sil -c "dbf=localmsgstore.db;uid=dba;pwd=sql"
   ```

3. Create a sender application to put messages in the message store. For information on using the .NET version of the QAnywhere client API, see "QAnywhere Java API reference for clients" on page 467.

```
import java.util.*;
import ianywhere.qanywhere.client.*;
public class sender
{
public static void main( Strings [] args ) {
try {
// QAnywhere initialization
QAManager mgr = QAManagerFactory.getInstance().createQAManager();
// Be sure to specify the DATABASE_TYPE
mgr.setProperty( "DATABASE_TYPE", "sqlanywhere" );
mgr.setProperty( "CONNECT_PARAMS",
"dbf=localmsgstore.db;uid=dba;pwd=sql" );
mgr.open( AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT );
mgr.start();
// Create a text message
QATextMessage msg = mgr.createTextMessage();
msg.setText( "Sample text" );
// Queue the message
mgr.putMessage( "dbqueue", msg );
// QAnywhere finalization
mgr.stop();
mgr.close();
} catch( Exception exc ) {
System.out.println( exc.getMessage() );
}
}
}
```

4. Compile the program using the following command line. You must have the Java JDK installed on your machine.

```
javac  -cp "%SQLANY12%\java\qaclient.jar" sender.java
```

5. Create a receiver application to retrieve messages from the message store. For information on using the Java version of the QAnywhere client API, see "QAnywhere Java API reference for clients" on page 467.

```
import java.util.*;
import ianywhere.qanywhere.client.*;
public class receiver
{
public static void main( Strings [] args ) {
try {
// QAnywhere initialization
QAManager mgr = QAManagerFactory.getInstance().createQAManager();
// Be sure to set the DATABASE_TYPE property.
mgr.setProperty( "DATABASE_TYPE", "sqlanywhere" );
mgr.setProperty( "CONNECT_PARAMS",
"dbf=localmsgstore.db;uid=dba;pwd=sql" );
mgr.open( AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT );
mgr.start();
// Get the message
QATextMessage msg = (QATextMessage)mgr.getMessage( "dbqueue" );
// Display the text
System.out.println( msg.getText() );
// QAnywhere finalization
mgr.stop();
mgr.close();
} catch( Exception exc ) {
System.out.println( exc.getMessage() );
}
}
}
```

6. Compile the program using the following command line. You must have the Java JDK installed on your machine.

   ```
   javac -cp "%SQLANY12%\java\qaclient.jar" receiver.java
   ```

7. Start the SQL Anywhere database:

   ```
   dbsrv12 localmsgstore.db
   ```

8. Run the sender application:

   ```
   java -cp ".\;%SQLANY12%\java\qaclient.jar;%SQLANY12%\java\jodbc.jar"
   sender
   ```

9. Run the receiver application:

   ```
   java -cp ".\;%SQLANY12%\java\qaclient.jar;%SQLANY12%\java\jodbc.jar"
   receiver
   ```

   The string *"Sample Text"* is displayed.

Cleaning the message store By default, messages that have reached a final state remain in the message store. After a period of use, messages accumulate causing your database to grow. When you initialized your database for use as a message bus, a stored procedure called **ml_qa_clearreceivedmessages** was created. This stored procedure will delete messages that have reached a final state from the message store. A convenient way to manage the growth of messages in your database is to create a database event that, when triggered, invokes the **ml_qa_clearreceivedmesssages** stored procedure. For example, the following database event causes messages in a final state to be deleted every day at midnight:

```
CREATE EVENT message_cleanup
SCHEDULE
START TIME '12:00AM' EVERY 24 HOURS
HANDLER begin call ml_qa_message_group.ml_qa_clearreceivedmessages() end
```

Viewing Messages Use Sybase Central to view messages in your SQL Anywhere database by connecting to a client store using the QAnywhere Plug-in.

Server message stores

The server message store is a relational database on the server that temporarily stores messages until they are transmitted to a client message store, web service or JMS system. Messages are exchanged between clients via the server message store.

A server message store is a MobiLink consolidated database and can be any RDBMS that MobiLink supports, with the exception of MySQL. You can create a new database for this purpose, or use an existing database.

Setting up the server message store

When setting up the server message store, an archive message store is created. The archive message store is a set of tables that coexist with the server message store, and stores all messages waiting to be deleted. A regularly executed system process transports messages between the message stores by removing all messages in the server message store that have reached a final state and then inserting them into the archive message store. Messages remain in the archive message store until deleted by a server delete rule. Usage of the archive message store improves the performance of the server message store by minimizing the amount of messages that need to be filtered during synchronization. See “Archive message store requests” on page 147.

To set up a database to use as a server message store, you run a setup script. The consolidated database should be configured for case insensitive comparisons and string operations. If you use the **Create Synchronization Model Wizard** to create your consolidated database, the setup is done for you.

See “Setting up a consolidated database” [*MobiLink - Server Administration*].

For information about creating SQL Anywhere databases, see “Initialization utility (dbinit)” [*SQL Anywhere Server - Database Administration*].

If you are using a SQL Anywhere database that was created before version 10.0.0, it must be upgraded.

For information about upgrading your database, see “Upgrading to SQL Anywhere 12” [*SQL Anywhere 12 - Changes and Upgrading*].

Note
The easiest way to create and maintain your server message store is in Sybase Central. From the QAnywhere 12 plug-in task pane, choose **Server Message Store**.

Example

To create a SQL Anywhere database called *qanytest.db*, run the following command:

```
dbinit -s qanytest.db
```

Run the MobiLink setup script on the database:

```
%SQLANY12%\MobiLink\setup\syncsa.sql
```

This database is ready to use as a server message store.

Introduction to Server Management Requests

A QAnywhere client application can send special messages to the server called **server management requests**. These messages contain content that is formatted as XML and are addressed to the QAnywhere system queue. They require a special authentication string. Server management requests can perform a variety of functions, such as querying for active clients, querying message store properties, and querying messages.

For details about the functions you can perform with server management requests and how to use them, see "Writing server management requests" on page 146.

Client message stores

The client message store can be a SQL Anywhere or UltraLite database on the remote device. SQL Anywhere databases are recommended for data synchronization applications. UltraLite databases are recommended for applications used exclusively for storing and forwarding messages. The application connects to this message store using the QAnywhere API. When using an UltraLite database as a client message store, the QAnywhere API accesses the store using the UltraLite Engine, and not the in-process UltraLite runtime.

The client message store must be used exclusively for QAnywhere applications. The QAnywhere message store database should not be accessed by any application other than QAnywhere applications using the QAnywhere API. However, you can run another database within the database server. This is useful if you have a QAnywhere client message store and a MobiLink synchronization client running on the same device.

Using a relational database as a message store provides a secure and high-performance store.

See "Creating a secure client message store" on page 117.

Setting up the client message store

To create a client message store

1. Create a SQL Anywhere or UltraLite database.

   See "Creating a SQL Anywhere database" [*SQL Anywhere Server - Database Administration*].

2. Initialize each client message store by running the QAnywhere Agent or the QAnywhere UltraLite Agent with the following options:

   - **-c option** to specify a connection string to the database you just created.

     See "-c qaagent option" on page 676.

   - **-si option** to initialize the database. The -si option creates a default database user and password. The agent shuts down after initializing the database.

     When you initialize QAnywhere by running qaagent with the -si option, the QAnywhere Agent creates client system tables that are required for QAnywhere messaging. QAnywhere also uses server system tables. These are created when you install MobiLink setup. All QAnywhere system table names begin ml_qa_ and cannot be altered.

     See "-si qaagent option" on page 690.

   - **-id option** optionally, if you want to pre-assign a client message store ID.

See "Creating client message store IDs" on page 24 and "-id qaagent option" on page 679.

- **-mu option** optionally, if you want to create a user name to use for authentication with the MobiLink server. If you do not use -mu at this point, you can specify it any time you start the QAnywhere Agent and the name is created if it does not already exist.

3. If you used the -mu option to create a user name, you need to add the name to the server message store. This can be done automatically using the mlsrv12 -zu+ option, or can be done in other ways.

   See "Registering QAnywhere client user names" on page 30.

4. Change the default passwords and take other steps to ensure that the client message store is secure.

   See "Creating a secure client message store" on page 117.

You can also upgrade a client message store that was created in a previous version of QAnywhere.

See "-su qaagent option" on page 692 and "-sur qaagent option" on page 693.

Note
The easiest way to create and maintain your client message store is in Sybase Central. From the QAnywhere 12 plug-in task pane, choose **Client Message Store**.

Creating client message store IDs

If you do not specify a client message store ID, then the first time you run qaagent after you run qaagent with -si, the device name is assigned as the client message store ID. The ID appears in the QAnywhere Agent window.

You may find it convenient to specify an ID manually. You can do so in the following ways:

- Specify the ID with the qaagent -id option when you use the qaagent -si option to initialize the client message store.
- Specify the ID with the -id option the first time you run qaagent after you initialize the client message store.

See "QAnywhere Agent utilities reference" on page 673.

Client message store IDs must differ by more than case. For example, don't have two message store IDs called AAA and aaa.

The client message store ID has a limit of 128 characters.

Transaction logs

It is recommended that you use a transaction log, both because a SQL Anywhere database runs most efficiently when using one and because transaction logs provide protection if there is database failure. However, the transaction log can grow very large. For this reason, the QAnywhere Agent by default sets the dbsrv12 -m option, which causes the contents of the transaction log to be deleted at checkpoints. This is recommended. If you specify the StartLine parameter in the qaagent -c option, you should specify -m.

Protecting your client message stores

For information about backup and recovery, see “Designing a backup and recovery plan” [*SQL Anywhere Server - Database Administration*].

Example of creating a client message store

The following command creates a SQL Anywhere database called qanyclient.db. (The dbinit -i and -s options are not required, but are good practice on small devices.)

```
dbinit -i -s qanyclient.db
```

The following command connects to *qanyclient.db* and initializes it as a QAnywhere client database:

```
qaagent -si -c "DBF=qanyclient.db"
```

See “Initialization utility (dbinit)” [*SQL Anywhere Server - Database Administration*] and “QAnywhere Agent utilities reference” on page 673.

SQL Anywhere and UltraLite client differences

QAnywhere client applications can now use an UltraLite database as the client message store. This provides a lighter-weight solution for pure messaging applications on mobile devices. A pure messaging application means an application that uses store and forward messaging, but not data synchronization.

Some of the key advantages of UltraLite are:

- It has a smaller application footprint and does not require full SQL Anywhere installation.
- It has a smaller process footprint. QAnywhere Agent requires only 3 processes instead of 4 (uleng12, dblsn, and qauagent instead of dbeng12, dbmlsync, dblsn, and qaagent).

Keep in mind the following limitations of UltraLite when deciding between SQL Anywhere and UltraLite:

- There is no support for "ESCAPE" keyword in transmission rule condition syntax.
- There is limited support for property attributes. You can only use property attribute functionality with the predefined property ias_Network. See “Custom client message store properties” on page 719.

UltraLite should always be used rather than SQL Anywhere when SQL Anywhere is not already installed. SQL Anywhere is available for circumstances where you want to add messaging along side an already implemented SQL Anywhere data synchronization solution. However, UltraLite is recommended in all pure messaging environments.

From an application perspective, the client API remains the same for UltraLite as for SQL Anywhere with the following exception: the QAManager configuration properties should include the setting DATABASE_TYPE=UltraLite for UltraLite message stores. If the property DATABASE_TYPE is not set, the default is SQLAnywhere.

The client APIs supported for UltraLite are C# (for Microsoft .NET) and Java. For UltraLite, the C++ and SQL APIs are not supported.

The other difference from an application perspective is that the QAnywhere Agent for UltraLite is qauagent.exe. The QAnywhere Agent for UltraLite supports many of the same options as the QAnywhere Agent, with the following exceptions:

- -sv is not applicable to UltraLite
- -pc[+|-] is not supported by qauagent
- -sur is not applicable to UltraLite
- -c connection parameters are restricted to those documented in "UltraLite connection parameters" [*UltraLite - Database Management and Reference*]

In general, transmission rules are fully supported by the QAnywhere Agent for UltraLite. The one limitation is the support for Property attributes. Transmission rules can only use the following attributes of the predefined property ias_Network:

- ias_Network.Cost
- ias_Network.CommunicationAddress
- ias_Network.CommunicationType

See also

- "Custom client message store properties" on page 719
- "qauagent utility" on page 696

Client message store properties

There are two types of client message store property:

- **Predefined message store properties** These message store properties are always prefixed with ias_ or IAS_.

- **Custom message store properties** These are message store properties that you define. You cannot prefix them with ias_ or IAS_.

You can access client message store properties using the get and set methods defined in the appropriate class and pass the name of the predefined or custom property as the first parameter.

See "Managing client message store properties" on page 125.

You can also use message store properties in transmission rules, delete rules, and message selectors. See:

- "QAnywhere transmission and delete rules" on page 733

Predefined client message store properties

Several client message store properties have been predefined for your convenience. The predefined message store properties are:

- ias_Adapters
- ias_MaxDeliveryAttempts
- ias_MaxDownloadSize
- ias_MaxUploadSize
- ias_Network
- ias_Network.Adapter
- ias_Network.RAS
- ias_Network.IP
- ias_Network.MAC
- ias_RASNames
- ias_StoreID
- ias_StoreInitialized
- ias_StoreVersion

For details about client message store predefined properties, see:

- “Predefined client message store properties” on page 718

Custom client message store properties

QAnywhere allows you to define your own client message store properties using the QAnywhere C++, Java, SQL or .NET APIs. These properties are shared between applications connected to the same message store. They are also synchronized to the server message store so that they are available to server-side transmission rules for this client.

Client message store property names are case insensitive. You can use a sequence of letters, digits, and underscores, but the first character must be a letter. The following names are reserved and may not be used as message store property names:

- NULL
- TRUE
- FALSE
- NOT
- AND
- OR
- BETWEEN
- LIKE
- IN
- IS
- ESCAPE (SQL Anywhere message stores only)
- Any name beginning with **ias_**

Client message store properties can have attributes that you define. An attribute is defined by appending a dot after the property name followed by the attribute name. The main use of this feature is to be able to use information about your network in your transmission rules.

Limited support is provided for property attributes when using UltraLite as a client message store. UltraLite message stores only support the predefined ias_Network property.

For more details about using customer client message store properties, see:

- “Using custom client message store property attributes” on page 719
- “Predefined client message store properties” on page 718

Setting up QAnywhere messaging

The following sections describe how to set up QAnywhere messaging on the client and server, how to use pus notifications, and how to set up a failover mechanism.

Setting up server-side components

Overview of setting up QAnywhere server-side components

1. Set up a server message store and start it. This can be any MobiLink consolidated database.

   See "Setting up the server message store" on page 22.

2. Start mlsrv12 with the -m option and a connection to the server message store.

   See "Starting QAnywhere with MobiLink enabled" on page 29.

3. Add client user names to the server message store.

   See "Registering QAnywhere client user names" on page 30.

Note
The easiest way to create and maintain your server message store is in Sybase Central. From the QAnywhere 12 plug-in task pane, choose **Server Message Store**.

Starting QAnywhere with MobiLink enabled

QAnywhere uses MobiLink synchronization to transport messages. The QAnywhere server is a MobiLink server with messaging enabled. See "Setting up a consolidated database" [*MobiLink - Server Administration*].

To run the QAnywhere server, start the MobiLink server (mlsrv12) with the following options:

- **-c *connection-string*** Specifies the connection string to connect to the server message store. This is a required mlsrv12 option.

  See "-c mlsrv12 option" [*MobiLink - Server Administration*].

- **-m** Enables QAnywhere messaging.

  See "-m mlsrv12 option" [*MobiLink - Server Administration*].

You can also use other MobiLink server options to customize your operations. For more information, see "mlsrv12 syntax" [*MobiLink - Server Administration*].

Note
If you are integrating with a JMS messaging system, there are other options you must specify when you start the MobiLink server.

See "Starting the MobiLink server for JMS integration" on page 131.

Example

To start QAnywhere messaging when you are using the sample server message store (*samples-dir \QAnywhere\server\qanyserv.db*), run the following command:

```
mlsrv12 -m -c "dsn=QAnywhere 12 Demo"
```

The QAnywhere sample server message store uses the following ODBC data source: **QAnywhere 12 Demo**.

Note
For information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database Administration*].

Registering QAnywhere client user names

Each QAnywhere client message store has a unique ID that identifies it. In addition, the client message store has a MobiLink user name that you can optionally use to authenticate your client message store with the MobiLink server. You can specify a MobiLink user name with the qaagent -mu option, or if you do not, one is created with the same name as your client message store ID.

You must register the MobiLink user name with the server message store. There are several methods for doing this:

- Use the mluser utility.

  See "MobiLink user authentication utility (mluser)" [*MobiLink - Server Administration*].

- Use the MobiLink 12 plug-in Sybase Central.

- Specify the -zu+ option with mlsrv12. In this case, any existing MobiLink users that have not been added to the consolidated database are added when they first synchronize. This is useful during development, but is not recommended for production environments.

  See "-zu mlsrv12 option" [*MobiLink - Server Administration*].

For more information about MobiLink user names, see "Introduction to MobiLink users" [*MobiLink - Client Administration*].

For more information about client message store IDs, see "-id qaagent option" on page 679.

Setting properties for clients on the QAnywhere server

As a convenience, you can use the QAnywhere 12 plug-in to set properties for QAnywhere clients on the QAnywhere server. When you do this, you need to add the client to the server. The first time you synchronize to the client, the properties are downloaded.

To add a client user name using Sybase Central

1. Start Sybase Central:
   a. Choose **Start** » **Programs** » **SQL Anywhere 12** » **Administration Tools** » **Sybase Central**.
   b. Choose **Connections** » **Connect With QAnywhere 12**.
   c. Specify an **ODBC Data Source Name** or **ODBC Data Source File**, and the **User ID** and **Password** if required. Click **OK**.
2. Choose **File** » **New** » **Client**.
3. Type the name of the client.
4. Click **OK**.

See also

- "Registering QAnywhere client user names" on page 30

Logging the QAnywhere server

The QAnywhere server is a MobiLink server with messaging enabled. The QAnywhere server log files are MobiLink log files.

For information about MobiLink log files, see "Logging MobiLink server actions" [*MobiLink - Server Administration*].

MobiLink server Log File Viewer

To view log files for the QAnywhere server, open Sybase Central and choose **Tools** » **QAnywhere 12** » **MobiLink server Log File Viewer**. You are prompted to choose a log file to view.

The Log Viewer reads information that is stored in MobiLink log files. It does not connect to the MobiLink server or change the composition of log files.

The Log Viewer allows you to filter the information that you view. In addition, it provides statistics based on the information in the log.

Using the Relay Server

To use a Relay Server for communication with the MobiLink server, configure the QAnywhere Agent to use HTTP or HTTPS as the network protocol.

For example:

```
qaagent -c
"dbf=mystore.db;server=mystore;dbn=mystore;uid=ml_qa_user;pwd=qanywhere"
     -x http(host=webserver01;port=80;url_suffix=/rs/client/rs_client.dll/
FarmName)
```

See also

- "Introduction to the Relay Server" [*Relay Server*]
- "Running the MobiLink server in a server farm" [*MobiLink - Server Administration*]

Setting up client-side components

Overview of setting up client-side components

1. Create a SQL Anywhere database and initialize it as a client message store.

   See "Setting up the client message store" on page 23.

2. Write client applications.

   See "Writing QAnywhere client applications" on page 49.

3. Start the QAnywhere Agent.

   See "Starting the QAnywhere agent" on page 44.

Note
The easiest way to create and maintain your client message store is in Sybase Central. From the QAnywhere 12 plug-in task pane, choose **Client Message Store**.

Using push notifications

A push notification is a special message delivered from the server message store to a QAnywhere client that prompts the client to initiate a message transmission. Push notification is on by default but is optional. Push notifications introduce extra components to the QAnywhere architecture:

- At the server, a QAnywhere Notifier sends push notifications.
- At the client, a QAnywhere Listener receives these push notifications and passes them on to the QAnywhere Agent.
- At the client, a notification of each push notification is sent to the system queue.

If you use the scheduled or automatic QAnywhere Agent policies, push notifications automatically cause clients to initiate message transmission. If you use the on demand policy, you must handle push requests manually using an event handler.

For more information about manually handling push notifications, see "Notifications of push notification" on page 60.

For more information about QAnywhere Agent policies, see "Determining when message transmission should occur on the client" on page 46.

Push notifications are enabled by default: the qaagent -push option is by default set to connected. In connected mode, push notifications are sent over TCP/IP persistent connection.

If you are using UDP, push notifications are likely to work without any configuration, but due to a limitation in the UDP implementation of ActiveSync, they do not work with ActiveSync.

See also

- "Scenario for messaging with push notifications" on page 6
- "Notifications of push notification" on page 60
- "-push qaagent option" on page 688

Configuring push notifications

A push notification is a special message that is sent from the QAnywhere server to a QAnywhere client when a message arrives at the server message store that is destined for that client. The push notification is sent by a program called the **Notifier**, which runs on the server, and is received by a program called the **Listener**, which runs on the client. Push notifications are sent via a **gateway**. When the client receives the push notification, it initiates message transmission to receive messages waiting at the server or it takes some custom action.

Notifiers, Listeners and gateways are configured to work in QAnywhere without any modification. In rare circumstances, you may want to configure them. Also, there are some Notifier settings that you may want to change. See:

- "Configuring the QAnywhere Notifier" on page 33
- "Configuring the Listener" on page 35
- "Configuring QAnywhere gateways" on page 36

You can disable push notifications and so not use Notifiers or Listeners. See "-push qaagent option" on page 688.

For information about the client's response to a push notification, see "Determining when message transmission should occur on the client" on page 46.

Configuring the QAnywhere Notifier

The QAnywhere Notifier is created by MobiLink setup scripts and is started when you run the MobiLink server with the -m option. The QAnywhere Notifier is called QAnyNotifier_client.

QAnyNotifier_client uses the defaults described in "MobiLink server settings for server-initiated synchronization" [*MobiLink - Server-Initiated Synchronization*], with the following exceptions:

- The gui property is set to off, meaning that the Notifier window is not displayed on the computer where the Notifier is running.
- The enable property is set to no, meaning that you have to run mlsrv12 with the -m option to start the Notifier.
- The poll_every property is set to 5, which means that the Notifier polls every five seconds to see if a push notification needs to be sent.

You can change the following Notifier properties:

- poll_every property
- resend interval in the request_cursor property
- time to live in the request_cursor property

Note
Other than the three properties listed here, you should not change any Notifier properties. Do not change any other columns in the request_cursor.

Poll_every property

You can change the default polling interval of QAnyNotifier_client by changing the value 5 in the following code and running it against your consolidated database:

```
CALL ml_add_property( 'SIS', 'Notifier(QAnyNotifier_client)', 'poll_every',
'5' )
```

See "Notifier properties" [*MobiLink - Server-Initiated Synchronization*].

Resend interval and time to live

The QAnywhere Notifier contains a default request_cursor. The request_cursor determines what information is sent in a push request, who receives the information, when, and where. You should not change any of the defaults except the resend interval and time to live. The resend interval specifies that an unreceived push notification should be resent every 5 minutes by default. The time to live specifies that an unreceived push notification is resent for 3 hours by default. These default settings are usually optimal. Following is the default request_cursor that is provided with QAnyNotifier_client:

```
SELECT
    u.user_id,
    'Default-DeviceTracker',
    'qa',
    u.name,
    u.name,
    '5M',
          '3H'
          FROM ml_qa_notifications u
          WHERE EXISTS(SELECT *
              FROM ml_listening l
              WHERE l.name = u.name AND l.listening = 'y')
```

For more information about the columns in the request_cursor, see "Push request requirements" [*MobiLink - Server-Initiated Synchronization*].

You can change the resend interval from the default of 5 minutes by changing the value 5M in the following code. You can change the time to live default of 3 hours by changing the value 3H.

```
CALL ml_add_property(
    'SIS',
    'Notifier(QAnyNotifier_client)',
    'request_cursor',
    'SELECT u.user_id,
        ''Default-DeviceTracker'',
        ''qa'',
        u.name,
        u.name,
        ''5M'',
        ''3H''
        FROM ml_qa_notifications u
        WHERE EXISTS(SELECT *
            FROM ml_listening l
            WHERE l.name = u.name AND l.listening = ''y'')'
)
```

For more information, see "request_cursor event" [*MobiLink - Server-Initiated Synchronization*].

See also

- "Configuring Notifier events and properties" [*MobiLink - Server-Initiated Synchronization*]
- "MobiLink server settings for server-initiated synchronization" [*MobiLink - Server-Initiated Synchronization*]
- "Notifiers" [*MobiLink - Server-Initiated Synchronization*]
- "ml_add_property system procedure" [*MobiLink - Server Administration*]
- "Push requests" [*MobiLink - Server-Initiated Synchronization*]

Configuring the Listener

The Listener runs on the same device as the client message store. The Listener receives push notifications from the server and passes them on to the QAnywhere Agent.

The Listener is configured to work with QAnywhere. In some rare circumstances, you may want to change the default behavior.

For example, if you need to manually start the Listener with custom options, you could do so with the following command:

```
dblsn.exe -u ias_mystore_lsn -e mystore -t+ mystore
          ... other options ...
```

For the QAnywhere Agent to find the Listener you just started, you would also need to restart the QAnywhere Agent as follows:

```
qaagent -c "dbf=mystore.db;server=mystore;dbn=mystore" -id mystore
  -lp 5001 -x tcpip(host=acme.com)
```

where 5001 is the receiver port of the UDP listener library of dblsn.

See also

- "Listeners" [*MobiLink - Server-Initiated Synchronization*]
- "MobiLink Listener utility for Windows devices (dblsn)" [*MobiLink - Server-Initiated Synchronization*]
- "Configuring QAnywhere gateways" on page 36

Configuring QAnywhere gateways

Gateways are the way that push notifications are sent. By default, QAnywhere uses the default device tracker gateway. The device tracker gateway first tries to use the SYNC gateway, which uses the same protocol as is used for MobiLink synchronization and which is persistent. Usually the default device tracker gateway is the best way to send push notifications. However, you can also use an SMS or UDP gateway.

To configure a gateway, see "MobiLink server settings for server-initiated synchronization" [*MobiLink - Server-Initiated Synchronization*] and "Gateway properties" [*MobiLink - Server-Initiated Synchronization*].

To use an SMS gateway, you need to start the Listener with new options. See "Configuring the Listener" on page 35.

To use a UDP gateway, you need to set the -push disconnected option of qaagent. See "-push qaagent option" on page 688.

See also

- "Gateways and carriers" [*MobiLink - Server-Initiated Synchronization*]

Setting up a failover mechanism

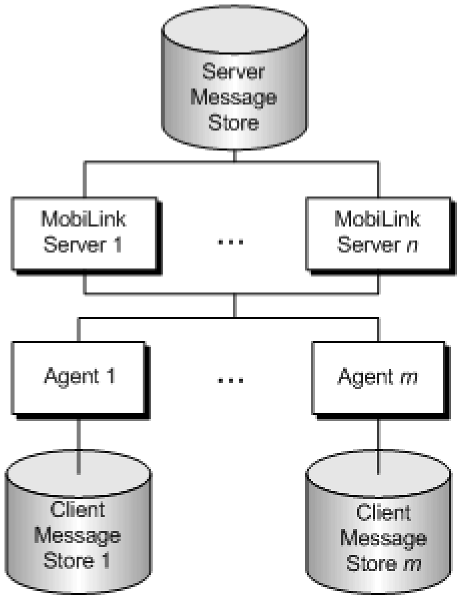
QAnywhere applications can be set up with a failover mechanism so that alternate MobiLink servers can be used if one fails. To support failover, each QAnywhere Agent must be started with a list of MobiLink servers. The first MobiLink server specified in the list is the primary server. The remaining servers in the list are alternate servers.

For example, running the following command on the remote device starts the QAnywhere Agent with one primary server and one alternate server:

```
qaagent -x tcpip(host=ml1.ianywhere.com)
        -x tcpip(host=ml2.ianywhere.com)
```

Each QAnywhere Agent can have a different primary server.

The following diagram describes a failover configuration in which you have multiple MobiLink servers and multiple QAnywhere agents. You have multiple client message stores, but all MobiLink servers are connected to the same server-side message store.



This configuration has the following characteristics:

- When a message transmission occurs, all messages in the server message store are delivered to the client message store regardless of the server that the QAnywhere Agent is connected to.
- Push Notifications are sent to a QAnywhere Agent only when the QAnywhere Agent is connected to its primary server.
- There is a single point of failure. If the computer with the server message store is unavailable, no messaging can take place.

By default, when you set up failover MobiLink servers, the QAnywhere Agent always tries an alternate server immediately upon a failure to reach the primary server. If you want to change this default behavior, you can use the QAnywhere Agent -fr option to cause the QAnywhere Agent to try the primary server again before going to the alternate server, and to specify the number of times it should retry. You can use the -fd option to specify the amount of time between retries of the primary server.

The -fr and -fd options apply only to the primary server. If a connection to the primary server cannot be established after the specified number of attempts, the QAnywhere Agent tries to connect to an alternate server. The Agent attempts to connect to each alternate server only once. An error is issued if the Agent cannot establish a connection to an alternate server.

See also

- “-x qaagent option” on page 695
- “-fd qaagent option” on page 678
- “-fr qaagent option” on page 678
- “Starting the QAnywhere agent” on page 44

Introduction to the QAnywhere agent

The QAnywhere Agent (qaagent) is a separate process running on the client device. It monitors the client message store and determines when message transmission should occur.

The QAnywhere Agent transmits messages between the server message store and the client message store. You can run multiple instances of the QAnywhere Agent on the same device, but each instance must be connected to its own message store. Each message store must have a unique message store ID.

Message transmission policies

QAnywhere clients use policies to determine when to perform a message transmission. Policies include:

- **"Scheduled policy" on page 39** The scheduled policy initiates message transmission at a specified time interval.
- **"Automatic policy" on page 40** The automatic policy initiates a message transmission whenever a message to or from the client is ready for delivery.
- **"On demand policy" on page 41** The on demand policy permits the user to control message transmission.
- **"Custom policy" on page 41** The custom policy uses transmission rules to add further control over message transmission.

Scheduled policy

The scheduled policy instructs the Agent to perform a transmission at a specified time interval.

To invoke a schedule, choose **scheduled** in the **Command File Properties** window or specify the keyword when you start the QAnywhere Agent:

qaagent -policy scheduled [*interval*] ...

where *interval* is in seconds.

The default is 900 seconds (15 minutes).

When a schedule is specified, every *n* seconds the Agent performs message transmission if any of the following conditions are met:

- New messages were placed in the client message store since the previous time interval elapsed.
- A message status change occurred since the previous time interval elapsed. This typically occurs when a message is acknowledged by the application.

  For more information about acknowledgement, see:

  - .NET: “AcknowledgementMode enumeration” on page 301
  - C++: “AcknowledgementMode class” on page 354
  - Java: “AcknowledgementMode interface” on page 467

- A push notification was received since the previous time interval elapsed.

- A network status change notification was received since the previous time interval elapsed.

- Push notifications are disabled.

You can call the trigger send/receive method to override the time interval. It forces message transmission to occur before the time interval elapses. See:

- .NET: “TriggerSendReceive method” on page 264
- C++: “triggerSendReceive method” on page 424
- Java: “triggerSendReceive method” on page 545
- SQL: “ml_qa_triggersendreceive” on page 656

Automatic policy

The automatic policy attempts to keep the client and server message stores as up-to-date as possible by synchronizing whenever a message is sent or received. This policy is not recommended for applications that frequently send and receive messages.

When using the automatic policy, message transmission is performed when any of the following conditions occurs:

- PutMessage() is called. See:

  - .NET: “PutMessage method” on page 250
  - C++: “putMessage method” on page 416
  - Java: “putMessage method” on page 534
  - SQL: “ml_qa_putmessage” on page 655

- A message status changes has occurred. This typically occurs when a received message is acknowledged by the application. See:

  - .NET: “AcknowledgementMode enumeration” on page 301
  - C++: “AcknowledgementMode class” on page 354
  - Java: “AcknowledgementMode interface” on page 467
  - SQL: all messaging using the SQL API is transactional

- A Push Notification is received.

  See “Using push notifications” on page 32.

- A Network Status Change Notification is received.

See “Notifications of push notification” on page 60.

- TriggerSendReceive() is called. See:
    - .NET: “TriggerSendReceive method” on page 264
    - C++: “triggerSendReceive method” on page 424
    - Java: “triggerSendReceive method” on page 545
    - SQL: “ml_qa_triggersendreceive” on page 656

On demand policy

The on demand policy causes message transmission to occur only when instructed to do so by an application.

An application forces a message transmission to occur by calling TriggerSendReceive().

When the agent receives a Push Notification or a Network Status Change Notification, a corresponding message is sent to the system queue. This allows an application to detect these events and force a message transmission by calling TriggerSendReceive(). See:

- .NET: “TriggerSendReceive method” on page 264
- C++: “triggerSendReceive method” on page 424
- Java: “triggerSendReceive method” on page 545
- SQL: “ml_qa_triggersendreceive” on page 656

For more information about handling push notifications and network status changes, see “System queue” on page 59.

Custom policy

A custom policy allows you to define when message transmission occurs and which messages to send in the message transmission.

When creating custom policy rules for your application, it is recommended that you include a default all-inclusive rule so that messages are not accidentally overlooked by other rules. For example, this rule synchronizes messages that are at least one day old,

```
auto=DATEADD( day, 1, ias_StatusTime ) < ias_CurrentTimestamp
```

The following is a list of factors that impact the effectiveness of synchronization and should be considered when creating your own custom policy rules.

- Message sizes
- Synchronization frequency
- Bandwidth and network reliability
- Priority messaging

- Data transfer costs

The custom policy is defined by a set of transmission rules.

Each rule is of the following form:

schedule = *condition*

where *schedule* defines when *condition* is evaluated. For more information, see "Rule syntax" on page 733.

All messages satisfying *condition* are transmitted. In particular, if *schedule* is automatic, the condition is evaluated when any of the following conditions occurs:

- PutMessage() is called. See:
  - .NET: "PutMessage method" on page 250
  - C++: "putMessage method" on page 416
  - Java: "putMessage method" on page 534
  - SQL: "ml_qa_putmessage" on page 655
- A message status change has occurred. This typically occurs when a message is acknowledged by the application. See:
  - .NET: "AcknowledgementMode enumeration" on page 301
  - C++: "AcknowledgementMode class" on page 354
  - Java: "AcknowledgementMode interface" on page 467
  - SQL: all messaging using the SQL API is transactional
- A Push Notification is received.

  See "Using push notifications" on page 32.
- A Network Status Change Notification is received.
- TriggerSendReceive ( ) is called. See:
  - .NET: "TriggerSendReceive method" on page 264
  - C++: "triggerSendReceive method" on page 424
  - Java: "triggerSendReceive method" on page 545
  - SQL: "ml_qa_triggersendreceive" on page 656

Understanding transmission status

The easiest way to determine the transmission status of a message is using Sybase Central. Go to the **General** tab of the **Message Properties** window to view the message transmission status. The possible values are:

- **transmitted** The message has been sent.

- **transmitting** The message is in the process of being sent.
- **untransmitted** The message has not been sent.
- **do_not_transmit** The message should not be sent.

Understanding message status

The easiest way to determine the status of a message is using Sybase Central. Go to the **General** tab of the **Message Properties** window to view the message status. The possible values are:

- **Pending** The message has been sent but not received.
- **Receiving** The message is in the process of being received, or it was received but not acknowledged.
- **Final** The message has achieved a final state.
- **Expired** The message was not received before its expiration time has passed.
- **Cancelled** The message has been cancelled.
- **Unreceivable** The message is either malformed, or there were too many failed attempts to deliver it.
- **Received** The message has been received and acknowledged.

Transmission rules

Message transmission is the action of moving messages from a client message store to a server message store, or vice versa.

Message transmission is handled by the QAnywhere Agent and the MobiLink server:

- The QAnywhere Agent is connected to the client message store. It transmits messages to and from the MobiLink server.
- The MobiLink server is connected to the server message store. It receives message transmissions from QAnywhere Agents and transmits them to other QAnywhere Agents.

Message transmission can only take place between a client message store and a server message store. A message transmission can only occur when a QAnywhere Agent is connected to a MobiLink server.

In QAnywhere, rules are logic that determines when message transmission is to occur, which messages to transmit, and when messages should be deleted. You can specify rules on the client and on the server.

Rules have two parts: a schedule and a condition. The schedule defines when an event is to occur. The condition defines which messages are to be part of the event. For example, if the event is message transmission, then the schedule indicates when transmission occurs and the condition defines which messages are included in the transmission. If the event is message deletion, then the schedule indicates when deleting occurs and the condition indicates which messages are deleted.

Transmission rules allow you to specify when message transmission is to occur and which messages to transmit. You can specify transmission rules for both the client and the server.

For more information about how to specify transmission rules, see:

- "Client transmission rules" on page 740
- "Server transmission rules" on page 741
- "Rule syntax" on page 733
- "Rule variables" on page 738

Delete rules

Delete rules allow you to specify when messages should be deleted from the message stores, if you do not want to use the default behavior. You can specify delete rules for both the client and the server.

For more information about using delete rules, see "Message delete rules" on page 743.

Starting the QAnywhere agent

You can run the Agent on the command line using command line options. At a minimum, you need to start the Agent with the following options:

- **Connection parameters** to connect to the client message store.

  In the **Agent Configuration File Properties** window, this is the information on the **Message Store** tab.

  In the qaagent command line, this is specified with the -c option.

  See "-c qaagent option" on page 676.

- **Client message store ID** to identify the client message store. The first time you run qaagent after you have initialized a client message store, you can optionally use this option to name the message store; if you do not, the device name is used by default. After that, you must use the -id option every time you start qaagent to specify a unique client message store ID.

  In the **Agent Configuration File Properties** window, this is specified on the **General** tab.

  In the qaagent command line, this is specified with the -id option.

  See "-id qaagent option" on page 679.

- **Network protocol and protocol options** to connect to the MobiLink server. This is required unless the MobiLink server is running on the same device as the QAnywhere agent and default communication parameters are used.

In the **Agent Configuration File Properties** window, this is the server information on the **Server** tab.

In the qaagent command line, this is the -x option.

See "-x qaagent option" on page 695.

For a complete list of all QAnywhere Agent options, see "qaagent utility" on page 673.

Starting qaagent on Windows Mobile

On Windows Mobile, you might want to start the QAnywhere Agent in quiet mode by specifying the -qi option.

See "-qi qaagent option" on page 690.

Running multiple instances of QAnywhere Agent

You can run multiple instances of qaagent on a device. However, when you start a second instance:

- The second instance of QAnywhere Agent must be started with a different database file.
- You must specify a unique message store ID using the -id option.

  See "-id qaagent option" on page 679.

Stopping the QAnywhere Agent

To stop the QAnywhere Agent, click **Shut Down** on the QAnywhere Agent messages window.

When you start the QAnywhere Agent in quiet mode, you can only stop it by running **qastop**.

See also

- "qastop utility" on page 717
- "-qi qaagent option" on page 690

Processes started by the QAnywhere Agent

The QAnywhere Agent starts other processes to handle various messaging tasks. Each of these processes is managed by the QAnywhere Agent, and does not need to be managed separately. When you start the QAnywhere Agent, it spawns the following processes:

- **dbmlsync** The dbmlsync executable is the MobiLink synchronization client. The dbmlsync executable is used to send and receive messages.

  Caution
  Do not run dbmlsync on a QAnywhere message store independently of qaagent.

- **dblsn** The dblsn executable is the Listener utility. It receives push notifications. If you are not using push notifications, you do not need to supply the dblsn executable when you deploy your application, and you must run qaagent with -push **none**.

  See "-push qaagent option" on page 688.

- **database server** The client message store is a SQL Anywhere or UltraLite database. QAnywhere Agent requires the database server to run the database. For Windows Mobile, the database server is *dbsrv12.exe*. For Windows, the database server is the personal database server *dbeng12.exe*.

  The QAnywhere Agent can spawn a database server or connect to a running server, depending on the communication parameters that you specify in the qaagent -c option.

  See "-c qaagent option" on page 676.

Deploying the QAnywhere Agent

For deployment information, see "Deploying QAnywhere applications" on page 113.

Determining when message transmission should occur on the client

On the client side, you determine when message transmission should occur by specifying **policies**. A policy tells the QAnywhere Agent when a message should be moved from the client message store to the server message store. If you do not specify a policy, transmission occurs automatically when a message is queued for delivery to the server by default. There is a custom policy and three predefined policies: scheduled, automatic, and on demand.

You can specify policies in the following ways:

- Using the QAnywhere 12 plug-in for Sybase Central, choose **Tools** » **QAnywhere 12** » **New Agent Configuration File for SQL Anywhere**. Policies are specified on the **General** tab of the **Agent Configuration File Properties** window. This task creates a file with a *.qaa* extension, a Sybase Central convention.

  To specify custom properties using the QAnywhere 12 plug-in for Sybase Central, choose **Tools** » **QAnywhere 12** » **New Agent Rule File**. This task creates a file with a *.qar* extension, a Sybase Central convention.

- Run qaagent on the command line using the -policy option. For custom policies, create a rules file and specify it.

See also

- “Message transmission policies” on page 39
- “Transmission rules” on page 43
- “-policy qaagent option” on page 686

Dealing with unreliable networks

Without incremental upload and download, messages are sent as a single piece, so if network connectivity is lost while a message is being uploaded or downloaded, transmission of the message fails. With incremental upload and download, large messages are broken into smaller message pieces. By allowing messages to be sent in smaller pieces, each message piece can be sent separately, resulting in the gradual upload or download of the message over several synchronizations. The complete message arrives at its destination once all of its message pieces have arrived.

For information on how to implement incremental uploads, see “-iu qaagent option” on page 681.

For information on how to implement incremental downloads, see “-idl qaagent option” on page 680.

Writing QAnywhere client applications

The following sections discuss how to write QAnywhere client applications, including an introduction to the various interfaces available for use with QAnywhere as well as an overview of the steps involved.

Introduction to the QAnywhere interfaces

QAnywhere client applications manage the receiving and sending of QAnywhere messages. The applications can be written using one of several QAnywhere APIs:

- QAnywhere .NET API
- QAnywhere C++ API
- QAnywhere Java API
- QAnywhere SQL API

You can use a combination of client types in your QAnywhere system. For example, messages that are generated using QAnywhere SQL can also be received by a client created using the APIs for .NET, C++, or Java. If you have configured a JMS connector on your server, the messages can also be received by JMS clients. Similarly, QAnywhere SQL can be used to receive messages that were generated by QAnywhere .NET, C++, Java, or JMS clients.

QAnywhere .NET API

The QAnywhere .NET API is a programming interface for deployment to Windows computers using the Microsoft .NET Framework and to handheld devices running the Microsoft .NET Compact Framework. The QAnywhere .NET API is provided as the iAnywhere.QAnywhere.Client namespace.

QAnywhere supports Microsoft Visual Studio.

Note
In this document, code samples for the .NET API use the C# programming language, but the API can be accessed using any programming language that Microsoft .NET supports.

Versions of the TestMessage sample application are written in Java, C#, and Visual Basic .NET. There is also a .NET compact framework sample.

For more information about the .NET version of the TestMessage sample application, see “Lesson 4: Explore the TestMessage client source code” on page 174.

See “QAnywhere .NET API reference for clients” on page 179.

QAnywhere C++ API

The QAnywhere C++ API supports Microsoft Visual Studio.

The QAnywhere C++ API consists of the following files:

- A set of header files (the main one being *qa.hpp*), located in *install-dir\sdk\include*.
- An import library (*qany12.lib*), located in *install-dir\sdk\lib\x86*, and *install-dir\sdk\lib\ce\arm.50*.
- A run-time DLL (*qany12.dll*) located in *install-dir\bin32*, and *install-dir\ce\arm.50*.

To access the API, your source code file must include the header file. The import library is used to link your application to the run-time DLL. The run-time DLL must be deployed with your application.

A version of the TestMessage sample application written in C++ is supplied in *samples-dir\QAnywhere \Desktop\MFC*.

See "QAnywhere C++ API reference for clients" on page 354.

QAnywhere Java API

The QAnywhere Java API supports JRE 1.4.2 and up. The Mobile web services wsdl compiler generates Java classes compatible with JDK 1.5.0 and up.

The QAnywhere Java API consists of the following files:

- API reference material, available in this book or in Javadoc format in the *documentation\en\javadocs \QAnywhere* subdirectory of your SQL Anywhere 12 installation.
- Runtime DLL (*qadbiuljni12.dll*) for UltraLite message stores, located in the *bin32* subdirectory of your SQL Anywhere 12 installation.
- An archive of the class files (*qaclient.jar*), located in the *java* subdirectory of your SQL Anywhere 12 installation.

The class file archive must be included in your path when you compile your application. The runtime DLL must be deployed with your application.

A version of the TestMessage sample application written in Java is supplied in *samples-dir\QAnywhere\Java *. (For information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database Administration*].)

See "QAnywhere Java API reference for clients" on page 467.

QAnywhere SQL API

The QAnywhere SQL API is a set of stored procedures that implement a messaging API in SQL. Using the QAnywhere SQL API, you can create messages, set or get message properties and content, send and receive messages, trigger message synchronization, and set and get message store properties.

See "QAnywhere SQL API reference" on page 619.

JMS connector

QAnywhere includes a JMS connector that provides connectivity between QAnywhere and JMS applications. See:

- "Scenario for messaging with external messaging systems" on page 7
- "JMS connectors" on page 129
- "Tutorial: Using JMS connectors" on page 140

Mobile web services connector

QAnywhere includes a mobile web services connector for messaging between QAnywhere and web services.

See "Mobile web services" on page 91.

Quick start to writing a client application

Overview of setting up a client application

1. Initialize the appropriate QAnywhere API. See:
   - "Setting up .NET applications" on page 52
   - "Setting up C++ applications" on page 54
   - "Setting up Java applications" on page 55
   - "Setting up SQL applications" on page 56

2. Set QAnywhere manager configuration properties. See "QAnywhere manager configuration properties" on page 81.

3. Write application code and compile. See:
   - "QAnywhere messages" on page 13
   - "Client message store properties" on page 26
   - "Sending QAnywhere messages" on page 61
   - "Receiving QAnywhere messages" on page 68
   - "Reading very large messages" on page 73
   - "Implementing transactional messaging" on page 63
   - "Shutting down QAnywhere" on page 80

4. Deploy the application to the target device.

   See "Deploying QAnywhere applications" on page 113.

Other resources for getting started

- "Tutorial: Exploring TestMessage" on page 169
- Sample applications are installed to *samples-dir\QAnywhere*. (For information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database Administration*].)

Initializing a QAnywhere API

Before you can send or receive messages using QAnywhere, you must complete the following initialization tasks.

Setting up .NET applications

Before you can send or receive messages using QAnywhere .NET clients, you must complete the following initialization tasks.

You must make two changes to your Visual Studio project to be able to use it:

- Add a reference to the QAnywhere .NET DLL. Adding a reference tells Visual Studio .NET which DLL to include to find the code for the QAnywhere .NET API.
- Add a line to your source code to reference the QAnywhere .NET API classes. To use the QAnywhere .NET API, you must add a line to your source code to reference the data provider. You must add a different line for C# than for Visual Basic .NET.

In addition, you must initialize the QAnywhere .NET API.

To add a reference to the QAnywhere .NET API in a Visual Studio project

1. Start Visual Studio and open your project.
2. In the **Solution Explorer** window, right-click the **References** folder and choose **Add Reference**.
3. On the **.NET** tab, click **Browse** to locate *iAnywhere.QAnywhere.Client.dll*. The default locations are:
   - .NET Framework 2.0: *install-dir\Assembly\V2*
   - .NET Compact Framework 2.0: *install-dir\ce\Assembly\V2*

   Select the DLL and click **Open**.
4. You can verify that the DLL is added to your project. Open the **Add Reference** window and then click the **.NET** tab. *iAnywhere.QAnywhere.Client.dll* appears in the **Selected Components** list. Click **OK** to close the window.

Referencing the data provider classes in your source code

To reference the QAnywhere .NET API classes in your code

1. Start Visual Studio and open your project.
2. If you are using C#, add the following line to the list of using directives at the beginning of your file:

   ```
   using iAnywhere.QAnywhere.Client;
   ```
3. If you are using Visual Basic, add the following line to the list of imports at the beginning of your file:

```
Imports iAnywhere.QAnywhere.Client
```

This line is not strictly required. However, it allows you to use short forms for the QAnywhere classes. Without it, you can still use the fully qualified class name in your code. For example:

```
iAnywhere.QAnywhere.Client.QAManager
mgr =
 new iAnywhere.QAnywhere.Client.QAManagerFactory.Instance.CreateQAManager(
"qa_manager.props" );
```

instead of

```
QAManager mgr = QAManagerFactory.Instance.CreateQAManager(
 "qa_manager.props" );
```

To initialize the QAnywhere .NET API

1. Include the iAnywhere.QAnywhere.Client namespace, as described in the previous procedure.

   ```
   using iAnywhere.QAnywhere.Client;
   ```

2. Create a QAManager object.

   For example, to create a default QAManager object, invoke CreateQAManager with null as its parameter:

   ```
   QAManager mgr;
   mgr = QAManagerFactory.Instance.CreateQAManager( null );
   ```

   Tip
   For maximum concurrency benefits, multi-threaded applications should create a QAManager for each thread. See "Multi-threading considerations" on page 81.

   For more information about QAManagerFactory, see "QAManagerFactory class" on page 265.

   You can alternatively create a QAManager object that is customized using a properties file. The properties file is specified in the CreateQAManager method:

   ```
   mgr = QAManagerFactory.Instance.CreateQAManager(
     "qa_mgr.props" );
   ```

   where *qa_mgr.props* is the name of the properties file that resides on the remote device.

3. Initialize the QAManager object. For example:

   ```
   mgr.Open(
      AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT);
   ```

   The argument to the open method is an acknowledgement mode, which indicates how messages are to be acknowledged. It must be one of IMPLICIT_ACKNOWLEDGEMENT or EXPLICIT_ACKNOWLEDGEMENT. With implicit acknowledgement, messages are acknowledged when they are received by the client. With explicit acknowledgement, you must call the Acknowledge method on the QAManager to acknowledge the message.

For more information about acknowledgement modes, see "AcknowledgementMode enumeration" on page 301.

You are now ready to send messages.

Note
Instead of creating a QAManager, you can create a QATransactionalManager. See "Implementing transactional messaging for .NET clients" on page 63.

See also

- "QAnywhere .NET API reference for clients" on page 179

Setting up C++ applications

Before you can send or receive messages using QAnywhere C++ clients, you must complete the following initialization tasks.

To initialize the QAnywhere C++ API

1. Include the QAnywhere header file.

   ```
   #include <qa.hpp>
   ```

   qa.hpp defines the QAnywhere classes.

2. Initialize QAnywhere.

   To do this, initialize a factory for creating QAManager objects.

   ```
   QAManagerFactory * factory;

   factory = QAnywhereFactory_init();
   if( factory == NULL ) {
         // Fatal error.
   }
   ```

   For more information about QAManagerFactory, see "QAManagerFactory class" on page 424.

3. Create a QAManager instance.

   You can create a default QAManager object as follows:

   ```
   QAManager *  mgr;

   // Create a manager
   mgr = factory->createQAManager( NULL );
   if( mgr == NULL ) {
     // fatal error
   }
   ```

   See "QAManager class" on page 387.

Tip
For maximum concurrency benefits, multi-threaded applications should create a QAManager for each thread. See "Multi-threading considerations" on page 81.

You can customize a QAManager object programmatically or using a properties file.

- To customize QAManager programmatically, use setProperty().

  See "Setting QAnywhere manager configuration properties programmatically" on page 84.
- To use a properties file, specify the properties file in createQAManager():

  ```
  mgr = factory->createQAManager( "qa_mgr.props" );
  ```

  where *qa_mgr.props* is the name of the properties file on the remote device.

  See "Setting QAnywhere manager configuration properties in a file" on page 82.

4. Initialize the QAManager object.

   ```
   qa_bool  rc;
   rc=mgr->open(
       AcknowledgementMode::IMPLICIT_ACKNOWLEDGEMENT );
   ```

   The argument to the open method is an acknowledgement mode, which indicates how messages are to be acknowledged. It must be one of **IMPLICIT_ACKNOWLEDGEMENT** or **EXPLICIT_ACKNOWLEDGEMENT**. With implicit acknowledgement, messages are acknowledged when they are received by the client. With explicit acknowledgement, you must call one of the acknowledge methods on the QAManager to acknowledge the message.

   For more information about acknowledgement modes, see "AcknowledgementMode class" on page 354.

Note
Instead of creating a QAManager, you can create a QATransactionalManager. See "Implementing transactional messaging for C++ clients" on page 65.

You are now ready to send messages.

See also

- "QAnywhere C++ API reference for clients" on page 354

Setting up Java applications

Before you can send or receive messages using QAnywhere Java clients, you must complete the following initialization tasks.

To initialize the QAnywhere Java API

1. Add the location of *qaclient.jar* to your classpath. By default, the file is located in *install-dir\Java*.

2. Import the ianywhere.qanywhere.client package.

   ```
   import ianywhere.qanywhere.client.*;
   ```

3. Create a QAManager object.

   ```
   QAManager mgr;
   mgr = QAManagerFactory.getInstance().createQAManager(null);
   ```

   You can also customize a QAManager object by specifying a properties file to the createQAManager method:

   ```
   mgr = QAManagerFactory.getInstance().createQAManager("qa_mgr.props.");
   ```

   Tip
   For maximum concurrency benefits, multi-threaded applications should create a QAManager for each thread. See “Multi-threading considerations” on page 81.

4. Initialize the QAManager object.

   ```
   mgr.open(AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT);
   ```

   The argument to the open method is an acknowledgement mode, which indicates how messages are to be acknowledged. It must be one of IMPLICIT_ACKNOWLEDGEMENT or EXPLICIT_ACKNOWLEDGEMENT. With implicit acknowledgement, messages are acknowledged when they are received by the client. With explicit acknowledgement, you must call one of the acknowledge methods on the QAManager to acknowledge the message.

   For more information about acknowledgement modes, see “AcknowledgementMode interface” on page 467.

Note
Instead of creating a QAManager, you can create a QATransactionalManager. See “Implementing transactional messaging for Java clients” on page 66.

You are now ready to send messages.

See also

- “QAnywhere Java API reference for clients” on page 467

Setting up SQL applications

QAnywhere SQL allows you to perform, in SQL, much of the messaging functionality of the QAnywhere .NET, C++, and Java APIs. This functionality includes creating messages, setting or getting message properties and content, sending and receiving messages, triggering message synchronization, and setting and getting message store properties.

Messages that are generated with QAnywhere SQL can also be received by clients created with the programming APIs. If you have configured a JMS connector on your server, the messages can also be received by JMS clients. Similarly, QAnywhere SQL can be used to receive messages that were generated by QAnywhere .NET, C++, or Java API, or JMS clients.

QAnywhere SQL messaging coexists with user transactions. This means that committing a transaction commits all the QAnywhere operations on that connection.

See “Writing QAnywhere client applications” on page 49.

Permissions

Only users with DBA privilege have automatic permission to execute the QAnywhere stored procedures. To give permission to a user, a user with DBA privilege must call the procedure ml_qa_grant_messaging_permissions.

See “ml_qa_grant_messaging_permissions” on page 653.

Acknowledgement modes

The QAnywhere SQL API does not support IMPLICIT_ACKNOWLEDGEMENT or EXPLICIT_ACKNOWLEDGEMENT modes. All messaging through the SQL API is transactional.

Example

The following example creates a trigger on an inventory table. The trigger sends a message when the inventory for an item falls below a certain threshold. The message is sent after the transaction invoking the trigger is committed. If the transaction is rolled back, the message is not sent.

```
CREATE TRIGGER inventory_trigger AFTER UPDATE ON inventory
REFERENCING old AS oldinv new AS newinv
FOR EACH ROW
begin
   DECLARE msgid VARCHAR(128);
   IF oldinv.quantity > newinv.quantity AND newinv.quantity < 10 THEN
      -- Create the message
      SET msgid = ml_qa_createmessage();
      -- Set the message content
      CALL ml_qa_settextcontent( msgid,
         'Inventory of item ' || newinv.itemname
            || ' has fallen to only ' || newinv.quantity );
      -- Make the message high priority
      CALL ml_qa_setpriority( msgid, 9 );
      -- Set a message subject
      CALL ml_qa_setstringproperty( msgid,
         'tm_Subject', 'Inventory low!' );
      -- Send the message to the inventoryManager queue
      CALL ml_qa_putmessage( msgid,
         'inventoryManager' );
   end if;
end
```

See also

- “QAnywhere SQL API reference” on page 619

QAnywhere message addresses

A QAnywhere message address has two parts, the client message store ID and the application queue name:

```
id\queue-name
```

The queue name is specified inside the application, and must be known to instances of the sending application on other devices. For information about client message store IDs, see “Setting up the client message store” on page 23.

Each address can have at most one application associated with it at a time. More than one application running with the same address can result in undefined behavior during message retrieval.

When constructing addresses as strings in an application, be sure to escape the backslash character if necessary. Follow the string escaping rules for the programming language you are using. If your JMS destination contains a backslash, you must escape it with another backslash.

The address cannot be longer than 255 characters.

System queue

Notifications and network status changes are both sent to QAnywhere applications as **system messages**. System messages are the same as other messages, but are received in a separate queue named **system**.

See “System queue” on page 59.

Sending a message to a JMS connector

A QAnywhere-to-JMS destination address has two parts:

- The connector address. This is the value of the ianywhere.connector.address property.

  See “Configuring JMS connector properties” on page 131.

- The JMS queue name. This is a queue that you create using your JMS administration tools.

The form of the destination address is:

```
connector-address\JMS-queue-name
```

For more information about addressing messages in a JMS application, see:

- “Sending a QAnywhere message to a JMS connector” on page 132
- “Addressing JMS messages meant for QAnywhere” on page 135
- “Connectors” on page 129

System queue

A special queue called **system** exists to receive QAnywhere system messages. There are two types of message that are sent to the system queue:

- "Network status notifications" on page 59
- "Notifications of push notification" on page 60

Example

The following C# code processes system and normal messages and can be useful if you are using an on demand policy. It assumes that you have defined the message handling methods onMessage() and onSystemMessage() that implement the application logic for processing the messages.

```
// Declare the message listener and system listener.
private QAManager.MessageListener _receiveListener;
private QAManager.MessageListener _systemListener;
...

// Create a MessageListener that uses the appropriate message handlers.
_receiveListener = new QAManager.MessageListener( onMessage );
_systemListener = new QAManager.MessageListener( onSystemMessage );
...

// Register the message handler.
mgr.SetMessageListener( queue-name, _receiveListener );
mgr.SetMessageListener( "system", _systemListener );
```

The system message handler may query the message properties to identify what information it contains. The message type property indicates if the message holds a network status notification. For example, for a message `msg`, you could perform the following processing:

```
msg_type = (MessageType)msg.GetIntProperty( MessageProperties.MSG_TYPE );
if( msg_type == MessageType.NETWORK_STATUS_NOTIFICATION ) {
  // Process a network status change.
  mgr.TriggerSendReceive( );
} else if ( msg_type == MessageType.PUSH_NOTIFICATION ) {
  // Process a push notification.
  mgr.TriggerSendReceive( );
} else if ( msg_type == MessageType.REGULAR ) {
  // This message type should not be received on the
  // system queue. Take appropriate action here.
}
```

Network status notifications

When there is a change in network status, a message of type NETWORK_STATUS_NOTIFICATION is sent to the system queue. It has an expiry of one minute. This expiry time cannot be changed.

When a device goes into network coverage or out of network coverage, a message is sent to the system queue that contains the following information:

- **ias_Adapters** String. A list of network adapters that can be used to connect to the MobiLink server. The list is delimited by a vertical bar. This property can be read but should not be set. See:
  - .NET: "ADAPTER field" on page 181
  - C++: "ADAPTER variable" on page 357
  - Java: "ADAPTER variable" on page 471
- **ias_RASNames** String. A list of network names that can be used to connect to the MobiLink server. The list is delimited by a vertical bar. See:
  - .NET: "RASNAMES field" on page 186
  - C++: "RASNAMES variable" on page 362
  - Java: "RASNAMES variable" on page 475
- **ias_NetworkStatus** Int. The state of the network connection. The value is 1 if connected, 0 otherwise. See:
  - .NET: "NETWORK_STATUS field" on page 184
  - C++: "NETWORK_STATUS variable" on page 360
  - Java: "NETWORK_STATUS variable" on page 474

Monitoring network availability

You can use network status notifications to monitor network availability and take action when a device comes into coverage. For example, use the on demand policy and call QAManagerBase triggerSendReceive when a system queue message is received of type NETWORK_STATUS_NOTIFICATION with ias_NetworkStatus=1.

See also

- ias_MessageType in "Predefined message properties" on page 659
- "System queue" on page 58

Notifications of push notification

A message of type PUSH_NOTIFICATION is sent to the system queue when a push notification is received from the server. This message is a notification that messages are queued on the server. It has an expiry of one minute. This expiry time cannot be changed.

This type of system message is useful if you are using the on demand policy. For example, you can call QAManagerBase triggerSendReceive when a system queue message is received of type PUSH_NOTIFICATION.

See also

- “Scenario for messaging with push notifications” on page 6
- “Using push notifications” on page 32
- “System queue” on page 58
- “Receiving messages asynchronously” on page 70
- ias_MessageType in “Predefined message properties” on page 659
- .NET: “MessageProperties class” on page 179
- C++: “MessageProperties class” on page 356
- Java: “MessageProperties interface” on page 469

Sending QAnywhere messages

The following procedures describe how to send messages from QAnywhere applications. These procedures assume that you have created and opened a QAManager object.

Sending a message from your application does not ensure it is delivered from your device. It simply places the message on a queue to be delivered. The QAnywhere Agent performs the task of sending the message to the MobiLink server, which in turn delivers it to its destination.

For more information about when message transmission occurs, see “Determining when message transmission should occur on the client” on page 46.

To send a message (.NET)

1. Create a new message.

   You can create either a text message or a binary message, using CreateTextMessage() or CreateBinaryMessage(), respectively.

   ```
   QATextMessage     msg;
   msg = mgr.CreateTextMessage();
   ```

2. Set message properties.

   Use methods of the QATextMessage or QABinaryMessage class to set properties.

   See “QAnywhere messages” on page 13.

3. Put the message on the queue, ready for sending.

   ```
   mgr.PutMessage( "store-id\\queue-name", msg );
   ```

   where *store-id* and *queue-name* are strings that combine to form the destination address.

   See “PutMessage method” on page 250 and “Determining when message transmission should occur on the client” on page 46.

To send a message (C++)

1. Create a new message.

   You can create either a text message or a binary message, using createTextMessage() or createBinaryMessage(), respectively.

   ```
   QATextMessage *   msg;
   msg = mgr->createTextMessage();
   ```

2. Set message properties.

   Use methods of the QATextMessage or QABinaryMessage class to set message properties.

   See "QAnywhere messages" on page 13.

3. Put the message on the queue, ready for sending.

   ```
   if( msg != NULL ) {
     if( !mgr->putMessage( "store-id\\queue-name", msg ) ) {
       // Display error using mgr->getLastErrorMsg().
       }
       mgr->deleteMessage( msg );
   }
   ```

   where *store-id* and *queue-name* are strings that combine to form the destination address.

   See "putMessage method" on page 416 and "Determining when message transmission should occur on the client" on page 46.

To send a message (Java)

1. Create a new message.

   You can create a text message or a binary message, using QAManagerBase.createTextMessage() or QAManagerBase.createBinaryMessage(), respectively.

   ```
   QATextMessage msg;
   msg = mgr.createTextMessage();
   ```

2. Set message properties.

   Use QATextMessage or QABinaryMessage methods to set message properties.

   See "QAnywhere messages" on page 13.

3. Put the message on the queue.

   ```
   mgr.putMessage("store-id\\queue-name", msg);
   ```

See "putMessage method" on page 534 and "Determining when message transmission should occur on the client" on page 46.

To send a message (SQL)

1. Declare a variable to hold the message ID.

```
begin
    declare @msgid varchar(128);
```

2. Create a new message.

```
    set @msgid = ml_qa_createmessage();
```

3. Set message properties.

   For more information, see "Message properties" on page 629.

4. Put the message on the queue.

```
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

See "ml_qa_putmessage" on page 655 and "Determining when message transmission should occur on the client" on page 46.

Implementing transactional messaging

Transactional messaging provides the ability to group messages in a way that guarantees that either all messages in the group are delivered, or none are. This is more commonly referred to as a single **transaction**.

When implementing transactional messaging, you create a special QAManagerBase object called QATransactionalManager.

For more information, see:

- .NET clients: "QATransactionalManager interface" on page 293
- C++ clients: "QATransactionalManager class" on page 457
- Java clients: "QATransactionalManager interface" on page 575
- SQL clients: all messaging is transactional for SQL clients and no transactional manager is required

Implementing transactional messaging for .NET clients

To create a transactional manager

1. Initialize QAnywhere.

   This step is the same as in non-transactional messaging.

```
using iAnywhere.QAnywhere.Client;
```

2. Create a QATransactionalManager object.

   For example, to create a default QATransactionalManager object, invoke CreateQATransactionalManager with null as its parameter:

   ```
   QAManager mgr;
   mgr =
     QAManagerFactory.Instance.CreateQATransactionalManager(
     null );
   ```

   See "QAManagerFactory class" on page 265.

   You can alternatively create a QATransactionalManager object that is customized using a properties file. The properties file is specified in the CreateQATransactionalManager method:

   ```
   mgr =
     QAManagerFactory.Instance.CreateQATransactionalManager(
     "qa_mgr.props" );
   ```

   where *qa_mgr.props* is the name of the properties file that resides on the remote device.

3. Initialize the QAManager object.

   ```
   mgr.Open();
   ```

You are now ready to send messages. The following procedure sends two messages in a single transaction.

To send multiple messages in a single transaction

1. Initialize message objects.

   ```
   QATextMessage msg_1;
   QATextMessage msg_2;
   ```

2. Send the messages.

   The following code sends two messages in a single transaction:

   ```
   msg_1 = mgr.CreateTextMessage();
   if( msg_1 != null ) {
     msg_2 = mgr.CreateTextMessage();
     if( msg_2 != null ) {
       if( !mgr.PutMessage( "jms_1\\queue_name", msg_1 ) ) {
         // Display message using mgr.GetLastErrorMsg().
       } else {
         if( !mgr.PutMessage( "jms_1\\queue_name", msg_2 ) ) {
           // Display message using mgr.GetLastErrorMsg().
         } else {
           mgr.Commit();
         }
       }
     }
   }
   ```

   The Commit method commits the current transaction and begins a new transaction. This method commits all PutMessage() method and GetMessage() method invocations.

Note
The first transaction begins with the call to open method.

See also

- "QATransactionalManager interface" on page 293

Implementing transactional messaging for C++ clients

To create a transactional manager

1. Initialize QAnywhere.

   This step is the same as in non-transactional messaging.

   ```
   #include <qa.hpp>
   QAManagerFactory *   factory;

   factory = QAnywhereFactory_init();
   if( factory == NULL ) {
       // Fatal error.
   }
   ```

2. Create a transactional manager.

   ```
   QATransactionalManager *  mgr;
   mgr = factory->createQATransactionalManager( NULL );
   if( mgr == NULL ) {
       // Fatal error.
   }
   ```

   As with non-transactional managers, you can specify a properties file to customize QAnywhere behavior. In this example, no properties file is used.

3. Initialize the manager.

   ```
   if( !mgr->open() ) {
      // Display message using mgr->getLastErrorMsg().
   }
   ```

You are now ready to send messages. The following procedure sends two messages in a single transaction.

To send multiple messages in a single transaction

1. Initialize message objects.

   ```
   QATextMessage *  msg_1;
   QATextMessage *  msg_2;
   ```

2. Send the messages.

   The following code sends two messages in a single transaction:

   ```
   msg_1 = mgr->createTextMessage();
   if( msg_1 != NULL ) {
   ```

```
    msg_2 = mgr->createTextMessage();
    if( msg_2 != NULL ) {
      if( !mgr->putMessage( "jms_1\\queue_name", msg_1 ) ) {
        // Display message using mgr->getLastErrorMsg().
      } else {
        if( !mgr->putMessage( "jms_1\\queue_name", msg_2 ) ) {
          // Display message using mgr->getLastErrorMsg().
        } else {
          mgr->commit();
        }
      }
      mgr->deleteMessage( msg_2 );
    }
    mgr->deleteMessage( msg_1 );
  }
```

The commit method commits the current transaction and begins a new transaction. This method commits all putMessage() method and getMessage() method invocations.

Note
The first transaction begins with the call to open method.

See also

- C++: "QATransactionalManager class" on page 457
- Java: "QATransactionalManager interface" on page 575

Implementing transactional messaging for Java clients

To create a transactional manager

1. Initialize QAnywhere.

   This step is the same as in non-transactional messaging.

   ```
   import ianywhere.qanywhere.client;
   QAManagerFactory factory = new QAManagerFactory();
   ```

   See "QAManagerFactory class" on page 545.

2. Create a QATransactionalManager object.

   For example, to create a default QATransactionalManager object, invoke createQATransactionalManager with null as its parameter:

   ```
   QAManager mgr;
   mgr = factory.createQATransactionalManager( null );
   ```

   You can alternatively create a QATransactionalManager object that is customized using a properties file. The properties file is specified in the createQATransactionalManager method:

   ```
   mgr = factory.createQATransactionalManager( "qa_mgr.props" );
   ```

where *qa_mgr.props* is the name of the properties file that resides on the remote device.

3. Initialize the QAManager object.

   ```
   mgr.open();
   ```

You are now ready to send messages. The following procedure sends two messages in a single transaction.

To send multiple messages in a single transaction

1. Initialize message objects.

   ```
   QATextMessage msg_1;
   QATextMessage msg_2;
   ```

2. Send the messages.

   The following code sends two messages in a single transaction:

   ```
   msg_1 = mgr.createTextMessage();
   if( msg_1 != null ) {
     msg_2 = mgr.createTextMessage();
     if( msg_2 != null ) {
       if( !mgr.putMessage( "jms_1\\queue_name", msg_1 ) ) {
         // Display message using mgr.getLastErrorMsg().
       } else {
         if( !mgr.putMessage( "jms_1\\queue_name", msg_2 ) ) {
           // Display message using mgr.getLastErrorMsg().
         } else {
           mgr.commit();
         }
       }
     }
   }
   ```

   The commit method commits the current transaction and begins a new transaction. This method commits all putMessage() method and getMessage() method invocations.

   Note
   The first transaction begins with the call to open method.

Canceling QAnywhere messages

Canceling a QAnywhere message puts the message into a canceled state before it is transmitted. With the default delete rules of the QAnywhere Agent, canceled messages are eventually deleted from the message store. Canceling a QAnywhere message fails if the message is already in a final state, or if it has been transmitted to the central messaging server.

The following procedures describe how to cancel QAnywhere messages.

Note
You cannot cancel a message using the QAnywhere SQL API.

To cancel a message (.NET)

1. Get the ID of the message to cancel.

   ```
   // msg is a QAMessage instance that has not been
   // transmitted.
   string msgID = msg.getMessageID();
   ```

2. Call CancelMessage with the ID of the message to cancel.

   ```
   mgr.CancelMessage(msgID);
   ```

   See "CancelMessage method" on page 234.

To cancel a message (C++)

1. Get the ID of the message to cancel.

   ```
   // msg is a QAMessage instance that has not been
   // transmitted.
   qa_string msgID = msg->getMessageID();
   ```

2. Call cancelMessage with the ID of the message to cancel.

   ```
   bool result = mgr->cancelMessage(msgID);
   ```

   See "cancelMessage method" on page 402.

To cancel a message (Java)

1. Get the ID of the message to cancel.

   ```
   // msg is a QAMessage instance that has not been
   // transmitted.
   String msgID = msg.getMessageID();
   ```

2. Call cancelMessage with the ID of the message to cancel.

   ```
   boolean result = mgr.cancelMessage(msgID);
   ```

   See "cancelMessage method" on page 520.

Receiving QAnywhere messages

The following topics describe how to receive QAnywhere messages.

Receiving messages synchronously

To receive messages synchronously, your application explicitly polls the queue for messages. It may poll the queue periodically, or when a user initiates a particular action such as clicking a Refresh button.

To receive messages synchronously (.NET)

1. Declare message objects to hold the incoming messages.

```
QAMessage msg;
QATextMessage text_msg;
```

2. Poll the message queue, collecting messages:

```
for(;;) {
    msg = mgr.GetMessageNoWait("queue-name");
    if( msg == null ) {
      break;
    }
    addMessage( msg );
  }
```

   See "GetMessageNoWait method" on page 243.

To receive messages synchronously (C++)

1. Declare message objects to hold the incoming messages.

```
QAMessage * msg;
QATextMessage * text_msg;
```

2. Poll the message queue, collecting messages:

```
for( ;; ) {
    msg = mgr->getMessageNoWait( "queue-name" );
    if( msg == NULL ) {
      break;
    }
    addMessage(msg);
  }
```

   See "getMessageNoWait method" on page 412.

To receive messages synchronously (Java)

1. Declare message objects to hold the incoming messages.

```
QAMessage msg;
QATextMessage text_message;
```

2. Poll the message queue, collecting messages:

```
if(mgr.start()) {
  for ( ;; ) {
    msg = mgr.getMessageNoWait("queue-name");
    if ( msg == null ) {
      break;
    }
    addMessage(msg);
  }
```

```
    mgr.stop();
  }
```

See "getMessageNoWait method" on page 528.

To receive messages synchronously (SQL)

1. Declare an object to hold the message ID.

```
begin
    declare @msgid varchar(128);
```

2. Poll the message queue, collecting messages.

```
    loop
        set @msgid = ml_qa_getmessagenowait( 'myaddress' );
        if @msgid is null then leave end if;
       message 'a message with content ' || ml_qa_gettextcontent( @msgid )
|| ' has been received';
    end loop;
    commit;
end
```

See:

- "ml_qa_getmessagenowait" on page 651
- "ml_qa_getmessagetimeout" on page 652
- "ml_qa_getmessage" on page 650

Receiving messages asynchronously

To receive messages asynchronously using the .NET, C++, and Java APIs, you can write and register a message listener function that is called by QAnywhere when a message appears in the queue. The message listener takes the incoming message as a parameter. The task you perform in your message listener depends on your application. For example, in the TestMessage sample application the message listener adds the message to the list of messages in the main TestMessage window.

Development tip for .NET, C++ and Java

It is safer to use QAManagers in mode EXPLICIT_ACKNOWLEDGEMENT to guard against the possibility of an application error occurring part way through the processing of received messages and the message being acknowledged anyway.

If the QAManager is opened in mode EXPLICIT_ACKNOWLEDGEMENT, the message can be acknowledged in the onMessage method only after it has been successfully processed. That way if there was an error processing the message, the message is received again because it was not acknowledged.

If the QAManager is opened in mode IMPLICIT_ACKNOWLEDGEMENT, the message passed to onMessage is acknowledged implicitly when onMessage returns. If the user application encounters an error while processing the message, the message is acknowledged and never received again.

To receive messages asynchronously (.NET)

1. Implement a message handler method.

   ```
   private void onMessage(QAMessage msg) {
       // Process message.
   }
   ```

2. Register the message handler.

   To register a message handler, create a QAManager.MessageListener object that has the message handler function as its argument. Then use the QAManager.SetMessageListener function to register the MessageListener with a specific queue. In the following example, *queue-name* is a string that is the name of the queue the QAManager object listens to.

   ```
   MessageListener listener;
   listener = new MessageListener( onMessage );
   mgr.SetMessageListener( "queue-name", listener );
   ```

   See "MessageListener delegate" on page 300 and "SetMessageListener method" on page 256.

To receive messages asynchronously (C++)

1. Create a class that implements the QAMessageListener interface.

   ```
   class MyClass: public QAMessageListener {
      public:
      void onMessage( QAMessage * Msg);
   };
   ```

   See "QAMessageListener class" on page 451.

2. Implement the onMessage method.

   The QAMessageListener interface contains one method, onMessage. Each time a message arrives in the queue, the QAnywhere library calls this method, passing the new message as the single argument.

   ```
   void MyClass::onMessage(QAMessage * msg) {
        // Process message.
   }
   ```

3. Register the message listener.

   ```
   my_listener = new MyClass();
   mgr->setMessageListener( "queue-name", my_listener );
   ```

   See "setMessageListener method" on page 420.

To receive a message asynchronously (Java)

1. Implement a message handler method and an exception handler method.

   ```
   class MyClass implements QAMessageListener {
     public void onMessage(QAMessage message) {
   ```

```
            // Process the message.
          }
          public void onException(
            QAException exception, QAMessage message) {
            // Handle the exception.
          }
        }
```

2. Register the message handler.

   ```
   MyClass listener = new MyClass();
   mgr.setMessageListener("queue-name", listener);
   ```

See "QAMessageListener interface" on page 566 and "setMessageListener method" on page 539.

To receive messages asynchronously (SQL)

- Create a stored procedure with the name **ml_qa_listener_*queue***, where *queue* is the name of a message queue.

  This procedure is called whenever a message is queued on the given queue.

  See "ml_qa_listener_queue" on page 654.

Receiving messages using a selector

You can use **message selectors** to select messages for receiving. A message selector is a SQL-like expression that specifies a condition to select a subset of messages to consider for receive operations.

The syntax and semantics of message selectors are exactly the same as the condition part of transmission rules.

See "Condition syntax" on page 734.

Example

The following C# example gets the next message from receiveQueue that has a message property called intprop with value 1.

```
msg = receiver.GetMessageBySelectorNoWait(
   receiveQueue, "intprop=1" );
```

The following C++ example gets the next message from receiveQueue that has a message property called intprop with value 1.

```
msg = receiver->getMessageBySelectorNoWait(
  receiveQueue, "intprop=1" );
```

The following Java example gets the next message from receiveQueue that has a message property called intprop with value 1.

```
msg = receiver.getMessageBySelectorNoWait(
  receiveQueue, "intprop=1");
```

See also

- .NET: “GetMessageBySelector method” on page 240 and “GetMessageBySelectorNoWait method” on page 241
- C++: “getMessageBySelector method” on page 410 and “getMessageBySelectorNoWait method” on page 410
- Java: “getMessageBySelector method” on page 526 and “getMessageBySelectorNoWait method” on page 526
- SQL: The SQL API does not support receiving messages using a selector

Reading very large messages

Sometimes messages are so large that they exceed the limit set with the QAManager property MAX_IN_MEMORY_MESSAGE_SIZE or its defaults of 1MB on Windows and 64KB on Windows Mobile. In this case, the message object cannot contain the full content of the message in memory, so methods that rely on the full content of the message being loaded into memory, such as readInt() and readString(), cannot be used. However, you can read very large messages directly from the message store in pieces. To do this, use QATextMessage.readText() or QABinaryMessage.readBinary() in a loop.

For more information, see:

- .NET: “ReadBinary method” on page 193 and “ReadText method” on page 292
- C++: “readBinary method” on page 371 and “readText method” on page 456
- Java: “readBinary method” on page 485 and “readText method” on page 572
- SQL: The SQL API does not support receiving very large messages

When you do this, you cannot use a QAManager that was opened with IMPLICIT_ACKNOWLEDGEMENT. You must use a QAManager that was opened with EXPLICIT_ACKNOWLEDGEMENT and you must complete all calls to readText() or readBinary() before acknowledging the message.

See “Acknowledgement modes” on page 57.

Browsing QAnywhere messages

You can browse messages in incoming and outgoing queues. Browse operations do not affect the status of messages.

For more information about message status, see ias_Status in “Predefined message properties” on page 659.

The following topics describe how to browse QAnywhere messages.

Browse all messages

You can browse the messages in all queues by calling the appropriate browseMessages() method.

The following .NET example uses the QAManager.BrowseMessages() method to browse all queues:

```
QAMessage msg;
IEnumerator msgs = mgr.BrowseMessages();
while( msgs.MoveNext() ) {
      msg = (QAMessage)msgs.Current;
      // Process message.
}
```

The following C++ example uses the QAManager browseMessages function to browse all queues:

```
QAMessage *msg;
qa_browse_handle bh = mgr->browseMessages();
for (;;) {
  msg = mgr->browseNextMessage( bh );
  if( msg == qa_null ) {
    break;
  }
  // Process message.
  mgr->browseClose( bh );
}
```

The following Java example uses the QAManager.browseMessages method to browse all queues:

```
QAMessage msg;
java.util.Enumeration msgs = mgr.browseMessages();
while( msgs.hasMoreElements() ) {
    msg = (QAMessage)msgs.nextElement();
  // Process message.
}
```

See also

- .NET: "BrowseMessages method" on page 231
- C++: "browseMessages method" on page 399
- Java: "browseMessages method" on page 517
- SQL: The SQL API does not support browsing messages

Browsing messages in a queue

You can browse the messages in a given queue by supplying the queue name to the appropriate browseMessagesByQueue() method.

The following .NET example uses the QAManager.BrowseMessagesByQueue method to browse a queue:

```
QAMessage msg;
IEnumerator msgs = mgr.BrowseMessagesByQueue( "q1" );
while( msgs.MoveNext() ) {
  msg = (QAMessage)msgs.Current;
  // Process message.
}
```

The following C++ example uses the QAManager browseMessagesByQueue function to browse a queue:

```
QAMessage *msg;
qa_browse_handle bh = mgr->browseMessagesByQueue( _T("q1") );
for (;;) {
  msg = mgr->browseNextMessage( bh );
  if( msg == qa_null ) {
    break;
  }
  // Process message.
}
mgr->browseClose( bh );
```

The following Java example uses the QAManager.browseMessagesByQueue method to browse a queue:

```
QAMessage msg;
java.util.Enumeration msgs = mgr.browseMessagesByQueue( "q1" );
while( msgs.hasMoreElements() ) {
  msg = (QAMessage)msgs.nextElement();
  // Process message.
}
```

See also

- .NET: "BrowseMessagesByQueue method" on page 233
- C++: "browseMessagesByQueue method" on page 400
- Java: "browseMessagesByQueue method" on page 518
- SQL: The SQL API does not support browsing messages

Browsing a message by ID

You can browse a particular message by specifying its ID to a browseMessagesbyID() method.

The following .NET example uses the QAManager.BrowseMessageByID method to browse a message:

```
QAMessage msg;
IEnumerator msgs = mgr.BrowseMessagesByID( "ID:123" );
if( msgs.MoveNext() ) {
  msg = (QAMessage)msgs.Current;
  // Process message.
}
```

The following C++ example uses the QAManager browseMessageByID function to browse a message :

```
QAMessage *msg;
qa_browse_handle bh = mgr->browseMessagesByID( _T( "ID:123" ) );
msg = mgr->browseNextMessage( bh );
if( msg != qa_null ) {
  // Process message.
}
mgr->browseClose( bh );
```

The following Java example uses the QAManager.browseMessageByID method to browse a message:

```
QAMessage msg;
java.util.Enumeration msgs = mgr.browseMessagesByID( "ID:123" );
if( msgs.hasMoreElements() ) {
  msg = (QAMessage)msgs.nextElement();
  // Process message.
}
```

See also

- .NET: “BrowseMessagesByID method” on page 232
- C++: “browseMessagesByID method” on page 399
- Java: “browseMessagesByID method” on page 518
- SQL: The SQL API does not support browsing messages

Browsing messages using a selector

You can use **message selectors** to select messages for browsing. A message selector is a SQL-like expression that specifies a condition to select a subset of messages to consider for browse operations.

The syntax and semantics of message selectors are exactly the same as the condition part of transmission rules.

See “Condition syntax” on page 734.

The following .NET example browses all messages in the message store that have a property called intprop with value 1.

```
QAMessage msg;
IEnumerator msgs = mgr.BrowseMessagesBySelector( "intprop = 1" );
while( msgs.MoveNext() ) {
  msg = (QAMessage)msgs.Current;
  // Process message.
}
```

The following C++ example browses all messages in the message store that have a property called intprop with value 1.

```
QAMessage *msg;
qa_browse_handle bh = mgr->browseMessagesBySelector( _T("intprop = 1") );
for (;;) {
  msg = mgr->browseNextMessage( bh );
  if( msg == qa_null ) {
    break;
  }
  // Process message.
}
mgr->browseClose( bh );
```

The following Java example browses all messages in the message store that have a property called intprop with value 1.

```
QAMessage msg;
java.util.Enumeration msgs = mgr.browseMessagesBySelector( "intprop = 1" );
while( msgs.hasMoreElements() ) {
  msg = (QAMessage)msgs.nextElement();
  // Process message.
}
```

See also

- .NET: “BrowseMessagesBySelector method” on page 233
- C++: “browseMessagesBySelector method” on page 401
- Java: “browseMessagesBySelector method” on page 519
- SQL: The SQL API does not support browsing messages

Handling QAnywhere exceptions

The QAnywhere C++, Java, and .NET APIs include special objects and properties for exception handling.

.NET exceptions

The QAException class encapsulates QAnywhere client application exceptions. After you catch a QAnywhere exception, you can use the QAException ErrorCode and Message properties to determine the error code and error message.

Note that if a QAException is thrown inside a message listener delegate and it is not caught in the message listener, then it gets logged to the QAManager log file. Since uncaught QAExceptions are only logged, it is recommended that all exceptions be handled within message listener delegates or handled by exception listener delegates so that they can be dealt with appropriately.

For more information about message listener delegates and exception listener delegates, see:

- “MessageListener delegate” on page 300
- “MessageListener2 delegate” on page 300
- “ExceptionListener delegate” on page 299
- “ExceptionListener2 delegate” on page 299

For more information about the log file, see “QAnywhere manager configuration properties” on page 81.

When a QAException is thrown, the current transaction is rolled back. When this happens in a message listener with a QATransactionalManager, the message that was being processed when the QAException was thrown is put back in the receive queue and so that it can be re-received. You can use the message store property ias_MaxDeliveryAttempts to prevent an infinite loop.

When the property ias_MaxDeliveryAttempts is set to a positive integer *n* by a QAnywhere application, as in `mgr.SetIntStoreProperty( "ias_MaxDeliveryAttempts", 5 )`, the QAnywhere client attempts to receive an unacknowledged message up to *n* times before setting the status of the message to unreceivable. If the property ias_MaxDeliveryAttempts is not set or is negative, the QAnywhere client attempts to receive messages an unlimited number of times.

For more information, see:

- “QAException class” on page 207
- “ErrorCode property” on page 211
- “Predefined client message store properties” on page 718

C++ exceptions

For C++, the QAError class encapsulates QAnywhere client application exceptions. You can use the QAManagerBase::getLastError() method or QAManagerFactory::getLastError() method to determine the error code associated with the last executed method. You can use the corresponding getLastErrorMessage() method to obtain the error text.

For a list of error codes and more information, see "QAError class" on page 380.

For more information about getLastError and getLastErrorMessage, see:

- QAManagerBase: "getLastError method" on page 408 and "getLastErrorMsg method" on page 408
- QAManagerFactory: "getLastError method" on page 427 and "getLastErrorMsg method" on page 428

Java exceptions

The QAException class encapsulates QAnywhere client application exceptions. After you catch a QAnywhere exception, you can use the QAException ErrorCode and Message properties to determine the error code and error message.

If a QAException is thrown inside a message listener and it is not caught in the message listener, then it is logged to the QAManager log file. Since uncaught QAExceptions are only logged, it is recommended that all exceptions be handled within message listeners or handled by exception listeners so that they can be dealt with appropriately.

For more information about message listeners and exception listeners, see:

- "QAMessageListener interface" on page 566
- "QAMessageListener2 interface" on page 568
- "QAException class" on page 498

For more information about the log file, see "QAnywhere manager configuration properties" on page 81.

When a QAException is thrown, the current transaction is rolled back. When this happens in a message listener with a QATransactionalManager, the message that was being processed when the QAException was thrown is put back in the receive queue and so that it can be re-received. You can use the message store property ias_MaxDeliveryAttempts to prevent an infinite loop.

When the property ias_MaxDeliveryAttempts is set to a positive integer *n* by a QAnywhere application, as in `mgr.SetIntStoreProperty( "ias_MaxDeliveryAttempts", 5 )`, the QAnywhere client attempts to receive an unacknowledged message up to *n* times before setting the status of the message to unreceivable. If the property ias_MaxDeliveryAttempts is not set or is negative, the QAnywhere client attempts to receive messages an unlimited number of times.

For more information, see:

- "ErrorCode property" on page 211
- "Predefined client message store properties" on page 718

Error codes

The following table lists QAnywhere error code values:

Error value	Description
0	No error.
1000	Initialization error.
1001	Termination error.
1002	Unable to access the client properties file.
1003	No destination.
1004	The function is not implemented.
1005	You cannot write to a message as it is in read-only mode.
1006	Error storing a message in the client message store.
1007	Error retrieving a message from the client message store.
1008	Error initializing the background thread.
1009	Error opening a connection to the message store.
1010	There is an invalid property in the client properties file.
1011	Error opening the log file.
1012	Unexpected end of message reached.
1013	The message store is too large relative to the free disk space on the device.
1014	The message store has not been initialized for messaging.
1015	Error getting queue depth.
1016	Cannot use QAManagerBase.getQueueDepth when the message store ID has not been set.
1017	Cannot use QAManagerBase.getQueueDepth on a given destination when filter is ALL.
1018	Error canceling message.
1019	Error canceling message. Cannot cancel a message that has already been sent.
1020	Error acknowledging the message.
1021	The QAManager is not open.
1022	The QAManager is already open.

Error value	Description
1023	The given selector has a syntax error.
1024	The timestamp is outside the acceptable range.
1025	Cannot open QAManager because the maximum number of concurrent server requests is not high enough. See "-gn dbsrv12 server option" [*SQL Anywhere Server - Database Administration*].
1026	Error retrieving property from message store.
1027	Error storing property to message store.

Shutting down QAnywhere

After you have completed sending and receiving messages, you can shut down the QAnywhere messaging system by completing one of the following procedures.

To shut down QAnywhere (.NET)

- Stop and close the QAnywhere manager.

```
mgr.Stop();
mgr.Close();
```

To shut down QAnywhere (C++)

1. Close the QAnywhere manager.

```
mgr->stop();
mgr->close();
```

2. Terminate the factory.

```
QAnywhereFactory_term();
```

This step shuts down the messaging part of your application.

To shut down QAnywhere (Java)

- Stop and close the QAnywhere manager.

```
mgr.stop();
mgr.close();
```

See also

- .NET: “Stop method” on page 263
- C++: “stop method” on page 423
- Java: “stop method” on page 544
- SQL: The SQL API does not support shutting down QAnywhere

Multi-threading considerations

Access to a QAManager is serialized. When you have multiple threads accessing a single QAManager, threads block while one thread performs a method call on the QAManager. To maximize concurrency, use a different QAManager for each thread. Only one thread is allowed to access an instance of QAManager at one time. Other threads block until the QAManager method that was invoked by the first thread returns.

QAnywhere manager configuration properties

You can set QAnywhere manager configuration properties in one of the following ways:

- Create a properties text file to define the QAnywhere manager configuration properties that is used by one Manager instance.

  See “Setting QAnywhere manager configuration properties in a file” on page 82.

- Set QAnywhere manager configuration properties programmatically.

  See “Setting QAnywhere manager configuration properties programmatically” on page 84.

The following are the QAnywhere manager configuration properties:

- **COMPRESSION_LEVEL=n** Set the compression level.

  n is the compression factor, which is expressed as is an integer between 0 and 9, where 0 indicates no compression and 9 indicates maximum compression.

- **CONNECT_PARAMS=connect-string** Specify a connection string for the QAnywhere manager to use to connect to the message store database. Specify each connection option in the form *keyword=value* with multiple options separated by semicolons.

  This property is not supported in the standalone client.

  The default is `"server=qanywhere;uid=ml_qa_user;pwd=qanywhere"`.

  For a list of options, see “Connection parameters” [*SQL Anywhere Server - Database Administration*].

  For information about managing the database user and password, see “Writing secure messaging applications” on page 117.

- **DATABASE_TYPE=string** Specify the type of database the QAnywhere manager is connected to. Use **sqlanywhere** for a SQL database, or **ultralite** for an UltraLite database. By default, the manager uses **sqlanywhere**.
- **LOG_FILE=filename** Specify the name of a file to use to write logging messages. Specifying this option implicitly enables logging.
- **MAX_IN_MEMORY_MESSAGE_SIZE=n** When reading a message, *n* is the largest message, in bytes, for which a buffer is allocated. A message larger than *n* bytes must be read using streaming operations. The default value is 1MB on Windows and 64KB on Windows Mobile.

The following are properties made exclusively for the standalone client:

- **ML_PROTOCOL_TYPE** Specify the protocol type. Valid options are **tcpip**, **tls**, **http**, or **https**.
- **ML_PROTOCOL_PARAMS** Specify the MobiLink connect parameters.
- **ML_PROTOCOL_USENAME** Performs the same effect as the -mu option in QAnywhere agent.
- **ML_PROTOCOL_PASSWORD** Performs the same effect as the -mn option in QAnywhere agent.
- **INC_UPLOAD** Performs the same effect as the -iu option in QAnywhere agent.
- **INC_DOWNLOAD** Performs the same effect as the -idl option in QAnywhere agent.
- **STORE_ID** Performs the same effect as the -id option in QAnywhere agent.
- **STORE_ENCRYPTION_KEY** Specify the encryption key to encrypt the MessageStore.
- **POLICY** Performs the same effect as the -policy option in QAnywhere agent.
- **DELETE_PERIOD** Specifies the number of seconds between executions of the delete rules. If the amount specified is a negative number, execution of the delete rules is disabled.
- **PUSH** Performs the same effect as the -push option in the QAnywhere agent.

Setting QAnywhere manager configuration properties in a file

Note
You can create or open a QAnywhere manager configuration file in Sybase Central. From the QAnywhere 12 plug-in task pane, choose **Create An Agent Configuration File**. When you have chosen a file name and location, the **Properties** window for the configuration file opens, where you can set the properties.

The information in a QAnywhere manager properties file is specific to one instance of a QAManager.

When using a properties file, it must be configured for and installed on the remote device with each deployed copy of your application.

For information about specifying the name of the property file, see:

- .NET API: "CreateQAManager method" on page 265
- C++ API: "createQAManager method" on page 425
- Java API: "createQAManager method" on page 546
- SQL API: You cannot set properties in a file using the QAnywhere SQL API. See "Setting QAnywhere manager configuration properties programmatically" on page 84.

If the properties file does not reside in the same directory as your client executable, you must also specify the absolute path. If you want to use the default settings for the properties, use null instead of a file name.

Values set in the file permit you to enable or disable some of the QAnywhere features, such as automatic message compression and logging.

Entries in a QAnywhere manager configuration properties file take the form *name*=*value*. For a list of property names, see "QAnywhere manager configuration properties" on page 81. If *value* has spaces, enclose it in double-quotes. Comment lines start with #. For example:

```
# contents of QAnywhere manager configuration properties file
LOG_FILE=.\sender.ini.txt
# A comment
CONNECT_PARAMS=server=qanywhere;uid=ml_qa_user;pwd=qanywhere
DATABASE_TYPE=sqlanywhere
MAX_IN_MEMORY_MESSAGE_SIZE=2048
COMPRESSION_LEVEL=0
```

Referencing the configuration file

Suppose you have a QAnywhere manager configuration properties file called *mymanager.props* with the following content:

```
COMPRESSION_LEVEL=9
CONNECT_PARMS=DBF=mystore.db
```

When you create QAManager, you reference the file by name.

The following is an example using C#:

```
QAManager     mgr;
mgr = QAManagerFactory.Instance.CreateQAManager( "mymanager.props" );
mgr.Open( AcknowledgeMode.EXPLICIT_ACKNOWLEDGEMENT );
```

For the .NET API, see "QAManager interface" on page 219 and "QAManagerFactory class" on page 265.

The following is an example using C++:

```
QAManagerFactory *  qa_factory;
QAManager *    mgr;
qa_factory = QAnywhereFactory_init();
mgr = qa_factory->createQAManager( "mymanager.props" );
mgr->open( AcknowledgementMode::EXPLICIT_ACKNOWLEDGEMENT );
```

For the C++ API, see "QAManager class" on page 387 and "QAManagerFactory class" on page 424.

The following is an example using Java:

```
QAManager mgr;
mgr = QAManagerFactory.getInstance().createQAManager("mymanager.props");
mgr.open( AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT );
```

For the Java API, see "QAManagerFactory class" on page 545 and "QAManager interface" on page 507.

Setting QAnywhere manager configuration properties programmatically

In the QAnywhere APIs, you can use the QAManagerBase set property method to set properties programmatically. Setting QAnywhere manager configuration properties programmatically must be done before calling the open method of a QAManager instance.

For more information about QAManager properties, see "QAnywhere manager configuration properties" on page 81.

Example

The following C# example sets properties programmatically. When you create the QAManager, you specify the property settings.

```
QAManager     mgr;
mgr = QAManagerFactory.Instance.CreateQAManager( null );
mgr.SetProperty( "COMPRESSION_LEVEL", "9" );
mgr.SetProperty( "CONNECT_PARAMS", "DBF=mystore.db" );
mgr.SetProperty( "DATABASE_TYPE", "sqlanywhere" );
mgr.Open( AcknowledgeMode.EXPLICIT_ACKNOWLEDGEMENT );
```

For the .NET API, see "QAManager interface" on page 219 and "QAManagerFactory class" on page 265.

The following C++ example sets properties programmatically. When you create the QAManager, you specify the property settings.

```
QAManagerFactory *  qa_factory;
QAManager *     mgr;
qa_factory = QAnywhereFactory_init();
mgr = qa_factory->createQAManager( NULL );
mgr->setProperty( "COMPRESSION_LEVEL", "9" );
mgr->setProperty( "CONNECT_PARAMS", "DBF=mystore.db" );
mgr->setProperty( "DATABASE_TYPE", "sqlanywhere" );
mgr->open( AcknowledgementMode::EXPLICIT_ACKNOWLEDGEMENT );
```

For the C++ API, see "QAManager class" on page 387 and "QAManagerFactory class" on page 424.

The following Java example sets properties programmatically. When you create the QAManager, you specify the property settings.

```
QAManager mgr;
mgr = QAManagerFactory.getInstance().createQAManager(null);
mgr.setProperty("COMPRESSION_LEVEL", 9);
mgr.setStringProperty("CONNECT_PARMS", "DBF=mystore.db");
mgr.setStringProperty("DATABASE_TYPE", "sqlanywhere");
mgr.open(AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT);
```

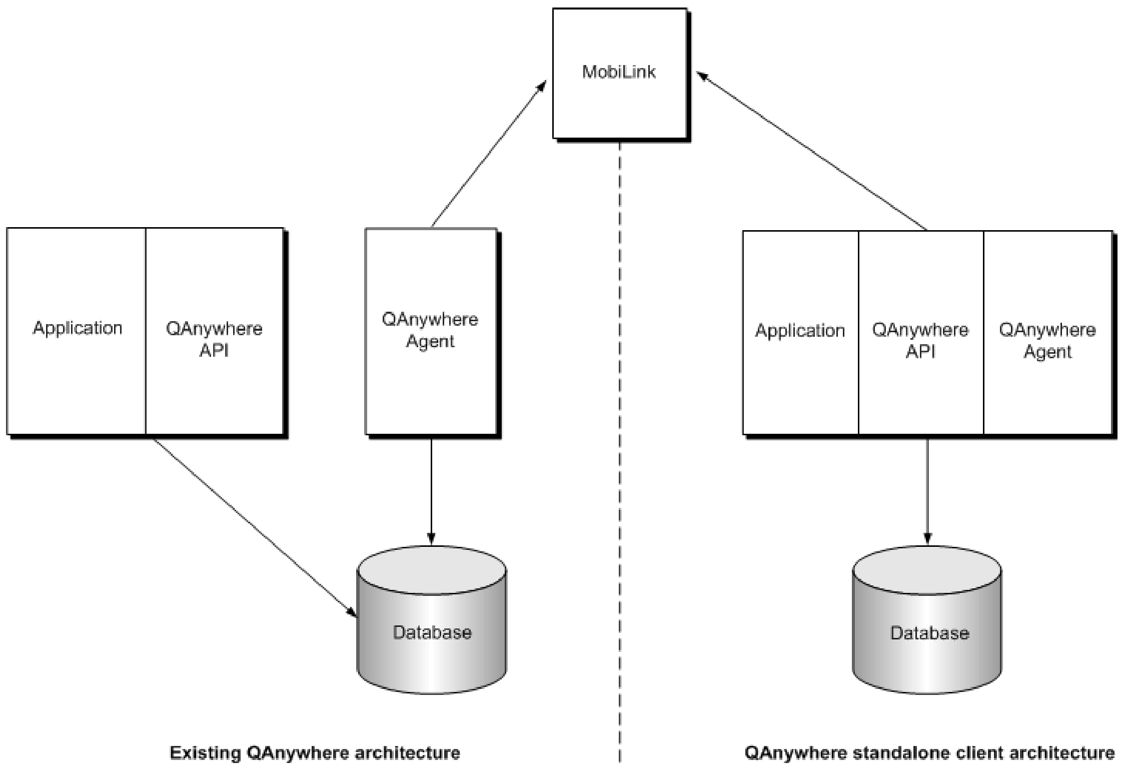
For the Java API, see “QAManagerFactory class” on page 545 and “QAManager interface” on page 507.

QAnywhere standalone client

The QAnywhere standalone client provides a compact client that enables you to set up a messaging system without worrying about running the QAnywhere Agent or administering your database. The standalone client incorporates both client store administration and QAnywhere Agent functionality into the same process that accesses the client API, so you are no longer required to create or maintain the client message stores and do not need to run the QAnywhere Agent as a separate process.

The following diagram shows the standalone client architecture and the existing QAnywhere architecture:

Existing QAnywhere architecture versus QAnywhere standalone client architecture



Understanding the standalone client message store

The message store is an UltraLite database that is bound to a store ID and is created and maintained automatically by the standalone client. The QAnywhere API accesses the message store using the in-process UltraLite runtime and not the UltraLite engine.

The standalone client message store differs from existing QAnywhere message stores in that only a single user application can access a message store at a time. That is, multiple standalone client applications on the same device require separate message stores and distinct store IDs. As a result of this, the Standalone

Client has no notion of "local messaging" whereby messages can be sent to different queues in the same message store. All messages sent through the standalone client are assumed to be for a different message store.

Since messages may reside in the message store even while the client application is not running, you can secure the store by providing a STORE_ENCRYPTION_KEY value on first use. The same key must then be provided each subsequent time a user attempts to use the message store. This encryption key also encrypts the data on disc. See "QAnywhere manager configuration properties" on page 81.

Deploying the standalone client

The QAnywhere standalone client is distributed in a separate dll file for .NET and a separate JAR file for Java:

- The .NET implementation is distributed in the dll *iAnywhere.QAnywhere.StandAloneClient.dll* and uses namespace iAnywhere.QAnywhere.StandAloneClient. See "QAnywhere .NET API reference for clients" on page 179.
- The Java implementation is distributed in the JAR file *qastandaloneclient.jar* and uses the package name ianywhere.qanywhere.standaloneclient. See "QAnywhere Java API reference for clients" on page 467.

Standalone client API

Both the Java and .NET implementations of the standalone client preserve the same API as the existing clients with the following exceptions.

The following QAManager configuration properties are exclusively for the standalone client:

- **ML_PROTOCOL_TYPE** Specifies the protocol type. Valid options are tcpip, tls, http, or https.

- **ML_PROTOCOL_PARAMS** Specifies MobiLink connection parameters.

- **ML_PROTOCOL_USENAME** Specifies the MobiLink user name. This is the same as the QAnywhere Agent -mu option. See "-mu qaagent option" on page 683.

- **ML_PROTOCOL_PASSWORD** Specifies a new password for the MobiLink user. This is the same as the QAnywhere Agent -mn option. See "-mn qaagent option" on page 682.

- **INC_UPLOAD** Specifies the incremental upload size. This is the same as the QAnywhere Agent -iu option. See "-iu qaagent option" on page 681.

- **INC_DOWNLOAD** Specifies the incremental download size. This is the same as the QAnywhere Agent -idl option. See "-idl qaagent option" on page 680.

- **STORE_ID** Specifies the ID of the client message store that the standalone client is to connect to. This is the same as the QAnywhere Agent -id option. See "-id qaagent option" on page 679.

- **STORE_ENCRYPTION_KEY** Specifies the encryption key used to encrypt the message store.
- **POLICY** Specifies a policy that determines when message transmission occurs. This is the same as the QAnywhere Agent -policy option. See "-policy qaagent option" on page 686.
- **DELETE_PERIOD** Specifies the number of seconds between execution of deletion of messages that have reached a final state.
- **PUSH** Specifies how push notifications are delivered. This is the same as the QAnywhere Agent -push option, except that the default is `-push lwpoll` for the standalone client. See "-push qaagent option" on page 688.

The following QAManager configuration properties are not supported in the QAnywhere standalone client:

- CONNECT_PARAMS
- DATABASE_TYPE

See also

- "QAnywhere manager configuration properties" on page 81
- "qaagent utility" on page 673

Mobile web services

Web Services have become a popular way to expose application functionality and enable better interoperability between the resources of various enterprises. They broaden the capabilities of mobile applications and simplify the development process.

Implementing web services in a mobile environment can be challenging because connectivity may not be available (or may be interrupted) and because of other limitations of wireless environments and devices. For example, a user working with a mobile application may want to make a request to a web service while offline and obtain the response when they go online, or an IT administrator may want to specify rules that restrict the size of web service responses based on the type of network connectivity the mobile application is using (such as GPRS, 802.11, or cradled).

QAnywhere addresses these challenges with mobile-optimized asynchronous web services that leverage the QAnywhere store-and-forward messaging architecture. By using QAnywhere mobile web services, your mobile applications can make web service requests, even when they are offline, and have those requests queued up for transmission later. The requests are delivered as QAnywhere messages and then a web services connector on the server side makes the request, gets the response from the web service, and returns the response to the client as a message. QAnywhere transmission rules can control which requests and responses are transmitted based on a wide variety of parameters (network being used, size of request/response, location, time of day, and so on). The result is a sophisticated and flexible architecture that allows mobile applications to tap into the vast functionality of web services using proven technology and a simple programming model.

From a development point of view, you can work with web service proxy classes much as you would in a connected environment and QAnywhere handles the transmission, authentication, serialization, and so on. A WSDL compiler is provided to take a WSDL document and generate special proxy classes (either .NET or Java) that a mobile application can use to invoke a web service. These classes use the underlying QAnywhere infrastructure to send requests and receive responses. When an object method call is made, a SOAP request is built automatically and delivered as a message to the server where a connector makes the web service request and returns the result as a message.

See also

- "Mobile web services" [*SQL Anywhere 12 - Introduction*]

Setting up mobile web services

The following steps provide an overview of the tasks required to set up mobile web services.

Overview of setting up mobile web services

1. Set up a server message store, if you don't already have one.

   See "Setting up the server message store" on page 22.

2. Start the MobiLink server with the -m option and a connection to the server message store.

   See "Starting QAnywhere with MobiLink enabled" on page 29.

3. Set up client message stores, if you don't already have them. These are SQL Anywhere databases that are used to temporarily store messages.

   See "Setting up the client message store" on page 23.

4. Run the iAnywhere WSDL compiler to create classes you can use in your application.

   See "Running the iAnywhere WSDL compiler" on page 92.

5. For each client, write a web service client application that uses the classes generated by the WSDL compiler.

   See "Writing mobile web service applications" on page 94.

6. Create a web services connector.

   See "Web service connectors" on page 137.

7. For each client, start the QAnywhere Agent (qaagent) with a connection to the local client message store.

   See "Starting the QAnywhere agent" on page 44.

Other resources for getting started

- An example showing how to set up a weather web service in Java is described in "Mobile web service example" on page 103.
- A mobile web service sample application using a currency exchange web service is installed to *samples-dir\QAnywhere\MobileWebServices*. (For information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database Administration*].) This sample is provided in both Java and C#.
- You can post questions on the QAnywhere newsgroup: ianywhere.public.sqlanywhere.qanywhere

Mobile web services development tips

- For mobile web services .NET applications, proxy classes generated by the WSDL compiler must be compiled into the application executable. They cannot be compiled into their own assembly.

- For mobile web services Java applications, JDK 1.5.x must be used.

- The iAnywhere WSDL compiler does not support CHAR data types. It is recommended that a STRING data type be used in place of CHAR.

Running the iAnywhere WSDL compiler

Given a WSDL source that describes a web service, the iAnywhere WSDL compiler generates a set of Java proxy classes, C# proxy classes, or SQL SOAP client procedures for SQL Anywhere that you include in your application.

The Java or C# classes generated by the WSDL compiler are intended for use with QAnywhere. These classes expose web service operations as method calls. The classes that are generated are:

- The main service binding class (this class inherits from ianywhere.qanywhere.ws.WSBase in the mobile web services runtime).
- A proxy class for each complex type specified in the WSDL file.

For information about the generated proxy classes, see:

- .NET: "QAnywhere .NET API reference for web services" on page 306
- Java: "QAnywhere Java API reference for web services" on page 586

The WSDL compiler supports WSDL 1.1 and SOAP 1.1 over HTTP and HTTPS.

Syntax

wsdlc [*options*] *wsdl-uri*

wsdl-uri

This is the specification for the WSDL (Web Services Description Language) source (a URL or file).

Options

- **-h** Display help text.

- **-v** Display verbose information.

- **-o *output-directory*** Specify an output directory for generated files.

- **-l *language*** Specify a language for the generated files. This is one of **java**, **cs**, or **sql**. These options must be specified in lowercase letters.

- **-d** Display debug information that may be helpful when contacting iAnywhere customer support.

Java-specific options

- **-p *package*** Specify a package name. This permits you to override the default package name.

C#-specific options

- **-n *namespace*** Specify a namespace. This permits you to wrap the generated classes in a namespace of your choosing.

SQL-specific options

- **-f *filename*** (Required) Specify the name of the output SQL file to which the SQL statements are written. This operation overwrites any existing file of the same name.

- **-p=*prefix*** Specify a prefix for the generated function or procedure names. The default prefix is the service name followed by a period (for example, "WSDish.").

- **-x** Generate procedure definitions rather than function definitions.

Writing mobile web service applications

Your application sends a web service request to QAnywhere, which sends the request to the mobile web service connector in the MobiLink server. The connector sends the request to the web service or queues the request until the web service is available. When QAnywhere receives the response, it notifies your application or queues the response until your application is available.

Setting up .NET mobile web service applications

Before using .NET with QAnywhere, you must make the following changes to your Visual Studio project:

- Add references to the QAnywhere .NET DLL and the mobile web services .NET DLL. This tells Visual Studio which DLL to include to find the code for the QAnywhere .NET API and the mobile web services .NET API.

- Add lines to your source code to reference the QAnywhere .NET API classes and the mobile web services .NET API classes. To use the QAnywhere .NET API, you must add a line to your source code to reference the data provider. You must add a different line for C# than for Visual Basic.

Complete instructions follow.

To add references to the QAnywhere .NET API and mobile web services API in a Visual Studio project

1. Start Visual Studio and open your project.

2. In the Solution Explorer window, right-click the **References** folder and choose **Add Reference**.

3. On the **Browse** tab, locate *iAnywhere.QAnywhere.Client.dll* and *iAnywhere.QAnywhere.WS.dll* in the following directories:

   - .NET Framework 2.0: *install-dir\Assembly\V2*
   - .NET Compact Framework 2.0: *install-dir\ce\Assembly\V2*

   From the appropriate directory for your environment, select each DLL and click **Open**.

4. To verify that the DLLs are added to your project, expand the **References** tree in the Solution Explorer. *iAnywhere.QAnywhere.Client.dll* and *iAnywhere.QAnywhere.WS.dll* should appear in the list.

Referencing the data provider classes in your source code

To reference the QAnywhere .NET API and mobile web services API classes in your code

1. Start Visual Studio and open your project.

2. If you are using C#, add the following lines to the list of using directives at the beginning of your file:

   ```
   using iAnywhere.QAnywhere.Client;
   using iAnywhere.QAnywhere.WS;
   ```

3. If you are using Visual Basic, add the following lines to the list of imports at the beginning of your file:

   ```
   Imports iAnywhere.QAnywhere.Client
   Imports iAnywhere.QAnywhere.WS
   ```

   The Imports lines are not strictly required. However, they allow you to use short forms for the QAnywhere and mobile web services classes. Without them, you can still use the fully qualified class name in your code. For example, the following code uses the long form:

   ```
   iAnywhere.QAnywhere.Client.QAManager
   mgr =
    new iAnywhere.QAnywhere.Client.QAManagerFactory.Instance.CreateQAManager(
   "qa_manager.props" );
   ```

   The following code uses the short forms:

   ```
   QAManager mgr = QAManagerFactory.Instance.CreateQAManager(
    "qa_manager.props" );
   ```

To initialize QAnywhere and mobile web services for .NET

1. Include the *iAnywhere.QAnywhere.Client* and *iAnywhere.QAnywhere.WS* namespaces, as described in the previous procedure.

   ```
   using iAnywhere.QAnywhere.Client;
   using iAnywhere.QAnywhere.WS;
   ```

2. Create a QAManager object.

   For example, to create a default QAManager object, invoke CreateQAManager with null as its parameter:

   ```
   QAManager mgr;
   mgr = QAManagerFactory.Instance.CreateQAManager( null );
   ```

   > **Tip**
   > For maximum concurrency benefits, multi-threaded applications should create a QAManager for each thread. See "Multi-threading considerations" on page 81.

   For more information about QAManagerFactory, see "QAManagerFactory class" on page 265.

   Alternatively, you can create a QAManager object that is customized using a properties file. The properties file is specified in the CreateQAManager method:

```
mgr = QAManagerFactory.Instance.CreateQAManager(
  "qa_mgr.props" );
```

where *qa_mgr.props* is the name of the properties file that resides on the remote device.

3. Initialize the QAManager object. For example:

   ```
   mgr.Open(
      AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT);
   ```

   The argument to the open method is an acknowledgement mode, which indicates how messages are to be acknowledged. It must be one of IMPLICIT_ACKNOWLEDGEMENT or EXPLICIT_ACKNOWLEDGEMENT.

   QAnywhere messages used by mobile web services are not accessible to the mobile web services application. When using a QAManager in EXPLICIT_ACKNOWLEDGEMENT mode, use the Acknowledge method of WSResult to acknowledge the QAnywhere message that contains the result of a web services request. This method indicates that the application has successfully processed the response.

   For more information about acknowledgement modes, see:

   - WSBase "SetQAManager method" on page 311
   - WSResult "Acknowledge method" on page 324

   Note
   Instead of creating a QAManager, you can create a QATransactionalManager. See "Implementing transactional messaging for .NET clients" on page 63.

4. Create an instance of the service binding class.

   The mobile web services WSDL compiler generates the service binding class from the WSDL document that defines the web service.

   The QAManager is used by the instance of the web service binding class to perform messaging operations in the process of making web service requests. You specify the connector address to use to send web service requests through QAnywhere by setting the property WS_CONNECTOR_ADDRESS of the service binding class. You configure each QAnywhere web service connector with the URL of a web service to connect to, and if an application needs web services located at more than one URL, configure the connector for each URL.

   For example:

   ```
   CurrencyConverterSoap service = new CurrencyConverterSoap( )
   service.SetQAManager(mgr);
   service.setProperty(
      "WS_CONNECTOR_ADDRESS",
      "ianywhere.connector.currencyconvertor\\");
   ```

   Note that the final \\ in the address must be included.

See also

- “QAnywhere .NET API reference for web services” on page 306
- “QAnywhere .NET API reference for clients” on page 179

Example

To initialize mobile web services, you must create a QAManager and create an instance of the service binding class. For example:

```
// QAnywhere initialization
  QAManager mgr = QAManagerFactory.Instance.CreateQAManager();
  mgr.SetProperty( "CONNECT_PARAMS",
"server=qanywhere;dbf=qanywhere.db;uid=ml_qa_user;pwd=qanywhere" );
  mgr.Open( AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT );
  mgr.Start();

  // Instantiate the web service proxy
  CurrencyConvertorSoap service = new CurrencyConvertorSoap();
  service.SetQAManager( mgr );
  service.SetProperty( "WS_CONNECTOR_ADDRESS",
"ianywhere.connector.currencyconvertor\\" );
```

The response time for the CurrencyConvertor sample depends on the availability of the web service. Asynchronous web service requests are useful when the mobile web service application is not always available. With this method, a web service request is made by calling a method on the service binding class to place the request in an outgoing queue. The method returns a WSResult, which can be used to query the status of the response at a later time, even after the application has been restarted. See “Asynchronous web service requests” on page 101.

Setting up Java mobile web service applications

To create mobile web service applications in Java, you must complete the following initialization tasks.

To initialize QAnywhere and mobile web services for Java

1. Add the location of the following files to your classpath. By default, they are located in *install-dir \Java*:

   - *qaclient.jar*
   - *iawsrt.jar*
   - *jaxrpc.jar*

2. Import the ianywhere.qanywhere.client and ianywhere.qanywhere.ws packages:

   ```
   import ianywhere.qanywhere.client.*;
   import ianywhere.qanywhere.ws.*;
   ```

3. Create a QAManager object.

   ```
   QAManager mgr;
   mgr = QAManagerFactory.getInstance().createQAManager(null);
   ```

You can also customize a QAManager object by specifying a properties file to the createQAManager method:

```
mgr = QAManagerFactory.getInstance().createQAManager("qa_mgr.props.");
```

Tip
For maximum concurrency benefits, multi-threaded applications should create a QAManager for each thread. See "Multi-threading considerations" on page 81.

4. Initialize the QAManager object.

   ```
   mgr.open(AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT);
   ```

   The argument to the open method is an acknowledgement mode, which indicates how messages are to be acknowledged. It must be one of IMPLICIT_ACKNOWLEDGEMENT or EXPLICIT_ACKNOWLEDGEMENT.

   QAnywhere messages used by mobile web services are not accessible to the mobile web services application. When using a QAManager in EXPLICIT_ACKNOWLEDGEMENT mode, use the Acknowledge method of WSResult to acknowledge the QAnywhere message that contains the result of a web services request. This method indicates that the application has successfully processed the response.

   For more information about acknowledgement modes, see:

   - "setQAManager method" on page 590
   - "acknowledge method" on page 599

Note
Instead of creating a QAManager, you can create a QATransactionalManager. See "Implementing transactional messaging for Java clients" on page 66.

5. Create an instance of the service binding class.

   The mobile web services WSDL compiler generates the service binding class from the WSDL document that defines the web service.

   In the process of making web service requests, the QAManager is used by the instance of the web service binding class to perform messaging operations. You specify the connector address to use to send web service requests through QAnywhere by setting the WS_CONNECTOR_ADDRESS property of the service binding class. Each QAnywhere web service connector is configured with a URL of a web service to connect to. This means that if an application needs web services located at more than one URL, then a QAnywhere connector must be configured for each service URL.

   For example:

   ```
   CurrencyConverterSoap service = new CurrencyConverterSoap( );
   service.setQAManager(mgr);
   service.setProperty("WS_CONNECTOR_ADDRESS",
   "ianywhere.connector.currencyconvertor\\");
   ```

Note that the final \\ in the address must be included.

See also

- "QAnywhere Java API reference for web services" on page 586
- "QAnywhere Java API reference for clients" on page 467

Example

To initialize mobile web services, you must create a QAManager and create an instance of the service binding class. For example:

```
// QAnywhere initialization
  Properties props = new Properties();
  props.put( "CONNECT_PARAMS",
"server=qanywhere;dbf=qanywhere.db;uid=ml_qa_user;pwd=qanywhere" );
  QAManager mgr = QAManagerFactory.getInstance().createQAManager( props );
  mgr.open( AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT );
  mgr.start();

  // Instantiate the web service proxy
  CurrencyConvertorSoap service = new CurrencyConvertorSoap();
  service.setQAManager( mgr );
  service.setProperty( "WS_CONNECTOR_ADDRESS",
"ianywhere.connector.currencyconvertor\\" );
```

Multiple instances of the service binding class

You should create an instance of the service binding class for each QAManager. If a mobile web services application has more than one instance of a service binding class, it is important that the service ID be set using the SetServiceID method. For example:

```
service1.SetServiceID("1")
service2.SetServiceID("2")
```

The service ID is combined with the service name to form a queue name for receiving web service responses. It is important that each instance of a given service has a unique service ID so that a given instance does not get responses to requests made by another instance of the service. If the service ID is not set, it defaults to "". The service ID is also important for preventing multiple applications that use the same service from conflicting with each other, since queue names persist messages in the message store across applications that are transient.

Compiling and running mobile web service applications

Runtime libraries

The runtime library for Java is *iawsrt.jar*, located in *install-dir\Java*.

The runtime library for C# is *iAnywhere.QAnywhere.WS.dll*, located in the following directories:

- .NET Framework 2.0: *install-dir\Assembly\V2*
- .NET Compact Framework 2.0: *install-dir\ce\Assembly\V2*

The following sections describe the files you need to compile and run mobile web service applications.

Required runtime libraries (Java)

Include the following files in your classpath. They are located in *install-dir\Java*:

- *jaxrpc.jar*
- *qaclient.jar*
- *iawsrt.jar*

Required runtime libraries (.NET)

The SQL Anywhere 12 installation automatically includes the following files in your Global Assembly Cache:

- *iAnywhere.QAnywhere.Client.dll*
- *iAnywhere.QAnywhere.WS.dll*

Shutting down mobile web services

A mobile web services application performs orderly shutdown by closing the QAManager. For example:

```
// QAnywhere finalization in C#:
mgr.Stop();
mgr.Close();

// QAnywhere finalization in Java:
mgr.stop();
mgr.close();
```

Making web service requests

There are two basic methods of making web service requests in a mobile web services application:

- **Synchronous** See "Synchronous web service requests" on page 100.
- **Asynchronous** See "Asynchronous web service requests" on page 101.

Synchronous web service requests

Synchronous web service requests are used when the application is connected to a network. With this method, a web service request is made by calling a method on the service binding class, and the result is returned only when the web service response has been received from the server.

Example

The following example makes a request to get the USD-to-CAD exchange rate:

```
//C#
double r = service.ConversionRate( Currency.USD, Currency.CAD );

// Java
double r = service.conversionRate( NET.webserviceX.Currency.USD,
NET.webserviceX.Currency.CAD );
```

Asynchronous web service requests

Asynchronous web service requests are useful when the mobile web service application is only occasionally connected to a network. With this method, a web service request is made by calling a method on the service binding class to place the request in an outgoing queue. The method returns a WSResult, which can be used to query the status of the response at a later time, even after the application has been restarted.

The following example makes an asynchronous request to get the USD-to-CAD exchange rate:

```
// C#
WSResult r = service.AsyncConversionRate( Currency.USD, Currency.CAD );

// Get the request ID.  Save it for later use if necessary.
string reqID = r.GetRequestID();

// Later: get the response for the specified request ID
WSResult r = service.GetResult( reqID );
if( r.GetStatus() == WSStatus.STATUS_RESULT_AVAILABLE ) {
  Console.WriteLine( "The conversion rate is " +
r.GetDoubleValue( "ConversionRateResult" ) );
} else {
  Console.WriteLine( "Response not available" );
}
// Java
WSResult r = service.asyncConversionRate( NET.webserviceX.Currency.USD,
NET.webserviceX.Currency.CAD );

// Get the request ID.  Save it for later use if necessary.
String reqID = r.getRequestID();

// Later: get the response for the specified request ID
WSResult r = service.getResult( reqID );
if( r.getStatus() == WSStatus.STATUS_RESULT_AVAILABLE ) {
    System.out.println( "The conversion rate is " +
r.getDoubleValue( "ConversionRateResult" ) );
} else {
    System.out.println( "Response not available" );
}
```

It is also possible to use a WSListener to get an asynchronous callback when the response to a web service request is available. For example:

```
// C#
// Make a request to get the USD to CAD exchange rate
WSResult r = service.AsyncConversionRate( Currency.USD, Currency.CAD );
```

```
// Register a listener for the result
service.SetListener( r.GetRequestID(), new CurrencyConvertorListener() );

// Java
// Make a request to get the USD to CAD exchange rate
WSResult r = service.asyncConversionRate( NET.webserviceX.Currency.USD,
NET.webserviceX.Currency.CAD );

// Register a listener for the result
service.setListener( r.getRequestID(), new CurrencyConvertorListener() );
```

The WSListener interface defines two methods for handling asynchronous events:

- **OnResult** An OnResult method is implemented to handle a response to a web service request. It is passed a WSResult object that represents the result of the web service request.
- **OnException** An OnException method is implemented to handle errors that occurred during processing of the response to the web service request. It is passed a WSException object and a WSResult object. The WSException object contains information about the error that occurred, and the WSResult object can be used to obtain the request ID that the response corresponds to.

```
// C#
class CurrencyConvertorListener : WSListener
{
   public CurrencyConvertorListener() {
   }

   public void OnResult( WSResult r ) {
    try {
         USDToCAD._statusMessage = "USD to CAD currency exchange rate: " +
r.GetDoubleValue( "ConversionRateResult" );
    } catch( Exception exc ) {
        USDToCAD._statusMessage = "Request " + r.GetRequestID() + " failed: "
+ exc.Message;
    }
   }

   public void OnException( WSException exc, WSResult r ) {
    USDToCAD._statusMessage = "Request " + r.GetRequestID() + " failed: " +
exc.Message;
   }
}
// Java
private class CurrencyConvertorListener implements WSListener
{
  public CurrencyConvertorListener() {
  }

  public void onResult( WSResult r ) {
   try {
        USDToCAD._statusMessage = "USD to CAD currency exchange rate: " +
r.getDoubleValue( "ConversionRateResult" );
   } catch( Exception exc ) {
       USDToCAD._statusMessage = "Request " + r.getRequestID() + " failed: "
+ exc.getMessage();
   }
   }

   public void onException( WSException exc, WSResult r ) {
       USDToCAD._statusMessage = "Request " + r.getRequestID() + " failed: "
+ exc.getMessage();
```

```
      }
   }
```

Mobile web service example

This example shows you how to create a mobile web service application. The application, which takes just a few minutes to create, uses the QAnywhere store-and-forward functionality so that you can issue a request for a weather report even if you are offline, and then see the report when it is available.

Global Weather web service

The following code describes a web service called Global Weather. (It is a wsdl file that was copied from a public weather web service.) Copy the code into a file and name the file *globalweather.wsdl*:

```
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions xmlns:http="http://schemas.xmlsoap.org/wsdl/http/"
xmlns:soap="http://schemas.xmlsoap.org/wsdl/soap/" xmlns:s="http://
www.w3.org/2001/XMLSchema" xmlns:soapenc="http://schemas.xmlsoap.org/soap/
encoding/" xmlns:tns="http://www.webserviceX.NET" xmlns:tm="http://
microsoft.com/wsdl/mime/textMatching/" xmlns:mime="http://
schemas.xmlsoap.org/wsdl/mime/" targetNamespace="http://www.webserviceX.NET"
xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">
  <wsdl:types>
    <s:schema elementFormDefault="qualified" targetNamespace="http://
www.webserviceX.NET">
      <s:element name="GetWeather">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="CityName"
type="s:string" />
            <s:element minOccurs="0" maxOccurs="1" name="CountryName"
type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetWeatherResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="GetWeatherResult"
type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetCitiesByCountry">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1" name="CountryName"
type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
      <s:element name="GetCitiesByCountryResponse">
        <s:complexType>
          <s:sequence>
            <s:element minOccurs="0" maxOccurs="1"
name="GetCitiesByCountryResult" type="s:string" />
          </s:sequence>
        </s:complexType>
      </s:element>
```

```
          <s:element name="string" nillable="true" type="s:string" />
        </s:schema>
      </wsdl:types>
      <wsdl:message name="GetWeatherSoapIn">
        <wsdl:part name="parameters" element="tns:GetWeather" />
      </wsdl:message>
      <wsdl:message name="GetWeatherSoapOut">
        <wsdl:part name="parameters" element="tns:GetWeatherResponse" />
      </wsdl:message>
      <wsdl:message name="GetCitiesByCountrySoapIn">
        <wsdl:part name="parameters" element="tns:GetCitiesByCountry" />
      </wsdl:message>
      <wsdl:message name="GetCitiesByCountrySoapOut">
        <wsdl:part name="parameters" element="tns:GetCitiesByCountryResponse" />
      </wsdl:message>
      <wsdl:message name="GetWeatherHttpGetIn">
        <wsdl:part name="CityName" type="s:string" />
        <wsdl:part name="CountryName" type="s:string" />
      </wsdl:message>
      <wsdl:message name="GetWeatherHttpGetOut">
        <wsdl:part name="Body" element="tns:string" />
      </wsdl:message>
      <wsdl:message name="GetCitiesByCountryHttpGetIn">
        <wsdl:part name="CountryName" type="s:string" />
      </wsdl:message>
      <wsdl:message name="GetCitiesByCountryHttpGetOut">
        <wsdl:part name="Body" element="tns:string" />
      </wsdl:message>
      <wsdl:message name="GetWeatherHttpPostIn">
        <wsdl:part name="CityName" type="s:string" />
        <wsdl:part name="CountryName" type="s:string" />
      </wsdl:message>
      <wsdl:message name="GetWeatherHttpPostOut">
        <wsdl:part name="Body" element="tns:string" />
      </wsdl:message>
      <wsdl:message name="GetCitiesByCountryHttpPostIn">
        <wsdl:part name="CountryName" type="s:string" />
      </wsdl:message>
      <wsdl:message name="GetCitiesByCountryHttpPostOut">
        <wsdl:part name="Body" element="tns:string" />
      </wsdl:message>
      <wsdl:portType name="GlobalWeatherSoap">
        <wsdl:operation name="GetWeather">
          <documentation xmlns="http://schemas.xmlsoap.org/wsdl/">Get weather
report for all major cities around the world.</documentation>
          <wsdl:input message="tns:GetWeatherSoapIn" />
          <wsdl:output message="tns:GetWeatherSoapOut" />
        </wsdl:operation>
        <wsdl:operation name="GetCitiesByCountry">
          <documentation xmlns="http://schemas.xmlsoap.org/wsdl/">Get all major
cities by country name(full / part).</documentation>
          <wsdl:input message="tns:GetCitiesByCountrySoapIn" />
          <wsdl:output message="tns:GetCitiesByCountrySoapOut" />
        </wsdl:operation>
      </wsdl:portType>
      <wsdl:portType name="GlobalWeatherHttpGet">
        <wsdl:operation name="GetWeather">
          <documentation xmlns="http://schemas.xmlsoap.org/wsdl/">Get weather
report for all major cities around the world.</documentation>
          <wsdl:input message="tns:GetWeatherHttpGetIn" />
          <wsdl:output message="tns:GetWeatherHttpGetOut" />
        </wsdl:operation>
        <wsdl:operation name="GetCitiesByCountry">
          <documentation xmlns="http://schemas.xmlsoap.org/wsdl/">Get all major
```

```
cities by country name(full / part).</documentation>
      <wsdl:input message="tns:GetCitiesByCountryHttpGetIn" />
      <wsdl:output message="tns:GetCitiesByCountryHttpGetOut" />
    </wsdl:operation>
  </wsdl:portType>
  <wsdl:portType name="GlobalWeatherHttpPost">
    <wsdl:operation name="GetWeather">
      <documentation xmlns="http://schemas.xmlsoap.org/wsdl/">Get weather
report for all major cities around the world.</documentation>
      <wsdl:input message="tns:GetWeatherHttpPostIn" />
      <wsdl:output message="tns:GetWeatherHttpPostOut" />
    </wsdl:operation>
    <wsdl:operation name="GetCitiesByCountry">
      <documentation xmlns="http://schemas.xmlsoap.org/wsdl/">Get all major
cities by country name(full / part).</documentation>
      <wsdl:input message="tns:GetCitiesByCountryHttpPostIn" />
      <wsdl:output message="tns:GetCitiesByCountryHttpPostOut" />
    </wsdl:operation>
  </wsdl:portType>
  <wsdl:binding name="GlobalWeatherSoap" type="tns:GlobalWeatherSoap">
    <soap:binding transport="http://schemas.xmlsoap.org/soap/http"
style="document" />
    <wsdl:operation name="GetWeather">
      <soap:operation soapAction="http://www.webserviceX.NET/GetWeather"
style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetCitiesByCountry">
      <soap:operation soapAction="http://www.webserviceX.NET/
GetCitiesByCountry" style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>
  <wsdl:binding name="GlobalWeatherHttpGet" type="tns:GlobalWeatherHttpGet">
    <http:binding verb="GET" />
    <wsdl:operation name="GetWeather">
      <http:operation location="/GetWeather" />
      <wsdl:input>
        <http:urlEncoded />
      </wsdl:input>
      <wsdl:output>
        <mime:mimeXml part="Body" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetCitiesByCountry">
      <http:operation location="/GetCitiesByCountry" />
      <wsdl:input>
        <http:urlEncoded />
      </wsdl:input>
      <wsdl:output>
        <mime:mimeXml part="Body" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>
  <wsdl:binding name="GlobalWeatherHttpPost"
type="tns:GlobalWeatherHttpPost">
    <http:binding verb="POST" />
    <wsdl:operation name="GetWeather">
      <http:operation location="/GetWeather" />
      <wsdl:input>
        <mime:content type="application/x-www-form-urlencoded" />
      </wsdl:input>
      <wsdl:output>
        <mime:mimeXml part="Body" />
      </wsdl:output>
    </wsdl:operation>
    <wsdl:operation name="GetCitiesByCountry">
      <http:operation location="/GetCitiesByCountry" />
      <wsdl:input>
        <mime:content type="application/x-www-form-urlencoded" />
      </wsdl:input>
      <wsdl:output>
        <mime:mimeXml part="Body" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>
  <wsdl:service name="GlobalWeather">
    <wsdl:port name="GlobalWeatherSoap" binding="tns:GlobalWeatherSoap">
     <soap:address location="http://www.webservicex.net/globalweather.asmx" /
>
    </wsdl:port>
    <wsdl:port name="GlobalWeatherHttpGet"
binding="tns:GlobalWeatherHttpGet">
     <http:address location="http://www.webservicex.net/globalweather.asmx" /
>
    </wsdl:port>
    <wsdl:port name="GlobalWeatherHttpPost"
binding="tns:GlobalWeatherHttpPost">
     <http:address location="http://www.webservicex.net/globalweather.asmx" /
>
    </wsdl:port>
  </wsdl:service>
</wsdl:definitions>
```

Generate proxy class

To create a mobile application to access the Global Weather web service, first run the QAnywhere WSDL compiler. It generates a proxy class that can be used in an application to make requests of the global weather service. In this example, the application is written in Java.

```
wsdlc -l java globalweather.wsdl
```

This command generates a proxy class called *GlobalWeatherSoap.java*, located in the *NET\webserviceX* subdirectory of the current directory. This proxy class is the service binding class for your application. The following is the content of *GlobalWeatherSoap.java*:

```
/*
 * GlobalWeatherSoap.java
 *
 * Generated by the iAnywhere WSDL Compiler Version 10.0.1.3415
 * Do not edit this file.
 */

package NET.webserviceX;

import ianywhere.qanywhere.ws.*;
import ianywhere.qanywhere.client.QABinaryMessage;
import ianywhere.qanywhere.client.QAException;

import java.io.*;

import javax.xml.transform.*;
import javax.xml.transform.sax.*;
import javax.xml.transform.stream.*;

public class GlobalWeatherSoap extends ianywhere.qanywhere.ws.WSBase
{

    public GlobalWeatherSoap(String iniFile) throws WSException
    {
        super(iniFile);
        init();
    }

    public GlobalWeatherSoap() throws WSException
    {
        init();
    }

    public void init()
    {

        setServiceName("GlobalWeather");
    }


    public java.lang.String getWeather(java.lang.String cityName,
                        java.lang.String countryName) throws QAException,
WSException, WSFaultException
    {
        try {
            StringWriter sw = new StringWriter();
            SAXTransformerFactory stf = (SAXTransformerFactory)
SAXTransformerFactory.newInstance();
            TransformerHandler hd = stf.newTransformerHandler();
            QABinaryMessage qaRequestMsg = null;

            hd.setResult( new StreamResult( sw ) );
            String        responsePartName = "GetWeatherResult";
            java.lang.String    returnValue;

            writeSOAPHeader( hd, "GetWeather", "http://
www.webserviceX.NET" );

WSBaseTypeSerializer.serialize(hd,"CityName",cityName,"string","http://
www.w3.org/2001/XMLSchema",true,true);

WSBaseTypeSerializer.serialize(hd,"CountryName",countryName,"string","http://
www.w3.org/2001/XMLSchema",true,true);
            writeSOAPFooter( hd, "GetWeather" );

            qaRequestMsg = createQAMessage( sw.toString(), "http://
www.webserviceX.NET/GetWeather", "GetWeatherResponse" );

            WSResult wsResult = invokeWait( qaRequestMsg );

            returnValue = wsResult.getStringValue(responsePartName);

            return returnValue;
        } catch( TransformerConfigurationException e ) {
                throw new WSException( e );
            }
        }

        public WSResult asyncGetWeather(java.lang.String cityName,
                            java.lang.String countryName) throws QAException,
    WSException
        {
            try {
                StringWriter sw = new StringWriter();
                SAXTransformerFactory stf = (SAXTransformerFactory)
    SAXTransformerFactory.newInstance();
                TransformerHandler hd = stf.newTransformerHandler();
                QABinaryMessage qaRequestMsg = null;

                hd.setResult( new StreamResult( sw ) );

                writeSOAPHeader( hd, "GetWeather", "http://
    www.webserviceX.NET" );

    WSBaseTypeSerializer.serialize(hd,"CityName",cityName,"string","http://
    www.w3.org/2001/XMLSchema",true,true);

    WSBaseTypeSerializer.serialize(hd,"CountryName",countryName,"string","http://
    www.w3.org/2001/XMLSchema",true,true);
                writeSOAPFooter( hd, "GetWeather" );

                qaRequestMsg = createQAMessage( sw.toString(), "http://
    www.webserviceX.NET/GetWeather", "GetWeatherResponse" );

                WSResult wsResult = invoke( qaRequestMsg );

                return wsResult;
            } catch( TransformerConfigurationException e ) {
                throw new WSException( e );
            }
        }


        public java.lang.String getCitiesByCountry(java.lang.String countryName)
    throws QAException, WSException, WSFaultException
        {
            try {
                StringWriter sw = new StringWriter();
                SAXTransformerFactory stf = (SAXTransformerFactory)
    SAXTransformerFactory.newInstance();
                TransformerHandler hd = stf.newTransformerHandler();
                QABinaryMessage qaRequestMsg = null;

                hd.setResult( new StreamResult( sw ) );
                String        responsePartName = "GetCitiesByCountryResult";
                java.lang.String    returnValue;

                writeSOAPHeader( hd, "GetCitiesByCountry", "http://
    www.webserviceX.NET" );

    WSBaseTypeSerializer.serialize(hd,"CountryName",countryName,"string","http://
    www.w3.org/2001/XMLSchema",true,true);
                writeSOAPFooter( hd, "GetCitiesByCountry" );

                qaRequestMsg = createQAMessage( sw.toString(), "http://
    www.webserviceX.NET/GetCitiesByCountry", "GetCitiesByCountryResponse" );

                WSResult wsResult = invokeWait( qaRequestMsg );
                returnValue = wsResult.getStringValue(responsePartName);

                return returnValue;
            } catch( TransformerConfigurationException e ) {
                throw new WSException( e );
            }
        }

        public WSResult asyncGetCitiesByCountry(java.lang.String countryName)
    throws QAException, WSException
        {
            try {
                StringWriter sw = new StringWriter();
                SAXTransformerFactory stf = (SAXTransformerFactory)
    SAXTransformerFactory.newInstance();
                TransformerHandler hd = stf.newTransformerHandler();
                QABinaryMessage qaRequestMsg = null;

                hd.setResult( new StreamResult( sw ) );

                writeSOAPHeader( hd, "GetCitiesByCountry", "http://
    www.webserviceX.NET" );

    WSBaseTypeSerializer.serialize(hd,"CountryName",countryName,"string","http://
    www.w3.org/2001/XMLSchema",true,true);
                writeSOAPFooter( hd, "GetCitiesByCountry" );

                qaRequestMsg = createQAMessage( sw.toString(), "http://
    www.webserviceX.NET/GetCitiesByCountry", "GetCitiesByCountryResponse" );

                WSResult wsResult = invoke( qaRequestMsg );

                return wsResult;
            } catch( TransformerConfigurationException e ) {
                throw new WSException( e );
            }
        }
    }
```

Write mobile web service applications

Next, write applications that use the service binding class to make requests of the web service and process the results. Following are two applications, both of which make web service requests offline and process the results when a connection is available.

The first application, called RequestWeather, makes a request of the global weather service and displays the ID of the request. Copy the following code into a file called *RequestWeather.java*:

```
import ianywhere.qanywhere.client.*;
import ianywhere.qanywhere.ws.*;
import NET.webserviceX.GlobalWeatherSoap;

class RequestWeather
{
    public static void main( String [] args ) {
    try {
        // QAnywhere initialization
        QAManager mgr = QAManagerFactory.getInstance().createQAManager();
        mgr.open( AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT );
        mgr.start();
        // Instantiate the web service proxy
        GlobalWeatherSoap service = new GlobalWeatherSoap();
        service.setQAManager( mgr );
        service.setProperty( "WS_CONNECTOR_ADDRESS",
"ianywhere.connector.globalweather\\" );

        // Make a request to get weather for Beijing
        WSResult r = service.asyncGetWeather( "Beijing", "China" );

        // Display the request ID so that it can be used by ShowWeather
        System.out.println( "Request ID: " + r.getRequestID() );

        // QAnywhere finalization
        mgr.stop();
        mgr.close();

    } catch( Exception exc ) {
        System.out.println( exc.getMessage() );
    }
    }
}
```

The second application, called ShowWeather, shows the weather conditions for a given request ID. Copy the following code into a file called *ShowWeather.java*:

```
import ianywhere.qanywhere.client.*;
import ianywhere.qanywhere.ws.*;
import NET.webserviceX.GlobalWeatherSoap;

class ShowWeather
{
   public static void main( String [] args ) {
   try {
     // QAnywhere initialization
     QAManager mgr = QAManagerFactory.getInstance().createQAManager();
     mgr.open( AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT );
     mgr.start();

     // Instantiate the web service proxy
     GlobalWeatherSoap service = new GlobalWeatherSoap();
     service.setQAManager( mgr );

     // Get the response for the specified request ID
     WSResult r = service.getResult( args[0] );
     if( r.getStatus() == WSStatus.STATUS_RESULT_AVAILABLE ) {
  System.out.println( "The weather is " +
r.getStringValue( "GetWeatherResult" ) );
  r.acknowledge();
     } else {
  System.out.println( "Response not available" );
     }

     // QAnywhere finalization
     mgr.stop();
     mgr.close();

 } catch( Exception exc ) {
     System.out.println( exc.getMessage() );
 }
    }
}
```

Compile the application and the service binding class:

```
javac -classpath ".;%sqlany12%\java\iawsrt.jar;%sqlany12%\java\qaclient.jar"
NET.webserviceX.GlobalWeatherSoap.java RequestWeather.java
javac -classpath ".;%sqlany12%\java\iawsrt.jar;%sqlany12%\java\qaclient.jar"
NET.webserviceX.GlobalWeatherSoap.java ShowWeather.java
```

Create QAnywhere message stores and start a QAnywhere Agent

Your mobile web service application requires a client message store on each mobile device. It also requires a server message store, but this example uses the QAnywhere sample server message store.

To create a client message store, create a SQL Anywhere database with the dbinit utility and then run the QAnywhere Agent to set it up as a client message store:

```
dbinit -i qanywhere.db
qaagent -q -si -c "dbf=qanywhere.db"
```

Start the QAnywhere Agent to connect to your client message store:

```
qaagent -c "dbf=qanywhere.db;server=qanywhere;uid=ml_qa_user;pwd=qanywhere"
```

Start the QAnywhere server:

```
mlsrv12 -m -zu+ -c "dsn=QAnywhere 12
Demo;uid=ml_server;pwd=sql;start=dbsrv12" -v+ -ot qanyserv.mls
```

Create a web service connector that listens for QAnywhere messages sent to the GetWeather web service, makes web service calls when messages arrive, and sends back responses to the originating client.

To create a web service connector

1. Open Sybase Central and click **Connections** » **Connect With QAnywhere 12**.
2. In the **User ID** field, type **ml_server**.
3. In the **Password** field, type **sql**.
4. Click **ODBC data source name** and type **QAnywhere 12 Demo**.
5. Click **OK**.
6. Choose **File** » **New** » **Connector**.
7. Click **Web Services**. Click **Next**.
8. In the **Connector Name** field, type **ianywhere.connector.globalweather**. Click **Next**.
9. In the **URL** field, type **http://www.webservicex.net/globalweather.asmx**. Click **Finish**.

Use the web service

To queue up a request to get the weather report from the web service, type:

```
java -classpath ".;%sqlany12%\java\iawsrt.jar;%sqlany12%\java\qaclient.jar"
RequestWeather
```

A request ID is returned.

To see the weather report, type the following. The end should be the request ID, which in this example is REQ123123123.

```
java -classpath ".;%sqlany12%\java\iawsrt.jar;%sqlany12%\java\qaclient.jar"
ShowWeather REQ123123123
```

A detailed weather report is returned.

Deploying QAnywhere applications

QAnywhere provides C++, Java, and .NET API support for SQL Anywhere message stores. The Java and .NET APIs also support UltraLite message stores. The files required for deploying QAnywhere applications are based on your Windows environment, message store type, and API selection. Additional files are required if you are developing Mobile Web Service applications.

In addition to the files listed below, a QAnywhere application requires:

- All files listed in the MobiLink synchronization client, Listener, and optionally the Security sections of "Deploying SQL Anywhere MobiLink clients" [*MobiLink - Server Administration*]. The Listener files are required only if you are using push notifications, which is the default.
- dbeng12 or dbsrv12 files from "Deploying database servers" [*SQL Anywhere Server - Programming*].

To deploy Sybase Central, see "Deploying administration tools" [*SQL Anywhere Server - Programming*].

Windows applications

All directories are relative to *install-dir* .

For more details on the file structure of a Windows Mobile environment, see "Windows Mobile applications" [*MobiLink - Server Administration*].

The following is a list of files required to set up a SQL Anywhere message store.

Client API	Windows files
C++	● *bin32\qany12.dll* ● *bin32\qaagent.exe* ● *bin32\qastop.exe*
Java	● *bin32\qaagent.exe* ● *bin32\qastop.exe* ● *java\qaclient.jar* ● *java\jodbc.jar* For Mobile Web Service applications, you also need the following: ● *java\iawsrt.jar* ● *java\jaxrpc.jar*

Client API	Windows files
.NET	• *bin32\qazlib.dll* • *bin32\qaagent.exe* • *bin32\qastop.exe* • *assembly\v2\iAnywhere.QAnywhere.Client.dll* • *assembly\v2\iAnywhere.QAnywhere.Resources.dll* • *assembly\v2\iAnywhere.Data.SQLAnywhere.dll* For Mobile Web Service applications, you also need the following: • *Assembly\v2\iAnywhere.QAnywhere.WS.dll*

The following is a list of files required to set up an UltraLite message store.

Client API	Windows files
Java	• *bin32\qauagent.exe* • *bin32\qastop.exe* • *bin32\qadbiuljni12.dll* • *java\qaclient.jar* For Mobile Web Service applications, you also need the following: • *java\iawsrt.jar* • *java\jaxrpc.jar*
.NET	• *bin32\qazlib.dll* • *bin32\qauagent.exe* • *bin32\qastop.exe* • *assembly\v2\iAnywhere.QAnywhere.Client.dll* • *assembly\v2\iAnywhere.QAnywhere.Resources.dll* • *ultralite\ultralite.NET\assembly\v2\iAnywhere.Data.UltraLite.dll* For Mobile Web Service applications, you also need the following: • *Assembly\v2\iAnywhere.QAnywhere.WS.dll*

When creating an UltraLite message store, you must create a udb database file using the UltraLite Create Database utility, then initialize the database using the QAnywhere UltraLite Agent's -si option. See "UltraLite Initialize Database utility (ulinit)" [*UltraLite - Database Management and Reference*] and "qauagent utility" on page 696.

Windows Mobile applications

All directories are relative to *install-dir* .

For more details on the file structure of a Windows environment, see "Windows applications" [*MobiLink - Server Administration*].

The following is a list of files required to set up a SQL Anywhere message store.

Client API	Windows Mobile files
C++	● *ce\arm.50\qany12.dll* ● *ce\arm.50\qaagent.exe* ● *ce\arm.50\qastop.exe*
Java	● *ce\arm.50\qaagent.exe* ● *ce\arm.50\qastop.exe* ● *java\qaclient.jar* ● *java\jodbc.jar* For Mobile Web Service applications, you also need the following: ● *java\iawsrt.jar* ● *java\jaxrpc.jar*
.NET	● *ce\arm.50\qazlib.dll* ● *ce\arm.50\qaagent.exe* ● *ce\arm.50\qastop.exe* ● *ce\assembly\v2\iAnywhere.QAnywhere.Client.dll* ● *ce\assembly\v2\iAnywhere.QAnywhere.Resources.dll* ● *ce\assembly\v2\iAnywhere.Data.SQLAnywhere.dll* For Mobile Web Service applications, you also need the following: ● *ce\Assembly\v2\iAnywhere.QAnywhere.WS.dll*

The following is a list of files required to set up an UltraLite message store.

Client API	Windows Mobile files
Java	● *ce\arm.50\qauagent.exe* ● *ce\arm.50\qastop.exe* ● *ce\arm.50\qadbiuljni12.dll* ● *java\qaclient.jar* For Mobile Web Service applications, you also need the following: ● *java\iawsrt.jar* ● *java\jaxrpc.jar*

Client API	Windows Mobile files
.NET	● *ce\arm.50\qazlib.dll* ● *ce\arm.50\qauagent.exe* ● *ce\arm.50\qastop.exe* ● *ce\assembly\v2\iAnywhere.QAnywhere.Client.dll* ● *ce\assembly\v2\iAnywhere.QAnywhere.Resources.dll* ● *ultralite\ultralite.NET\ce\assembly\v2\iAnywhere.Data.UltraLite.dll* For Mobile Web Service applications, you also need the following: ● *ce\Assembly\v2\iAnywhere.QAnywhere.WS.dll*

When creating an UltraLite message store, you must create a database file using the UltraLite Create Database utility, then initialize the database using the -si option for the QAnywhere UltraLite Agent. See "UltraLite Initialize Database utility (ulinit)" [*UltraLite - Database Management and Reference*] and "qauagent utility" on page 696.

Registering the QAnywhere .NET API DLL

The QAnywhere .NET API DLL (*Assembly\v2\iAnywhere.QAnywhere.Client.dll*) needs to be registered in the Global Assembly Cache on Windows (except on Windows Mobile). The Global Assembly Cache lists all the registered programs on your computer. When you install SQL Anywhere, the installation program registers it. In Windows Mobile you do not need to register the DLL.

If you are deploying QAnywhere, you must register the QAnywhere .NET API DLL (*Assembly \v2\iAnywhere.QAnywhere.Client.dll*) using the gacutil utility that is included with the .NET Framework.

Writing secure messaging applications

The following sections describe ways of ensuring your messaging applications are secure.

Creating a secure client message store

To secure your client message store, you can:

- Change the default passwords.

  See "Manage client message store passwords" on page 117.

- Encrypt the contents of the message store.

  See "Encrypting the client message store" on page 118.

Example

First, create a SQL Anywhere database with an encryption key:

```
dbinit mystore.db -i -s -ek some_phrase
```

The -i and -s options are optimal for small devices. The -ek option specifies the encryption key for strong encryption. See "Initialization utility (dbinit)" [*SQL Anywhere Server - Database Administration*].

Next, initialize the database as a client message store:

```
qaagent -id mystore -si -c "dbf=mystore.db;dbkey=some_phrase"
```

Next, create a new remote user with DBA authority, and a password for this user. Revoke the default QAnywhere user and change the password of the default DBA user. Log in as user DBA with password sql and execute the following SQL statements:

```
CREATE USER secure_user IDENTIFIED BY secure_password
GRANT MEMBERSHIP IN GROUP ml_qa_user_group TO secure_user
GRANT REMOTE DBA TO secure_user
REVOKE CONNECT FROM ml_qa_user
ALTER USER DBA IDENTIFIED BY new_dba_password
COMMIT
```

Note
All QAnywhere users must belong to ml_qa_user_group and have remote DBA authority.

Next, start the QAnywhere Agent with the secure DBA user:

```
qaagent -id mystore -c
"dbf=mystore.db;dbkey=some_phrase;uid=secure_user;pwd=secure_password"
```

Manage client message store passwords

You should change the passwords for the default user IDs that were created for the message store. The default user ID DBA with password SQL is created for every SQL Anywhere database. In addition, the qaagent -si option creates a default user ID of ml_qa_user, and creates a default password of qanywhere. To change these passwords, use the GRANT statement.

See "Changing a password" [*SQL Anywhere Server - Database Administration*].

Encrypting the client message store

The following command can be used to encrypt the client message store when you create it.

```
dbinit -i -s -ek encryption-key database-file
```

(The -i and -s options are good practice for creating databases on small devices.) When a message store has been initialized with an encryption key, the encryption key is required to start the database server on the encrypted message store.

Use the following command to specify the encryption key to start the QAnywhere Agent with an encrypted message store. The QAnywhere Agent automatically starts the database server on the encrypted message store using the encryption key provided.

```
qaagent -c "DBF=database-file;DBKEY=encryption-key"
```

Any application can now access the encrypted message store through the QAnywhere APIs. Note that, since the database server used to manage the message store is already running, the application does not need to provide the encryption key.

If the QAnywhere Agent is not running and an application needs to access an encrypted message store, the QAnywhere APIs automatically starts the database server using the connection parameters specified in the QAnywhere Manager initialization file. To start the database server on an encrypted message store, the encryption key must be specified in the database connection parameters as follows.

```
CONNECT_PARAMS=DBF=database-file;DBKEY=encryption-key
```

See also

- "Encrypting and decrypting a database" [*SQL Anywhere Server - Database Administration*]
- "Initialization utility (dbinit)" [*SQL Anywhere Server - Database Administration*]
- QAnywhere Agent "-c qaagent option" on page 676

Encrypting the communication stream

The qaagent -x option can be used to specify a secure communication stream that the QAnywhere Agent can use to communicate with a MobiLink server. It allows you to implement server authentication using server-side certificates, and it allows you to encrypt the communication stream using strong encryption.

See "-x qaagent option" on page 695.

You must set up transport-layer security for the MobiLink server as well. For information about creating digital certificates and setting up the MobiLink server, see "Encrypting MobiLink client/server communications" [*SQL Anywhere Server - Database Administration*].

Separately licensed component required
ECC encryption and FIPS-certified encryption require a separate license. All strong encryption technologies are subject to export regulations.

See "Separately licensed components" [*SQL Anywhere 12 - Introduction*].

Examples

The following examples show how to establish a secure communication stream between the QAnywhere Agent and the MobiLink server. They use sample identity files that are installed when the SQL Anywhere security option is installed.

Secure TCP/IP using RSA:

```
mlsrv12 -x tls(tls_type=rsa;identity=rsaserver.id;identity_password=test)
qaagent -x tls(tls_type=rsa;trusted_certificates=rsaroot.crt)
```

Secure TCP/IP using ECC:

```
mlsrv12 -x tls(tls_type=ecc;identity=eccserver.id;identity_password=test)
qaagent -x tls(tls_type=ecc;trusted_certificates=eccroot.crt)
```

Secure HTTP using HTTPS (only RSA certificates are supported for HTTPS):

```
mlsrv12 -x https(identity=rsaserver.id;identity_password=test)
qaagent -x https(trusted_certificates=rsaroot.crt)
```

Using password authentication with MobiLink

Once you have established a secure communication stream between the remote device and the server, you may also want to authenticate the user of the device to ensure that they are allowed to communicate with the server.

You do this by creating a MobiLink user name for the client message store and registering it on the server message store.

See also

- "-mu qaagent option" on page 683
- "-mp qaagent option" on page 682
- "MobiLink users" [*MobiLink - Client Administration*]

Securing server management requests

Server management requests can be secured using a password. The message string property ias_ServerPassword specifies the server password. The server password is set using the ianywhere.qa.server.password.e property. If this property is not set, the password is QAnywhere.

The server password is transmitted as text. Use an encrypted communication stream to send server management requests that require a server password.

For more information about the ianywhere.qa.server.password.e property, see "Server properties" on page 724.

Adding users with the MobiLink user authentication utility

To ensure security, use the MobiLink user authentication utility (mluser) to add users. The mluser utility allows you to register a MobiLink user name with the server message store on the consolidated database. The user name and password parameters are then used by the QAnywhere agent to authenticate the user during message transmission. See "MobiLink user authentication utility (mluser)" [*MobiLink - Server Administration*].

If you are using push notifications, it is also necessary to add a MobiLink user for the Listener (dblsn). For each user added, a Listener must also be added with the username ias_[user]_lsn.

New users can also be added using the -zu+ option with mlsrv12, however you should not use this option if security is an issue. Using mlsrv12 with the -zu+ option causes all new users to be added to the consolidated database when they first synchronize. This means that unrecognized users are added without authentication. See "-zu mlsrv12 option" [*MobiLink - Server Administration*].

Security with the Relay Server

When using the Relay Server, set options in the Relay Server configuration file to control the level of security required. See "Relay Server configuration file" [*Relay Server*].

Set up a secure communication stream with the web server, for example, HTTPS with trusted certificate, to ensure security of communications between the QAnywhere agent and the web server. See the qaagent "-x qaagent option" on page 695.

Refer to the Relay Server documentation for information on setting up a secure communication stream between the Relay Server and MobiLink. See "Introduction to the Relay Server" [*Relay Server*].

Administering a server message store

The following sections describe how to administer a server message store.

Transmission rules

Transmission rules allow you to specify when message transmission is to occur and which messages to transmit. You can specify transmission rules for both the client and the server.

Managing server transmission rules is an important part of administering a server message store.

Server transmission rules govern the behavior of messages going from the server to the client. Server transmission rules are handled by the MobiLink server. They apply both when you are using push notifications and when you are not using notifications.

There are several ways to set server transmission rules:

- Write a server management request to set the transmission rule.

  See "Specifying transmission rules with a server management request" on page 160.

- Use Sybase Central to set the rules.

  See "Specifying server transmission rules using Sybase Central" on page 122.

- Create a server transmission rules file and specify it when you start the MobiLink server. This method is deprecated.

  See "Specifying server transmission rules with a transmission rules file (deprecated)" on page 742.

Server transmission rules

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There are several ways to set server transmission rules:

- Write a server management request to set the transmission rule.

  See "Specifying transmission rules with a server management request" on page 160.

- Use Sybase Central to set the rules.

  See "Specifying server transmission rules using Sybase Central" on page 122.

- Create a server transmission rules file and specify it when you start the MobiLink server. This method is deprecated.

  See "Specifying server transmission rules with a transmission rules file (deprecated)" on page 742.

Specifying server transmission rules using Sybase Central

You can create and edit transmission rules in Sybase Central.

To specify default server transmission rules

1. Start Sybase Central:
   - Choose **Start** » **Programs** » **SQL Anywhere 12** » **Administration Tools** » **Sybase Central**.
   - From **Connections**, choose **Connect With QAnywhere 12**.
   - Specify an **ODBC Data Source Name** or **ODBC Data Source File**, and the **User ID** and **Password** if required. Click **Connect**.
2. Under **Server Messages Stores**, select the data source name.
3. Choose **File** » **Properties**.
4. Open the **Transmission Rules** tab and select **Customize The Default Transmission Rules**.
5. Click **New** to add a rule.
6. Add conditions either by typing them into the text field or by choosing **Message Variables** or **Constants** from the dropdown lists.
7. Click **OK** to exit.

Specifying server transmission rules with a server management request

You can use a server management request to specify default server transmission rules that apply to all users, or you can specify transmission rules for each client.

To specify default transmission rules for a server, set the ianywhere.qa.server.rules property for the client ianywhere.server.defaultClient. For a client, use the ianywhere.qa.server.rules property to specify server transmission rules.

For more information about using a server management request to specify transmission rules, see “Specifying transmission rules with a server management request” on page 160.

Managing the message archive

The archive message store is a set of tables that coexist with the server message store, and stores all messages waiting to be deleted. A regularly executed system process transports messages between the message stores by removing all messages in the server message store that have reached a final state, and then inserting them into the archive message store.

Messages remain in the archive message store until deleted by a server delete rule. Usage of the archive message store improves the performance of the server message store by minimizing the amount of messages that need to be filtered during synchronization. See "Delete rules" on page 44.

Using server management requests

A server management request is a special message sent from the client to the server. The server management request contains content, formatted XML, that instructs the server to perform various functions.

Use the following functions to administer a server message store with server management requests:

- "Refreshing client transmission rules" on page 148
- "Canceling messages" on page 149
- "Deleting messages" on page 150

For details on using server management requests, see:

- "Administering the server message store with server management requests" on page 148
- "Writing server management requests" on page 146
- "Server management request reference" on page 665

Administering a client message store

The following sections describe how to administer a client message store.

Monitoring QAnywhere clients

You can monitor QAnywhere clients using server management requests or Sybase Central.

Server management requests can be user to obtain a list of clients currently on the server. This list contains clients who are registered on the server, including remote clients, open connectors, and destination aliases. See "Monitoring QAnywhere clients" on page 166.

In Sybase Central, use the **Clients** pane of the server message store to see a list of clients that are currently on the server.

Monitoring client properties

You can monitor QAnywhere client properties using server management requests or Sybase Central.

Server management requests can be used to see what properties are set for a client. The response lists only the properties that have been set for the client (not defaults). See "Monitoring properties" on page 166.

In Sybase Central, you and view and change client properties using the QAnywhere **Client Properties** window.

Managing client message store properties

Client message store properties can be set in your client application for each client message store.

See "Managing client message store properties in your application" on page 722.

Client message store properties can be used in transmission rules to filter messages to the client or used in delete rules to determine messages to add.

See "QAnywhere transmission and delete rules" on page 733.

Client message store properties can also be specified in server management messages, and stored on the server message store.

See "Server management requests" on page 145.

Destination aliases

A **destination alias** is a list of message addresses and other destination aliases. When a message is sent to a destination alias, it is sent to all members of the list.

A member of a destination alias can have a delivery condition associated with it. Only messages that match the condition are forwarded to the corresponding member.

Example

Define a destination alias called all_clients with members client1 and client2.

Define the following delivery condition for client1:

```
ias_Priority=1
```

Define the following delivery condition for client2:

```
ias_Priority=9
```

Only messages with priority 1 are sent to client1 and those with priority 9 are sent to client2.

Creating destination aliases

You can create and manage a destination alias using the following methods:

- Server management requests

  See "Creating destination aliases with a server management request" on page 161.

- Sybase Central

  See "Using Sybase Central" on page 127.

Using Sybase Central

You can use Sybase Central to create or modify a destination alias.

To create a destination alias using Sybase Central

1. Start Sybase Central:
   - Choose **Start** » **Programs** » **SQL Anywhere 12** » **Administration Tools** » **Sybase Central**.
   - Choose **Connections** » **Connect with QAnywhere 12**.
   - Specify an **ODBC Data Source Name** or **ODBC Data Source File**, and a **User ID** and **Password** if required.
   - Click **OK**.
2. Choose **File** » **New** » **Destination Alias**.

3. In the **Alias** field, type a name for the alias.
4. In the **Destinations** field, type the name of each destination on its own line.
5. Click **OK**.

Connectors

The following sections provide information about using JMS connectors and web service connectors with QAnywhere.

JMS connectors

The Java Message Service (JMS) API provides messaging capabilities to Java applications. In addition to exchanging messages among QAnywhere client applications, you can exchange messages with external messaging systems that support a JMS interface. You do this using a specially configured client known as a connector. In a QAnywhere deployment, the external messaging system is set up to act like a QAnywhere client. It has its own address and configuration.

For more information about the architecture of this approach, see “Scenario for messaging with external messaging systems” on page 7.

When running MobiLink with QAnywhere messaging in a server farm environment, only the QAnywhere connectors in the primary server start. If the primary server fails, the QAnywhere connectors are automatically started in the new primary server so that message ordering is preserved while exchanging data in the external messaging system, such as JMS. For more information, see “Running the MobiLink server in a server farm” [*MobiLink - Server Administration*].

Setting up JMS connectors

The following steps provide an overview of the tasks required to set up QAnywhere with JMS connectors, assuming that you already have QAnywhere set up.

Overview of integrating a QAnywhere application with an external JMS system

1. Create JMS queues using the JMS administration tools for your JMS system. The QAnywhere connector listens on a single JMS queue for JMS messages. You must create this queue if it does not already exist.

   See the documentation of your JMS product for information about how to create queues.

2. Open Sybase Central and connect to your server message store.

3. Choose **File** » **New** » **Connector**.

4. Click **JMS** and then select the type of web server you are using on the **Which JMS System Are You Using** list. Click **Next**.

5. On the **Connector Names** page:

- In the **Connector Name** field, type the connector address that a QAnywhere client should use to address the connector. See "Sending a QAnywhere message to a JMS connector" on page 132.
- In the **Receiver Destination** field, type the queue name used by the connector to listen for messages from JMS targeted for QAnywhere clients.
- Click **Next**.

6. On the **JNDI Settings** page:
   - In the **JNDI Factory** field, type the factory name used to access the external JMS JNDI name service.
   - In the **Name Service URL** field, type the URL to access the JMS JNDI name service.
   - In the **User Name** field, type the authentication name to connect to the external JMS JNDI name service.
   - In the **Password** field, type the authentication password to connect to the external JMS JNDI name service.
   - Click **Next**.
7. On the **JMS Queue Settings** page:
   - In the **Queue Factory** field, type the external JMS provider queue factory name.
   - In the **User Name** field, type the user ID to connect to the external JMS queue connection.
   - In the **Password** field, type the password to connect to the external JMS queue connection.
   - Click **Next**.
8. On the **JMS Topic Settings** page:
   - In the **Topic Factory** field, type the external JMS provider topic factory name.
   - In the **User Name** field, type the user ID to connect to the external JMS topic connection.
   - In the **Password** field, type the password to connect to the external JMS topic connection.
   - Click **Finish**.
9. Click **OK**.
10. Start the MobiLink server with a connection to the server message store and the -sl java options. See "Starting the MobiLink server for JMS integration" on page 131.
11. To set additional options on your JMS connector, right-click the connector you just created and choose properties; or you can use server management requests.

    For a list of available properties, see "Configuring JMS connector properties" on page 131.

    For information about how to set connector properties with server management requests, see "Administering connectors with server management requests" on page 150.

To send messages

1. To send a message from an application in your QAnywhere system to the external messaging system, create a QAnywhere message and send it to ***connector-address\JMS-queue-name***.

See “Sending a QAnywhere message to a JMS connector” on page 132.

2. To send a message from the external messaging system to an application in your QAnywhere system:
   - Create a JMS message.
   - Set the ias_ToAddress property to the QAnywhere ***id\queue*** (where *id* is the ID of your client message store and *queue* is your application queue name).
   - Put the message in the JMS queue.

   See “Addressing JMS messages meant for QAnywhere” on page 135.

Other resources for getting started

- QAnywhere JMS samples are installed to *samples-dir\QAnywhere\jms*. (For information about *samples-dir*, see “Samples directory” [*SQL Anywhere Server - Database Administration*].)
- You can post questions on the QAnywhere newsgroup: ianywhere.public.sqlanywhere.qanywhere
- For more information on setting up messaging in a server farm environment, see “Running the MobiLink server in a server farm” [*MobiLink - Server Administration*].

Starting the MobiLink server for JMS integration

To exchange messages with an external messaging system that supports a JMS interface, you must start the MobiLink server (mlsrv12) with the following options:

- **-c *connection-string*** To connect to the server message store.

  See “-c mlsrv12 option” [*MobiLink - Server Administration*].

- **-m** To enable QAnywhere messaging.

- **-sl java (-cp "*jarfile*.jar")** To add the client jar files required to use the external JMS provider.

  See “-sl java mlsrv12 option” [*MobiLink - Server Administration*].

Example

The following example starts a MobiLink server using a JMS client library called *jmsclient.jar* (in the current working directory) and the QAnywhere sample database as a message store. The command should be entered all on one line.

```
mlsrv12 -sl java(-cp
"jmsclient.jar") -m -c "dsn=QAnywhere 12 Demo" ...
```

Configuring JMS connector properties

You use JMS connector properties to specify connection information with the JMS system. They configure a connector to a third party JMS messaging system such as BEA WebLogic or Sybase EAServer.

You can set and/or view properties in several places:

- Sybase Central **Connector Wizard**.

  See "Setting up JMS connectors" on page 129.

- Sybase Central **Connector Properties** window.

- Server management requests.

  See "Creating and configuring connectors" on page 151.

- The ml_qa_global_props MobiLink system table.

For a list of all the JMS connector properties, see "JMS connector properties" on page 726.

Configuring multiple connectors

QAnywhere can connect to multiple JMS message systems by defining a JMS connector for each JMS system. The only property value that must be unique among the configured connectors is ianywhere.connector.address.

The ianywhere.connector.address property is the address prefix that QAnywhere clients must specify to address messages meant for the JMS system.

See also

- "Sending a QAnywhere message to a JMS connector" on page 132
- "Configuring JMS connector properties" on page 131
- "Creating and configuring connectors" on page 151

Sending a QAnywhere message to a JMS connector

A QAnywhere client can send a message to a JMS system by setting the address to the following value:

connector-address\JMS-queue-name

The *connector-address* is the value of the connector property ianywhere.connector.address, while *JMS-queue-name* is the name used to look up the JMS queue or topic using the Java Naming and Directory Interface.

If your *JMS-queue-name* contains a backslash, you must escape the backslash with another backslash. For example, a queue called qq in the context ss should be specified as `ss\\qq`.

```
// C# example
QAMessage msg;
QAManager mgr;
...
mgr.PutMessage( @"ianywhere.connector.wsmqfs\ss\\qq",msg);
```

```
// C++ example
QAManagerBase *mgr;
QATextMessage *msg;
...
mgr->putMessage("ianywhere.connector.easerver\\ss\\\\qq", msg);
```

Example

For example, if the ianywhere.connector.address is set to ianywhere.connector.easerver and the JMS queue name is myqueue, then the code to set the address would be:

```
// C# example
QAManagerBase mgr;
QAMessage msg;

// Initialize the manager.
...
msg = mgr.CreateTextMessage()

 // Set the message content.
...
mgr.PutMessage(@"ianywhere.connector.easerver\myqueue", msg);

// C++ example
QAManagerBase *mgr;
QATextMessage *msg;

// Initialize the manager.
...
msg = mgr.createTextMessage();

// Set the message content.
...
mgr->putMessage("ianywhere.connector.easerver\\myqueue", msg);
```

See also

- “QAnywhere message addresses” on page 58
- “Configuring JMS connector properties” on page 131

Sending a message from a JMS connector to a QAnywhere client

QAnywhere messages are mapped naturally on to JMS messages.

QAnywhere message content

QAnywhere	JMS	Remarks
QATextMessage	javax.jms.TextMessage	message text copied as Unicode
QABinaryMessage	javax.jms.BytesMessage	message bytes copied exactly

QAnywhere built-in headers

The following table describes the mapping of built-in headers. In C++ and JMS, these are method names; for example, Address is called getAddress() or setAddress() for QAnywhere, and getJMSDestination() or setJMSDestination() for JMS. In .NET, these are properties with the exact name given below; for example, Address is Address.

QAnywhere	JMS	Remarks
Address	JMSDestination and JMS property ias_ToAddress	If the destination contains a backslash, you must escape it with a second backslash. Only the JMS part of the address is mapped to the Destination. Under rare circumstances, there may be an additional QAnywhere address suffix if a message loops back into QAnywhere. This is put in ias_ToAddress.
Expiration	JMSExpiration	
InReplyToID	N/A	Not mapped.
MessageID	N/A	Not mapped.
Priority	JMSPriority	
Redelivered	N/A	Not mapped.
ReplyToAddress	JMS property ias_ReplyToAddress	Mapped to JMS property.
Connector's xjms.receiveDestination property value	JMSReplyTo	ReplyTo set to Destination used by connector to receive JMS messages.
Timestamp	N/A	Not mapped.
N/A	JMSTimestamp	When mapping a JMS message to a QAnywhere message, the JMSTimestamp property of the QAnywhere message is set to the JMSTimestamp of the JMS message.
Timestamp	N/A	When mapping a QAnywhere message to a JMS message, the JMSTimestamp of the JMS message is set to the time of creation of the JMS message.

QAnywhere properties

QAnywhere properties are all mapped naturally to JMS properties, preserving type, with the following exception: if the QAnywhere message has a property called JMSType, then this is mapped to the JMS header property JMSType.

Addressing JMS messages meant for QAnywhere

A JMS client can send a message to a QAnywhere client by setting the JMS message property ias_ToAddress to the QAnywhere address, and then sending the message to the JMS Destination corresponding to the connector property xjms.receiveDestination.

See "QAnywhere message addresses" on page 58.

Example

For example, to send a message to the QAnywhere address "qaddr" (where the connector setting of xjms.receiveDestination is "qanywhere_receive"):

```
import javax.jms.*;
try {
    QueueSession session;
    QueueSender sender;
    TextMessage mgr;
    Queue connectorQueue;

    // Initialize the session.
    connectorQueue = session.createQueue("qanywhere_receive");
    sender = session.createSender( connectorQueue );
    msg = session.createTextMessage();
    msg.setStringProperty("ias_ToAddress", "qaddr");

    // Set the message content.
    sender.send(msg);
}
catch( JMSException e ) {
    // Handle the exception.
}
```

Mapping JMS messages on to QAnywhere messages

JMS messages are mapped naturally on to QAnywhere messages.

JMS message content

JMS	QAnywhere	Remarks
javax.jms.TextMessage	QATextMessage	Message text copied as Unicode
javax.jms.BytesMessage	QABinaryMessage	Message bytes copied exactly

JMS	QAnywhere	Remarks
javax.jms.StreamMessage	N/A	Not supported
javax.jms.MapMessage	N/A	Not supported
javax.jms.ObjectMessage	N/A	Not supported

JMS built-in headers

The following table describes the mapping of built-in headers. In C++ and JMS, these are method names; for example, Address is called getAddress() or setAddress() for QAnywhere, and getJMSDestination() or setJMSDestination() for JMS. In .NET, these are properties with the exact name given below; for example, Address is Address.

JMS	QAnywhere	Remarks
JMS Destination	N/A	The JMS destination must be set to the queue specified in the connector property xjms.receiveDestination.
JMS Expiration	Expiration	
JMS CorrelationID	InReplyToID	
JMS MessageID	N/A	Not mapped.
JMS Priority	Priority	
JMS Redelivered	N/A	Not mapped.
JMS ReplyTo and connector's ianywhere.connector.address property value	ReplyToAddress	The connector address is concatenated with the JMS ReplyTo Destination name delimited by '\'.
JMS DeliveryMode	N/A	Not mapped.
JMS Type	QAnywhere message property JMSType	
JMS Timestamp	N/A	Not mapped.

JMS properties

JMS properties are all mapped naturally to QAnywhere properties, preserving type, with a few exceptions. The QAnywhere Address property is set from the value of the JMS message property ias_ToAddress. If the JMS message property ias_ReplyToAddress is set, then the QAnywhere ReplyToAddress is additionally suffixed with this value delimited by a '\'.

Web service connectors

A web service connector listens for QAnywhere messages sent to a particular address, and makes web service calls when messages arrive. Web service responses are sent back to the originating client as QAnywhere messages. All messages sent to the web services connector should be created using the proxy classes generated by the QAnywhere WSDL compiler.

When running MobiLink with QAnywhere messaging in a server farm environment, only the QAnywhere connectors in the primary server start. If the primary server fails, the QAnywhere connectors are automatically started in the new primary server so that message ordering is preserved while exchanging data in the external messaging system, such as JMS. For more information, see "Running the MobiLink server in a server farm" [*MobiLink - Server Administration*].

Setting up web service connectors

To create a web service connector

1. Open Sybase Central and connect to your server message store.

2. Choose **File** » **New** » **Connector**.

3. Click **Web Services**. Click **Next**.

4. In the **Connector Name** field, type the connector address that a QAnywhere client should use to address the connector. Click **Next**.

5. In the **URL** field, type the URL of the web service (for example, *http://localhost:8080/qanyserv/F2C*). Click **Next**.

   You can optionally specify a timeout period in milliseconds, which cancels requests if the web service does not respond in the specified time. This sets the property webservice.socket.timeout.

6. On the **HTTP Parameters** page, click **The Web Service Must Be Accessed Through A Proxy** and then complete the following fields:

   - In the **HTTP user name** field, type the user name. This sets the property webservice.http.authName.
   - In the **HTTP password** field, type the user password. This sets the property webservice.http.password.e.
   - In the **Proxy host name** field, type the host name. If you specify this property, you must specify the webservice.http.proxy.port property.

- In the **Proxy port** field, type the port to connect to on the proxy server. If you specify this property, you must specify the webservice.http.proxy.host property.
- In the **Proxy user name** field, type the proxy user name to use if the proxy requires authentication. If you specify this property, you must also specify the webservice.http.proxy.password.e property.
- Click **Finish**.

7. To set additional options on your web service connector, you can right-click the connector you just created and choose **Properties**; or you can use server management requests.

   For a list of available properties, see "Web service connector properties" on page 138.

   For information about using server management requests, see "Administering connectors with server management requests" on page 150.

Web service connector properties

Use web service connector properties to specify connection information with the web service. You can set these properties in the Sybase Central Connector Wizard.

See "Web service connectors" on page 137.

You can view web service connector properties in the Sybase Central **Connector Properties** window, or in the ml_qa_global_props MobiLink system table.

To open the **Connector Properties** window, right-click the connector in Sybase Central and choose **Properties**.

To view web service properties

1. Open Sybase Central and connect to your server message store.
2. Under **Server Message Stores** in the left pane, select the name of your data source.
3. In the right pane, select the **Connectors** tab, and then select the name of the web service connector.
4. Choose **File** » **Properties**

Web service connector properties

- **ianywhere.connector.nativeConnection** The Java class that implements the connector. It is for QAnywhere internal use only, and should not be deleted or modified.
- **ianywhere.connector.id (deprecated)** An identifier that uniquely identifies the connector. The default is ianywhere.connector.address.
- **ianywhere.connector.address** The connector address that a QAnywhere client should use to address the connector. This address is also used to prefix all logged error, warning, and informational messages appearing in the MobiLink messages window for this connector.

In Sybase Central, you set this property in the **Connector Wizard**, **Connector Name** page, **Connector Name** field.

- **ianywhere.connector.compressionLevel** The default compression factor of messages received from the web service. Compression is an integer between 0 and 9, with 0 indicating no compression and 9 indicating maximum compression.

  In Sybase Central, you set this property on the **Connector Properties** window, on the **General** tab, in the **Compression Level** section.

- **ianywhere.connector.logLevel** The amount of connector information displayed in the MobiLink messages window and the MobiLink server message log file. Values for the log level are as follows:

  - **1** Log error messages.
  - **2** Log error and warning messages.
  - **3** Log error, warning, and information messages.
  - **4** Log error, warning, information, and debug messages.

  In Sybase Central, you set this property on the **Connector Properties** window, on the **General** tab, in the **Logging Level** section.

- **ianywhere.connector.outgoing.retry.max** The default number of retries for messages going from QAnywhere to the external messaging system. The default value is 5. Specify 0 to have the connector retry forever.

  In Sybase Central, you can set this property in the **Connector Properties** window under the **Properties** tab by clicking **New**.

- **ianywhere.connector.startupType** Startup types can be automatic, manual, or disabled.

- **webservice.http.authName** If the web service requires HTTP authentication, use this property to specify the user name.

- **webservice.http.password.e** If the web service requires HTTP authentication, use this property to specify the password.

- **webservice.http.proxy.authName** If the proxy requires authentication, use this property to set the proxy user name. If you specify this property, you must also specify the webservice.http.proxy.password.e property.

- **webservice.http.proxy.host** If the web service must be accessed through an HTTP proxy, use this property to specify the host name. If you specify this property, you must specify the webservice.http.proxy.port property.

- **webservice.http.proxy.password.e** If the proxy requires authentication, use this property to set the proxy password. If you specify this property, you must also specify the webservice.http.proxy.authName property.

- **webservice.http.proxy.port** The port to connect to on the proxy server. If you specify this property, you must specify the webservice.http.proxy.host property.

Sending a message to a web service connector

A message is sent to a web service connector through the mobile web services API. Use the setProperty method from the class ianywhere.qanywhere.ws.WSBase to set the WS_CONNECTOR_ADDRESS property to the ID of the web service connector. See "WSBase class" on page 586.

For example, when the following line of code from the CurrencyConvertor sample is specified, the web service APIs used to make web service requests send these requests as messages through the web service connector.

```
service.setProperty(
    "WS_CONNECTOR_ADDRESS",
    "ianywhere.connector.currencyconvertor\\" );
```

Tutorial: Using JMS connectors

A JMS connector provides connectivity between a JMS message system and QAnywhere. In this tutorial, you send messages between a Windows JMS client application and a QAnywhere client application.

Required software

- SQL Anywhere 12
- Java Software Development Kit
- A JMS connector

Competencies and experience

You require:

- Familiarity with Java
- Basic knowledge of configuring your JMS connector

Goals

You gain competence and familiarity with:

- Configuring your JMS connector to communicate with a sample QAnywhere application
- Sending messages between a JMS message system and a sample QAnywhere application

Key concepts

This section uses the following steps to provide connectivity between a JMS message system and QAnywhere using a SQL Anywhere sample database:

- Preparing your JMS connector to send and receive messages
- Running the QAnywhere server and client components, and the JMS client
- Sending a message from the QAnywhere client to the JMS client, and vice-versa

Suggested background reading

For more information about using JMS connectors, see "Connectors" on page 129.

Lesson 1: Set up client and server components

To prepare your JMS provider

1. Refer to your JMS server documentation to start the server.
2. Create the following queues within your JMS server:
   - **testmessage** The TestMessage sample uses this queue name to listen for messages.
   - **qanywhere_receive** The QAnywhere JMS connector uses this queue name to listen for messages.

   You may need to restart the server after creating the queues. Refer to your JMS server documentation for more details.

To start the QAnywhere client and server components

1. Create a QAnywhere JMS connector for your JMS system using Sybase Central. See "Setting up JMS connectors" on page 129.
2. At the command prompt, run the following command:

   ```
   mlsrv12 -m -c "dsn=QAnywhere 12 Demo" -sl
   java(-cp JMS-client-jar-files) -vcrs
   -zu+
   ```

   where *JMS-client-jar-files* is a semicolon delimited list of jar files that are required to access the JMS server. See your JMS server documentation for details.

   The MobiLink server starts for messaging.
3. From the **Start** menu, choose **Programs** » **SQL Anywhere 12** » **QAnywhere** » **Tutorial using SQL Anywhere** » **QAnywhere Agent For SQL Anywhere -- saclient1**.

   The QAnywhere Agent loads.
4. From the **Start** menu, choose **Programs** » **SQL Anywhere 12** » **QAnywhere** » **Tutorial using SQL Anywhere** » **TestMessage -- saclient1**.

   The QAnywhere sample application loads.

To start the JMS version of the TestMessage client

1. At the command prompt, run the following command:

   ```
   edit samples-dir/QAnywhere/JMS/TestMessage/build.bat
   ```

2. Examine the code in the *build.bat* file and ensure that your JMS server file paths are correct.

   For example, if you use EAServer, the default settings are defined under the **easerver** heading:

   ```
   :easerver
   REM For EAServer, compile with the following JAR files
   SET easerver_install=c:\program files\sybase\easerver6
   SET jmsjars=%easerver_install%\lib\eas-client-15.jar
   GOTO build_app
   ```

   If EAServer is not located in the *c:\program files\sybase\easerver6* directory, update the **easerver_install** variable so that it points to the proper install directory. Make sure that the **jmsjars** variable points to the proper location of the JMS server jar files.

   If your JMS server is not listed, use the **custom** header settings defined near the beginning of the batch file to define your own JMS file path locations.

   When finished, save your changes and exit the editor.

3. At the command prompt, run the following command to compile the JMS TestMessage client:

   ```
   build.bat JMS-server-name
   ```

   where *JMS-server-name* is the name of your JMS server represented as a header name in *build.bat*. Acceptable values are **easerver**, **fioranomq**, **jboss**, **tibco**, **weblogic**, and **custom**. By default, *build.bat* uses **easerver**.

4. At the command prompt, run the following command:

   ```
   edit samples-dir/QAnywhere/JMS/TestMessage/run.bat
   ```

5. Examine the code in the *run.bat* file and ensure that your JMS server file paths are correct.

   For example, if you use EAServer, the default settings are defined under the **easerver** heading:

   ```
   :easerver
   REM For EAServer, compile with the following JAR files
   SET easerver_install=c:\program files\sybase\easerver6
   SET jmsjars=%easerver_install%\lib\eas-client-15.jar
   GOTO build_app
   ```

   If EAServer is not located in the *c:\program files\sybase\easerver6* directory, update the **easerver_install** variable so that it points to the proper install directory. Make sure that the **jmsjars** variable points to the proper location of the JMS server jar files.

   If your JMS server is not listed, use the **custom** header settings defined near the beginning of the batch file to define your own JMS file path locations.

When finished, save your changes and exit the editor.

6. At the command prompt, run the following command to run the JMS TestMessage client:

   ```
   run.bat JMS-server-name
   ```

   where *JMS-server-name* is the name of your JMS server represented as a header name in *build.bat*. Acceptable values are **easerver**, **fioranomq**, **jboss**, **tibco**, **weblogic**, and **custom**. By default, *build.bat* uses **easerver**.

7. Move the JMS TestMessage window to the right side of your screen under the existing **TestMessage -- saclient1** window.

Lesson 2: Send a message from a JMS client to a QAnywhere client

To send a message from a JMS client to a QAnywhere client

1. From JMS TestMessage **Message** menu, choose **New**.
2. In the **Destination ID** field, type **saclient1**.
3. Complete the **Subject** and **Message** fields with sample text.
4. Click **Send**.

   A window appears, indicating that a message has been received.

Lesson 3: Send a message from a QAnywhere client to a JMS client

To find out the name of the QAnywhere JMS connector

1. Choose **Start** » **Programs** » **SQL Anywhere** » **Sybase Central**.
2. Choose **Connections** » **Connect With QAnywhere 12**.
3. Click **ODBC Data Source Name**.
4. Click **Browse** and select **QAnywhere 12 Demo**.
5. Click **OK**.
6. Click **OK**.
7. Select the **Connectors** tab.

   The right-pane displays a list of all active JMS connectors.

8. Examine the name field.

   There should only be one active QAnywhere JMS connector in the list. The name of the connector is displayed under the name field.

To send a message from a QAnywhere client to a JMS client

1. In the **saclient1 - TestMessage** window, click **Message** » **New**.
2. In the **Destination ID** field, type the name of your JMS system.
3. In the **Subject** and **Message** fields, type sample text.
4. Click **Send**.

   A window appears, indicating that a message has been received.

Tutorial cleanup

Shut down TestMessage clients, the QAnywhere Agent, and the MobiLink server.

To Shut down all applications

1. To close the JMS TestMessage client application, choose **File** » **Exit**.
2. To close the **saclient1 - TestMessage Client** window, choose **File** » **Exit**.
3. To close the **saclient1 - QAnywhere Agent** window and the MobiLink server, choose **Shut Down** in their respective windows.
4. To disconnect from your JMS connector, refer to your JMS server documentation.

Server management requests

A QAnywhere client application can send special messages to the server called **server management requests**. These messages contain content that is formatted as XML and are addressed to the QAnywhere system queue. They require a special authentication string. Server management requests can perform a variety of functions, such as:

- Starting and stopping connectors and web services.

  See "Opening connectors" on page 152 and "Closing connectors" on page 153.

- Monitoring connector status.

  See "Monitoring connectors" on page 153.

- Setting and refreshing client transmission rules.

  See "Specifying transmission rules with a server management request" on page 160.

- Monitoring message status.

  See "Monitoring QAnywhere" on page 163.

- Setting, updating, deleting, and querying client message store properties on the server.

  See "Setting server properties with a server management request" on page 159.

- Canceling messages.

  See "Canceling messages" on page 149.

- Querying for active clients, message store properties, and messages.

Addressing server management requests

By default, server management requests must be addressed to **ianywhere.server\system.** To change the client ID portion of this address, set the ianywhere.qa.server.id property and restart the server. For example, if the ianywhere.qa.server.id property is set to myServer, server management requests are addressed to myServer\system.

For more information about setting the ianywhere.qa.server.id property, see "Server properties" on page 724.

For more information about addressing QAnywhere messages, see "Sending QAnywhere messages" on page 61.

For more information about the system queue, see "System queue" on page 59.

Examples

The following is a sample message details request. It generates a single report that displays the message ID, status, and target address of all messages with priority 9 currently on the server.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
```

```
      <MessageDetailsRequest>
         <request>
            <requestId>testRequest</requestId>
            <condition>
               <priority>9</priority>
            </condition>
            <status/>
            <address/>
         </request>
      </MessageDetailsRequest>
   </actions>
```

The following example is in C#. It sets a server-side transmission rule for a client such that messages from the server are only transmitted to the client called someClient if the priority is greater than 4.

```
QAManager mgr = ...; // Initialize the QAManager
QAMessage msg = mgr.CreateTextMessage();
msg.SetStringProperty( "ias_ServerPassword", "QAnywhere" );

// Indenting and newlines are just for readability
msg.Text = "<?xml version="1.0" encoding="UTF-8"?>\n"
+ "<actions>\n"
+ " <SetProperty>\n"
+ "  <prop>\n"
+ "   <client>someClient</client>\n"
+ "   <name>ianywhere.qa.server.rules</name>\n"
+ "   <value>ias_Priority &gt; 4</value>\n"
+ "  </prop>\n"
+ " </SetProperty>\n"
+ " <RestartRules>\n"
+ "  <client>someClient</client>\n"
+ " </RestartRules>\n"
+ "</actions>\n";

mgr.PutMessage( @"ianywhere.server\system", msg );
```

Authenticating server management requests

The **ianywhere.qa.server.password.e** server property is used to specify a password that is used for authenticating server management requests. If this property is not set, the password is QAnywhere. See "Server properties" on page 724.

Writing server management requests

Server management requests contain content that is formatted as XML.

Note
You cannot use symbols such as > or < in the content of server management requests. Instead, use &gt; and &lt;.

Each type of server management request includes it own XML tags. For example, to close a connector you use the <CloseConnector> tag.

Each server management request starts with an <actions> tag.

actionsResponseId Tag

Use the actionsResponseId tag as a subtag to the <actions> tag to track and report the progress of the operations in the <action> tag. A report is created by the server when the <action> tag is processed.

The report contains the id of the <actionsResponseId> tag and the error messages generated by the request. Once the report is created, it is sent to the reply address of the server management request.

The following is an example of a server management request using the actionsResponseId tag,

```
<?xml version="1.0" encountered="UTF-8"?>
<actions>
  <actionsResponseId>myActionID</actionsResponseId>
  <MessageDetailsRequest>
    <request>
      <requestId>testRequest</requestId>
      <condition>
        <priority>9</priority>
      </condition>
      <status/>
      <address/>
    </request>
  </MessageDetailsRequest>
</actions>
```

The following is an example of an actionsResponseId report where the myActionId request did not generate errors.

```
<?xml version="1.0" encoding="UTF-8"?>
<ActionsResponse>
<actionsResponseId>myActionId</actionsResponseId>
<error/>
</ActionsResponse>
```

Archive message store requests

To view the details of messages in the archive message store, use the <archived> tag as a subtag to the <condition> tag. If the tag is omitted, the report only contains messages from the server message store.

To determine if a message exists in the archive message store, use the <archived> tag as a subtag to the <request> tag.

Example

The following request returns true if testRequest exists in the archive message store, and false if it exists in the server message store.

```
<request>
   <requestID>testRequest</requestID>
   <status/>
   <archived/>
</request>
```

Creating destination aliases

You can use server management requests to create and modify destination aliases. See "Creating destination aliases with a server management request" on page 161.

For more information about destination aliases, see "Destination aliases" on page 127.

For an overview of how to use server management requests, including how to authenticate and schedule them, see "Server management requests" on page 145.

Administering the server message store with server management requests

You can use server management requests to administer the server message store.

For an overview of how to use server management requests, including how to authenticate and schedule them, see "Server management requests" on page 145.

Refreshing client transmission rules

When a server-side client transmission rule is changed, the rules for the corresponding client must be refreshed. You can change client transmission rules in a server management request by setting the property ianywhere.qa.server.rules.

A RestartRules tag contains a single client tag, which specifies the name of the client to refresh.

<RestartRules> subtags	**Description**
<client>	The name of the client for which to refresh transmission rules.

Example

The server XML needs to specify the new transmission rule property and then restart rule processing using the RestartRules tag. For example, the following XML changes the server-side transmission rule for client myclient to `auto = ias_Priority > 4`. Note the proper encoding of ">" in the XML.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <SetProperty>
      <prop>
        <client>myclient</client>
        <name>ianywhere.qa.server.rules</name>
        <value>auto = ias_Priority &gt; 4</value>
      </prop>
    </SetProperty>
    <RestartRules>
        <client>myclient</client>
        </RestartRules>
    </actions>
```

Canceling messages

You can create a server management request to cancel messages in the server message store. You can create a one-time cancellation request or you can schedule your cancellation request to happen automatically. You can also optionally generate a report that details the messages that have been canceled.

Messages can only be canceled if they are in a non-final state and have not been transmitted to the recipient when the request is activated.

<CancelMessageRequest> subtags	**Description**
<request>	Groups information about a particular request. Specifying more than one <request> tag is equivalent to sending multiple separate server management requests.

<Request> subtags	**Description**
<condition>	Groups conditions for including a message to be canceled. See "Condition tag" on page 665.
<persistent>	Specifies that the request should be made persistent in the server database (so that messages can be canceled even if the server is restarted). Only used with schedules.
<requestId>	Specifies a unique identifier for the request that is included in each report generated as a result of this request. Using different values for this field allows more than one request to be active at the same time. Using the same request id allows the client to override or delete active requests.
<replyAddr>	The return address for each report generated as a result of this request. If this tag is omitted, the default return address of reports is the return address of the originating message.
<report>	Causes a report to be sent each time the request is activated. To cause a report to be sent each time the request is activated, put an empty <report> tag inside the <request> tag.
<schedule>	Specifies that the report should be generated on a schedule. See "Server management request parent tags" on page 665.

Example

This request cancels messages on the server with the address ianywhere.connector.myConnector\deadqueue:

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
 <CancelMessageRequest>
  <request>
   <requestId>cancelRequest</requestId>
   <condition>
    <customRule>ias_Address='ianywhere.connector.myConnector\deadqueue'</
customRule>
   </condition>
  </request>
 </CancelMessageRequest>
</actions>
```

Deleting messages

To specify a clean-up policy on the server, set the property ianywhere.qa.server.deleteRules for the special client ianywhere.server.deleteRules with the rule or rules governing which messages can be deleted from the server.

The following example changes the message clean-up policy to delete expired and canceled messages:

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <SetProperty>
 <prop>
     <client>ianywhere.server.deleteRules</client>
     <name>ianywhere.qa.server.deleteRules</name>
     <value>auto = ias_Status in ( ias_ExpiredStatus, ias_CancelledStatus )
and ias_TransmissionStatus = IAS_TRANSMITTED</value>
 </prop>
    </SetProperty>
    <RestartRules>
 <client>ianywhere.server.deleteRules</client>
    </RestartRules>
</actions>
```

Administering connectors with server management requests

You can use server management requests to create, configure, delete, start, stop, and monitor connectors.

For an overview of how to use server management requests, including how to authenticate and schedule them, see “Server management requests” on page 145.

See also

- “Connectors” on page 129
- “Web service connectors” on page 137

Creating and configuring connectors

To create connectors, add properties using <SetProperty> and then use <OpenConnector>.

Example

In the following example, the server management request first sets several relevant properties and associates them with the client ianywhere.connector.jboss, which is the client ID of the new connector. JMS-specific properties are set in such a way that a connector to a local JBOSS JMS server are indicated. The connector is then started using the OpenConnector tag. Note that if you have not started the MobiLink server with the relevant jar files of the JMS client, the connector is not started.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <SetProperty>
        <prop>
       <client>ianywhere.connector.jboss</client>
       <name>ianywhere.connector.nativeConnection</name>
  <value>ianywhere.message.connector.jms.NativeConnectionJMS</value>
   </prop>
        <prop>
       <client>ianywhere.connector.jboss</client>
       <name>ianywhere.connector.address</name>
  <value>ianywhere.connector.jboss</value>
   </prop>
        <prop>
       <client>ianywhere.connector.jboss</client>
       <name>xjms.jndi.factory</name>
  <value>org.jnp.interfaces.NamingContextFactory</value>
   </prop>
        <prop>
       <client>ianywhere.connector.jboss</client>
       <name>xjms.jndi.url</name>
  <value>jnp://0.0.0.0:1099</value>
   </prop>
        <prop>
       <client>ianywhere.connector.jboss</client>
       <name>xjms.topicFactory</name>
  <value>ConnectionFactory</value>
   </prop>
        <prop>
       <client>ianywhere.connector.jboss</client>
       <name>xjms.queueFactory</name>
  <value>ConnectionFactory</value>
   </prop>
        <prop>
       <client>ianywhere.connector.jboss</client>
       <name>xjms.receiveDestination</name>
  <value>qanywhere_receive</value>
   </prop>
        <prop>
       <client>ianywhere.connector.jboss</client>
       <name>xjms.deadMessageDestination</name>
  <value>qanywhere_deadMessage</value>
   </prop>
    </SetProperty>
    <OpenConnector>
        <client>ianywhere.connector.jboss</client>
    </OpenConnector>
</actions>
```

Modifying connectors

To modify connectors, close the connector, change properties with the <SetProperty> tag, and then open the connector.

Example

In the following example, the logging level of the connector is changed to 4. The connector with the ID ianywhere.connector.jboss is closed; the connector property logLevel is changed to 4, and then the connector is re-opened with the new log level.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <CloseConnector>
        <client>ianywhere.connector.jboss</client>
    </CloseConnector>
    <SetProperty>
        <prop>
       <client>ianywhere.connector.jboss</client>
  <name>ianywhere.connector.logLevel</name>
  <value>4</value>
   </prop>
    </SetProperty>
    <OpenConnector>
        <client>ianywhere.connector.jboss</client>
    </OpenConnector>
</actions>
```

Deleting connectors

To delete connectors, use <SetProperty> to remove all properties for the client.

Example

In the following example, the connector with the ID ianywhere.connector.jboss is closed. All of its properties are deleted by the <SetProperty> tag, omitting the name and value tags.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <SetProperty>
        <prop>
       <client>ianywhere.connector.jboss</client>
       <name>ianywhere.connector.nativeConnection</name>
     </prop>
    </SetProperty>
</actions>
```

Opening connectors

To open connectors, use <OpenConnector>.

An OpenConnector tag contains a single client tag that specifies the name of the connector to open.

<OpenConnector> subtag	Description
<client>	The name of the connector to open.

See also

- "Connectors" on page 129
- "Web service connectors" on page 137

Example

The following example opens the simpleGroup connector.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <OpenConnector>
     <client>simpleGroup</client>
    </OpenConnector>
</actions>
```

Closing connectors

To close connectors, use <CloseConnector>. A CloseConnector tag contains a single client tag that specifies the name of the connector to close.

<CloseConnector> subtags	Description
<client>	The name of the connector to close.

See also

- "Connectors" on page 129
- "Web service connectors" on page 137

Example

The following example closes the simpleGroup connector.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <CloseConnector>
     <client>simpleGroup</client>
    </CloseConnector>
</actions>
```

Monitoring connectors

To obtain information about connectors, write a special kind of server management request called a client status request. It contains a <ClientStatusRequest> tag that uses one or more <request> tags containing the information necessary to register the request.

Your client status request can obtain reports about connectors in several ways:

- Make a one-time request.
- Register a State Change Listener to have a report sent whenever the connector's state changes.
- Register an Error Listener to have a report sent whenever an error occurs on the connector.

In addition, you can schedule a report to be sent at certain times or intervals.

ClientStatusRequest tag

To get information about connectors, use <ClientStatusRequest>.

A client status request is composed of one or more <request> tags containing all the necessary information to register the request.

<ClientStatusRequest> subtag	**Description**
<request>	Groups information in requests.

request tag for client status requests

In the <request> tag, use an optional <replyAddr> tag to specify the return address for each report generated as a result of this request. If this tag is omitted, the default return address of reports is the reply address of the originating message.

Use an optional <requestId> to add a label for the request that is included in each report. When you register multiple requests, or when you delete or modify requests, the ID makes it possible to distinguish which reports were generated from a particular request.

To specify a list of connectors for the request, include one or more <client> tags, each with one connector address. For a one-time request, all the connectors are included in the report. For an event listener request, the server listens to each of these connectors.

To specify that event details should be made persistent during any server downtime, specify the <persistent> tag. This tag does not require any data and can be of the form <persistent/> or <persistent></persistent>.

You can optionally specify a list of events by including one or more <onEvent> tags with one event type per tag. If these tags are omitted, the client status request produces a one-time request. Otherwise, the client status request registers event listeners for the specified events.

<request> subtags for client status requests	Description
<client>	You can include one or more <client> tags, with one connector address per tag. For a one-time request, all the connectors listed are included in the report. For an event listener request, the server begins to listen to each of these connectors.
<onEvent>	Specifies the events upon which the server should generate reports. You can include one or more <onEvent> tags, with one event type per tag. If these tags are omitted, the Client Status Request produces a one-time request. Otherwise, the Client Status Request is used to register event listeners for the specified events.
<persistent>	Specifies that the details information in this Client Status Request should be made persistent in the server database.
<replyAddr>	Specifies the return address for each report generated as a result of this request. If this tag is omitted, the default return address of reports is the reply address of the originating message.
<requestId>	A label for the report. This value is used as a label for the request and is included in each report generated as a result of this request. This makes it possible to distinguish which reports were generated from a particular request when multiple requests have been registered and to delete or modify outstanding requests.
<schedule>	See "Server management request parent tags" on page 665.

One-time client status requests

You create a one-time request by omitting <onEvent> and <schedule> tags from the client status request. In this case, a single report is generated that contains the current status information for each connector specified in the client status request.

The following XML message omits the <onEvent> and <schedule> tags and so is an example of a one-time request. It generates a single report containing the current status information for each connector specified in the <ClientStatusRequest> tag.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
 <ClientStatusRequest>
  <request>
   <replyAddr>ianywhere.connector.beajms\q11</replyAddr>
   <requestId>myOneTimeRequest</requestId>
   <client>ianywhere.server</client>
```

```
      <client>ianywhere.connector.beajms</client>
    </request>
  </ClientStatusRequest>
</actions>
```

On-event client status requests

To specify events for which you want the QAnywhere Server to generate status reports, include one or more <onEvent> tags in your client status request. Unlike one-time requests, the server does not immediately respond to the request, but instead begins listening for events to occur. Each time one of these events is triggered, a report is sent containing information about the connector that caused the event.

The following events are supported for on-event requests:

Event	When it occurs
open	A closed connector is opened.
close	A previously opened or paused connector is closed.
statusChange	The status of the connector is changed from one state to another. Possible states are open and close.
error	An unexpected error is thrown by the connector.
fatalError	An unhandled fatal error is thrown by the connector.
none	This never occurs. This effectively removes all previous event watches from the connector.

In the following example, the connector with address ianywhere.connector.beajms\q11 is sent a status report each time the server connector changes its status or generates an error.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
  <ClientStatusRequest>
    <request>
      <replyAddr>ianywhere.connector.beajms\q11</replyAddr>
      <requestId>myEventRequest</requestId>
      <client>ianywhere.server</client>
      <onEvent>statusChange</onEvent>
      <onEvent>error</onEvent>
    </request>
  </ClientStatusRequest>
</actions>
```

Multiple simultaneous requests

Each return address can have its own set of event listeners for any number of connectors, including the server connector. Adding an event listener to a connector does not disturb any other event listeners in the server (except possibly one that it is replacing).

Request replacement

If you add an event listener to a connector that already has an event listener registered to it by the same return address, it replaces the old listener with the new one. For example, if a statusChange listener for connector abc is registered to address x/y and you register an error listener for abc to address x/y, abc no longer responds to statusChange events.

To register more than one event to the same address, you must create a single request with more than one <onEvent> tag.

Removing a request

If an event listener for a connector is registered to an address, you can remove the event listener by providing another client status request from the same address with the "none" event specified.

In the following example, all event listeners are removed for the server connector registered to the address ianywhere.connector.beajms\q11:

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
 <ClientStatusRequest>
  <request>
   <replyAddr>ianywhere.connector.beajms\q11</replyAddr>
   <client>ianywhere.server</client>
   <onEvent>none</onEvent>
  </request>
 </ClientStatusRequest>
</actions>
```

Persistent client status requests

To specify that the details of a request are saved into the global properties table on the message store (where they can be automatically reinstated after a server restart), include the <persistent> tag in a client status request. Persistence can be used with scheduled events and event listeners, but not one-time requests. The rules for adding and removing persistent requests are similar to those for regular requests, except that scheduled events and event listeners cannot be added separately. Instead, when adding a persistent request, the client must specify all event listeners and schedules for a particular connector/reply address pair in the same request.

The following example adds the event listener and schedule to ianywhere.connector.myConnector and makes them persistent. It also overwrites any previous persistent requests from this connector/reply address pair. A report is sent every half hour and when a connector status change occurs.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
 <ClientStatusRequest>
  <request>
   <replyAddr>ianywhere.connector.beajms\q11</replyAddr>
   <client>ianywhere.connector.myConnector</client>
   <onEvent>statusChange</onEvent>
   <schedule>
    <everyminute>30</everyminute>
   </schedule>
   <persistent/>
  </request>
 </ClientStatusRequest>
</actions>
```

Event listener persistence

If a connector is closed, any event listeners it has registered to its address persist in the server until the server is shut down. If the connector is reopened, the stored event listeners become active again.

Connector states

A connector can be in one of two states:

- **running** The connector is accepting and processing incoming and outgoing messages. This state is reflected in the connector property ianywhere.connector.state=1.

- **not running** The connector is not accepting or processing incoming or outgoing messages. This state is reflected in the connector property ianywhere.connector.state=2. When the connector state is changed to "running" the connector is initialized from scratch.

For information about how to change the connector state, see "Modifying connectors" on page 152.

Client status reports

A client status report is generated by the server each time a report is requested by a connector or a registered event occurs. It is generated as a simple text message which does not contain any message properties.

Depending on what information is available at the time of the event, any of the following values may be included in each component report:

- client (always present)
- UTCDatetime (always present)
- vendorStatusDescription (always present)
- statusCode (always present)
- vendorStatusCode
- statusSubCode
- statusDescription

For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<ClientStatusReport>
 <requestId>myRequest</requestId>
 <componentReport>
  <client>ianywhere.server</client>
  <UTCDatetime>Tue May 31 13:53:02 EDT 2005</UTCDatetime>
  <statusCode>Running</statusCode>
  <vendorStatusDescription></vendorStatusDescription>
 </componentReport>
 <componentReport>
  <client>ianywhere.connector.beajms</client>
  <UTCDatetime>Tue May 31 13:53:02 EDT 2005</UTCDatetime>
  <statusCode>Not running</statusCode>
  <vendorStatusDescription></vendorStatusDescription>
 </componentReport>
</ClientStatusReport>
```

Setting server properties with a server management request

A <SetProperty> tag contains one or more <prop> tags, each of which specifies a property to set. Each prop tag consists of a <client> tag, a <name> tag, and a <value> tag. To delete a property, omit the <value> tag.

<prop> subtags	Description
<client>	The name of the client for which to set a server property.
<name>	The name of the property to set.
<value>	The value of the property being set. If not included, the property gets deleted.

For an overview of how to use server management requests, including how to authenticate and schedule them, see "Server management requests" on page 145.

Example

The following server management request sets the ianywhere.qa.member.client3 property to Y for the destination alias called simpleGroup, which adds client3 to simpleGroup.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <SetProperty>
     <prop>
        <client>simpleGroup</client>
        <name>ianywhere.qa.member.client3</name>
        <value>Y</value>
     </prop>
    </SetProperty>
</actions>
```

The next example does the following:

- Creates or modifies the value of the client1 property myProp1 to 3.
- Deletes the client1 property myProp2.
- Modifies the value of the client2 property myProp3 to "some value".

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <SetProperty>
 <prop>
     <client>client1</client>
     <name>myProp1</name>
     <value>3</value>
 </prop>
 <prop>
     <client>client1</client>
     <name>myProp2</name>
 </prop>
```

```
         <prop>
             <client>client2</client>
             <name>myProp3</name>
             <value>some value</value>
         </prop>
     </SetProperty>
</actions>
```

Specifying transmission rules with a server management request

With a server management request, you can specify default server transmission rules that apply to all users, or you can specify transmission rules for each client.

To specify default transmission rules (for a server), set the ianywhere.qa.server.rules property for the client ianywhere.server.defaultClient. For a client, use the ianywhere.qa.server.rules property to specify server transmission rules.

For an overview of how to use server management requests, including how to authenticate and schedule them, see "Server management requests" on page 145.

Example

The following example creates the default rule that only high priority messages (priority greater than 6) should be sent:

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
  <SetProperty>
    <prop>
      <client>ianywhere.server.defaultClient</client>
      <name>ianywhere.qa.server.rules</name>
      <value>auto = ias_Priority &gt; 6</value>
    </prop>
  </SetProperty>
  <RestartRules>
    <client>ianywhere.server.defaultClient</client>
  </RestartRules>
</actions>
```

The following example creates a rule for a client called myClient that only messages with a content size less than 100 should be transmitted during business hours (8 a.m. and 6 p.m.):

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
  <SetProperty>
    <prop>
      <client>myClient</client>
      <name>ianywhere.qa.server.rules</name>
      <value>auto = ias_ContentSize &lt; 100
        or ias_CurrentTime &gt; '8:00:00'
        or ias_CurrentTime &lt; '18:00:00'</value>
    </prop>
  </SetProperty>
  <RestartRules>
```

```
    <client>myClient</client>
  </RestartRules>
</actions>
```

Creating destination aliases with a server management request

You can use server management requests to create and modify destination aliases.

For more information about destination aliases, see "Destination aliases" on page 127.

For an overview of how to use server management requests, including how to authenticate and schedule them, see "Server management requests" on page 145.

To create a destination alias, send a server management request in which the client name is the name of the destination alias and the following properties are specified. The group is identified by the group, address, and nativeConnection properties. Members of the group are specified with the member property.

```
<prop>
  <client>simpleGroup</client>
  <name>ianywhere.connector.nativeConnection</name>
  <value>ianywhere.message.connector.group.GroupConnector
  </value>
</prop>
```

Property	Description

iany-where.qa.group	Set this property to Y to indicate that you are configuring a destination alias. For example:
	
	`<prop>`
	`  <client>simpleGroup</client>`
	`  <name>ianywhere.qa.group</name>`
	`  <value>Y</value>`
	`</prop>`

ianywhere.con-nector.address	Specify the client ID of the destination alias. For example:
	
	`<prop>`
	`  <client>simpleGroup</client>`
	`  <name>ianywhere.connector.address</name>`
	`  <value>simpleGroup</value>`
	`</prop>`

ianywhere.con-nector.native-Connection	Set to ianywhere.message.connector.group.GroupConnector. For example:
	
	`<prop>`
	`  <client>simpleGroup</client>`
	`  <name>ianywhere.connector.nativeConnection</name>`
	`  <value>ianywhere.message.connector.group.GroupConnector`
	`  </value>`
	`</prop>`

Property	Description

iany-where.qa.mem-ber.*client-name* \queue-name	Specify Y to add a member or N to remove a member. You can also optionally specify a delivery condition. See "Condition syntax" on page 734. For example, to add client1 to the destination alias simpleGroup, set the property as follows. The queue-name is optional. Repeat this property for every client you want to add:
	`<prop>`
	`  <client>simpleGroup</client>`
	`  <name>ianywhere.qa.member.client1\queue1</name>`
	`  <value>Y</value>`
	`</prop>`

For more information about server management requests, see "Server management requests" on page 145.

See also

- "QAnywhere transmission and delete rules" on page 733

Example

The following server management request creates a destination alias called simpleGroup with members called client1 and client2\q11. This example starts the destination alias so that it immediately begins handling messages.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
  <SetProperty>
    <prop>
      <client>simpleGroup</client>
      <name>ianywhere.qa.group</name>
      <value>Y</value>
    </prop>
    <prop>
      <client>simpleGroup</client>
      <name>ianywhere.connector.address</name>
      <value>simpleGroup</value>
    </prop>
    <prop>
      <client>simpleGroup</client>
      <name>ianywhere.connector.nativeConnection</name>
      <value>ianywhere.message.connector.group.GroupConnector</value>
    </prop>
    <prop>
      <client>simpleGroup</client>
      <name>ianywhere.connector.logLevel</name>
      <value>4</value>
    </prop>
    <prop>
      <client>simpleGroup</client>
      <name>ianywhere.qa.member.client1</name>
      <value>Y</value>
    </prop>
    <prop>
      <client>simpleGroup</client>
      <name>ianywhere.qa.member.client2\q11</name>
      <value>Y</value>
    </prop>
  </SetProperty>
```

```
    <OpenConnector>
      <client>simpleGroup</client>
    </OpenConnector>
</actions>
```

Adding and removing members in a destination alias

To add members to a destination alias, create a server management request that specifies the member in a property. The group must be restarted for the member setting to take effect.

The following example adds the member client3 and restarts the group simpleGroup:

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <SetProperty>
  <prop>
      <client>simpleGroup</client>
      <name>ianywhere.qa.member.client3</name>
      <value>Y</value>
  </prop>
    </SetProperty>
    <CloseConnector>
  <client>simpleGroup</client>
    </CloseConnector>
    <OpenConnector>
  <client>simpleGroup</client>
    </OpenConnector>
</actions>
```

To remove members from a destination alias, create a server management request that contains a property setting indicating that the member must be removed. The group must be restarted for the member removal setting to take effect.

The following example removes the member client3 and restarts the group simpleGroup:

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
    <SetProperty>
  <prop>
      <client>simpleGroup</client>
      <name>ianywhere.qa.member.client3</name>
  </prop>
    </SetProperty>
    <CloseConnector>
  <client>simpleGroup</client>
    </CloseConnector>
    <OpenConnector>
  <client>simpleGroup</client>
    </OpenConnector>
</actions>
```

Monitoring QAnywhere

You can use a server management request to get information about a set of messages. The server compiles the information and sends it back to the client in a message. You can create a one-time message details request or schedule your message details request to happen automatically. In addition, you can specify that your request should be persistent, so that the message is sent even if the server is restarted.

For an overview of how to use server management requests, including how to authenticate and schedule them, see "Server management requests" on page 145.

Message details requests

To write a server management request for message details, use the <MessageDetailsRequest> tag.

A message details request contains one or more <request> tags containing all the necessary information to register the request. Specifying more than one <request> tag is equivalent to sending multiple separate message details requests.

Use the optional <replyAddr> tag to specify the return address for each report generated as a result of the request. If this tag is omitted, the default return address of reports is the reply address of the originating message.

Use a <requestId> tag to specify a unique identifier for the request that is included in each report generated as a result of this request. Using different values for this field allows more than one request to be active at the same time. Using the same request ID allows the client to override or delete active requests.

Specify a <condition> tag to determine which messages should be included in the report. See "Condition tag" on page 665.

You can also specify a list of details to determine what details of each message should be included in the report. You do this by including a set of empty detail element tags in the request.

You can use the <persistent> tag to specify that event details should be made persistent during any server downtime. This tag does not require any data and can be of the form <persistent/> or <persistent></persistent>.

You can use <schedule> to include all the necessary details needed to register a scheduled report. See "Server management request parent tags" on page 665.

<MessageDetailsRequest> sub-tags	Description
<request>	Groups information about a particular request. Specifying more than one <request> tag is equivalent to sending multiple separate server management requests for message information. See below.

Request tag

<Request> sub-tags	Description
<address>	Requests the address of each message.
<archived>	Requests whether the message is in the archive store.
<condition>	Groups conditions for including a message in the report. See "Condition tag" on page 665.
<contentSize>	Requests the content size of each message.
<expires>	Requests the expiration time of each message.
<kind>	Requests whether the message is text or binary.
<messageId>	Requests the message ID of each message.
<originator>	Requests the originator of each message.
<persistent>	Including this tag indicates that the results of the request should be made persistent in the server database (so that the report is sent even if the server is restarted).
<priority>	Requests the priority of each message.
<property>	Requests a list of all message properties and values for each message.
<statusTime>	Requests the status time of each message.
<replyAddr>	Specifies the return address for each report generated as a result of this request. If this tag is omitted, the default return address of reports is the reply address of the originating message.
<requestId>	This value is a unique identifier for the request and is included in each report generated as a result of this request. Using different values for this field allows more than one request to be active at the same time. Using the same request id allows the client to override or delete active requests.
<schedule>	Including this tag indicates that the report should be generated on a schedule. Subtags of <schedule> identify the schedule on which the report runs. See "Server management request parent tags" on page 665.
<status>	Requests the status of each message.
<transmission-Status>	Requests the transmission status of each message.

Monitoring QAnywhere clients

You can use a server management request to obtain a list of clients currently on the server. This list contains clients who are registered on the server, including remote clients, open connectors, and destination aliases.

For an overview of how to use server management requests, including how to authenticate and schedule them, see "Server management requests" on page 145.

To obtain a list of clients, use the <GetClientList> tag in your server management request. For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
 <GetClientList/>   (or <GetClientList></GetClientList> )
</actions>
```

The response that is generated is sent to the reply address of the message containing the request. The response contains a list of <client> tags, each naming one client connected to the server. For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<GetClientListResponse>
 <client>ianywhere.server</client>
 <client>ianywhere.connector.myConnector</client>
 <client>myClient</client>
</GetClientListResponse>
```

Monitoring properties

You can use a server management request to see what properties are set for a client. The response lists only the properties that have been set for the client (not defaults).

For an overview of how to use server management requests, including how to authenticate and schedule them, see "Server management requests" on page 145.

To get a list of properties for a client, use the <GetProperties> tag in your server management request. For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
 <GetProperties>
  <client>ianywhere.connector.myConnector</client>
 </GetProperties>
</actions>
```

The response that is generated is sent to the reply address of the message containing the request. The response contains the name of the client and a list of <prop> tags, each containing the details of one property. For example:

```
<?xml version="1.0" encoding="UTF-8"?>
<GetPropertiesResponse>
 <client>ianywhere.connector.myConnector</client>
 <prop>
  <name>ianywhere.connector.logLevel</name>
  <value>4</value>
 </prop>
 <prop>
  <name>ianywhere.connector.state</name>
  <value>2</value>
 </prop>
</GetPropertiesResponse>
```

Tutorial: Exploring TestMessage

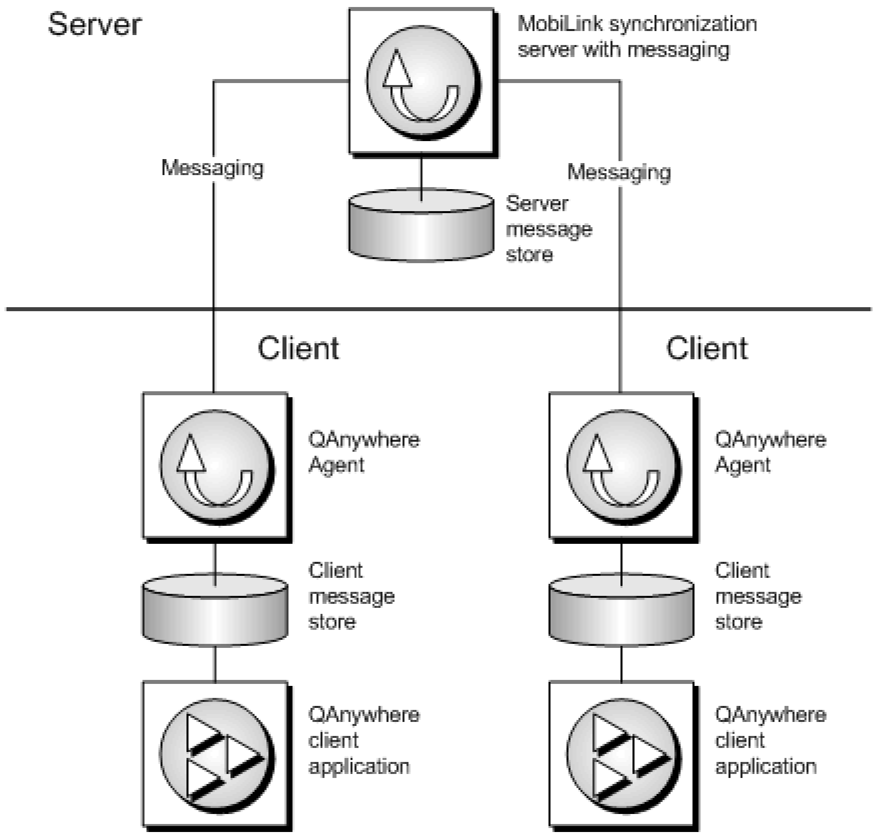
TestMessage is a sample QAnywhere client application. This application demonstrates how you can use QAnywhere to create your own messaging client applications. TestMessage provides a single client-to-client interface to send, receive, and display messages. Being human-readable, text messages provide a useful demonstration of QAnywhere messaging, but QAnywhere provides much more than text messaging. It is a general purpose application-to-application messaging system that provides message-based communication among many clients.

The tutorial is written for a Windows desktop system. While these platforms are convenient for demonstration purposes, you can also use the QAnywhere API to write applications that run on Windows Mobile devices. Source code is provided for Windows Mobile for C++, Visual Basic, C#, and Java. There is also a C# version written on the .NET Compact Framework.

Lesson 1: Start MobiLink with messaging

Background

QAnywhere uses MobiLink synchronization to send and receive messages. All messages from one client to another are delivered through a central MobiLink server. The architecture of a typical system, with only two QAnywhere clients, is shown in the following diagram.



The server message store is a database configured for use as a MobiLink consolidated database. The TestMessage sample uses a SQL Anywhere consolidated database as its server message store.

The only tables needed in the server message store are the MobiLink system tables that are included in any supported database that is set up as a MobiLink consolidated database.

The system tables are maintained by MobiLink. A relational database provides a secure, high performance message store. It enables you to easily integrate messaging into an existing data management and synchronization system.

QAnywhere messaging is usually run over separate computers, but in this tutorial all components are running on a single computer. It is important to keep track of which activities are client activities and which are server activities.

In this lesson, you perform actions at the server.

Activity

The MobiLink server can be started with messaging by supplying the -m option, and specifying a connection string to the server message store. The TestMessage sample uses a QAnywhere sample database for the server message store. For the TestMessage sample, you can start the MobiLink server for messaging using the command line options, using a sample shortcut in your SQL Anywhere installation, or with the QAnywhere 12 plug-in to Sybase Central.

Start the messaging server

1. From the **Start** menu, choose **Programs** » **SQL Anywhere 12** » **QAnywhere** » **MobiLink QAnywhere Sample**.

   Alternatively, at a command prompt, run the following command:

   ```
   mlsrv12 -m -c "dsn=QAnywhere 12 Demo" -vcrs -zu+
   ```

   This command line uses the following mlsrv12 options:

Option	Description
-m	The -m option enables messaging. See "-m mlsrv12 option" [*MobiLink - Server Administration*].
-c	The -c option specifies the connection string to the server message store, in this case using the QAnywhere 12 Demo ODBC data source. See "-c mlsrv12 option" [*MobiLink - Server Administration*].
-vcrs	The -vcrs option provides verbose logging of server activities, which is useful during development. See "-v mlsrv12 option" [*MobiLink - Server Administration*].
-zu+	The -zu+ option automatically adds user names to the system; this is convenient for tutorial or development purposes but is not normally used in a production environment. See "-zu mlsrv12 option" [*MobiLink - Server Administration*].

2. Move the MobiLink server messages window to the center of your screen, which represents the server in this tutorial.

See also

- "Starting QAnywhere with MobiLink enabled" on page 29
- "-m mlsrv12 option" [*MobiLink - Server Administration*]
- "Quick start to QAnywhere" on page 10
- "Simple messaging scenario" on page 5

Lesson 2: Run the TestMessage application

Background

TestMessage is a simple application that uses QAnywhere to send and receive text messages. Text messaging is used in this tutorial because it provides a simple and accessible demonstration of messaging. QAnywhere is, however, not just a text messaging system; it provides general purpose application-to-application messaging.

In this lesson, you are performing activities at a client. Typically, clients run on separate computers from the server.

In this lesson, you start the client message store that is part of the TestMessage sample. In Lesson 3, you use this message store to send a message to another client message store.

Activity

To start the QAnywhere Agent with the TestMessage client message store

1. From the **Start** menu, choose **Programs** » **SQL Anywhere 12** » **QAnywhere** » **Tutorial Using SQL Anywhere** » **QAnywhere Agent For SQLAnywhere - saclient1**.

   The **QAnywhere Agent** connects to the first TestMessage sample client message store and manages message transmission to and from this message store.

2. Move the first **QAnywhere Agent** window to the right side of your screen.

   Note
   You must allow a few seconds for the first instance of the QAnywhere Agent to start before you proceed to the next step.

3. From the **Start** menu, choose **Programs** » **SQL Anywhere 12** » **QAnywhere** » **Tutorial Using SQL Anywhere** » **QAnywhere Agent For SQLAnywhere - saclient2**.

   A second **QAnywhere Agent** starts and connects to the second TestMessage sample client message store and manages message transmission to and from this message store.

4. Move the second **QAnywhere Agent** window to the left side of your screen.

To start TestMessage

1. From the **Start** menu, choose **Programs** » **SQL Anywhere 12** » **QAnywhere** » **Tutorial Using SQL Anywhere** » **TestMessage -- saclient1**.
2. Move the **saclient1 - TestMessage** window to the right side of your screen.
3. In the **saclient1 - TestMessage** window, click **Tools** » **Options**.
4. Verify **testmessage** appears in the **Queue Name Used To Listen For Incoming Messages** field. Click **Cancel**.
5. From the **Start** menu, choose **Programs** » **SQL Anywhere 12** » **QAnywhere** » **Tutorial Using SQL Anywhere** » **TestMessage -- saclient2**.
6. Move the **saclient2 - TestMessage** window to the left side of your screen.
7. In the **saclient2 - TestMessage** window, click **Tools** » **Options**.
8. Verify **testmessage** appears in the **Queue Name Used To Listen For Incoming Messages** field. Click **Cancel**.

Discussion

You can configure the way that the QAnywhere Agent monitors messages by setting a message transmission policy. This sample is designed to only work with the automatic or scheduled policy, and it starts the QAnywhere Agent using the automatic policy. The QAnywhere policies are:

- **scheduled** This policy setting instructs the QAnywhere Agent to transmit messages periodically. If you don't specify an interval, the default is 15 minutes.
- **automatic** This default policy setting causes the QAnywhere Agent to transmit messages whenever a message to or from the client message store is ready for delivery.
- **on demand** This policy setting causes the QAnywhere Agent to transmit messages only when instructed to by an application.
- **custom** In this mode, you provide a set of rules to specify more complicated transmission behavior.

QAnywhere messages are delivered to a QAnywhere address, which consists of a client message store ID and a queue name. The default ID is the computer name on which the QAnywhere Agent is running. Each message store requires its own QAnywhere Agent. Each application can listen to multiple queues, but each queue should be specific to a single application.

See also

- "Starting the QAnywhere agent" on page 44
- "Determining when message transmission should occur on the client" on page 46
- "qaagent utility" on page 673
- "QAnywhere transmission and delete rules" on page 733
- "Writing QAnywhere client applications" on page 49
- QAnywhere samples, which are installed to *samples-dir\QAnywhere*. (For more information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database Administration*].)

Lesson 3: Send a message

Background

In this lesson you send a message from the TestMessage saclient1 application to the TestMessage saclient2 application.

Activity

To send a message from TestMessage

1. In the **saclient1 - TestMessage** window, click **Message** » **New**.
2. In the **Destination ID** field, type **saclient2**.
3. In the **Subject** field, type the current time. Using the current time makes it easy to track individual messages.

4. In **Message** field, type **sample**.

5. Click **Send**.

6. Click **OK**.

7. In the **saclient2 - TestMessage** window, select the message. The content of the message appears in the bottom pane.

Discussion

Like other QAnywhere applications, TestMessage uses the QAnywhere API to manage messages. The QAnywhere API is supplied as a C++ API, a Java API, a Microsoft .NET API, and a SQL API.

See also

- "QAnywhere message addresses" on page 58
- "Sending QAnywhere messages" on page 61
- "Message delete rules" on page 743

Lesson 4: Explore the TestMessage client source code

Background

This section of the tutorial takes you on a brief tour of the source code behind the TestMessage client application.

A lot of the code implements the Windows interface, through which you can send, receive, and view the messages. This portion of the tutorial, however, focuses on the portions of the code given to QAnywhere.

You can find the TestMessage source code in *Samples\QAnywhere*.

Several versions of the TestMessage source code are provided. The following versions are provided for Windows platforms:

- A C++ version built using the Microsoft Foundation Classes is provided as *Samples\QAnywhere\Windows\MFC\TestMessage\TestMessage.sln*.

- A C# version built on the .NET Framework is provided as *Samples\QAnywhere\Windows\.NET\CS\TestMessage\TestMessage.sln*.

- A Java version is provided as *Samples\QAnywhere\Java\TestMessage\TestMessage.java*.

The following version is provided for .NET Compact Framework:

- A C# version built on the .NET Compact Framework is provided as *Samples\QAnywhere\Windows Mobile Classic\.NET\CS\TestMessage\TestMessage.sln*.

Required software

Visual Studio 2005 or later is required to open the solution files and build the .NET Framework projects and the .NET Compact Framework project.

Exploring the C# source

This section takes you through the C# source code. The two versions are structured in a very similar manner.

Rather than look at each line in the application, this lesson highlights particular lines that are useful for understanding QAnywhere applications. It uses the C# version to illustrate these lines.

1. Open the version of the TestMessage project that you are interested in.

   Double-click the solution file to open the project in Visual Studio. For example, *Samples\QAnywhere\Windows\.NET\CS\TestMessage\TestMessage.sln* is a solution file. There are several solution files for different environments.

2. Ensure that Solution Explorer is open.

   You can open the Solution Explorer from the **View** menu.

3. Inspect the **Source Files** folder.

   There are two files of particular importance. The *MessageList* file (*MessageList.cs*) receives messages and lets you view them. The *NewMessage* file (*NewMessage.cs*) allows you to construct and send messages.

4. From Solution Explorer, open the *MessageList* file.

5. Inspect the included namespaces.

   Every QAnywhere application requires the iAnywhere.QAnywhere.Client namespace. The assembly that defines this namespace is supplied as the DLL *iAnywhere.QAnywhere.Client.dll*. The files are in the following locations:

   - .NET Framework 2.0: *install-dir\Assembly\V2*
   - .NET Compact Framework 2.0: *install-dir\ce\Assembly\V2*

   For your own projects, you must include a reference to this DLL when compiling. The namespace is included using the following line at the top of each file:

   ```
   using iAnywhere.QAnywhere.Client;
   ```

6. Inspect the startReceiver method.

   This method performs initialization tasks that are common to QAnywhere applications:

   - Create a QAManager object.

     ```
     _qaManager =
     QAManagerFactory.Instance.CreateQAManager();
     ```

QAnywhere provides a QAManagerFactory object to create QAManager objects. The QAManager object handles QAnywhere messaging operations: in particular, receiving messages (getting messages from a queue) and sending messages (putting messages on a queue).

QAnywhere provides two types of manager: QAManager and QATransactionalManager. When using QATransactionalManager, all send and receive operations occur within a transaction, so that either all messages are sent (or received) or none are.

- Write a method to handle messages.

  The onMessage() method is called by QAnywhere to handle regular non-system messages. The message it receives is encoded as a QAMessage object. The QAMessage class and its children, QATextMessage and QABinaryMessage, provide properties and methods that hold all the information QAnywhere applications need about a message.

  ```
  private void onMessage( QAMessage msg ) {
     Invoke( new onMessageDelegate( onMessageReceived ),
        new Object [] { msg } );
  }
  ```

  This code uses the Invoke method of the Form to cause the event to be processed on the thread that runs the underlying window so that the user interface can be updated to display the message. This is also the thread that created the QAManager. With some exceptions, the QAManager can only be accessed from the thread that created it.

- Declare a MessageListener, as defined in the MessageList_Load method.

  ```
  _receiveListener = new
      QAManager.MessageListener( onMessage );
  ```

  The OnMessage() method is called whenever a message is received by the QAnywhere Agent and placed in the queue that the application listens to.

  Message listeners and notification listeners
  Message listeners are different from the Listener component described in "Scenario for messaging with push notifications" on page 6. The Listener component receives notifications, while message listener objects retrieve messages from the queue.

When you set a message listener for the queue, the QAnywhere Manager passes messages that arrive on that queue to that listener. Only one listener can be set for a given queue. Setting with a null listener clears out any listener for that queue.

The MessageListener implementation receives messages asynchronously. You can also receive messages synchronously; that is, the application explicitly goes and looks for messages on the queue, perhaps in response to a user action such as clicking a Refresh button, rather than being notified when messages appear.

Other initialization tasks include:

- Open and start the QAManager object.

```
_qaManager.Open(
        AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT );
_qaManager.Start();
```

The AcknowledgementMode enumeration constants determine how the receipt of messages is acknowledged to the sender. The EXPLICIT_ACKNOWLEDGEMENT constant indicates that messages are not acknowledged until a call to one of the QAManager acknowledge methods is made.

- Load any messages that are waiting in the queue.

  ```
  loadMessages();
  ```

- Assign a listener to a queue for future messages.

  The listener was declared in the MessageList_Load() method.

  ```
  _qaManager.SetMessageListener(
    _options.ReceiveQueueName,
    _receiveListener );
  ```

  The Options ReceiveQueueName property contains the string **testmessage**, which is the TestMessage queue as set in the **TestMessage Options** window.

7. Inspect the addMessage() method in the same file.

   This method is called whenever the application receives a message. It gets properties of the message such as its reply-to address, preferred name, and the time it was sent (Timestamp), and displays the information in the TestMessage user interface. The following lines cast the incoming message into a QATextMessage object and get the reply-to address of the message:

   ```
   text_msg = ( QATextMessage )msg;
   from = text_msg.ReplyToAddress;
   ```

   This completes a brief look at some of the major tasks in the *MessageList* file.

8. From Solution Explorer, open the *NewMessage* file.

9. Inspect the sendMessage() method.

   This method takes the information entered in the **New Message** window and constructs a QATextMessage object. The QAManager then puts the message in the queue to be sent.

   Here are the lines that create a QATextMessage object and set its ReplyToAddress property:

   ```
   qa_manager = MessageList.GetQAManager();
   msg = qa_manager.CreateTextMessage();
   msg.ReplyToAddress = MessageList.getOptions().ReceiveQueueName;
   ```

   Here are the lines that put the message in the queue to be sent. The variable `dest` is the destination address, supplied as an argument to the function.

   ```
   qa_manager.PutMessage( dest, msg );
   ```

See also

- “QAnywhere C++ API reference for clients” on page 354
- “QAnywhere .NET API reference for clients” on page 179
- “Writing QAnywhere client applications” on page 49
- The TestMessage sample, which is installed to *samples-dir\QAnywhere*. (For information about *samples-dir*, see “Samples directory” [*SQL Anywhere Server - Database Administration*].)

Tutorial cleanup

Shut down all instances of TestMessage, the QAnywhere Agent, and the MobiLink server.

QAnywhere reference

This section provides reference documentation of the QAnywhere APIs.

QAnywhere .NET API reference for clients

Namespace (for regular clients)

```
iAnywhere.QAnywhere.Client
```

Namespace (for standalone clients)

```
iAnywhere.QAnywhere.StandAloneClient
```

MessageProperties class

Provides fields storing standard message property names.

Visual Basic syntax

```
Public Class MessageProperties
```

C# syntax

```
public class MessageProperties
```

Members

All members of MessageProperties class, including all inherited members.

Name	Description
“ADAPTER field”	For system queue messages, the network adapter that is being used to connect to the QAnywhere server.
“ADAPTERS field”	This property name refers to a delimited list of network adapters that can be used to connect to the QAnywhere server.
“DELIVERY_COUNT field”	This property name refers to the number of attempts that have been made so far to deliver the message.
“IP field”	For system queue messages, the IP address of the network adapter that is being used to connect to the QAnywhere server.
“MAC field”	For system queue messages, the MAC address of the network adapter that is being used to connect to the QAnywhere server.

Name	Description
“MSG_TYPE field”	This property name refers to MessageType values associated with a QAnywhere message.
“NETWORK_STATUS field”	This property name refers to the state of the network connection.
“ORIGINATOR field”	This property name refers to the message store ID of the originator of the message.
“RAS field”	For system queue messages, the RAS entry name that is being used to connect to the QAnywhere server.
“RASNAMES field”	For system queue messages, a delimited list of RAS entry names that can be used to connect to the QAnywhere server.
“STATUS field”	This property name refers to the current status of the message.
“STATUS_TIME field”	This property name refers to the time at which the message became its current status.
“TRANSMISSION_STATUS field”	This property name refers to the current transmission status of the message.

Remarks

The MessageProperties class provides standard message property names. You can pass MessageProperties fields to QAMessage methods used to get and set message properties.

For more information, see “QAnywhere messages” on page 13.

See also

- “QAMessage interface” on page 271
- “GetIntProperty method” on page 276
- “GetStringProperty method” on page 279

Example

Assume you have the following QAMessage instance:

```
QAMessage msg = mgr.createTextMessage();
```

The following example gets the value corresponding to MessageProperties.MSG_TYPE using the QAMessage.GetIntProperty method. The MessageType enumeration maps the integer result to an appropriate message type.

```
msg_type = (MessageType)t_msg.GetIntProperty(
    MessageProperties.MSG_TYPE
);
```

The following example shows the onSystemMessage method which is used to handle QAnywhere system messages. The message type is evaluated using MessageProperties.MSG_TYPE variable and the

QAMessage.GetIntProperty method. A delimited list of RAS entry names is obtained using MessageProperties.RASNAMES and the QAMessage.GetStringProperty method.

```
private void onSystemMessage(QAMessage msg) {
    QATextMessage    t_msg;
    MessageType       msg_type;
    String           network_adapters;
    String           network_names;
    String           network_info;

    t_msg = (QATextMessage)msg;
    if( t_msg != null ) {
          // Evaluate message type.
          msg_type =
(MessageType)t_msg.GetIntProperty( MessageProperties.MSG_TYPE );

        if( msg_type == MessageType.NETWORK_STATUS_NOTIFICATION ) {
            // Handle network status notification.
            network_info = "";
            network_adapters =
t_msg.GetStringProperty( MessageProperties.ADAPTERS );
        if( network_adapters != null &amp;&amp; network_adapters.Length > 0)
{
                network_info +=
String.Format( _resources.GetString( "NetworkAdapter" ), network_adapters );
            }

            network_names =
t_msg.GetStringProperty( MessageProperties.RASNAMES );
            //...
          }
    }
}
```

ADAPTER field

For system queue messages, the network adapter that is being used to connect to the QAnywhere server.

Visual Basic syntax

Public Const **ADAPTER** As String

C# syntax

public const string **ADAPTER**;

Remarks

The value of this field is ias_Network.Adapter.

For more information, see "Predefined client message store properties" on page 718.

You can pass MessageProperties.ADAPTER in the QAMessage.GetStringProperty method to access the associated property.

See also

- “MessageProperties class” on page 179
- “GetStringProperty method” on page 279

ADAPTERS field

This property name refers to a delimited list of network adapters that can be used to connect to the QAnywhere server.

Visual Basic syntax

```
Public Const ADAPTERS As String
```

C# syntax

```
public const string ADAPTERS;
```

Remarks

It is used for system queue messages.

You can pass MessageProperties.ADAPTERS in the QAMessage.GetStringProperty method to access the associated property.

For more information, see “Predefined client message store properties” on page 718.

See also

- “MessageProperties class” on page 179
- “GetStringProperty method” on page 279

DELIVERY_COUNT field

This property name refers to the number of attempts that have been made so far to deliver the message.

Visual Basic syntax

```
Public Const DELIVERY_COUNT As String
```

C# syntax

```
public const string DELIVERY_COUNT;
```

Remarks

The value of this field is ias_DeliveryCount.

You can pass MessageProperties.DELIVERY_COUNT in the QAMessage.GetIntProperty method to access the associated property.

See also

- "MessageProperties class" on page 179
- "GetIntProperty method" on page 276

IP field

For system queue messages, the IP address of the network adapter that is being used to connect to the QAnywhere server.

Visual Basic syntax

```
Public Const IP As String
```

C# syntax

```
public const string IP;
```

Remarks

The value of this field is ias_Network.IP.

For more information, see "Predefined client message store properties" on page 718.

You can pass MessageProperties.IP in the QAMessage.GetStringProperty method to access the associated property.

See also

- "MessageProperties class" on page 179
- "GetStringProperty method" on page 279

MAC field

For system queue messages, the MAC address of the network adapter that is being used to connect to the QAnywhere server.

Visual Basic syntax

```
Public Const MAC As String
```

C# syntax

```
public const string MAC;
```

Remarks

The value of this field is ias_Network.MAC.

For more information, see "Predefined client message store properties" on page 718.

You can pass MessageProperties.MAC in the QAMessage.GetStringProperty method to access the associated property.

See also

- “MessageProperties class” on page 179
- “GetStringProperty method” on page 279

MSG_TYPE field

This property name refers to MessageType values associated with a QAnywhere message.

Visual Basic syntax

```
Public Const MSG_TYPE As String
```

C# syntax

```
public const string MSG_TYPE;
```

Remarks

The value of this field is ias_MessageType.

You can pass MessageProperties.MSG_TYPE in the QAMessage.GetIntProperty method to access the associated property.

See also

- “MessageProperties class” on page 179
- “MessageType enumeration” on page 302
- “GetIntProperty method” on page 276
- “GetStringProperty method” on page 279

NETWORK_STATUS field

This property name refers to the state of the network connection.

Visual Basic syntax

```
Public Const NETWORK_STATUS As String
```

C# syntax

```
public const string NETWORK_STATUS;
```

Remarks

The value is 1 if the network is accessible and 0 otherwise.

The network status is used for system queue messages (for example, network status changes).

For more information, see “Predefined client message store properties” on page 718.

You can pass MessageProperties.NETWORK_STATUS in the QAMessage.GetIntProperty method to access the associated property.

See also

- “MessageProperties class” on page 179
- “GetIntProperty method” on page 276

ORIGINATOR field

This property name refers to the message store ID of the originator of the message.

Visual Basic syntax

```
Public Const ORIGINATOR As String
```

C# syntax

```
public const string ORIGINATOR;
```

Remarks

The value of this field is ias_Originator.

You can pass MessageProperties.ORIGINATOR in the QAMessage.GetStringProperty method to access the associated property.

See also

- “MessageProperties class” on page 179
- “GetStringProperty method” on page 279

RAS field

For system queue messages, the RAS entry name that is being used to connect to the QAnywhere server.

Visual Basic syntax

```
Public Const RAS As String
```

C# syntax

```
public const string RAS;
```

Remarks

The value of this field is ias_Network.RAS.

For more information, see “Predefined client message store properties” on page 718.

You can pass MessageProperties.RAS in the QAMessage.GetStringProperty method to access the associated property.

See also

- “MessageProperties class” on page 179
- “GetStringProperty method” on page 279

RASNAMES field

For system queue messages, a delimited list of RAS entry names that can be used to connect to the QAnywhere server.

Visual Basic syntax

```
Public Const RASNAMES As String
```

C# syntax

```
public const string RASNAMES;
```

Remarks

The value of this field is ias_RASNames.

For more information, see “Predefined client message store properties” on page 718.

You can pass MessageProperties.RASNAMES in the QAMessage.GetStringProperty method to access the associated property.

See also

- “MessageProperties class” on page 179
- “GetStringProperty method” on page 279

STATUS field

This property name refers to the current status of the message.

Visual Basic syntax

```
Public Const STATUS As String
```

C# syntax

```
public const string STATUS;
```

Remarks

For a list of property values, see the StatusCodes.

The value of this field is ias_Status.

You can pass MessageProperties.STATUS in the QAMessage.GetIntProperty method to access the associated property.

See also

- "StatusCodes enumeration" on page 305
- "MessageProperties class" on page 179
- "GetIntProperty method" on page 276

STATUS_TIME field

This property name refers to the time at which the message became its current status.

Visual Basic syntax

```
Public Const STATUS_TIME As String
```

C# syntax

```
public const string STATUS_TIME;
```

Remarks

It is a local time. When STATUS_TIME is passed to QAMessage.GetProperty, it returns a DateTime object. The value of this field is ias_StatusTime.

See also

- "GetProperty method" on page 277
- "MessageProperties class" on page 179
- "GetProperty method" on page 277

TRANSMISSION_STATUS field

This property name refers to the current transmission status of the message.

Visual Basic syntax

```
Public Const TRANSMISSION_STATUS As String
```

C# syntax

```
public const string TRANSMISSION_STATUS;
```

Remarks

For a list of property values, see the StatusCodes.

The value of this field is ias_TransmissionStatus.

You can pass MessageProperties.TRANSMISSION_STATUS in the QAMessage.GetIntProperty method to access the associated property.

See also

- "StatusCodes enumeration" on page 305
- "MessageProperties class" on page 179
- "GetIntProperty method" on page 276

MessageStoreProperties class

This class defines constant values for useful message store property names.

Visual Basic syntax

```
Public Class MessageStoreProperties
```

C# syntax

```
public class MessageStoreProperties
```

Members

All members of MessageStoreProperties class, including all inherited members.

Name	Description
"MAX_DELIVERY_ATTEMPTS field"	This property name refers to the maximum number of times that a message can be received, without explicit acknowledgement, before its status is set to StatusCodes.UNRECEIVABLE.

Remarks

The MessageStoreProperties class provides standard message property names. You can pass MessageProperties fields to QAManagerBase methods used to get and set pre-defined or custom message store properties.

For more information, see "Client message store properties" on page 26.

MAX_DELIVERY_ATTEMPTS field

This property name refers to the maximum number of times that a message can be received, without explicit acknowledgement, before its status is set to StatusCodes.UNRECEIVABLE.

Visual Basic syntax

```
Public Const MAX_DELIVERY_ATTEMPTS As String
```

C# syntax

```
public const string MAX_DELIVERY_ATTEMPTS;
```

Remarks

The value of this field is ias_MaxDeliveryAttempts.

iAnywhere.QAnywhere.Client.StatusCodes MessageStoreProperties

QABinaryMessage interface

An QABinaryMessage object is used to send a message containing a stream of uninterpreted bytes.

Visual Basic syntax

```
Public Interface QABinaryMessage Inherits QAMessage
```

C# syntax

```
public interface QABinaryMessage : QAMessage
```

Base classes

- "QAMessage interface" on page 271

Members

All members of QABinaryMessage interface, including all inherited members.

Name	Description
"ClearBody method"	Clears the body of the message.
"ClearProperties method"	Clears all the properties of the message.
"GetBooleanProperty method"	Gets a boolean message property.
"GetByteProperty method"	Gets a byte message property.
"GetDoubleProperty method"	Gets a double message property.
"GetFloatProperty method"	Gets a float message property.
"GetIntProperty method"	Gets an int message property.
"GetLongProperty method"	Gets a long message property.
"GetProperty method"	Gets a message property.
"GetPropertyNames method"	Gets an enumerator over the property names of the message.
"GetPropertyType method"	Returns the property type of the given property.
"GetSbyteProperty method"	Gets a signed byte message property.

Name	Description
“GetShortProperty method”	Gets a short message property.
“GetStringProperty method”	Gets a string message property.
“PropertyExists method”	Indicates whether the given property has been set for this message.
“ReadBinary method”	Reads up to length number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.
“ReadBoolean method”	Reads a boolean value starting from the unread portion of the QABinaryMessage instance's message body.
“ReadChar method”	Reads a char value starting from the unread portion of a QABinaryMessage message body.
“ReadDouble method”	Reads a double value starting from the unread portion of a QABinaryMessage message body.
“ReadFloat method”	Reads a float value starting from the unread portion of a QABinaryMessage message body.
“ReadInt method”	Reads an integer value starting from the unread portion of a QABinaryMessage message body.
“ReadLong method”	Reads a long value starting from the unread portion of a QABinaryMessage message body.
“ReadSbyte method”	Reads a signed byte value starting from the unread portion of a QABinaryMessage message body.
“ReadShort method”	Reads a short value starting from the unread portion of a QABinaryMessage message body.
“ReadString method”	Reads a string value starting from the unread portion of a QABinaryMessage message body.
“Reset method”	Resets a message so that the reading of values starts from the beginning of the message body.
“SetBooleanProperty method”	Sets a boolean property.
“SetByteProperty method”	Sets a byte property.
“SetDoubleProperty method”	Sets a double property.
“SetFloatProperty method”	Sets a float property.

Name	Description
"SetIntProperty method"	Sets an int property.
"SetLongProperty method"	Sets a long property.
"SetProperty method"	Sets a property.
"SetSbyteProperty method"	Sets a signed byte property.
"SetShortProperty method"	Sets a short property.
"SetStringProperty method"	Sets a string property.
"WriteBinary method"	Appends length bytes from a byte array starting at the given offset to the QABinaryMessage instance's message body.
"WriteBoolean method"	Appends a boolean value to the QABinaryMessage instance's message body.
"WriteChar method"	Appends a char value to the QABinaryMessage instance's message body.
"WriteDouble method"	Appends a double value to the QABinaryMessage instance's message body.
"WriteFloat method"	Appends a float value to the QABinaryMessage instance's message body.
"WriteInt method"	Appends an integer value to the QABinaryMessage instance's message body.
"WriteLong method"	Appends a long value to the QABinaryMessage instance's message body.
"WriteSbyte method"	Appends a signed byte value to the QABinaryMessage instance's message body.
"WriteShort method"	Appends a short value to the QABinaryMessage instance's message body.
"WriteString method"	Appends a string value to the QABinaryMessage instance's message body.
"Address property"	The destination address for the QAMessage instance.
"BodyLength property"	Returns the size of the message body in bytes.
"Expiration property"	Gets the message's expiration value.

Name	Description
"InReplyToID property"	The message id of the message for which this message is a reply.
"MessageID property"	The globally unique message id of the message.
"Priority property"	The priority of the message (ranging from 0 to 9).
"Redelivered property"	Indicates whether the message has been previously received but not acknowledged.
"ReplyToAddress property"	The reply to address of this message.
"Timestamp property"	The message timestamp.

Remarks

It inherits from the QAMessage class and adds a bytes message body. QABinaryMessage provides a variety of functions to read from and write to the bytes message body.

When the message is first created, the body of the message is in write-only mode. After a message has been sent, the client that sent it can retain and modify it without affecting the message that has been sent. The same message object can be sent multiple times.

When a message is received, the provider has called QABinaryMessage.Reset() so that the message body is in read-only mode and reading of values starts from the beginning of the message body.

Example

The following example uses the QABinaryMessage writeString function to write the string "Q" followed by the string "Anywhere" to a QABinaryMessage instances message body.

```
// create a binary message instance
QABinaryMessage binary_message;
binary_message = qa_manager.CreateBinaryMessage();

// set optional message properties ...
binary_message.ReplyToAddress = "my-queue-name";

// write to the message body
binary_message->WriteString("Q");
binary_messge->WriteString("Anywhere");

// put the message in the local database, ready for sending
 if(!qa_manager->putMessage( "store-id\\queue-name", msg )) {
        handleError();
    }
```

The message is sent by the QAnywhere Agent. On the receiving end, the first QABinaryMessage.ReadString invocation returns "Q", and the next QABinaryMessage.ReadString invocation returns "Anywhere".

For more information, see "Determining when message transmission should occur on the client" on page 46 and "Writing QAnywhere client applications" on page 49.

ReadBinary method

Reads up to length number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.

Overload list

Name	Description
"ReadBinary(byte[]) method"	Reads some number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.
"ReadBinary(byte[], int) method"	Reads up to length number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.
"ReadBinary(byte[], int, int) method"	Reads up to length number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest starting at dest[offset].

ReadBinary(byte[]) method

Reads some number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.

Visual Basic syntax

```
Public Function ReadBinary(ByVal dest As Byte()) As Integer
```

C# syntax

```
public int ReadBinary(byte[] dest)
```

Parameters

- **dest** The byte array that will contain the read bytes.

Returns

The number of bytes read from the message body, or -1 if there are no more bytes available.

Exceptions

- **"QAException class"** Thrown if there was an error reading bytes from the message.

Remarks

The ReadBinary(dest) method has the same effect as: ReadBinary(dest,0,dest.Length)

See also

- "QABinaryMessage interface" on page 189

ReadBinary(byte[], int) method

Reads up to length number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.

Visual Basic syntax

```
Public Function ReadBinary(
    ByVal dest As Byte(),
    ByVal length As Integer
) As Integer
```

C# syntax

```
public int ReadBinary(byte[] dest, int length)
```

Parameters

- **dest** The byte array that will contain the read bytes.
- **length** The maximum number of bytes to read.

Returns

The number of bytes read from the message body, or -1 if there are no more bytes available.

Exceptions

- **"QAException class"** Thrown if there was an error reading bytes

Remarks

The ReadBinary(dest,len) method has the same effect as: ReadBinary(dest,0,len)

See also

- "QABinaryMessage interface" on page 189

ReadBinary(byte[], int, int) method

Reads up to length number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest starting at dest[offset].

Visual Basic syntax

```
Public Function ReadBinary(
    ByVal dest As Byte(),
    ByVal offset As Integer,
    ByVal length As Integer
) As Integer
```

C# syntax

```
public int ReadBinary(byte[] dest, int offset, int length)
```

Parameters

- **dest** The byte array that will contain the read bytes.
- **offset** The start offset of the destination array.
- **length** The maximum number of bytes to read.

Returns

The number of bytes read from the message body, or -1 if there are no more bytes available

Exceptions

- **“QAException class”** Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

If dest is null, an ArgumentNullException is thrown. If offset is negative, or length is negative, or offset +length is greater than the length of dest, then an ArgumentOutOfRangeException is thrown.

See also

- “QABinaryMessage interface” on page 189

ReadBoolean method

Reads a boolean value starting from the unread portion of the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Function ReadBoolean() As Boolean
```

C# syntax

```
public bool ReadBoolean()
```

Returns

The boolean value read from the message body.

Exceptions

- **“QAException class”** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- “QABinaryMessage interface” on page 189
- “WriteBoolean method” on page 202

ReadChar method

Reads a char value starting from the unread portion of a QABinaryMessage message body.

Visual Basic syntax

```
Public Function ReadChar() As Char
```

C# syntax

```
public char ReadChar()
```

Returns

The character value read from the message body.

Exceptions

- **"QAException class"** if there was a conversion error reading the value or if there is no more input.

See also

- "QABinaryMessage interface" on page 189
- "WriteChar method" on page 202

ReadDouble method

Reads a double value starting from the unread portion of a QABinaryMessage message body.

Visual Basic syntax

```
Public Function ReadDouble() As Double
```

C# syntax

```
public double ReadDouble()
```

Returns

The double value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "QABinaryMessage interface" on page 189
- "WriteDouble method" on page 203

ReadFloat method

Reads a float value starting from the unread portion of a QABinaryMessage message body.

Visual Basic syntax

```
Public Function ReadFloat() As Single
```

C# syntax

```
public float ReadFloat()
```

Returns

The float value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "QABinaryMessage interface" on page 189
- "WriteFloat method" on page 203

ReadInt method

Reads an integer value starting from the unread portion of a QABinaryMessage message body.

Visual Basic syntax

```
Public Function ReadInt() As Integer
```

C# syntax

```
public int ReadInt()
```

Returns

The int value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "QABinaryMessage interface" on page 189
- "WriteInt method" on page 204

ReadLong method

Reads a long value starting from the unread portion of a QABinaryMessage message body.

Visual Basic syntax

```
Public Function ReadLong() As Long
```

C# syntax

```
public long ReadLong()
```

Returns

The long value read from the message body.

Exceptions

- **“QAException class”** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- “QABinaryMessage interface” on page 189
- “WriteLong method” on page 204

ReadSbyte method

Reads a signed byte value starting from the unread portion of a QABinaryMessage message body.

Visual Basic syntax

```
Public Function ReadSbyte() As SByte
```

C# syntax

```
public sbyte ReadSbyte()
```

Returns

The signed byte value read from the message body.

Exceptions

- **“QAException class”** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- “QABinaryMessage interface” on page 189
- “WriteSbyte method” on page 205

ReadShort method

Reads a short value starting from the unread portion of a QABinaryMessage message body.

Visual Basic syntax

```
Public Function ReadShort() As Short
```

C# syntax

```
public short ReadShort()
```

Returns

The short value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "QABinaryMessage interface" on page 189
- "WriteShort method" on page 205

ReadString method

Reads a string value starting from the unread portion of a QABinaryMessage message body.

Visual Basic syntax

```
Public Function ReadString() As String
```

C# syntax

```
public string ReadString()
```

Returns

The string value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "QABinaryMessage interface" on page 189
- "WriteString method" on page 206

Reset method

Resets a message so that the reading of values starts from the beginning of the message body.

Visual Basic syntax

```
Public Sub Reset()
```

C# syntax

```
public void Reset()
```

Remarks

The Reset method also puts the QABinaryMessage message body in read-only mode.

See also

- "QABinaryMessage interface" on page 189

WriteBinary method

Appends length bytes from a byte array starting at the given offset to the QABinaryMessage instance's message body.

Overload list

Name	Description
"WriteBinary(byte[]) method"	Appends a byte array value to the QABinaryMessage instance's message body.
"WriteBinary(byte[], int) method"	Appends length bytes from a byte array to the QABinaryMessage instance's message body.
"WriteBinary(byte[], int, int) method"	Appends length bytes from a byte array starting at the given offset to the QABinaryMessage instance's message body.

WriteBinary(byte[]) method

Appends a byte array value to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteBinary(ByVal val As Byte())
```

C# syntax

```
public void WriteBinary(byte[] val)
```

Parameters

- **val** The byte array value to write to the message body.

Exceptions

- **"QAException class"** Thrown if there was a problem appending the byte array to the message body

Remarks

The WriteBinary(val) method has the same effect as: WriteBinary(val,0,val.Length)

See also

- "QABinaryMessage interface" on page 189

WriteBinary(byte[], int) method

Appends length bytes from a byte array to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteBinary(ByVal val As Byte(), ByVal length As Integer)
```

C# syntax

```
public void WriteBinary(byte[] val, int length)
```

Parameters

- **val** The byte array value to write to the message body.
- **length** The number of bytes to write.

Exceptions

- **"QAException class"** Thrown if there was a problem appending the byte array to the message body

Remarks

The WriteBinary(val,len) method has the same effect as: WriteBinary(val,0,len)

See also

- "QABinaryMessage interface" on page 189

WriteBinary(byte[], int, int) method

Appends length bytes from a byte array starting at the given offset to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteBinary(
    ByVal val As Byte(),
    ByVal offset As Integer,
    ByVal length As Integer
)
```

C# syntax

```
public void WriteBinary(byte[] val, int offset, int length)
```

Parameters

- **val** The byte array value to write to the message body.
- **offset** The offset within the byte array to begin writing.
- **length** The number of bytes to write.

Exceptions

- **"QAException class"** Thrown if there was a problem appending the byte array to the message body

Remarks

If val is null, a ArgumentNullException is thrown. If offset is negative, or length is negative, or length +offset is greater than the length of val then an ArgumentOutOfRangeException is thrown.

See also

- "QABinaryMessage interface" on page 189

WriteBoolean method

Appends a boolean value to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteBoolean(ByVal val As Boolean)
```

C# syntax

```
public void WriteBoolean(bool val)
```

Parameters

- **val** The boolean value to write to the message body.

Remarks

The boolean is represented as a one-byte value. True is represented as 1; false is represented as 0.

See also

- "QABinaryMessage interface" on page 189
- "ReadBoolean method" on page 195

WriteChar method

Appends a char value to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteChar(ByVal val As Char)
```

C# syntax

```
public void WriteChar(char val)
```

Parameters

- **val** The char value to write to the message body.

Remarks

The char is represented as a two byte value and the high order byte is appended first.

See also

- "QABinaryMessage interface" on page 189
- "ReadChar method" on page 195

WriteDouble method

Appends a double value to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteDouble(ByVal val As Double)
```

C# syntax

```
public void WriteDouble(double val)
```

Parameters

- **val** The double value to write to the message body.

Remarks

The double is converted to a representive 8-byte long and higher order bytes are appended first.

See also

- "QABinaryMessage interface" on page 189
- "ReadDouble method" on page 196

WriteFloat method

Appends a float value to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteFloat(ByVal val As Single)
```

C# syntax

```
public void WriteFloat(float val)
```

Parameters

- **val** The float value to write to the message body.

Remarks

The float parameter is converted to a representative 4-byte integer and the higher order bytes are appended first.

See also

- "QABinaryMessage interface" on page 189
- "ReadFloat method" on page 196

WriteInt method

Appends an integer value to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteInt(ByVal val As Integer)
```

C# syntax

```
public void WriteInt(int val)
```

Parameters

- **val** The int value to write to the message body.

Remarks

The integer parameter is represented as a 4 byte value and higher order bytes are appended first.

See also

- "QABinaryMessage interface" on page 189
- "ReadInt method" on page 197

WriteLong method

Appends a long value to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteLong(ByVal val As Long)
```

C# syntax

```
public void WriteLong(long val)
```

Parameters

- **val** The long value to write to the message body.

Remarks

The long parameter is represented using an 8-byte value and higher order bytes are appended first.

See also

- "QABinaryMessage interface" on page 189
- "ReadLong method" on page 197

WriteSbyte method

Appends a signed byte value to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteSbyte(ByVal val As SByte)
```

C# syntax

```
public void WriteSbyte(sbyte val)
```

Parameters

- **val** The signed byte value to write to the message body.

Remarks

The signed byte is represented as a one byte value.

See also

- "QABinaryMessage interface" on page 189
- "ReadSbyte method" on page 198

WriteShort method

Appends a short value to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteShort(ByVal val As Short)
```

C# syntax

```
public void WriteShort(short val)
```

Parameters

- **val** The short value to write to the message body.

Remarks

The short parameter is represented as a two byte value and the higher order byte is appended first.

See also

- "QABinaryMessage interface" on page 189
- "ReadShort method" on page 198

WriteString method

Appends a string value to the QABinaryMessage instance's message body.

Visual Basic syntax

```
Public Sub WriteString(ByVal val As String)
```

C# syntax

```
public void WriteString(string val)
```

Parameters

- **val** The string value to write to the message body.

Remarks

Note
The receving application needs to invoke QABinaryMessage.ReadString for each WriteString invocation.

Note
The UTF-8 representation of the string to be written can be at most 32767 bytes.

See also

- "QABinaryMessage interface" on page 189
- "ReadString method" on page 199

BodyLength property

Returns the size of the message body in bytes.

Visual Basic syntax

```
Public ReadOnly Property BodyLength As Long
```

C# syntax

```
public long BodyLength {get;}
```

See also

- "QABinaryMessage interface" on page 189

QAException class

Encapsulates QAnywhere client application exceptions.

Visual Basic syntax

```
Public MustInherit Class QAException Inherits System.Exception
```

C# syntax

```
public abstract class QAException : System.Exception
```

Base classes

- System.Exception

Members

All members of QAException class, including all inherited members.

Name	Description
GetBaseException method (Inherited from System.Exception)	When overridden in a derived class, returns the System.Exception that is the root cause of one or more subsequent exceptions.
GetObjectData method (Inherited from System.Exception)	When overridden in a derived class, sets the System.Runtime.Serialization.SerializationInfo with information about the exception.
GetType method (Inherited from System.Exception)	Gets the runtime type of the current instance.
ToString method (Inherited from System.Exception)	Creates and returns a string representation of the current exception.
Data property (Inherited from System.Exception)	Gets a collection of key/value pairs that provide additional user-defined information about the exception.

Name	Description
“DetailedMessage property”	The detailed error message of the exception.
“ErrorCode property”	The error code of the exception.
HelpLink property (Inherited from System.Exception)	Gets or sets a link to the help file associated with this exception.
HResult property (Inherited from System.Exception)	Gets or sets HRESULT, a coded numerical value that is assigned to a specific exception.
InnerException property (Inherited from System.Exception)	Gets the System.Exception instance that caused the current exception.
Message property (Inherited from System.Exception)	Gets a message that describes the current exception.
“NativeErrorCode property”	The native error code of the exception.
Source property (Inherited from System.Exception)	Gets or sets the name of the application or the object that causes the error.
StackTrace property (Inherited from System.Exception)	Gets a string representation of the frames on the call stack at the time the current exception was thrown.
TargetSite property (Inherited from System.Exception)	Gets the method that throws the current exception.
“COMMON_ALREADY_OPEN_ERROR field”	The QAManager is already open.
“COMMON_GET_INIT_FILE_ERROR field”	Unable to access the client properties file.
“COMMON_GET_PROPERTY_ERROR field”	Error retrieving property from message store.
“COMMON_GETQUEUEDEPTH_ERROR field”	Error getting the queue depth.

Name	Description
"COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG field"	Cannot use QAManager-Base.getQueueDepth on a given destination when filter is ALL.
"COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID field"	Cannot use %QAManager-Base.getQueueDepth when the message store ID has not been set.
"COMMON_INIT_ERROR field"	Initialization error.
"COMMON_INIT_THREAD_ERROR field"	Error initializing the background thread.
"COMMON_INVALID_PROPERTY field"	There is an invalid property in the client properties file.
"COMMON_MSG_ACKNOWLEDGE_ERROR field"	Error acknowledging the message.
"COMMON_MSG_CANCEL_ERROR field"	Error cancelling message.
"COMMON_MSG_CANCEL_ERROR_SENT field"	Error cancelling message.
"COMMON_MSG_NOT_WRITEABLE_ERROR field"	You cannot write to a message that is in read-only mode.
"COMMON_MSG_RETRIEVE_ERROR field"	Error retrieving a message from the client message store.
"COMMON_MSG_STORE_ERROR field"	Error storing a message in the client message store.
"COMMON_MSG_STORE_NOT_INITIALIZED field"	The message store has not been initialized for messaging.
"COMMON_MSG_STORE_TOO_LARGE field"	The message store is too large relative to the free disk space on the device.
"COMMON_NO_DEST_ERROR field"	No destination.
"COMMON_NO_IMPLEMENTATION field"	The method is not implemented.
"COMMON_NOT_OPEN_ERROR field"	The QAManager is not open.

Name	Description
“COMMON_OPEN_ERROR field”	Error opening a connection to the message store.
“COMMON_OPEN_LOG_FILE_ERROR field”	Error opening the log file.
“COMMON_OPEN_MAXTHREADS_ERROR field”	Cannot open the QAManager because the maximum number of concurrent server requests is not high enough (see database server -gn option).
“COMMON_REOPEN_ERROR field”	Error re-opening connection to message store.
“COMMON_SELECTOR_SYNTAX_ERROR field”	The given selector has a syntax error.
“COMMON_SET_PROPERTY_ERROR field”	Error storing property to message store.
“COMMON_TERMINATE_ERROR field”	Termination error.
“COMMON_UNEXPECTED_EOM_ERROR field”	Unexpected end of message reached.
“COMMON_UNREPRESENTABLE_TIMESTAMP field”	The timestamp is outside of the acceptable range.
“QA_NO_ERROR field”	No error.

Remarks

You can use the QAException class to catch QAnywhere exceptions.

Example

The following method uses the QAException class to catch QAnywhere exceptions:

```
public static void startReceiver() {
    _mainWindow._messageList.Items.Clear();
    _mainWindow._detailWindow.Text = "";

    try {
          _qaManager = QAManagerFactory.Instance.CreateQAManager(null);
          _qaManager.Open(AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT);
          _qaManager.Start();
          _mainWindow.loadMessages();

_qaManager.SetMessageListener(Options.getReceiveQueueName(),_receiveListener)
;
          _qaManager.SetMessageListener("system", _systemListener);
```

```
        }
        catch(QAException e) {
              MessageBox.Show("Error code: " + e.ErrorCode );
              MessageBox.Show("Error message: " + e.Message );
        }
    }
```

DetailedMessage property

The detailed error message of the exception.

Visual Basic syntax

```
Public ReadOnly Property DetailedMessage As String
```

C# syntax

```
public abstract string DetailedMessage {get;}
```

ErrorCode property

The error code of the exception.

Visual Basic syntax

```
Public ReadOnly Property ErrorCode As Integer
```

C# syntax

```
public abstract int ErrorCode {get;}
```

NativeErrorCode property

The native error code of the exception.

Visual Basic syntax

```
Public ReadOnly Property NativeErrorCode As Integer
```

C# syntax

```
public abstract int NativeErrorCode {get;}
```

COMMON_ALREADY_OPEN_ERROR field

The QAManager is already open.

Visual Basic syntax

```
Public Const COMMON_ALREADY_OPEN_ERROR As Integer
```

C# syntax

```
public const int COMMON_ALREADY_OPEN_ERROR;
```

See also

- "QAManager interface" on page 219

COMMON_GET_INIT_FILE_ERROR field

Unable to access the client properties file.

Visual Basic syntax

```
Public Const COMMON_GET_INIT_FILE_ERROR As Integer
```

C# syntax

```
public const int COMMON_GET_INIT_FILE_ERROR;
```

COMMON_GET_PROPERTY_ERROR field

Error retrieving property from message store.

Visual Basic syntax

```
Public Const COMMON_GET_PROPERTY_ERROR As Integer
```

C# syntax

```
public const int COMMON_GET_PROPERTY_ERROR;
```

COMMON_GETQUEUEDEPTH_ERROR field

Error getting the queue depth.

Visual Basic syntax

```
Public Const COMMON_GETQUEUEDEPTH_ERROR As Integer
```

C# syntax

```
public const int COMMON_GETQUEUEDEPTH_ERROR;
```

See also

- "GetQueueDepth method" on page 244

COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG field

Cannot use QAManagerBase.getQueueDepth on a given destination when filter is ALL.

Visual Basic syntax

```
Public Const COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG As Integer
```

C# syntax

```
public const int COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG;
```

See also

- "GetQueueDepth method" on page 244

COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID field

Cannot use %QAManagerBase.getQueueDepth when the message store ID has not been set.

Visual Basic syntax

```
Public Const COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID As Integer
```

C# syntax

```
public const int COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID;
```

See also

- "GetQueueDepth method" on page 244

COMMON_INIT_ERROR field

Initialization error.

Visual Basic syntax

```
Public Const COMMON_INIT_ERROR As Integer
```

C# syntax

```
public const int COMMON_INIT_ERROR;
```

COMMON_INIT_THREAD_ERROR field

Error initializing the background thread.

Visual Basic syntax

```
Public Const COMMON_INIT_THREAD_ERROR As Integer
```

C# syntax

```
public const int COMMON_INIT_THREAD_ERROR;
```

COMMON_INVALID_PROPERTY field

There is an invalid property in the client properties file.

Visual Basic syntax

```
Public Const COMMON_INVALID_PROPERTY As Integer
```

C# syntax

```
public const int COMMON_INVALID_PROPERTY;
```

COMMON_MSG_ACKNOWLEDGE_ERROR field

Error acknowledging the message.

Visual Basic syntax

```
Public Const COMMON_MSG_ACKNOWLEDGE_ERROR As Integer
```

C# syntax

```
public const int COMMON_MSG_ACKNOWLEDGE_ERROR;
```

COMMON_MSG_CANCEL_ERROR field

Error cancelling message.

Visual Basic syntax

```
Public Const COMMON_MSG_CANCEL_ERROR As Integer
```

C# syntax

```
public const int COMMON_MSG_CANCEL_ERROR;
```

COMMON_MSG_CANCEL_ERROR_SENT field

Error cancelling message.

Visual Basic syntax

```
Public Const COMMON_MSG_CANCEL_ERROR_SENT As Integer
```

C# syntax

```
public const int COMMON_MSG_CANCEL_ERROR_SENT;
```

Remarks

You cannot cancel a message that has already been sent.

COMMON_MSG_NOT_WRITEABLE_ERROR field

You cannot write to a message that is in read-only mode.

Visual Basic syntax

```
Public Const COMMON_MSG_NOT_WRITEABLE_ERROR As Integer
```

C# syntax

```
public const int COMMON_MSG_NOT_WRITEABLE_ERROR;
```

COMMON_MSG_RETRIEVE_ERROR field

Error retrieving a message from the client message store.

Visual Basic syntax

```
Public Const COMMON_MSG_RETRIEVE_ERROR As Integer
```

C# syntax

```
public const int COMMON_MSG_RETRIEVE_ERROR;
```

COMMON_MSG_STORE_ERROR field

Error storing a message in the client message store.

Visual Basic syntax

```
Public Const COMMON_MSG_STORE_ERROR As Integer
```

C# syntax

```
public const int COMMON_MSG_STORE_ERROR;
```

COMMON_MSG_STORE_NOT_INITIALIZED field

The message store has not been initialized for messaging.

Visual Basic syntax

```
Public Const COMMON_MSG_STORE_NOT_INITIALIZED As Integer
```

C# syntax

```
public const int COMMON_MSG_STORE_NOT_INITIALIZED;
```

COMMON_MSG_STORE_TOO_LARGE field

The message store is too large relative to the free disk space on the device.

Visual Basic syntax

```
Public Const COMMON_MSG_STORE_TOO_LARGE As Integer
```

C# syntax

```
public const int COMMON_MSG_STORE_TOO_LARGE;
```

COMMON_NO_DEST_ERROR field

No destination.

Visual Basic syntax

```
Public Const COMMON_NO_DEST_ERROR As Integer
```

C# syntax

```
public const int COMMON_NO_DEST_ERROR;
```

COMMON_NO_IMPLEMENTATION field

The method is not implemented.

Visual Basic syntax

```
Public Const COMMON_NO_IMPLEMENTATION As Integer
```

C# syntax

```
public const int COMMON_NO_IMPLEMENTATION;
```

COMMON_NOT_OPEN_ERROR field

The QAManager is not open.

Visual Basic syntax

```
Public Const COMMON_NOT_OPEN_ERROR As Integer
```

C# syntax

```
public const int COMMON_NOT_OPEN_ERROR;
```

See also

- "QAManager interface" on page 219

COMMON_OPEN_ERROR field

Error opening a connection to the message store.

Visual Basic syntax

```
Public Const COMMON_OPEN_ERROR As Integer
```

C# syntax

```
public const int COMMON_OPEN_ERROR;
```

COMMON_OPEN_LOG_FILE_ERROR field

Error opening the log file.

Visual Basic syntax

```
Public Const COMMON_OPEN_LOG_FILE_ERROR As Integer
```

C# syntax

```
public const int COMMON_OPEN_LOG_FILE_ERROR;
```

COMMON_OPEN_MAXTHREADS_ERROR field

Cannot open the QAManager because the maximum number of concurrent server requests is not high enough (see database server -gn option).

Visual Basic syntax

```
Public Const COMMON_OPEN_MAXTHREADS_ERROR As Integer
```

C# syntax

```
public const int COMMON_OPEN_MAXTHREADS_ERROR;
```

COMMON_REOPEN_ERROR field

Error re-opening connection to message store.

Visual Basic syntax

```
Public Const COMMON_REOPEN_ERROR As Integer
```

C# syntax

```
public const int COMMON_REOPEN_ERROR;
```

COMMON_SELECTOR_SYNTAX_ERROR field

The given selector has a syntax error.

Visual Basic syntax

```
Public Const COMMON_SELECTOR_SYNTAX_ERROR As Integer
```

C# syntax

```
public const int COMMON_SELECTOR_SYNTAX_ERROR;
```

COMMON_SET_PROPERTY_ERROR field

Error storing property to message store.

Visual Basic syntax

```
Public Const COMMON_SET_PROPERTY_ERROR As Integer
```

C# syntax

```
public const int COMMON_SET_PROPERTY_ERROR;
```

COMMON_TERMINATE_ERROR field

Termination error.

Visual Basic syntax

```
Public Const COMMON_TERMINATE_ERROR As Integer
```

C# syntax

```
public const int COMMON_TERMINATE_ERROR;
```

COMMON_UNEXPECTED_EOM_ERROR field

Unexpected end of message reached.

Visual Basic syntax

```
Public Const COMMON_UNEXPECTED_EOM_ERROR As Integer
```

C# syntax

```
public const int COMMON_UNEXPECTED_EOM_ERROR;
```

COMMON_UNREPRESENTABLE_TIMESTAMP field

The timestamp is outside of the acceptable range.

Visual Basic syntax

```
Public Const COMMON_UNREPRESENTABLE_TIMESTAMP As Integer
```

C# syntax

```
public const int COMMON_UNREPRESENTABLE_TIMESTAMP;
```

QA_NO_ERROR field

No error.

Visual Basic syntax

```
Public Const QA_NO_ERROR As Integer
```

C# syntax

```
public const int QA_NO_ERROR;
```

QAManager interface

The QAManager class derives from QAManagerBase and manages non-transactional QAnywhere messaging operations.

Visual Basic syntax

```
Public Interface QAManager Inherits QAManagerBase
```

C# syntax

```
public interface QAManager : QAManagerBase
```

Base classes

- "QAManagerBase interface" on page 226

Members

All members of QAManager interface, including all inherited members.

Name	Description
"Acknowledge method"	Acknowledges that the client application successfully received a QAnywhere message.
"AcknowledgeAll method"	Acknowledges that the client application successfully received QAnywhere messages.
"AcknowledgeUntil method"	Acknowledges the given QAMessage instance and all unacknowledged messages received before the given message.
"BrowseMessages method"	This method is deprecated.
"BrowseMessagesByID method"	Browses the message with the given message ID.
"BrowseMessagesByQueue method"	Browses the next available messages waiting that have been sent to the given address.
"BrowseMessagesBySelector method"	Browses messages queued in the message store that satisfy the given selector.
"CancelMessage method"	Cancels the message with the given message ID.
"Close method"	Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.
"CreateBinaryMessage method"	Creates a QABinaryMessage object.
"CreateTextMessage method"	Creates a QATextMessage object.
"GetBooleanStoreProperty method"	Gets a boolean value for a pre-defined or custom message store property.
"GetDoubleStoreProperty method"	Gets a double value for a pre-defined or custom message store property.
"GetFloatStoreProperty method"	Gets a float value for a pre-defined or custom message store property.
"GetIntStoreProperty method"	Gets a int value for a pre-defined or custom message store property.
"GetLongStoreProperty method"	Gets a long value for a pre-defined or custom message store property.
"GetMessage method"	Returns the next available QAMessage sent to the specified address.

Name	Description
“GetMessageBySelector method”	Returns the next available QAMessage sent to the specified address that satisfies the given selector.
“GetMessageBySelectorNoWait method”	Returns the next available QAMessage sent to the given address that satisfies the given selector.
“GetMessageBySelectorTimeout method”	Returns the next available QAMessage sent to the given address that satisfies the given selector.
“GetMessageNoWait method”	Returns the next available QAMessage sent to the given address.
“GetMessageTimeout method”	Returns the next available QAMessage sent to the given address.
“GetQueueDepth method”	Returns the total depth of all queues, based on a given filter.
“GetSbyteStoreProperty method”	Gets a signed byte value for a pre-defined or custom message store property.
“GetShortStoreProperty method”	Gets a short value for a pre-defined or custom message store property.
“GetStoreProperty method”	Gets a System.Object representing a message store property.
“GetStorePropertyNames method”	Gets an enumerator over the message store property names.
“GetStringStoreProperty method”	Gets a string value for a pre-defined or custom message store property.
“Open method”	Open the QAManager with the given AcknowledgementMode value.
“PropertyExists method”	Tests if there currently exists a value for the given the property.
“PutMessage method”	Prepares a message to send to another QAnywhere client.
“PutMessageTimeToLive method”	Prepares a message to send to another QAnywhere client.
“Recover method”	Forces all unacknowledged messages into a status of StatusCodes.PENDING.
“ReOpen method”	Reopens the QAManagerBase.

Name	Description
"SetBooleanStoreProperty method"	Sets a pre-defined or custom message store property to a boolean value.
"SetDoubleStoreProperty method"	Sets a pre-defined or custom message store property to a double value.
"SetExceptionListener method"	Sets an ExceptionListener delegate to receive QAExceptions when processing QAnywhere messages asynchronously.
"SetExceptionListener2 method"	Sets an ExceptionListener2 delegate to receive QAExceptions when processing QAnywhere messages asynchronously.
"SetFloatStoreProperty method"	Sets a pre-defined or custom message store property to a float value.
"SetIntStoreProperty method"	Sets a pre-defined or custom message store property to a int value.
"SetLongStoreProperty method"	Sets a pre-defined or custom message store property to a long value.
"SetMessageListener method"	Sets a MessageListener delegate to receive QAnywhere messages asynchronously.
"SetMessageListener2 method"	Sets a MessageListener2 delegate to receive QAnywhere messages asynchronously.
"SetMessageListenerBySelector method"	Sets a MessageListener delegate to receive QAnywhere messages asynchronously, with a message selector.
"SetMessageListenerBySelector2 method"	Sets a MessageListener2 delegate to receive QAnywhere messages asynchronously, with a message selector.
"SetProperty method"	Allows you to set QAnywhere Manager configuration properties programmatically.
"SetSbyteStoreProperty method"	Sets a pre-defined or custom message store property to a sbyte value.
"SetShortStoreProperty method"	Sets a pre-defined or custom message store property to a short value.
"SetStoreProperty method"	Sets a pre-defined or custom message store property to a System.Object value.

Name	Description
“SetStringStoreProperty method”	Sets a pre-defined or custom message store property to a string value.
“Start method”	Starts the QAManagerBase for receiving incoming messages in message listeners.
“Stop method”	Stops the QAManagerBase's reception of incoming messages.
“TriggerSendReceive method”	Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.
“Mode property”	Returns the QAManager acknowledgement mode for received messages.

Remarks

For a detailed description of derived behavior, see QAManagerBase.

The QAManager can be configured for implicit or explicit acknowledgement as defined in the AcknowledgementMode class. To acknowledge messages as part of a transaction, use QATransactionalManager. Use the QAManagerFactory to create QAManager and QATransactionalManager objects.

See also

- “AcknowledgementMode enumeration” on page 301
- “QATransactionalManager interface” on page 293

Acknowledge method

Acknowledges that the client application successfully received a QAnywhere message.

Visual Basic syntax

```
Public Sub Acknowledge(ByVal msg As QAMessage)
```

C# syntax

```
public void Acknowledge(QAMessage msg)
```

Parameters

- **msg** the message to acknowledge.

Exceptions

- **“QAException class”** Thrown if there is a problem acknowledging the message.

Remarks

> **Note**
> when a QAMessage is acknowledged, its status property changes to StatusCodes.RECEIVED. When a QAMessage MessageProperties.STATUS message property changes to StatusCodes.RECEIVED, it can be deleted using the default delete rule.

For more information about delete rules, see “Message delete rules” on page 743.

See also

- “QAManager interface” on page 219
- “AcknowledgeUntil method” on page 225
- “StatusCodes enumeration” on page 305
- “MessageProperties class” on page 179
- “AcknowledgeAll method” on page 224

AcknowledgeAll method

Acknowledges that the client application successfully received QAnywhere messages.

Visual Basic syntax

```
Public Sub AcknowledgeAll()
```

C# syntax

```
public void AcknowledgeAll()
```

Exceptions

- **“QAException class”** Thrown if there is a problem acknowledging the messages.

Remarks

All unacknowledged messages are acknowledged.

> **Note**
> when a QAMessage is acknowledged, its MessageProperties.STATUS property changes to StatusCodes.RECEIVED. When a QAMessage status changes to StatusCodes.RECEIVED, it can be deleted using the default delete rule.

For more information about delete rules, see “Message delete rules” on page 743.

See also

- "QAManager interface" on page 219
- "Acknowledge method" on page 223
- "AcknowledgeUntil method" on page 225
- "StatusCodes enumeration" on page 305
- "MessageProperties class" on page 179

AcknowledgeUntil method

Acknowledges the given QAMessage instance and all unacknowledged messages received before the given message.

Visual Basic syntax

```
Public Sub AcknowledgeUntil(ByVal msg As QAMessage)
```

C# syntax

```
public void AcknowledgeUntil(QAMessage msg)
```

Parameters

- **msg** The last message to acknowledge. All earlier unacknowledged messages are also acknowledged.

Exceptions

- **"QAException class"** Thrown if there is a problem acknowledging the messages.

Remarks

Note
when a QAMessage is acknowledged, its MessageProperties.STATUS property changes to StatusCodes.RECEIVED. When a QAMessage status changes to StatusCodes.RECEIVED, it can be deleted using the default delete rule.

For more information about delete rules, see "Message delete rules" on page 743.

See also

- "QAManager interface" on page 219
- "Acknowledge method" on page 223
- "AcknowledgeAll method" on page 224
- "StatusCodes enumeration" on page 305
- "MessageProperties class" on page 179

Open method

Open the QAManager with the given AcknowledgementMode value.

Visual Basic syntax

```
Public Sub Open(ByVal mode As AcknowledgementMode)
```

C# syntax

```
public void Open(AcknowledgementMode mode)
```

Parameters

- **mode** The acknowledgement mode, one of AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT or AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT.

Exceptions

- **"QAException class"** Thrown if there is a problem opening the QAManager instance.

Remarks

The Open method must be the first method called after creating a QAManager.

See also

- "QAManager interface" on page 219

Recover method

Forces all unacknowledged messages into a status of StatusCodes.PENDING.

Visual Basic syntax

```
Public Sub Recover()
```

C# syntax

```
public void Recover()
```

Exceptions

- **"QAException class"** Thrown if there is a problem recovering.

Remarks

That is, these messages must be received again using QAManagerBase.GetMessage.

See also

- "QAManager interface" on page 219
- "GetMessage method" on page 240

QAManagerBase interface

This class acts as a base class for QATransactionalManager and QAManager, which manage transactional and non-transactional messaging, respectively.

Visual Basic syntax

```
Public Interface QAManagerBase
```

C# syntax

```
public interface QAManagerBase
```

Derived classes

- “QAManager interface” on page 219
- “QATransactionalManager interface” on page 293

Members

All members of QAManagerBase interface, including all inherited members.

Name	Description
“BrowseMessages method”	This method is deprecated.
“BrowseMessagesByID method”	Browses the message with the given message ID.
“BrowseMessagesByQueue method”	Browses the next available messages waiting that have been sent to the given address.
“BrowseMessagesBySelector method”	Browses messages queued in the message store that satisfy the given selector.
“CancelMessage method”	Cancels the message with the given message ID.
“Close method”	Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.
“CreateBinaryMessage method”	Creates a QABinaryMessage object.
“CreateTextMessage method”	Creates a QATextMessage object.
“GetBooleanStoreProperty method”	Gets a boolean value for a pre-defined or custom message store property.
“GetDoubleStoreProperty method”	Gets a double value for a pre-defined or custom message store property.
“GetFloatStoreProperty method”	Gets a float value for a pre-defined or custom message store property.
“GetIntStoreProperty method”	Gets a int value for a pre-defined or custom message store property.

Name	Description
"GetLongStoreProperty method"	Gets a long value for a pre-defined or custom message store property.
"GetMessage method"	Returns the next available QAMessage sent to the specified address.
"GetMessageBySelector method"	Returns the next available QAMessage sent to the specified address that satisfies the given selector.
"GetMessageBySelectorNoWait method"	Returns the next available QAMessage sent to the given address that satisfies the given selector.
"GetMessageBySelectorTimeout method"	Returns the next available QAMessage sent to the given address that satisfies the given selector.
"GetMessageNoWait method"	Returns the next available QAMessage sent to the given address.
"GetMessageTimeout method"	Returns the next available QAMessage sent to the given address.
"GetQueueDepth method"	Returns the total depth of all queues, based on a given filter.
"GetSbyteStoreProperty method"	Gets a signed byte value for a pre-defined or custom message store property.
"GetShortStoreProperty method"	Gets a short value for a pre-defined or custom message store property.
"GetStoreProperty method"	Gets a System.Object representing a message store property.
"GetStorePropertyNames method"	Gets an enumerator over the message store property names.
"GetStringStoreProperty method"	Gets a string value for a pre-defined or custom message store property.
"PropertyExists method"	Tests if there currently exists a value for the given the property.
"PutMessage method"	Prepares a message to send to another QAnywhere client.
"PutMessageTimeToLive method"	Prepares a message to send to another QAnywhere client.
"ReOpen method"	Reopens the QAManagerBase.

Name	Description
“SetBooleanStoreProperty method”	Sets a pre-defined or custom message store property to a boolean value.
“SetDoubleStoreProperty method”	Sets a pre-defined or custom message store property to a double value.
“SetExceptionListener method”	Sets an ExceptionListener delegate to receive QAExceptions when processing QAnywhere messages asynchronously.
“SetExceptionListener2 method”	Sets an ExceptionListener2 delegate to receive QAExceptions when processing QAnywhere messages asynchronously.
“SetFloatStoreProperty method”	Sets a pre-defined or custom message store property to a float value.
“SetIntStoreProperty method”	Sets a pre-defined or custom message store property to a int value.
“SetLongStoreProperty method”	Sets a pre-defined or custom message store property to a long value.
“SetMessageListener method”	Sets a MessageListener delegate to receive QAnywhere messages asynchronously.
“SetMessageListener2 method”	Sets a MessageListener2 delegate to receive QAnywhere messages asynchronously.
“SetMessageListenerBySelector method”	Sets a MessageListener delegate to receive QAnywhere messages asynchronously, with a message selector.
“SetMessageListenerBySelector2 method”	Sets a MessageListener2 delegate to receive QAnywhere messages asynchronously, with a message selector.
“SetProperty method”	Allows you to set QAnywhere Manager configuration properties programmatically.
“SetSbyteStoreProperty method”	Sets a pre-defined or custom message store property to a sbyte value.
“SetShortStoreProperty method”	Sets a pre-defined or custom message store property to a short value.
“SetStoreProperty method”	Sets a pre-defined or custom message store property to a System.Object value.

Name	Description
“SetStringStoreProperty method”	Sets a pre-defined or custom message store property to a string value.
“Start method”	Starts the QAManagerBase for receiving incoming messages in message listeners.
“Stop method”	Stops the QAManagerBase's reception of incoming messages.
“TriggerSendReceive method”	Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.
“Mode property”	Returns the QAManager acknowledgement mode for received messages.

Remarks

Use the QAManagerBase.Start() method to allow a QAManagerBase instance to listen for messages. There must be only a single instance of QAManagerBase per thread in your application.

You can use instances of this class to create and manage QAnywhere messages. Use the QAManagerBase.CreateBinaryMessage() method and the QAManagerBase.CreateTextMessage() method to create appropriate QAMessage instances. QAMessage instances provide a variety of methods to set message content and properties.

To send QAnywhere messages, use the QAManagerBase.PutMessage method to place the addressed message in the local message store queue. The message is transmitted by the QAnywhere Agent based on its transmission policies or when you call QAManagerBase.TriggerSendReceive().

For more information about qaagent transmission policies, see “Determining when message transmission should occur on the client” on page 46.

Messages are released from memory when you close a QAManagerBase instance using the QAManagerBase.Close method.

QAManagerBase also provides methods to set and get message store properties.

For more information, see “Client message store properties” on page 26 and the MessageStoreProperties class.

See also

- “CreateBinaryMessage method” on page 235
- “TriggerSendReceive method” on page 264
- “Close method” on page 235
- “QAException class” on page 207

BrowseMessages method

This method is deprecated.

Overload list

Name	Description
"BrowseMessages() method"	Browses all available messages in the message store.
"BrowseMessages(string) method"	This method is deprecated.

BrowseMessages() method

Browses all available messages in the message store.

Visual Basic syntax

```
Public Function BrowseMessages() As System.Collections.IEnumerator
```

C# syntax

```
public System.Collections.IEnumerator BrowseMessages()
```

Returns

An enumerator over the available messages.

Remarks

The messages are just being browsed, so they cannot be acknowledged. Because browsing messages allocates native resources, you should call the Reset() method of the enumerator when you are done with it. If it is not called, the native resources will not be freed until this QAManagerBase object is freed.

Use QAManagerBase.GetMessage to receive messages so they can be acknowledged.

See also

- "BrowseMessagesByQueue method" on page 233
- "BrowseMessagesByID method" on page 232
- "BrowseMessages method" on page 231

BrowseMessages(string) method

This method is deprecated.

Visual Basic syntax

```
Public Function BrowseMessages(
    ByVal address As String
) As System.Collections.IEnumerator
```

C# syntax

```
public System.Collections.IEnumerator BrowseMessages(string address)
```

Parameters

- **address** The address of the messages.

Returns

An enumerator over the available messages.

Remarks

Use the BrowseMessagesByQueue(string) method instead.

Browses the next available messages waiting that have been sent to a given address. The address parameter takes the form store-id\queue-name or queue-name. The messages are just being browsed, so they cannot be acknowledged.

Because browsing messages allocates native resources, you should call the Reset() method of the enumerator when you are done with it. If it is not called, the native resources will not be freed until this QAManagerBase object is freed.

Use QAManagerBase.GetMessage to receive messages so they can be acknowledged.

See also

- "BrowseMessagesByQueue method" on page 233
- "BrowseMessagesByID method" on page 232
- "BrowseMessagesBySelector method" on page 233
- "BrowseMessages method" on page 231

BrowseMessagesByID method

Browses the message with the given message ID.

Visual Basic syntax

```
Public Function BrowseMessagesByID(
    ByVal msgid As String
) As System.Collections.IEnumerator
```

C# syntax

```
public System.Collections.IEnumerator BrowseMessagesByID(string msgid)
```

Parameters

- **msgid** The message id of the message.

Returns

An enumerator containing 0 or 1 messages.

Remarks

The message is just being browsed, so it cannot be acknowledged. Because browsing messages allocates native resources, you should call the Reset() method of the enumerator when you are done with it. If it is not called, the native resources will not be freed until this QAManagerBase object is freed.

Use QAManagerBase.GetMessage to receive messages so they can be acknowledged.

See also

- "BrowseMessagesByQueue method" on page 233
- "BrowseMessages method" on page 231

BrowseMessagesByQueue method

Browses the next available messages waiting that have been sent to the given address.

Visual Basic syntax

```
Public Function BrowseMessagesByQueue(
    ByVal address As String
) As System.Collections.IEnumerator
```

C# syntax

```
public System.Collections.IEnumerator BrowseMessagesByQueue(
    string address
)
```

Parameters

- **address** The address of the messages.

Returns

An enumerator over the available messages.

Remarks

The messages are just being browsed, so they cannot be acknowledged. Because browsing messages allocates native resources, you should call the Reset() method of the enumerator when you are done with it. If it is not called, the native resources will not be freed until this QAManagerBase object is freed.

Use QAManagerBase.GetMessage to receive messages so they can be acknowledged.

See also

- "BrowseMessagesByID method" on page 232
- "BrowseMessages method" on page 231

BrowseMessagesBySelector method

Browses messages queued in the message store that satisfy the given selector.

Visual Basic syntax

```
Public Function BrowseMessagesBySelector(
    ByVal selector As String
) As System.Collections.IEnumerator
```

C# syntax

```
public System.Collections.IEnumerator BrowseMessagesBySelector(
    string selector
)
```

Parameters

- **selector** The selector.

Returns

An enumerator over the available messages.

Remarks

The message is just being browsed, so it cannot be acknowledged. Because browsing messages allocates native resources, you should call the Reset() method of the enumerator when you are done with it. If it is not called, the native resources will not be freed until this QAManagerBase object is freed.

Use QAManagerBase.GetMessage to receive messages so they can be acknowledged.

See also

- "BrowseMessagesByQueue method" on page 233
- "BrowseMessages method" on page 231
- "BrowseMessagesByID method" on page 232

CancelMessage method

Cancels the message with the given message ID.

Visual Basic syntax

```
Public Sub CancelMessage(ByVal msgid As String)
```

C# syntax

```
public void CancelMessage(string msgid)
```

Parameters

- **msgid** The message ID of the message to cancel.

Exceptions

- **"QAException class"** Thrown if there is a problem cancelling the message.

Remarks

CancelMessage puts a message into a canceled state before it is transmitted. With the default delete rules of the QAnywhere Agent, canceled messages will eventually be deleted from the message store.

CancelMessage will fail if the message is already in a final state, or if it has been transmitted to the central messaging server.

For more information about delete rules, see "Message delete rules" on page 743.

Close method

Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.

Visual Basic syntax

```
Public Sub Close()
```

C# syntax

```
public void Close()
```

Exceptions

- **"QAException class"** Thrown if there is a problem closing the QAManagerBase instance.

Remarks

This method cannot be called in a message/exception listener.

Additional calls to Close() following the first are ignored.

CreateBinaryMessage method

Creates a QABinaryMessage object.

Visual Basic syntax

```
Public Function CreateBinaryMessage() As QABinaryMessage
```

C# syntax

```
public QABinaryMessage CreateBinaryMessage()
```

Returns

A new QABinaryMessage instance.

Exceptions

- **"QAException class"** Thrown if there is a problem creating the message.

Remarks

A QABinaryMessage object is used to send a message containing a message body of uninterpreted bytes.

See also

- "QABinaryMessage interface" on page 189

CreateTextMessage method

Creates a QATextMessage object.

Visual Basic syntax

```
Public Function CreateTextMessage() As QATextMessage
```

C# syntax

```
public QATextMessage CreateTextMessage()
```

Returns

A new QATextMessage instance.

Exceptions

- **"QAException class"** Thrown if there is a problem creating the message.

Remarks

A QATextMessage object is used to send a message containing a string message body.

See also

- "QATextMessage interface" on page 289

GetBooleanStoreProperty method

Gets a boolean value for a pre-defined or custom message store property.

Visual Basic syntax

```
Public Function GetBooleanStoreProperty(
    ByVal propName As String
) As Boolean
```

C# syntax

```
public bool GetBooleanStoreProperty(string propName)
```

Parameters

- **propName** The pre-defined or custom property name.

Returns

The boolean property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

GetDoubleStoreProperty method

Gets a double value for a pre-defined or custom message store property.

Visual Basic syntax

```
Public Function GetDoubleStoreProperty(
    ByVal propName As String
) As Double
```

C# syntax

```
public double GetDoubleStoreProperty(string propName)
```

Parameters

- **propName** The pre-defined or custom property name.

Returns

The double property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

GetFloatStoreProperty method

Gets a float value for a pre-defined or custom message store property.

Visual Basic syntax

```
Public Function GetFloatStoreProperty(
    ByVal propName As String
) As Single
```

C# syntax

```
public float GetFloatStoreProperty(string propName)
```

Parameters

- **propName** The pre-defined or custom property name.

Returns

The float property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

GetIntStoreProperty method

Gets a int value for a pre-defined or custom message store property.

Visual Basic syntax

```
Public Function GetIntStoreProperty(ByVal propName As String) As Integer
```

C# syntax

```
public int GetIntStoreProperty(string propName)
```

Parameters

- **propName** The pre-defined or custom property name.

Returns

The integer property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

GetLongStoreProperty method

Gets a long value for a pre-defined or custom message store property.

Visual Basic syntax

```
Public Function GetLongStoreProperty(ByVal propName As String) As Long
```

C# syntax

```
public long GetLongStoreProperty(string propName)
```

Parameters

- **propName** The pre-defined or custom property name.

Returns

The long property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26

See also

- "MessageStoreProperties class" on page 188

GetMessage method

Returns the next available QAMessage sent to the specified address.

Visual Basic syntax

```
Public Function GetMessage(ByVal address As String) As QAMessage
```

C# syntax

```
public QAMessage GetMessage(string address)
```

Parameters

- **address** Specifies the queue name used by the QAnywhere client to receive messages.

Returns

The next QAMessage, or null if no message is available.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form store-id\queue-name or queue-name.

If there is no message available, this call blocks indefinitely until a message is available. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

See also

- "QAMessage interface" on page 271

GetMessageBySelector method

Returns the next available QAMessage sent to the specified address that satisfies the given selector.

Visual Basic syntax

```
Public Function GetMessageBySelector(
    ByVal address As String,
    ByVal selector As String
) As QAMessage
```

C# syntax

```
public QAMessage GetMessageBySelector(string address, string selector)
```

Parameters

- **address** This address specifies the queue name used by the QAnywhere client to receive messages.
- **selector** The selector.

Returns

The next QAMessage, or null if no message is available.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form store-id\queue-name or queue-name.

If there is no message available, this call blocks indefinitely until a message is available. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

See also

- "QAMessage interface" on page 271

GetMessageBySelectorNoWait method

Returns the next available QAMessage sent to the given address that satisfies the given selector.

Visual Basic syntax

```
Public Function GetMessageBySelectorNoWait(
    ByVal address As String,
    ByVal selector As String
) As QAMessage
```

C# syntax

```
public QAMessage GetMessageBySelectorNoWait(
    string address,
    string selector
)
```

Parameters

- **address** Specifies the queue name used by the QAnywhere client to receive messages.
- **selector** The selector.

Returns

The next available message or null there are no available message.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form store-id\queue-name or queue-name. If no message is available, this method returns immediately. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

See also

- "QAMessage interface" on page 271

GetMessageBySelectorTimeout method

Returns the next available QAMessage sent to the given address that satisfies the given selector.

Visual Basic syntax

```
Public Function GetMessageBySelectorTimeout(
    ByVal address As String,
    ByVal selector As String,
    ByVal timeout As Long
) As QAMessage
```

C# syntax

```
public QAMessage GetMessageBySelectorTimeout(
    string address,
    string selector,
    long timeout
)
```

Parameters

- **address** Specifies the queue name used by the QAnywhere client to receive messages.
- **selector** The selector.
- **timeout** The time to wait, in milliseconds, for a message to become available.

Returns

The next QAMessage, or null if no message is available.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form store-id\queue-name or queue-name. If no message is available, this method waits for the specified timeout and then returns. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

See also

- "QAMessage interface" on page 271

GetMessageNoWait method

Returns the next available QAMessage sent to the given address.

Visual Basic syntax

```
Public Function GetMessageNoWait(ByVal address As String) As QAMessage
```

C# syntax

```
public QAMessage GetMessageNoWait(string address)
```

Parameters

- **address** this address specifies the queue name used by the QAnywhere client to receive messages.

Returns

The next available message or null there is no available message.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form store-id\queue-name or queue-name. If no message is available, this method returns immediately. Use this method to receive messages synchronously. For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

See also

- "QAMessage interface" on page 271

GetMessageTimeout method

Returns the next available QAMessage sent to the given address.

Visual Basic syntax

```
Public Function GetMessageTimeout(
    ByVal address As String,
    ByVal timeout As Long
) As QAMessage
```

C# syntax

```
public QAMessage GetMessageTimeout(string address, long timeout)
```

Parameters

- **address** Specifies the queue name used by the QAnywhere client to receive messages.
- **timeout** The time to wait, in milliseconds, for a message to become available.

Returns

The next QAMessage, or null if no message is available.

Exceptions

- **“QAException class”** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form store-id\queue-name or queue-name.

If no message is available, this method waits for the specified timeout and then returns. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see “Receiving messages asynchronously” on page 70.

GetQueueDepth method

Returns the total depth of all queues, based on a given filter.

Overload list

Name	Description
“GetQueueDepth(QueueDepthFilter) method”	Returns the total depth of all queues, based on a given filter.

Name	Description
"GetQueueDepth(string, QueueDepthFilter) method"	Returns the depth of a queue, based on a given filter.

GetQueueDepth(QueueDepthFilter) method

Returns the total depth of all queues, based on a given filter.

Visual Basic syntax

```
Public Function GetQueueDepth(
    ByVal filter As QueueDepthFilter
) As Integer
```

C# syntax

```
public int GetQueueDepth(QueueDepthFilter filter)
```

Parameters

- **filter** A filter indicating incoming messages, outgoing messages, or all messages.

Returns

The number of messages.

Exceptions

- **"QAException class"** Thrown if there was an error.

Remarks

The incoming depth of the queue is the number of incoming messages which have not been received (for example, using QAManagerBase.GetMessage). The outgoing depth of a queue is the number of outgoing messages (including uncommitted) that have not been transmitted to the server.

See also

- "QueueDepthFilter enumeration" on page 304

GetQueueDepth(string, QueueDepthFilter) method

Returns the depth of a queue, based on a given filter.

Visual Basic syntax

```
Public Function GetQueueDepth(
    ByVal address As String,
    ByVal filter As QueueDepthFilter
) As Integer
```

C# syntax

```
public int GetQueueDepth(string address, QueueDepthFilter filter)
```

Parameters

- **filter** A filter indicating incoming messages, outgoing messages, or all messages.
- **address** The queue name.

Returns

The number of messages.

Exceptions

- **"QAException class"** Thrown if there was an error.

Remarks

The incoming depth of the queue is the number of incoming messages which have not been received (for example, using QAManagerBase.GetMessage). The outgoing depth of a queue is the number of outgoing messages (including uncommitted) that have not been transmitted to the server.

See also

- "QueueDepthFilter enumeration" on page 304

GetSbyteStoreProperty method

Gets a signed byte value for a pre-defined or custom message store property.

Visual Basic syntax

```
Public Function GetSbyteStoreProperty(ByVal propName As String) As SByte
```

C# syntax

```
public sbyte GetSbyteStoreProperty(string propName)
```

Parameters

- **propName** The pre-defined or custom property name.

Returns

The signed byte property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

GetShortStoreProperty method

Gets a short value for a pre-defined or custom message store property.

Visual Basic syntax

```
Public Function GetShortStoreProperty(ByVal propName As String) As Short
```

C# syntax

```
public short GetShortStoreProperty(string propName)
```

Parameters

- **propName** the pre-defined or custom property name.

Returns

The short property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

GetStoreProperty method

Gets a System.Object representing a message store property.

Visual Basic syntax

```
Public Function GetStoreProperty(ByVal propName As String) As Object
```

C# syntax

```
public Object GetStoreProperty(string propName)
```

Parameters

- **propName** The pre-defined or custom property name.

Returns

The property value.

Exceptions

- **“QAException class”** Thrown if there is a problem retrieving the property.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

See also

- “MessageStoreProperties class” on page 188

GetStorePropertyNames method

Gets an enumerator over the message store property names.

Visual Basic syntax

```
Public Function GetStorePropertyNames()
    As System.Collections.IEnumerator
```

C# syntax

```
public System.Collections.IEnumerator GetStorePropertyNames()
```

Returns

An enumerator over the message store property names.

Remarks

For more information about client store properties, see “Client message store properties” on page 26.

GetStringStoreProperty method

Gets a string value for a pre-defined or custom message store property.

Visual Basic syntax

```
Public Function GetStringStoreProperty(
    ByVal propName As String
) As String
```

C# syntax

```
public string GetStringStoreProperty(string propName)
```

Parameters

- **propName** The pre-defined or custom property name.

Returns

The string property value or null if the property does not exist.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the string value.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

PropertyExists method

Tests if there currently exists a value for the given the property.

Visual Basic syntax

```
Public Function PropertyExists(ByVal propName As String) As Boolean
```

C# syntax

```
public bool PropertyExists(string propName)
```

Parameters

- **propName** The pre-defined or custom property name.

Returns

true if the message store has a value mapped to the property. false otherwise.

Exceptions

- **“QAException class”** Thrown if there is a problem retrieving the property value.

Remarks

You can use this method to determine if a given property name currently has a value mapped to it by the message store.

See also

- “MessageStoreProperties class” on page 188

PutMessage method

Prepares a message to send to another QAnywhere client.

Visual Basic syntax

```
Public Sub PutMessage(ByVal address As String, ByVal msg As QAMessage)
```

C# syntax

```
public void PutMessage(string address, QAMessage msg)
```

Parameters

- **address** The address of the message specifying the destination queue name.
- **msg** The message to put in the local message store for transmission.

Exceptions

- **“QAException class”** Thrown if there is a problem putting the message.

Remarks

The PutMessage method inserts a message and a destination address into your local message store. The time of message transmission depends on QAnywhere Agent transmission policies.

For more information, see “Determining when message transmission should occur on the client” on page 46.

The address takes the form id\queue-name, where id is the destination message store ID and queue-name identifies a queue that is used by the destination QAnywhere client to listen for or receive messages.

For more information about QAnywhere addresses, see “QAnywhere message addresses” on page 58.

See also

- “PutMessageTimeToLive method” on page 251

PutMessageTimeToLive method

Prepares a message to send to another QAnywhere client.

Visual Basic syntax

```
Public Sub PutMessageTimeToLive(
    ByVal address As String,
    ByVal msg As QAMessage,
    ByVal ttl As Long
)
```

C# syntax

```
public void PutMessageTimeToLive(
    string address,
    QAMessage msg,
    long ttl
)
```

Parameters

- **address** The address of the message specifying the destination queue name.
- **msg** The message to put.
- **ttl** The delay, in milliseconds, before the message will expire if it has not been delivered. A value of 0 indicates the message will not expire.

Exceptions

- **"QAException class"** Thrown if there is a problem putting the message.

Remarks

The PutMessageTimeToLive method inserts a message and a destination address into your local message store. The time of message transmission depends on QAnywhere Agent transmission policies. However, if the next message tranmission time exceeds the given time-to-live value, the message expires.

For more information, see "Determining when message transmission should occur on the client" on page 46.

The address takes the form id\queue-name, where id is the destination message store id and queue-name identifies a queue that is used by the destination QAnywhere client to listen for or receive messages.

For more information about QAnywhere addresses, see "QAnywhere message addresses" on page 58.

ReOpen method

Reopens the QAManagerBase.

Visual Basic syntax

```
Public Sub ReOpen()
```

C# syntax

```
public void ReOpen()
```

Exceptions

- **“QAException class”** Thrown if there is a problem reopening the QAManagerBase instance.

Remarks

This re-establishes connections to the message store, without releasing any resources. This method may called in a message or exception listener, and in that case it is not necessary to call Start() again. This method simply executes Close() then Open() if not called in a listener, and in that case Start() must be called to restart receiving of messages.

SetBooleanStoreProperty method

Sets a pre-defined or custom message store property to a boolean value.

Visual Basic syntax

```
Public Sub SetBooleanStoreProperty(
    ByVal propName As String,
    ByVal val As Boolean
)
```

C# syntax

```
public void SetBooleanStoreProperty(string propName, bool val)
```

Parameters

- **propName** The pre-defined or custom property name.
- **val** The boolean property value.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

See also

- “MessageStoreProperties class” on page 188

SetDoubleStoreProperty method

Sets a pre-defined or custom message store property to a double value.

Visual Basic syntax

```
Public Sub SetDoubleStoreProperty(
    ByVal propName As String,
    ByVal val As Double
)
```

C# syntax

```
public void SetDoubleStoreProperty(string propName, double val)
```

Parameters

- **propName** The pre-defined or custom property name.
- **val** The double property value.

Remarks

You can use this method to set pre-defined or user-defined client. store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

SetExceptionListener method

Sets an ExceptionListener delegate to receive QAExceptions when processing QAnywhere messages asynchronously.

Visual Basic syntax

```
Public Sub SetExceptionListener(
    ByVal address As String,
    ByVal listener As ExceptionListener
)
```

C# syntax

```
public void SetExceptionListener(
    string address,
    ExceptionListener listener
)
```

Parameters

- **address** The address of messages.
- **listener** The exception listener to register.

Remarks

ExceptionListener delegate accepts QAException and QAMessage parameters. You may set an ExceptionListener and a MessageListener for a given address, but you must be consistent with the Listener/Listener2 delegates. That is, you cannot set an ExceptionListener and a MessageListener2, nor an ExceptionListener2 and a MessageListener, for the same address.

For more information, see "Receiving messages asynchronously" on page 70.

SetExceptionListener2 method

Sets an ExceptionListener2 delegate to receive QAExceptions when processing QAnywhere messages asynchronously.

Visual Basic syntax

```
Public Sub SetExceptionListener2(
    ByVal address As String,
    ByVal listener As ExceptionListener2
)
```

C# syntax

```
public void SetExceptionListener2(
    string address,
    ExceptionListener2 listener
)
```

Parameters

- **address** The address of messages.
- **listener** The exception listener to register.

Remarks

ExceptionListener2 delegate accepts QAManagerBase, QAException and QAMessage parameters. You may set an ExceptionListener2 and a MessageListener2 for a given address, but you must be consistent with the Listener/Listener2 delegates. That is, you cannot set an ExceptionListener and a MessageListener2, nor an ExceptionListener2 and a MessageListener, for the same address.

For more information, see "Receiving messages asynchronously" on page 70.

SetFloatStoreProperty method

Sets a pre-defined or custom message store property to a float value.

Visual Basic syntax

```
Public Sub SetFloatStoreProperty(
    ByVal propName As String,
        ByVal val As Single
    )
```

C# syntax

```
    public void SetFloatStoreProperty(string propName, float val)
```

Parameters

- **propName** The pre-defined or custom property name.
- **val** The float property value.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

SetIntStoreProperty method

Sets a pre-defined or custom message store property to a int value.

Visual Basic syntax

```
    Public Sub SetIntStoreProperty(
        ByVal propName As String,
        ByVal val As Integer
    )
```

C# syntax

```
    public void SetIntStoreProperty(string propName, int val)
```

Parameters

- **propName** The pre-defined or custom property name.
- **val** The int property value.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

SetLongStoreProperty method

Sets a pre-defined or custom message store property to a long value.

Visual Basic syntax

```
Public Sub SetLongStoreProperty(
    ByVal propName As String,
    ByVal val As Long
)
```

C# syntax

```
public void SetLongStoreProperty(string propName, long val)
```

Parameters

- **propName** The pre-defined or custom property name.
- **val** The long property value

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

SetMessageListener method

Sets a MessageListener delegate to receive QAnywhere messages asynchronously.

Visual Basic syntax

```
Public Sub SetMessageListener(
    ByVal address As String,
    ByVal listener As MessageListener
)
```

C# syntax

```
public void SetMessageListener(string address, MessageListener listener)
```

Parameters

- **address** The address of messages.
- **listener** The listener to register.

Remarks

Use this method to receive message asynchronously.

MessageListener delegate accepts a single QAMessage parameter.

The SetMessageListener address parameter specifies a local queue name used to receive the message. You can only have one listener delegate assigned to a given queue. You may set an ExceptionListener and a MessageListener for a given address, but you must be consistent with the Listener/Listener2 delegates. That is, you cannot set an ExceptionListener and a MessageListener2, nor an ExceptionListener2 and a MessageListener, for the same address.

If you want to listen for QAnywhere system messages, including push notifications and network status changes, specify system as the queue name.

For more information, see "Receiving messages asynchronously" on page 70.

See also

- "MessageListener delegate" on page 300

SetMessageListener2 method

Sets a MessageListener2 delegate to receive QAnywhere messages asynchronously.

Visual Basic syntax

```
Public Sub SetMessageListener2(
    ByVal address As String,
    ByVal listener As MessageListener2
)
```

C# syntax

```
public void SetMessageListener2(
    string address,
    MessageListener2 listener
)
```

Parameters

- **address** The address of messages.
- **listener** The listener to register.

Remarks

Use this method to receive message asynchronously.

MessageListener2 delegate accepts QAManagerBase and QAMessage parameters.

The SetMessageListener2 address parameter specifies a local queue name used to receive the message. You can only have one listener delegate assigned to a given queue. You may set an ExceptionListener2 and a MessageListener2 for a given address, but you must be consistent with the Listener/Listener2 delegates. That is, you cannot set an ExceptionListener and a MessageListener2, nor an ExceptionListener2 and a MessageListener, for the same address.

If you want to listen for QAnywhere system messages, including push notifications and network status changes, specify system as the queue name.

For more information, see "Receiving messages asynchronously" on page 70.

SetMessageListenerBySelector method

Sets a MessageListener delegate to receive QAnywhere messages asynchronously, with a message selector.

Visual Basic syntax

```
Public Sub SetMessageListenerBySelector(
    ByVal address As String,
    ByVal selector As String,
    ByVal listener As MessageListener
)
```

C# syntax

```
public void SetMessageListenerBySelector(
    string address,
    string selector,
    MessageListener listener
)
```

Parameters

- **address** The address of messages.
- **listener** The listener to register.
- **selector** The selector to be used to filter the messages to be received.

Remarks

Use this method to receive message asynchronously.

MessageListener delegate accepts a single QAMessage parameter.

The SetMessageListener address parameter specifies a local queue name used to receive the message. You can only have one listener delegate assigned to a given queue. The selector parameter specifies a selector to be used to filter the messages to be received on the given address. You may set an ExceptionListener and a MessageListener for a given address, but you must be consistent with the Listener/Listener2 delegates. That is, you cannot set an ExceptionListener and a MessageListener2, nor an ExceptionListener2 and a MessageListener, for the same address.

If you want to listen for QAnywhere system messages, including push notifications and network status changes, specify system as the queue name.

For more information, see "Receiving messages asynchronously" on page 70 and "System queue" on page 58.

See also

- "MessageListener delegate" on page 300

SetMessageListenerBySelector2 method

Sets a MessageListener2 delegate to receive QAnywhere messages asynchronously, with a message selector.

Visual Basic syntax

```
Public Sub SetMessageListenerBySelector2(
    ByVal address As String,
    ByVal selector As String,
    ByVal listener As MessageListener2
)
```

C# syntax

```
public void SetMessageListenerBySelector2(
    string address,
    string selector,
    MessageListener2 listener
)
```

Parameters

- **address** The address of messages.
- **listener** The listener to register.
- **selector** The selector to be used to filter the messages to be received.

Remarks

Use this method to receive message asynchronously.

MessageListener2 delegate accepts a single QAMessage parameter.

The SetMessageListener2 address parameter specifies a local queue name used to receive the message. You can only have one listener delegate assigned to a given queue. The selector parameter specifies a selector to be used to filter the messages to be received on the given address. You may set an ExceptionListener2 and a MessageListener2 for a given address, but you must be consistent with the Listener/Listener2 delegates. That is, you cannot set an ExceptionListener and a MessageListener2, nor an ExceptionListener2 and a MessageListener, for the same address.

If you want to listen for QAnywhere system messages, including push notifications and network status changes, specify system as the queue name.

For more information, see "Receiving messages asynchronously" on page 70 and "System queue" on page 58.

SetProperty method

Allows you to set QAnywhere Manager configuration properties programmatically.

Visual Basic syntax

```
Public Sub SetProperty(ByVal name As String, ByVal val As String)
```

C# syntax

```
public void SetProperty(string name, string val)
```

Parameters

- **name** The QAnywhere Manager configuration property name.
- **val** The QAnywhere Manager configuration property value

Exceptions

- **"QAException class"** Thrown if there is a problem setting the property.

Remarks

You can use this method to override default QAnywhere Manager configuration properties by specifying a property name and value. For a list of properties, see "QAnywhere manager configuration properties" on page 81.

You can also set QAnywhere Manager configuration properties using a properties file and the QAManagerFactory.CreateQAManager method.

Note
For more information, see "Setting QAnywhere manager configuration properties in a file" on page 82. you must set required properties before calling QAManager.Open or QATransactionalManager.Open().

See also

- "Open method" on page 225
- "Open method" on page 298

SetSbyteStoreProperty method

Sets a pre-defined or custom message store property to a sbyte value.

Visual Basic syntax

```
Public Sub SetSbyteStoreProperty(
    ByVal propName As String,
    ByVal val As SByte
)
```

C# syntax

```
public void SetSbyteStoreProperty(string propName, sbyte val)
```

Parameters

- **propName** The pre-defined or custom property name.
- **val** The sbyte property value.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

SetShortStoreProperty method

Sets a pre-defined or custom message store property to a short value.

Visual Basic syntax

```
Public Sub SetShortStoreProperty(
    ByVal propName As String,
    ByVal val As Short
)
```

C# syntax

```
public void SetShortStoreProperty(string propName, short val)
```

Parameters

- **propName** The pre-defined or custom property name.
- **val** The short property value.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- “MessageStoreProperties class” on page 188

SetStoreProperty method

Sets a pre-defined or custom message store property to a System.Object value.

Visual Basic syntax

```
Public Sub SetStoreProperty(
    ByVal propName As String,
    ByVal val As Object
)
```

C# syntax

```
public void SetStoreProperty(string propName, Object val)
```

Parameters

- **propName** The pre-defined or custom property name.
- **val** The property value.

Remarks

The property type must be one of the acceptable primitive types, or String. You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

See also

- “MessageStoreProperties class” on page 188

SetStringStoreProperty method

Sets a pre-defined or custom message store property to a string value.

Visual Basic syntax

```
Public Sub SetStringStoreProperty(
    ByVal propName As String,
    ByVal val As String
)
```

C# syntax

```
public void SetStringStoreProperty(string propName, string val)
```

Parameters

- **propName** The pre-defined or custom property name.
- **val** The string property value.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

See also

- "MessageStoreProperties class" on page 188

Start method

Starts the QAManagerBase for receiving incoming messages in message listeners.

Visual Basic syntax

```
Public Sub Start()
```

C# syntax

```
public void Start()
```

Exceptions

- **"QAException class"** Thrown if there is a problem starting the QAManagerBase instance.

Remarks

The QAManagerBase does not need to be started if there are no message listeners set, that is, if messages are received with the GetMessage methods. It is not recommended to use the GetMessage methods as well as message listeners for receiving messages. Use one or the other of the asynchronous (message listener) or synchronous (GetMessage) models. Any calls to Start() beyond the first without an intervening QAManagerBase.Stop() call are ignored.

See also

- "Stop method" on page 263

Stop method

Stops the QAManagerBase's reception of incoming messages.

Visual Basic syntax

```
Public Sub Stop()
```

C# syntax

```
public void Stop()
```

Exceptions

- **“QAException class”** Thrown if there is a problem stopping the QAManagerBase instance.

Remarks

The messages are not lost. They will not be received until the manager is started again. Any calls to Stop() beyond the first without an intervening QAManagerBase.Start() call are ignored.

See also

- “Start method” on page 263

TriggerSendReceive method

Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

Visual Basic syntax

```
Public Sub TriggerSendReceive()
```

C# syntax

```
public void TriggerSendReceive()
```

Exceptions

- **“QAException class”** Thrown if there is a problem triggering the send/receive.

Remarks

QAManagerBase TriggerSendReceive results in immediate message synchronization between a QAnywhere Agent and the central messaging server. A manual TriggerSendReceive call results in immediate message transmission, independent of the QAnywhere Agent transmission policies.

QAnywhere Agent transmission policies determine how message transmission occurs. For example, message transmission can occur automatically at regular intervals, when your client receives a push notification, or when you call the QAManagerBase.PutMessage method to send a message.

For more information, see “Determining when message transmission should occur on the client” on page 46.

See also

- “PutMessage method” on page 250

Mode property

Returns the QAManager acknowledgement mode for received messages.

Visual Basic syntax

```
Public ReadOnly Property Mode As AcknowledgementMode
```

C# syntax

```
public AcknowledgementMode Mode {get;}
```

Remarks

For a list of possible values, see AcknowledgementMode.
AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT and
AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT apply to QAManager instances;
AcknowledgementMode.TRANSACTIONAL is the mode for QATransactionalManager instances.

QAManagerFactory class

This class acts as a factory class for creating QATransactionalManager and QAManager objects.

Visual Basic syntax

```
Public MustInherit Class QAManagerFactory
```

C# syntax

```
public abstract class QAManagerFactory
```

Members

All members of QAManagerFactory class, including all inherited members.

Name	Description
"CreateQAManager method"	Returns a new QAManager instance with the specified properties.
"CreateQATransactionalManager method"	Returns a new QATransactionalManager instance with the specified properties.
"Instance property"	A singleton QAManagerFactory instance.

Remarks

You can only have one instance of QAManagerFactory.

CreateQAManager method

Returns a new QAManager instance with the specified properties.

Overload list

Name	Description
"CreateQAManager() method"	Returns a new QAManager instance with default properties.
"CreateQAManager(Hashtable) method"	Returns a new QAManager instance with the specified properties as a Hashtable.
"CreateQAManager(string) method"	Returns a new QAManager instance with the specified properties.

CreateQAManager() method

Returns a new QAManager instance with default properties.

Visual Basic syntax

```
Public Overridable Function CreateQAManager() As QAManager
```

C# syntax

```
public virtual abstract QAManager CreateQAManager()
```

Returns

A new QAManager instance.

Exceptions

- **"QAException class"** Thrown if there is a problem creating the manager.

Remarks

You can use the QAManagerBase.SetProperty to set QAnywhere manager configuration properties programmatically after you create the instance.

For a list of QAnywhere manager configuration properties, see "QAnywhere manager configuration properties" on page 81.

See also

- "QAManager interface" on page 219

CreateQAManager(Hashtable) method

Returns a new QAManager instance with the specified properties as a Hashtable.

Visual Basic syntax

```
Public Overridable Function CreateQAManager(
    ByVal properties As Hashtable
) As QAManager
```

C# syntax

```
public virtual abstract QAManager CreateQAManager(Hashtable properties)
```

Parameters

- **properties** A hashtable for configuring the QAManager instance.

Returns

A new QAManager instance.

Exceptions

- **"QAException class"** Thrown if there is a problem creating the manager.

Remarks

If the hashtable parameter is null, the QAManager is created using default properties. You can use the QAManagerBase.SetProperty to set QAnywhere manager configuration properties programmatically after you create the instance.

For a list of QAnywhere manager configuration properties, see "QAnywhere manager configuration properties" on page 81.

See also

- "QAManager interface" on page 219

CreateQAManager(string) method

Returns a new QAManager instance with the specified properties.

Visual Basic syntax

```
Public Overridable Function CreateQAManager(
    ByVal iniFile As String
) As QAManager
```

C# syntax

```
public virtual abstract QAManager CreateQAManager(string iniFile)
```

Parameters

- **iniFile** A properties file for configuring the QAManager instance.

Returns

A new QAManager instance.

Exceptions

- **"QAException class"** Thrown if there is a problem creating the manager.

Remarks

If the properties file parameter is null, the QAManager is created using default properties. You can use the QAManagerBase.SetProperty to set QAnywhere manager configuration properties programmatically after you create the instance.

For a list of QAnywhere manager configuration properties, see "QAnywhere manager configuration properties" on page 81.

For more information, see "Setting QAnywhere manager configuration properties in a file" on page 82.

See also

- "QAManager interface" on page 219

CreateQATransactionalManager method

Returns a new QATransactionalManager instance with the specified properties.

Overload list

Name	Description
"CreateQATransactionalManager() method"	Returns a new QATransactionalManager instance with default properties.
"CreateQATransactionalManager(Hashtable) method"	Returns a new QATransactionalManager instance with the specified properties as a Hashtable.
"CreateQATransactionalManager(string) method"	Returns a new QATransactionalManager instance with the specified properties.

CreateQATransactionalManager() method

Returns a new QATransactionalManager instance with default properties.

Visual Basic syntax

```
Public Overridable Function CreateQATransactionalManager()
    As QATransactionalManager
```

C# syntax

```
public virtual abstract QATransactionalManager
CreateQATransactionalManager()
```

Returns

A new QATransactionalManager instance.

Exceptions

- **"QAException class"** Thrown if there is a problem creating the manager.

Remarks

You can use the QAManagerBase.SetProperty to set QAnywhere manager configuration properties programmatically after you create the instance.

For a list of QAnywhere manager configuration properties, see "QAnywhere manager configuration properties" on page 81.

See also

- "QATransactionalManager interface" on page 293

CreateQATransactionalManager(Hashtable) method

Returns a new QATransactionalManager instance with the specified properties as a Hashtable.

Visual Basic syntax

```
Public Overridable Function CreateQATransactionalManager(
    ByVal properties As Hashtable
) As QATransactionalManager
```

C# syntax

```
public virtual abstract QATransactionalManager
CreateQATransactionalManager(
    Hashtable properties
)
```

Parameters

- **properties** A hashtable for configuring the QATransactionalManager instance.

Returns

A new QATransactionalManager

Exceptions

- **"QAException class"** Thrown if there is a problem creating the manager.

Remarks

If the hashtable parameter is null, the QATransactionalManager is created using default properties. You can use the QAManagerBase.SetProperty to set QAnywhere manager configuration properties programmatically after you create the instance.

For a list of QAnywhere manager configuration properties, see "QAnywhere manager configuration properties" on page 81.

See also

- “QATransactionalManager interface” on page 293

CreateQATransactionalManager(string) method

Returns a new QATransactionalManager instance with the specified properties.

Visual Basic syntax

```
Public Overridable Function CreateQATransactionalManager(
    ByVal iniFile As String
) As QATransactionalManager
```

C# syntax

```
public virtual abstract QATransactionalManager
CreateQATransactionalManager(
    string iniFile
)
```

Parameters

- **iniFile** A properties file for configuring the QATransactionalManager instance, or null to create the QATransactionalManager instance with default properties.

Returns

A new QATransactionalManager

Exceptions

- **“QAException class”** Thrown if there is a problem creating the manager.

Remarks

If the properties file parameter is null, the QATransactionalManager is created using default properties. You can use the QAManagerBase.SetProperty to set QAnywhere Manager configuration properties programmatically after you create the instance.

For a list of QAnywhere Manager configuration properties, see “QAnywhere manager configuration properties” on page 81.

For more information, see “Setting QAnywhere manager configuration properties in a file” on page 82.

See also

- “QATransactionalManager interface” on page 293

Instance property

A singleton QAManagerFactory instance.

Visual Basic syntax

```
Public Shared ReadOnly Property Instance As QAManagerFactory
```

C# syntax

```
public QAManagerFactory Instance {get;}
```

Exceptions

- **"QAException class"** Thrown if there is a problem creating the manager factory.

QAMessage interface

Provides an interface to set message properties and header fields.

Visual Basic syntax

```
Public Interface QAMessage
```

C# syntax

```
public interface QAMessage
```

Derived classes

- "QABinaryMessage interface" on page 189
- "QATextMessage interface" on page 289

Members

All members of QAMessage interface, including all inherited members.

Name	Description
"ClearBody method"	Clears the body of the message.
"ClearProperties method"	Clears all the properties of the message.
"GetBooleanProperty method"	Gets a boolean message property.
"GetByteProperty method"	Gets a byte message property.
"GetDoubleProperty method"	Gets a double message property.
"GetFloatProperty method"	Gets a float message property.
"GetIntProperty method"	Gets an int message property.
"GetLongProperty method"	Gets a long message property.
"GetProperty method"	Gets a message property.

Name	Description
“GetPropertyNames method”	Gets an enumerator over the property names of the message.
“GetPropertyType method”	Returns the property type of the given property.
“GetSbyteProperty method”	Gets a signed byte message property.
“GetShortProperty method”	Gets a short message property.
“GetStringProperty method”	Gets a string message property.
“PropertyExists method”	Indicates whether the given property has been set for this message.
“SetBooleanProperty method”	Sets a boolean property.
“SetByteProperty method”	Sets a byte property.
“SetDoubleProperty method”	Sets a double property.
“SetFloatProperty method”	Sets a float property.
“SetIntProperty method”	Sets an int property.
“SetLongProperty method”	Sets a long property.
“SetProperty method”	Sets a property.
“SetSbyteProperty method”	Sets a signed byte property.
“SetShortProperty method”	Sets a short property.
“SetStringProperty method”	Sets a string property.
“Address property”	The destination address for the QAMessage instance.
“Expiration property”	Gets the message's expiration value.
“InReplyToID property”	The message id of the message for which this message is a reply.
“MessageID property”	The globally unique message id of the message.
“Priority property”	The priority of the message (ranging from 0 to 9).
“Redelivered property”	Indicates whether the message has been previously received but not acknowledged.
“ReplyToAddress property”	The reply to address of this message.
“Timestamp property”	The message timestamp.

Remarks

The derived classes QABinaryMessage and QATextMessage provide specialized methods to read and write to the message body. You can use QAMessage methods to set predefined or custom message properties.

For a list of pre-defined property names, see the MessageProperties.

For more information about setting message properties and header fields, see "QAnywhere messages" on page 13.

See also

- "QABinaryMessage interface" on page 189
- "QATextMessage interface" on page 289

ClearBody method

Clears the body of the message.

Visual Basic syntax

```
Public Sub ClearBody()
```

C# syntax

```
public void ClearBody()
```

ClearProperties method

Clears all the properties of the message.

Visual Basic syntax

```
Public Sub ClearProperties()
```

C# syntax

```
public void ClearProperties()
```

GetBooleanProperty method

Gets a boolean message property.

Visual Basic syntax

```
Public Function GetBooleanProperty(ByVal propName As String) As Boolean
```

C# syntax

```
public bool GetBooleanProperty(string propName)
```

Parameters

- **propName** The property name.

Returns

The property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

GetByteProperty method

Gets a byte message property.

Visual Basic syntax

```
Public Function GetByteProperty(ByVal propName As String) As Byte
```

C# syntax

```
public byte GetByteProperty(string propName)
```

Parameters

- **propName** The property name.

Returns

The property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

GetDoubleProperty method

Gets a double message property.

Visual Basic syntax

```
Public Function GetDoubleProperty(ByVal propName As String) As Double
```

C# syntax

```
public double GetDoubleProperty(string propName)
```

Parameters

- **propName** The property name.

Returns

The property value.

Exceptions

- **“QAException class”** Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “MessageProperties class” on page 179

GetFloatProperty method

Gets a float message property.

Visual Basic syntax

```
Public Function GetFloatProperty(ByVal propName As String) As Single
```

C# syntax

```
public float GetFloatProperty(string propName)
```

Parameters

- **propName** The property name.

Returns

The property value.

Exceptions

- **“QAException class”** Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “MessageProperties class” on page 179

GetIntProperty method

Gets an int message property.

Visual Basic syntax

```
Public Function GetIntProperty(ByVal propName As String) As Integer
```

C# syntax

```
public int GetIntProperty(string propName)
```

Parameters

- **propName** The property name.

Returns

The property value.

Exceptions

- **“QAException class”** Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “MessageProperties class” on page 179

GetLongProperty method

Gets a long message property.

Visual Basic syntax

```
Public Function GetLongProperty(ByVal propName As String) As Long
```

C# syntax

```
public long GetLongProperty(string propName)
```

Parameters

- **propName** The property name.

Returns

The property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

GetProperty method

Gets a message property.

Visual Basic syntax

```
Public Function GetProperty(ByVal propName As String) As Object
```

C# syntax

```
public Object GetProperty(string propName)
```

Parameters

- **propName** The property name.

Returns

The property value.

Exceptions

- **"QAException class"** Thrown if the property does not exist.

Remarks

The property must be one of the acceptable primitive types, string, or DateTime.

GetPropertyNames method

Gets an enumerator over the property names of the message.

Visual Basic syntax

```
Public Function GetPropertyNames() As System.Collections.IEnumerator
```

C# syntax

```
public System.Collections.IEnumerator GetPropertyNames()
```

Returns

An enumerator over the message property names.

GetPropertyType method

Returns the property type of the given property.

Visual Basic syntax

```
Public Function GetPropertyType(
    ByVal propName As String
) As PropertyType
```

C# syntax

```
public PropertyType GetPropertyType(string propName)
```

Parameters

- **propName** The name of the property.

Returns

The property type.

GetSbyteProperty method

Gets a signed byte message property.

Visual Basic syntax

```
Public Function GetSbyteProperty(ByVal propName As String) As SByte
```

C# syntax

```
public sbyte GetSbyteProperty(string propName)
```

Parameters

- **propName** the property name.

Returns

The property value.

Exceptions

- **“QAException class”** Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “MessageProperties class” on page 179

GetShortProperty method

Gets a short message property.

Visual Basic syntax

```
Public Function GetShortProperty(ByVal propName As String) As Short
```

C# syntax

```
public short GetShortProperty(string propName)
```

Parameters

- **propName** The property name.

Returns

The property value.

Exceptions

- **“QAException class”** Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “MessageProperties class” on page 179

GetStringProperty method

Gets a string message property.

Visual Basic syntax

```
Public Function GetStringProperty(ByVal propName As String) As String
```

C# syntax

```
public string GetStringProperty(string propName)
```

Parameters

- **propName** The property name.

Returns

The property value or null if the property does not exist.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

PropertyExists method

Indicates whether the given property has been set for this message.

Visual Basic syntax

```
Public Function PropertyExists(ByVal propName As String) As Boolean
```

C# syntax

```
public bool PropertyExists(string propName)
```

Parameters

- **propName** The property name.

Returns

True if the property exists.

SetBooleanProperty method

Sets a boolean property.

Visual Basic syntax

```
Public Sub SetBooleanProperty(
    ByVal propName As String,
    ByVal val As Boolean
)
```

C# syntax

```
public void SetBooleanProperty(string propName, bool val)
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

SetByteProperty method

Sets a byte property.

Visual Basic syntax

```
Public Sub SetByteProperty(ByVal propName As String, ByVal val As Byte)
```

C# syntax

```
public void SetByteProperty(string propName, byte val)
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

SetDoubleProperty method

Sets a double property.

Visual Basic syntax

```
Public Sub SetDoubleProperty(
    ByVal propName As String,
    ByVal val As Double
)
```

C# syntax

```
public void SetDoubleProperty(string propName, double val)
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

SetFloatProperty method

Sets a float property.

Visual Basic syntax

```
Public Sub SetFloatProperty(
    ByVal propName As String,
    ByVal val As Single
)
```

C# syntax

```
public void SetFloatProperty(string propName, float val)
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

SetIntProperty method

Sets an int property.

Visual Basic syntax

```
Public Sub SetIntProperty(
    ByVal propName As String,
    ByVal val As Integer
)
```

C# syntax

```
public void SetIntProperty(string propName, int val)
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

SetLongProperty method

Sets a long property.

Visual Basic syntax

```
Public Sub SetLongProperty(ByVal propName As String, ByVal val As Long)
```

C# syntax

```
public void SetLongProperty(string propName, long val)
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

SetProperty method

Sets a property.

Visual Basic syntax

```
Public Sub SetProperty(ByVal propName As String, ByVal val As Object)
```

C# syntax

```
public void SetProperty(string propName, Object val)
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

The property type must be one of the acceptable primitive types, or String.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

SetSbyteProperty method

Sets a signed byte property.

Visual Basic syntax

```
Public Sub SetSbyteProperty(
    ByVal propName As String,
    ByVal val As SByte
)
```

C# syntax

```
public void SetSbyteProperty(string propName, sbyte val)
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

SetShortProperty method

Sets a short property.

Visual Basic syntax

```
Public Sub SetShortProperty(
    ByVal propName As String,
    ByVal val As Short
)
```

C# syntax

```
public void SetShortProperty(string propName, short val)
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 179

SetStringProperty method

Sets a string property.

Visual Basic syntax

```
Public Sub SetStringProperty(
    ByVal propName As String,
        ByVal val As String
    )
```

C# syntax

```
public void SetStringProperty(string propName, string val)
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “MessageProperties class” on page 179

Address property

The destination address for the QAMessage instance.

Visual Basic syntax

```
Public ReadOnly Property Address As String
```

C# syntax

```
public string Address {get;}
```

Remarks

When a message is sent, this field is ignored. After completion of a send operation, the field holds the destination address specified in QAManagerBase.PutMessage.

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “PutMessage method” on page 250

Expiration property

Gets the message's expiration value.

Visual Basic syntax

```
Public ReadOnly Property Expiration As Date
```

C# syntax

```
public DateTime **Expiration** {get;}
```

Remarks

When a message is sent, the Expiration header field is left unassigned. After completion of the send method, it holds the expiration time of the message.

This is a read-only property because the expiration time of a message is set by adding the time-to-live argument of QAManagerBase.PutMessageTimeToLive to the current time.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

InReplyToID property

The message id of the message for which this message is a reply.

Visual Basic syntax

```
Public Property InReplyToID As String
```

C# syntax

```
public string InReplyToID {get;set;}
```

Remarks

May be null.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

MessageID property

The globally unique message id of the message.

Visual Basic syntax

```
Public ReadOnly Property MessageID As String
```

C# syntax

```
public string MessageID {get;}
```

Remarks

This property is null until a message is put.

When a message is sent using QAManagerBase.PutMessage, the MessageID is null and can be ignored. When the send method returns, it contains an assigned value.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "PutMessage method" on page 250

Priority property

The priority of the message (ranging from 0 to 9).

Visual Basic syntax

```
Public Property Priority As Integer
```

C# syntax

```
public int Priority {get;set;}
```

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

Redelivered property

Indicates whether the message has been previously received but not acknowledged.

Visual Basic syntax

```
Public ReadOnly Property Redelivered As Boolean
```

C# syntax

```
public bool Redelivered {get;}
```

Remarks

Redelivered is set by a receiving QAManager when it detects that a message being received was received before.

For example, an application receives a message using a QAManager opened with AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT, and shuts down without acknowledging the message. When the application starts again and receives the same message the Redelivered header will be true.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "QAManager interface" on page 219
- "AcknowledgementMode enumeration" on page 301

ReplyToAddress property

The reply to address of this message.

Visual Basic syntax

```
Public Property ReplyToAddress As String
```

C# syntax

```
public string ReplyToAddress {get;set;}
```

Remarks

May be null.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

Timestamp property

The message timestamp.

Visual Basic syntax

```
Public ReadOnly Property Timestamp As Date
```

C# syntax

```
public DateTime Timestamp {get;}
```

Remarks

This Timestamp header field contains the time a message was created.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

QATextMessage interface

QATextMessage inherits from the QAMessage class and adds a text message body.

Visual Basic syntax

```
Public Interface QATextMessage Inherits QAMessage
```

C# syntax

```
public interface QATextMessage : QAMessage
```

Base classes

- "QAMessage interface" on page 271

Members

All members of QATextMessage interface, including all inherited members.

Name	Description
"ClearBody method"	Clears the body of the message.
"ClearProperties method"	Clears all the properties of the message.
"GetBooleanProperty method"	Gets a boolean message property.
"GetByteProperty method"	Gets a byte message property.
"GetDoubleProperty method"	Gets a double message property.
"GetFloatProperty method"	Gets a float message property.
"GetIntProperty method"	Gets an int message property.
"GetLongProperty method"	Gets a long message property.
"GetProperty method"	Gets a message property.
"GetPropertyNames method"	Gets an enumerator over the property names of the message.
"GetPropertyType method"	Returns the property type of the given property.
"GetSbyteProperty method"	Gets a signed byte message property.
"GetShortProperty method"	Gets a short message property.
"GetStringProperty method"	Gets a string message property.
"PropertyExists method"	Indicates whether the given property has been set for this message.
"ReadText method"	Read unread text into the given buffer.
"Reset method"	Resets the text position of the message to the beginning.
"SetBooleanProperty method"	Sets a boolean property.
"SetByteProperty method"	Sets a byte property.

Name	Description
"SetDoubleProperty method"	Sets a double property.
"SetFloatProperty method"	Sets a float property.
"SetIntProperty method"	Sets an int property.
"SetLongProperty method"	Sets a long property.
"SetProperty method"	Sets a property.
"SetSbyteProperty method"	Sets a signed byte property.
"SetShortProperty method"	Sets a short property.
"SetStringProperty method"	Sets a string property.
"WriteText method"	Append text to the text of the message.
"Address property"	The destination address for the QAMessage instance.
"Expiration property"	Gets the message's expiration value.
"InReplyToID property"	The message id of the message for which this message is a reply.
"MessageID property"	The globally unique message id of the message.
"Priority property"	The priority of the message (ranging from 0 to 9).
"Redelivered property"	Indicates whether the message has been previously received but not acknowledged.
"ReplyToAddress property"	The reply to address of this message.
"Text property"	The message text.
"TextLength property"	The length, in characters, of the message.
"Timestamp property"	The message timestamp.

Remarks

QATextMessage provides methods to read from and write to the text message body.

When the message is first created, the body of the message is in write-only mode. After a message has been sent, the client that sent it can retain and modify it without affecting the message that has been sent. The same message object can be sent multiple times.

When a message is received, the provider has called QATextMessage.Reset() so that the message body is in read-only mode and reading of values starts from the beginning of the message body.

See also

- "QABinaryMessage interface" on page 189
- "QAMessage interface" on page 271

ReadText method

Read unread text into the given buffer.

Visual Basic syntax

```
Public Function ReadText(ByVal buf As StringBuilder) As Integer
```

C# syntax

```
public int ReadText(StringBuilder buf)
```

Parameters

- **buf** Target buffer for any read text.

Returns

The number of characters read or -1 if there are no more characters to read.

Remarks

Any additional unread text must be read by subsequent calls to this method. Text is read from the beginning of any unread text.

Reset method

Resets the text position of the message to the beginning.

Visual Basic syntax

```
Public Sub Reset()
```

C# syntax

```
public void Reset()
```

WriteText method

Append text to the text of the message.

Visual Basic syntax

```
Public Sub WriteText(ByVal val As String)
```

C# syntax

```
public void WriteText(string val)
```

Parameters

- **val** The text to append.

Text property

The message text.

Visual Basic syntax

```
Public Property Text As String
```

C# syntax

```
public string Text {get;set;}
```

Remarks

If the message exceeds the maximum size specified by the QAManager.MAX_IN_MEMORY_MESSAGE_SIZE, this property is null. In this case, use the QATextMessage.ReadText method to read the text.

For more information about QAManager properties, see "QAnywhere manager configuration properties" on page 81.

See also

- "ReadText method" on page 292

TextLength property

The length, in characters, of the message.

Visual Basic syntax

```
Public ReadOnly Property TextLength As Long
```

C# syntax

```
public long TextLength {get;}
```

QATransactionalManager interface

The QATransactionalManager class derives from QAManagerBase and manages transactional QAnywhere messaging operations.

Visual Basic syntax

```
Public Interface QATransactionalManager Inherits QAManagerBase
```

C# syntax

```
public interface QATransactionalManager : QAManagerBase
```

Base classes

- "QAManagerBase interface" on page 226

Members

All members of QATransactionalManager interface, including all inherited members.

Name	Description
"BrowseMessages method"	This method is deprecated.
"BrowseMessagesByID method"	Browses the message with the given message ID.
"BrowseMessagesByQueue method"	Browses the next available messages waiting that have been sent to the given address.
"BrowseMessagesBySelector method"	Browses messages queued in the message store that satisfy the given selector.
"CancelMessage method"	Cancels the message with the given message ID.
"Close method"	Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.
"Commit method"	Commits the current transaction and begins a new transaction.
"CreateBinaryMessage method"	Creates a QABinaryMessage object.
"CreateTextMessage method"	Creates a QATextMessage object.
"GetBooleanStoreProperty method"	Gets a boolean value for a pre-defined or custom message store property.
"GetDoubleStoreProperty method"	Gets a double value for a pre-defined or custom message store property.
"GetFloatStoreProperty method"	Gets a float value for a pre-defined or custom message store property.

Name	Description
"GetIntStoreProperty method"	Gets a int value for a pre-defined or custom message store property.
"GetLongStoreProperty method"	Gets a long value for a pre-defined or custom message store property.
"GetMessage method"	Returns the next available QAMessage sent to the specified address.
"GetMessageBySelector method"	Returns the next available QAMessage sent to the specified address that satisfies the given selector.
"GetMessageBySelectorNoWait method"	Returns the next available QAMessage sent to the given address that satisfies the given selector.
"GetMessageBySelectorTimeout method"	Returns the next available QAMessage sent to the given address that satisfies the given selector.
"GetMessageNoWait method"	Returns the next available QAMessage sent to the given address.
"GetMessageTimeout method"	Returns the next available QAMessage sent to the given address.
"GetQueueDepth method"	Returns the total depth of all queues, based on a given filter.
"GetSbyteStoreProperty method"	Gets a signed byte value for a pre-defined or custom message store property.
"GetShortStoreProperty method"	Gets a short value for a pre-defined or custom message store property.
"GetStoreProperty method"	Gets a System.Object representing a message store property.
"GetStorePropertyNames method"	Gets an enumerator over the message store property names.
"GetStringStoreProperty method"	Gets a string value for a pre-defined or custom message store property.
"Open method"	Opens a QATransactionalManager instance.
"PropertyExists method"	Tests if there currently exists a value for the given the property.
"PutMessage method"	Prepares a message to send to another QAnywhere client.

Name	Description
"PutMessageTimeToLive method"	Prepares a message to send to another QAnywhere client.
"ReOpen method"	Reopens the QAManagerBase.
"Rollback method"	Rolls back the current transaction and begins a new transaction.
"SetBooleanStoreProperty method"	Sets a pre-defined or custom message store property to a boolean value.
"SetDoubleStoreProperty method"	Sets a pre-defined or custom message store property to a double value.
"SetExceptionListener method"	Sets an ExceptionListener delegate to receive QAExceptions when processing QAnywhere messages asynchronously.
"SetExceptionListener2 method"	Sets an ExceptionListener2 delegate to receive QAExceptions when processing QAnywhere messages asynchronously.
"SetFloatStoreProperty method"	Sets a pre-defined or custom message store property to a float value.
"SetIntStoreProperty method"	Sets a pre-defined or custom message store property to a int value.
"SetLongStoreProperty method"	Sets a pre-defined or custom message store property to a long value.
"SetMessageListener method"	Sets a MessageListener delegate to receive QAnywhere messages asynchronously.
"SetMessageListener2 method"	Sets a MessageListener2 delegate to receive QAnywhere messages asynchronously.
"SetMessageListenerBySelector method"	Sets a MessageListener delegate to receive QAnywhere messages asynchronously, with a message selector.
"SetMessageListenerBySelector2 method"	Sets a MessageListener2 delegate to receive QAnywhere messages asynchronously, with a message selector.
"SetProperty method"	Allows you to set QAnywhere Manager configuration properties programmatically.
"SetSbyteStoreProperty method"	Sets a pre-defined or custom message store property to a sbyte value.

Name	Description
"SetShortStoreProperty method"	Sets a pre-defined or custom message store property to a short value.
"SetStoreProperty method"	Sets a pre-defined or custom message store property to a System.Object value.
"SetStringStoreProperty method"	Sets a pre-defined or custom message store property to a string value.
"Start method"	Starts the QAManagerBase for receiving incoming messages in message listeners.
"Stop method"	Stops the QAManagerBase's reception of incoming messages.
"TriggerSendReceive method"	Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.
"Mode property"	Returns the QAManager acknowledgement mode for received messages.

Remarks

For a detailed description of derived behavior, see QAManagerBase.

The QATransactionalManager can only be used for transactional acknowledgement. Use the QATransactionalManager.Commit() method to commit all QAManagerBase.PutMessage and QAManagerBase.GetMessage invocations.

For more information, see "Implementing transactional messaging" on page 63.

See also

- "QATransactionalManager interface" on page 293

Commit method

Commits the current transaction and begins a new transaction.

Visual Basic syntax

```
Public Sub Commit()
```

C# syntax

```
public void Commit()
```

Exceptions

- **"QAException class"** Thrown if there is a problem committing.

Remarks

Note
This method commits all QAManagerBase.PutMessage and QAManagerBase.GetMessage invocations. The first transaction begins with the call to QATransactionalManager.Open().

See also

- "QATransactionalManager interface" on page 293

Open method

Opens a QATransactionalManager instance.

Visual Basic syntax

```
Public Sub Open()
```

C# syntax

```
public void Open()
```

Exceptions

- **"QAException class"** Thrown if there is a problem opening the manager

Remarks

The Open method must be the first method called after creating a manager.

See also

- "QATransactionalManager interface" on page 293

Rollback method

Rolls back the current transaction and begins a new transaction.

Visual Basic syntax

```
Public Sub Rollback()
```

C# syntax

```
public void Rollback()
```

Exceptions

- **"QAException class"** Thrown if there is a problem rolling back

Remarks

This method rolls back all uncommitted QAManagerBase.PutMessage and QAManagerBase.GetMessage invocations.

See also

- "QATransactionalManager interface" on page 293

ExceptionListener delegate

ExceptionListener delegate definition.

Visual Basic syntax

```
Public Delegate Sub ExceptionListener(
    ByVal ex As QAException,
    ByVal msg As QAMessage
)
```

C# syntax

```
public delegate void ExceptionListener(QAException ex, QAMessage msg);
```

Parameters

- **ex** The exception that occurred.
- **msg** The message that was received, or null if the message could not be constructed.

Remarks

You pass an ExceptionListener to the QAManagerBase.SetExceptionListener.

ExceptionListener2 delegate

ExceptionListener2 delegate definition.

Visual Basic syntax

```
Public Delegate Sub ExceptionListener2(
    ByVal mgr As QAManagerBase,
    ByVal ex As QAException,
    ByVal msg As QAMessage
)
```

C# syntax

```
public delegate void ExceptionListener2(
    QAManagerBase mgr,
    QAException ex,
    QAMessage msg
);
```

Parameters

- **mgr** The QAManagerBase that processed the message.
- **ex** The exception that occurred.
- **msg** The message that was received, or null if the message could not be constructed.

Remarks

You pass an ExceptionListener2 to the QAManagerBase.SetExceptionListener2.

MessageListener delegate

MessageListener delegate definition.

Visual Basic syntax

```
Public Delegate Sub MessageListener(ByVal msg As QAMessage)
```

C# syntax

```
public delegate void MessageListener(QAMessage msg);
```

Parameters

- **msg** The message that was received.

Remarks

You pass a MessageListener to the QAManagerBase.SetMessageListener method.

See also

- "SetMessageListener method" on page 256

MessageListener2 delegate

MessageListener2 delegate definition.

Visual Basic syntax

```
Public Delegate Sub MessageListener2(
    ByVal mgr As QAManagerBase,
    ByVal msg As QAMessage
)
```

C# syntax

```
public delegate void MessageListener2(QAManagerBase mgr, QAMessage msg);
```

Parameters

- **mgr** The QAManagerBase that received the message.
- **msg** The message that was received.

Remarks

You pass a MessageListener2 to the QAManagerBase.SetMessageListener2.

AcknowledgementMode enumeration

Indicates how messages should be acknowledged by QAnywhere client applications.

Visual Basic syntax

```
Public Enum AcknowledgementMode
```

C# syntax

```
public enum AcknowledgementMode
```

Members

Member name	Description
EXPLICIT_ACKNOWLEDGEMENT	Indicates that received messages are acknowledged using one of the QAManager acknowledge methods.
IMPLICIT_ACKNOWLEDGEMENT	Indicates that all messages are acknowledged as soon as they are received by a client application. If you receive messages synchronously, messages are acknowledged as soon as the QAManagerBase.GetMessage(string) method returns. If you receive messages asynchronously, the message is acknowledged as soon as the event handling function returns.
TRANSACTIONAL	This mode indicates that messages are only acknowledged as part of the on going transaction. This mode is automatically assigned to QATransactionalManager instances.

Remarks

The implicit and explicit acknowledgement modes are assigned to a QAManager instance using the QAManager.Open(AcknowledgementMode) method.

For more information, see "Initializing a QAnywhere API" on page 52.

With implicit acknowledgement, messages are acknowledged as soon as they are received by a client application. With explicit acknowledgement, you must call one of the QAManager acknowledgement methods. The server propagates all status changes from client to client.

For more information, see "Receiving messages synchronously" on page 68 and "Receiving messages asynchronously" on page 70.

See also

- "QAManager interface" on page 219
- "QATransactionalManager interface" on page 293
- "QAManagerBase interface" on page 226

MessageType enumeration

Defines constant values for the MessageProperties.MSG_TYPE message property.

Visual Basic syntax

```
Public Enum MessageType
```

C# syntax

```
public enum MessageType
```

Members

Member name	Description	Value
NETWORK_STATUS_NOTIFICATION	Identifies a QAnywhere system message used to notify QAnywhere client applications of network status changes. Network status changes apply to the device receiving the system message. Use MessageProperties.ADAPTERS, MessageProperties.RASNAMES, and MessageProperties.NETWORK_STATUS fields to identify new network status information. For more information, see "System queue" on page 58.	14
PUSH_NOTIFICATION	Identifies a QAnywhere system message used to notify QAnywhere client applications of push notifications. If you use the on-demand qaagent policy, a typical response is to call QAManagerBase.TriggerSendReceive() to receive messages waiting with the central message server. For more information, see "System queue" on page 58.	13

Member name	Description	Value
REGULAR	If no message type property exists then the message type is assumed to be REGULAR. This type of message is not treated specially by the message system.	0

See also

- "TriggerSendReceive method" on page 264
- "MessageProperties class" on page 179

Example

The following example shows the onSystemMessage method which is used to handle QAnywhere system messages. The message type is compared to MessageType.NETWORK_STATUS_NOTIFICATION.

```
private void onSystemMessage(QAMessage msg) {
    QATextMessage   t_msg;
    MessageType     msg_type;
    String          network_adapters;
    String          network_names;
    String          network_info;

    t_msg = (QATextMessage)msg;
    if(t_msg != null) {
          // Evaluate message type.
          msg_type =
(MessageType)t_msg.GetIntProperty( MessageProperties.MSG_TYPE );
        if(msg_type == MessageType.NETWORK_STATUS_NOTIFICATION) {
            // Handle network status notification...
        }
    }
}
```

PropertyType enumeration

QAMessage property type enumeration, corresponding naturally to the C# types.

Visual Basic syntax

```
Public Enum PropertyType
```

C# syntax

```
public enum PropertyType
```

Members

Member name	Description
BOOLEAN	Indicates a boolean property.

Member name	Description
BYTE	Indicates a signed byte property.
DOUBLE	Indicates a double property.
FLOAT	Indicates a float property.
INT	Indicates an int property.
LONG	Indicates an long property.
SHORT	Indicates a short property.
STRING	Indicates a string property.
UNKNOWN	Indicates an unknown property type, usually because the property is unknown.

QueueDepthFilter enumeration

Provides queue depth filter values for QAManagerBase.GetQueueDepth(QueueDepthFilter) and QAManagerBase.GetQueueDepth(string,QueueDepthFilter).

Visual Basic syntax

```
Public Enum QueueDepthFilter
```

C# syntax

```
public enum QueueDepthFilter
```

Members

Member name	Description
ALL	Count both incoming and outgoing messages. System messages and expired messages are not included in any queue depth counts.
IN-COM-ING	Count only incoming messages. An incoming message is defined as a message whose originator is different than the agent ID of the message store.
LOCAL	Count only local messages in the message store. A local message is defined as a message whose originator and target are the agent ID of the message store.

Member name	Description
OUT-GOING	Count only outgoing messages. An outgoing message is defined as a message whose originator is the agent ID of the message store, and whose destination is not the agent ID of the message store.

See also

- "GetQueueDepth method" on page 244

StatusCodes enumeration

This enumeration defines a set of codes for the status of a message.

Visual Basic syntax

```
Public Enum StatusCodes
```

C# syntax

```
public enum StatusCodes
```

Members

Member name	Description	Value
CAN-CELED	The message has been canceled. This code applies to the MessageProperties.STATUS.	40
EXPIRED	The message has expired because it was not received before its expiration time had passed. This code applies to the MessageProperties.STATUS.	30
FINAL	This constant is used to determine if a message has achieved a final state. A message has achieved a final state if and only if its status is greater than this constant. This code applies to the MessageProperties.STATUS.	20
LOCAL	The message is addressed to the local message store and will not be transmitted to the server. This code applies to the MessageProperties.TRANSMISSION_STATUS.	2

Member name	Description	Value
PENDING	The message has been sent but not received and acknowledged. This code applies to the MessageProperties.STATUS.	1
RE-CEIVED	The message has been received and acknowledged by the receiver. This code applies to the MessageProperties.STATUS.	60
RECEIV-ING	The message is in the process of being received, or it was received but not ac-knowledged. This code applies to the MessageProperties.STATUS.	10
TRANS-MITTED	The message has been transmitted to the server. This code applies to the MessageProperties.TRANSMISSION_STATUS.	1
TRANS-MITTING	The message is in the process of being transmitted to the server. This code applies to the MessageProperties.TRANSMISSION_STATUS.	3
UNREC-EIVABLE	The message has been marked as unreceivable. The message is either malformed, or there were too many failed attempts to deliv-er it. This code applies to the MessageProperties.STATUS.	50
UN-TRANS-MITTED	The message has not been transmitted to the server. This code applies to the MessageProperties.TRANSMISSION_STATUS.	0

QAnywhere .NET API reference for web services

Namespace
`iAnywhere.QAnywhere.WS`

WSBase class

This is the base class for the main web service proxy class generated by the mobile web service compiler.

Visual Basic syntax

```
Public Class WSBase
```

C# syntax

```
public class WSBase
```

Members

All members of WSBase class, including all inherited members.

Name	Description
"WSBase constructor"	Constructs a WSBase instance with the properties specified by a configuration property file.
"ClearRequestProperties method"	Clears all request properties that have been set for this WSBase.
"GetResult method"	Gets a WSResult object that represents the results of a web service request.
"GetServiceID method"	Gets the service ID for this instance of WSBase.
"SetListener method"	Sets a listener for the results of a given web service request.
"SetProperty method"	Sets a configuration property for this instance of WSBase.
"SetQAManager method"	Sets the QAManagerBase that is used by this web service client to do web service requests.
"SetRequestProperty method"	Sets a request property for webservice requests made by this WSBase.
"SetServiceID method"	Sets a user-defined ID for this instance of WSBase.

WSBase constructor

Constructs a WSBase instance with the properties specified by a configuration property file.

Overload list

Name	Description
"WSBase() constructor"	Constructs a WSBase instance with default properties.
"WSBase(string) constructor"	Constructs a WSBase instance with the properties specified by a configuration property file.

WSBase() constructor

Constructs a WSBase instance with default properties.

Visual Basic syntax

```
Public Sub New()
```

C# syntax

```
public WSBase()
```

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem constructing the WSBase.

WSBase(string) constructor

Constructs a WSBase instance with the properties specified by a configuration property file.

Visual Basic syntax

```
Public Sub New(ByVal iniFile As String)
```

C# syntax

```
public WSBase(string iniFile)
```

Parameters

- **iniFile** A file containing configuration properties.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem constructing the WSBase.

Remarks

Valid configuration properties are:

LOG_FILE a file to which to log runtime information.

LOG_LEVEL a value between 0 and 6 that controls the verbosity of information logged, with 6 being the highest verbosity.

WS_CONNECTOR_ADDRESS the address of the web service connector in the MobiLink server.

The default WS_CONNECTOR_ADDRESS is ianywhere.connector.webservices\\.

ClearRequestProperties method

Clears all request properties that have been set for this WSBase.

Visual Basic syntax

```
Public Sub ClearRequestProperties()
```

C# syntax

```
public void ClearRequestProperties()
```

GetResult method

Gets a WSResult object that represents the results of a web service request.

Visual Basic syntax

```
Public Function GetResult(ByVal requestID As String) As WSResult
```

C# syntax

```
public WSResult GetResult(String requestID)
```

Parameters

- **requestID** The ID of the web service request.

Returns

A WSResult instance representing the results of the web service request.

See also

- "WSStatus enumeration" on page 353

GetServiceID method

Gets the service ID for this instance of WSBase.

Visual Basic syntax

```
Public Function GetServiceID() As String
```

C# syntax

```
public String GetServiceID()
```

Returns

The service ID.

SetListener method

Sets a listener for the results of a given web service request.

Overload list

Name	Description
"SetListener(string, WSListener) method"	Sets a listener for the results of a given web service request.
"SetListener(WSListener) method"	Sets a listener for the results of all web service requests made by this instance of WSBase.

SetListener(string, WSListener) method

Sets a listener for the results of a given web service request.

Visual Basic syntax

```
Public Sub SetListener(
    ByVal requestID As String,
    ByVal listener As WSListener
)
```

C# syntax

```
public void SetListener(string requestID, WSListener listener)
```

Parameters

- **requestID** The ID of the web service request to which to listen for results.
- **listener** The listener object that gets called when the result of the given web service request is available.

Remarks

Listeners are typically used to get results of the asyncXYZ methods of the service.

To remove a listener, call SetListener with null as the listener.

Note
This method replaces the listener set by any previous call to SetListener.

SetListener(WSListener) method

Sets a listener for the results of all web service requests made by this instance of WSBase.

Visual Basic syntax

```
Public Sub SetListener(ByVal listener As WSListener)
```

C# syntax

```
public void SetListener(WSListener listener)
```

Parameters

- **listener** The listener object that gets called when the result of a web service request is available.

Remarks

Listeners are typically used to get results of the asyncXYZ methods of the service.

To remove a listener, call SetListener with null as the listener.

> **Note**
> This method replaces the listener set by any previous call to SetListener.

SetProperty method

Sets a configuration property for this instance of WSBase.

Visual Basic syntax

```
Public Sub SetProperty(ByVal property As String, ByVal val As String)
```

C# syntax

```
public void SetProperty(string property, string val)
```

Parameters

- **property** The property name to set.
- **val** The property value.

Remarks

Configuration properties must be set before any asynchronous or synchronous web service request is made. This method has no effect if it is called after a web service request has been made.

Valid configuration properties are:

LOG_FILE a file to which to log runtime information.

LOG_LEVEL a value between 0 and 6 that controls the verbosity of information logged, with 6 being the highest verbosity.

WS_CONNECTOR_ADDRESS the address of the web service connector in the MobiLink server. The default is: ianywhere.connector.webservices\\.

SetQAManager method

Sets the QAManagerBase that is used by this web service client to do web service requests.

Visual Basic syntax

```
Public Sub SetQAManager(ByVal mgr As QAManagerBase)
```

C# syntax

```
public void SetQAManager(QAManagerBase mgr)
```

Parameters

- **mgr** The QAManagerBase to use.

Remarks

Note
If you use an EXPLICIT_ACKNOWLEDGEMENT QAManager, you can acknowledge the result of an asynchronous web service request by calling the acknowledge() method of WSResult. The result of a synchronous web service request is automatically acknowledged, even in the case of an EXPLICIT_ACKNOWLEDGEMENT QAManager. If you use an IMPLICIT_ACKNOWLEDGEMENT QAManager, the result of any web service request is acknowledged automatically.

SetRequestProperty method

Sets a request property for webservice requests made by this WSBase.

Visual Basic syntax

```
Public Sub SetRequestProperty(
    ByVal name As String,
    ByVal value As Object
)
```

C# syntax

```
public void SetRequestProperty(string name, Object value)
```

Parameters

- **name** The property name to set.
- **value** The property value.

Remarks

A request property is set on each QAMessage that is sent by this WSBase, until the property is cleared. A request property is cleared by setting it to a null value. The type of the message property is determined by the class of the value parameter. For example, if value is an instance of Int32, then SetIntProperty is used to set the property on the QAMessage.

SetServiceID method

Sets a user-defined ID for this instance of WSBase.

Visual Basic syntax

```
Public Sub SetServiceID(ByVal serviceID As String)
```

C# syntax

```
public void SetServiceID(String serviceID)
```

Parameters

- **serviceID** The service ID.

Remarks

The service ID should be set to a value unique to this instance of WSBase. It is used internally to form a queue name for sending and receiving web service requests. Therefore, the service ID should be persisted between application sessions, in order to retrieve results of web service requests made in a previous session.

WSException class

This class represents an exception that occurred during processing of a web service request.

Visual Basic syntax

```
Public Class WSException Inherits System.Exception
```

C# syntax

```
public class WSException : System.Exception
```

Base classes

- System.Exception

Derived classes

- "WSFaultException class" on page 317

Members

All members of WSException class, including all inherited members.

Name	Description
"WSException constructor"	Constructs a new exception with the specified error message.
GetBaseException method (Inherited from System.Exception)	When overridden in a derived class, returns the System.Exception that is the root cause of one or more subsequent exceptions.

Name	Description
GetObjectData method (Inherited from System.Exception)	When overridden in a derived class, sets the System.Runtime.Serialization.SerializationInfo with information about the exception.
GetType method (Inherited from System.Exception)	Gets the runtime type of the current instance.
ToString method (Inherited from System.Exception)	Creates and returns a string representation of the current exception.
Data property (Inherited from System.Exception)	Gets a collection of key/value pairs that provide additional user-defined information about the exception.
"ErrorCode property"	The error code associated with this exception.
HelpLink property (Inherited from System.Exception)	Gets or sets a link to the help file associated with this exception.
HResult property (Inherited from System.Exception)	Gets or sets HRESULT, a coded numerical value that is assigned to a specific exception.
InnerException property (Inherited from System.Exception)	Gets the System.Exception instance that caused the current exception.
Message property (Inherited from System.Exception)	Gets a message that describes the current exception.
Source property (Inherited from System.Exception)	Gets or sets the name of the application or the object that causes the error.
StackTrace property (Inherited from System.Exception)	Gets a string representation of the frames on the call stack at the time the current exception was thrown.
TargetSite property (Inherited from System.Exception)	Gets the method that throws the current exception.
"WS_STATUS_HTTP_ERROR field"	Error code indicating that there was an error in the web service HTTP request made by the web services connector.

Name	Description
"WS_STATUS_HTTP_OK field"	Error code indicating that the webservice HTTP request by the web services connector was successful.
"WS_STATUS_HTTP_RETRIES_EXCEEDED field"	Error code indicating that the number of HTTP retries was exceeded the web services connector.
"WS_STATUS_SOAP_PARSE_ERROR field"	Error code indicating that there was an error in the web services runtime or in the webservices connector in parsing a SOAP response or request.

WSException constructor

Constructs a new exception with the specified error message.

Overload list

Name	Description
"WSException(Exception) constructor"	Constructs a new exception.
"WSException(string) constructor"	Constructs a new exception with the specified error message.
"WSException(string, int) constructor"	Constructs a new exception with the specified error message and error code.

WSException(Exception) constructor

Constructs a new exception.

Visual Basic syntax

```
Public Sub New(ByVal ex As Exception)
```

C# syntax

```
public WSException(Exception ex)
```

Parameters

- **ex** The exception.

WSException(string) constructor

Constructs a new exception with the specified error message.

Visual Basic syntax

```
Public Sub New(ByVal msg As String)
```

C# syntax

```
public WSException(string msg)
```

Parameters

- **msg** The error message.

WSException(string, int) constructor

Constructs a new exception with the specified error message and error code.

Visual Basic syntax

```
Public Sub New(ByVal msg As String, ByVal errorCode As Integer)
```

C# syntax

```
public WSException(string msg, int errorCode)
```

Parameters

- **msg** The error message.
- **errorCode** The error code.

ErrorCode property

The error code associated with this exception.

Visual Basic syntax

```
Public Property ErrorCode As Integer
```

C# syntax

```
public int ErrorCode {get;set;}
```

WS_STATUS_HTTP_ERROR field

Error code indicating that there was an error in the web service HTTP request made by the web services connector.

Visual Basic syntax

```
Public Shared WS_STATUS_HTTP_ERROR As Integer
```

C# syntax

```
public static int WS_STATUS_HTTP_ERROR;
```

WS_STATUS_HTTP_OK field

Error code indicating that the webservice HTTP request by the web services connector was successful.

Visual Basic syntax

```
Public Shared WS_STATUS_HTTP_OK As Integer
```

C# syntax

```
public static int WS_STATUS_HTTP_OK;
```

WS_STATUS_HTTP_RETRIES_EXCEEDED field

Error code indicating that the number of HTTP retries was exceeded the web services connector.

Visual Basic syntax

```
Public Shared WS_STATUS_HTTP_RETRIES_EXCEEDED As Integer
```

C# syntax

```
public static int WS_STATUS_HTTP_RETRIES_EXCEEDED;
```

WS_STATUS_SOAP_PARSE_ERROR field

Error code indicating that there was an error in the web services runtime or in the webservices connector in parsing a SOAP response or request.

Visual Basic syntax

```
Public Shared WS_STATUS_SOAP_PARSE_ERROR As Integer
```

C# syntax

```
public static int WS_STATUS_SOAP_PARSE_ERROR;
```

WSFaultException class

This class represents a SOAP Fault exception from the web service connector.

Visual Basic syntax

```
Public Class WSFaultException Inherits WSException
```

C# syntax

```
public class WSFaultException : WSException
```

Base classes

- “WSException class” on page 313

Members

All members of WSFaultException class, including all inherited members.

Name	Description
“WSFaultException constructor”	Constructs a new exception with the specified error message.
GetBaseException method (Inherited from System.Exception)	When overridden in a derived class, returns the System.Exception that is the root cause of one or more subsequent exceptions.
GetObjectData method (Inherited from System.Exception)	When overridden in a derived class, sets the System.Runtime.Serialization.SerializationInfo with information about the exception.
GetType method (Inherited from System.Exception)	Gets the runtime type of the current instance.
ToString method (Inherited from System.Exception)	Creates and returns a string representation of the current exception.
“WSException constructor”	Constructs a new exception with the specified error message.
Data property (Inherited from System.Exception)	Gets a collection of key/value pairs that provide additional user-defined information about the exception.
“ErrorCode property”	The error code associated with this exception.
HelpLink property (Inherited from System.Exception)	Gets or sets a link to the help file associated with this exception.

Name	Description
HResult property (Inherited from System.Exception)	Gets or sets HRESULT, a coded numerical value that is assigned to a specific exception.
InnerException property (Inherited from System.Exception)	Gets the System.Exception instance that caused the current exception.
Message property (Inherited from System.Exception)	Gets a message that describes the current exception.
Source property (Inherited from System.Exception)	Gets or sets the name of the application or the object that causes the error.
StackTrace property (Inherited from System.Exception)	Gets a string representation of the frames on the call stack at the time the current exception was thrown.
TargetSite property (Inherited from System.Exception)	Gets the method that throws the current exception.
"WS_STATUS_HTTP_ERROR field"	Error code indicating that there was an error in the web service HTTP request made by the web services connector.
"WS_STATUS_HTTP_OK field"	Error code indicating that the webservice HTTP request by the web services connector was successful.
"WS_STATUS_HTTP_RETRIES_EXCEEDED field"	Error code indicating that the number of HTTP retries was exceeded the web services connector.
"WS_STATUS_SOAP_PARSE_ERROR field"	Error code indicating that there was an error in the web services runtime or in the webservices connector in parsing a SOAP response or request.

WSFaultException constructor

Constructs a new exception with the specified error message.

Visual Basic syntax

```
Public Sub New(ByVal msg As String)
```

C# syntax

```
public WSFaultException(string msg)
```

Parameters

- **msg** The error message.

WSListener interface

This class represents a listener for results of web service requests.

Visual Basic syntax

```
Public Interface WSListener
```

C# syntax

```
public interface WSListener
```

Members

All members of WSListener interface, including all inherited members.

Name	Description
"OnException method"	Called when an exception occurs during processing of the result of an asynchronous web service request.
"OnResult method"	Called with the result of an asynchronous web service request.

OnException method

Called when an exception occurs during processing of the result of an asynchronous web service request.

Visual Basic syntax

```
Public Sub OnException(
    ByVal e As WSException,
    ByVal wsResult As WSResult
)
```

C# syntax

```
public void OnException(WSException e, WSResult wsResult)
```

Parameters

- **e** The WSException that occurred during processing of the result.
- **wsResult** A WSResult, from which the request ID may be obtained. Values of this WSResult are not defined.

OnResult method

Called with the result of an asynchronous web service request.

Visual Basic syntax

```
Public Sub OnResult(ByVal wsResult As WSResult)
```

C# syntax

```
public void OnResult(WSResult wsResult)
```

Parameters

- **wsResult** The WSResult describing the result of a web service request.

WSResult class

This class represents the results of a web service request.

Visual Basic syntax

```
Public Class WSResult
```

C# syntax

```
public class WSResult
```

Members

All members of WSResult class, including all inherited members.

Name	Description
"Acknowledge method"	Acknowledges that this WSResult has been processed.
"GetArrayValue method"	Gets an array of complex types value from this WSResult.
"GetBoolArrayValue method"	Gets an array of bool values from this WSResult.
"GetBooleanArrayValue method"	Gets an array of Boolean values from this WSResult.
"GetBooleanValue method"	Gets a Boolean value from this WSResult.
"GetBoolValue method"	Gets a bool value from this WSResult.
"GetByteArrayValue method"	Gets an array of byte values from this WSResult.
"GetByteValue method"	Gets a byte value from this WSResult.
"GetCharArrayValue method"	Gets an array of char values from this WSResult.

Name	Description
“GetCharValue method”	Gets a char value from this WSResult.
“GetDecimalArrayValue method”	Gets an array of decimal values from this WSResult.
“GetDecimalValue method”	Gets a decimal value from this WSResult.
“GetDoubleArrayValue method”	Gets an array of double values from this WSResult.
“GetDoubleValue method”	Gets a double value from this WSResult.
“GetErrorMessage method”	Gets the error message.
“GetFloatArrayValue method”	Gets an array of float values from this WSResult.
“GetFloatValue method”	Gets a float value from this WSResult.
“GetInt16ArrayValue method”	Gets an array of Int16 values from this WSResult.
“GetInt16Value method”	Gets an Int16 value from this WSResult.
“GetInt32ArrayValue method”	Gets an array of Int32 values from this WSResult.
“GetInt32Value method”	Gets an Int32 value from this WSResult.
“GetInt64ArrayValue method”	Gets an array of Int64 values from this WSResult.
“GetInt64Value method”	Gets an Int64 value from this WSResult.
“GetIntArrayValue method”	Gets an array of int values from this WSResult.
“GetIntValue method”	Gets an int value from this WSResult.
“GetLongArrayValue method”	Gets an array of long values from this WSResult.
“GetLongValue method”	Gets a long value from this WSResult.
“GetNullableBoolArrayValue method”	Gets an array of bool values from this WSResult.
“GetNullableBoolValue method”	Gets a bool value from this WSResult.
“GetNullableDecimalArrayValue method”	Gets an array of NullableDecimal values from this WSResult.
“GetNullableDecimalValue method”	Gets a NullableDecimal value from this WSResult.
“GetNullableDoubleArrayValue method”	Gets an array of double values from this WSResult.
“GetNullableDoubleValue method”	Gets a double value from this WSResult.

Name	Description
“GetNullableFloatArrayValue method”	Gets an array of float values from this WSResult.
“GetNullableFloatValue method”	Gets a float value from this WSResult.
“GetNullableIntArrayValue method”	Gets an array of int values from this WSResult.
“GetNullableIntValue method”	Gets an int value from this WSResult.
“GetNullableLongArrayValue method”	Gets an array of long values from this WSResult.
“GetNullableLongValue method”	Gets an Int64 value from this WSResult.
“GetNullableSByteArrayValue method”	Gets an array of byte values from this WSResult.
“GetNullableSByteValue method”	Gets a byte value from this WSResult.
“GetNullableShortArrayValue method”	Gets an array of short values from this WSResult.
“GetNullableShortValue method”	Gets a short value from this WSResult.
“GetObjectArrayValue method”	Gets an array of Object values from this WSResult.
“GetObjectValue method”	Gets an object value from this WSResult.
“GetRequestID method”	Gets the request ID that this WSResult represents.
“GetSByteArrayValue method”	Gets an array of sbyte values from this WSResult.
“GetSByteValue method”	Gets an sbyte value from this WSResult.
“GetShortArrayValue method”	Gets an array of short values from this WSResult.
“GetShortValue method”	Gets a short value from this WSResult.
“GetSingleArrayValue method”	Gets an array of Single values from this WSResult.
“GetSingleValue method”	Gets a Single value from this WSResult.
“GetStatus method”	Gets the status of this WSResult.
“GetStringArrayValue method”	Gets an array of string values from this WSResult.
“GetStringValue method”	Gets a string value from this WSResult.
“GetUIntArrayValue method”	Gets an array of unsigned int values from this WSResult.
“GetUIntValue method”	Gets a unsigned int value from this WSResult.

Name	Description
“GetULongArrayValue method”	Gets an array of unsigned long values from this WSResult.
“GetULongValue method”	Gets a unsigned long value from this WSResult.
“GetUShortArrayValue method”	Gets an array of unsigned short values from this WSResult.
“GetUShortValue method”	Gets a unsigned short value from this WSResult.
“GetValue method”	Gets the value of a complex type from this WSResult.
“SetLogger method”	Turns debug on or off.

Remarks

A WSResult object is obtained in one of three ways:

- It is passed to the WSListener.onResult.
- It is returned by an asyncXYZ method of the service proxy generated by the compiler.
- It is obtained by calling WSBase.getResult with a specific request ID.

Acknowledge method

Acknowledges that this WSResult has been processed.

Visual Basic syntax

```
Public Sub Acknowledge()
```

C# syntax

```
public void Acknowledge()
```

Remarks

This method is only useful when an EXPLICIT_ACKNOWLEDGEMENT QAManager is being used.

GetArrayValue method

Gets an array of complex types value from this WSResult.

Visual Basic syntax

```
Public Function GetArrayValue(
    ByVal parentName As String
) As WSSerializable()
```

C# syntax

```
public WSSerializable[] GetArrayValue(string parentName)
```

Parameters

- **parentName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetBoolArrayValue method

Gets an array of bool values from this WSResult.

Visual Basic syntax

```
Public Function GetBoolArrayValue(
    ByVal elementName As String
) As Boolean()
```

C# syntax

```
public bool[] GetBoolArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetBooleanArrayValue method

Gets an array of Boolean values from this WSResult.

Visual Basic syntax

```
Public Function GetBooleanArrayValue(
    ByVal elementName As String
) As System.Boolean()
```

C# syntax

```
public System.Boolean[] GetBooleanArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetBooleanValue method

Gets a Boolean value from this WSResult.

Visual Basic syntax

```
Public Function GetBooleanValue(
    ByVal childName As String
) As System.Boolean
```

C# syntax

```
public System.Boolean GetBooleanValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetBoolValue method

Gets a bool value from this WSResult.

Visual Basic syntax

```
Public Function GetBoolValue(ByVal childName As String) As Boolean
```

C# syntax

```
public bool GetBoolValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetByteArrayValue method

Gets an array of byte values from this WSResult.

Visual Basic syntax

```
Public Function GetByteArrayValue(ByVal elementName As String) As Byte()
```

C# syntax

```
public byte[] GetByteArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetByteValue method

Gets a byte value from this WSResult.

Visual Basic syntax

```
Public Function GetByteValue(ByVal childName As String) As Byte
```

C# syntax

```
public byte GetByteValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetCharArrayValue method

Gets an array of char values from this WSResult.

Visual Basic syntax

```
Public Function GetCharArrayValue(ByVal elementName As String) As Char()
```

C# syntax

```
public char[] GetCharArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetCharValue method

Gets a char value from this WSResult.

Visual Basic syntax

```
Public Function GetCharValue(ByVal childName As String) As Char
```

C# syntax

```
public char GetCharValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetDecimalArrayValue method

Gets an array of decimal values from this WSResult.

Visual Basic syntax

```
Public Function GetDecimalArrayValue(
    ByVal elementName As String
) As Decimal()
```

C# syntax

```
public decimal[] GetDecimalArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetDecimalValue method

Gets a decimal value from this WSResult.

Visual Basic syntax

```
Public Function GetDecimalValue(ByVal childName As String) As Decimal
```

C# syntax

```
public decimal GetDecimalValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetDoubleArrayValue method

Gets an array of double values from this WSResult.

Visual Basic syntax

```
Public Function GetDoubleArrayValue(
    ByVal elementName As String
) As Double()
```

C# syntax

```
public double[] GetDoubleArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetDoubleValue method

Gets a double value from this WSResult.

Visual Basic syntax

```
Public Function GetDoubleValue(ByVal childName As String) As Double
```

C# syntax

```
public double GetDoubleValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetErrorMessage method

Gets the error message.

Visual Basic syntax

```
Public Function GetErrorMessage() As String
```

C# syntax

```
public string GetErrorMessage()
```

Returns

The error message.

GetFloatArrayValue method

Gets an array of float values from this WSResult.

Visual Basic syntax

```
Public Function GetFloatArrayValue(
    ByVal elementName As String
) As Single()
```

C# syntax

```
public float[] GetFloatArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetFloatValue method

Gets a float value from this WSResult.

Visual Basic syntax

```
Public Function GetFloatValue(ByVal childName As String) As Single
```

C# syntax

```
public float GetFloatValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetInt16ArrayValue method

Gets an array of Int16 values from this WSResult.

Visual Basic syntax

```
Public Function GetInt16ArrayValue(
    ByVal elementName As String
) As System.Int16()
```

C# syntax

```
public System.Int16[] GetInt16ArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetInt16Value method

Gets an Int16 value from this WSResult.

Visual Basic syntax

```
Public Function GetInt16Value(ByVal childName As String) As System.Int16
```

C# syntax

```
public System.Int16 GetInt16Value(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetInt32ArrayValue method

Gets an array of Int32 values from this WSResult.

Visual Basic syntax

```
Public Function GetInt32ArrayValue(
    ByVal elementName As String
) As System.Int32()
```

C# syntax

```
public System.Int32[] GetInt32ArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetInt32Value method

Gets an Int32 value from this WSResult.

Visual Basic syntax

```
Public Function GetInt32Value(ByVal childName As String) As System.Int32
```

C# syntax

```
public System.Int32 GetInt32Value(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetInt64ArrayValue method

Gets an array of Int64 values from this WSResult.

Visual Basic syntax

```
Public Function GetInt64ArrayValue(
    ByVal elementName As String
) As System.Int64()
```

C# syntax

```
public System.Int64[] GetInt64ArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetInt64Value method

Gets an Int64 value from this WSResult.

Visual Basic syntax

```
Public Function GetInt64Value(ByVal childName As String) As System.Int64
```

C# syntax

```
public System.Int64 GetInt64Value(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetIntArrayValue method

Gets an array of int values from this WSResult.

Visual Basic syntax

```
Public Function GetIntArrayValue(
    ByVal elementName As String
) As Integer()
```

C# syntax

```
public int[] GetIntArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetIntValue method

Gets an int value from this WSResult.

Visual Basic syntax

```
Public Function GetIntValue(ByVal childName As String) As Integer
```

C# syntax

```
public int GetIntValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetLongArrayValue method

Gets an array of long values from this WSResult.

Visual Basic syntax

```
Public Function GetLongArrayValue(ByVal elementName As String) As Long()
```

C# syntax

```
public long[] GetLongArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetLongValue method

Gets a long value from this WSResult.

Visual Basic syntax

```
Public Function GetLongValue(ByVal childName As String) As Long
```

C# syntax

```
public long GetLongValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableBoolArrayValue method

Gets an array of bool values from this WSResult.

Visual Basic syntax

```
Public Function GetNullableBoolArrayValue(
    ByVal elementName As String
) As NullableBool()
```

C# syntax

```
public NullableBool[] GetNullableBoolArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableBoolValue method

Gets a bool value from this WSResult.

Visual Basic syntax

```
Public Function GetNullableBoolValue(
    ByVal childName As String
) As NullableBool
```

C# syntax

```
public NullableBool GetNullableBoolValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableDecimalArrayValue method

Gets an array of NullableDecimal values from this WSResult.

Visual Basic syntax

```
Public Function GetNullableDecimalArrayValue(
    ByVal elementName As String
) As NullableDecimal()
```

C# syntax

```
public NullableDecimal[] GetNullableDecimalArrayValue(
    string elementName
)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableDecimalValue method

Gets a NullableDecimal value from this WSResult.

Visual Basic syntax

```
Public Function GetNullableDecimalValue(
    ByVal childName As String
) As NullableDecimal
```

C# syntax

```
public NullableDecimal GetNullableDecimalValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableDoubleArrayValue method

Gets an array of double values from this WSResult.

Visual Basic syntax

```
Public Function GetNullableDoubleArrayValue(
    ByVal elementName As String
) As NullableDouble()
```

C# syntax

```
public NullableDouble[] GetNullableDoubleArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableDoubleValue method

Gets a double value from this WSResult.

Visual Basic syntax

```
Public Function GetNullableDoubleValue(
    ByVal childName As String
) As NullableDouble
```

C# syntax

```
public NullableDouble GetNullableDoubleValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableFloatArrayValue method

Gets an array of float values from this WSResult.

Visual Basic syntax

```
Public Function GetNullableFloatArrayValue(
    ByVal elementName As String
) As NullableFloat()
```

C# syntax

```
public NullableFloat[] GetNullableFloatArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableFloatValue method

Gets a float value from this WSResult.

Visual Basic syntax

```
Public Function GetNullableFloatValue(
    ByVal childName As String
) As NullableFloat
```

C# syntax

```
public NullableFloat GetNullableFloatValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableIntArrayValue method

Gets an array of int values from this WSResult.

Visual Basic syntax

```
Public Function GetNullableIntArrayValue(
    ByVal elementName As String
) As NullableInt()
```

C# syntax

```
public NullableInt[] GetNullableIntArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableIntValue method

Gets an int value from this WSResult.

Visual Basic syntax

```
Public Function GetNullableIntValue(
    ByVal childName As String
) As NullableInt
```

C# syntax

```
public NullableInt GetNullableIntValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableLongArrayValue method

Gets an array of long values from this WSResult.

Visual Basic syntax

```
Public Function GetNullableLongArrayValue(
    ByVal elementName As String
) As NullableLong()
```

C# syntax

```
public NullableLong[] GetNullableLongArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableLongValue method

Gets an Int64 value from this WSResult.

Visual Basic syntax

```
Public Function GetNullableLongValue(
    ByVal childName As String
) As NullableLong
```

C# syntax

```
public NullableLong GetNullableLongValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableSByteArrayValue method

Gets an array of byte values from this WSResult.

Visual Basic syntax

```
Public Function GetNullableSByteArrayValue(
    ByVal elementName As String
) As NullableSByte()
```

C# syntax

```
public NullableSByte[] GetNullableSByteArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableSByteValue method

Gets a byte value from this WSResult.

Visual Basic syntax

```
Public Function GetNullableSByteValue(
    ByVal childName As String
) As NullableSByte
```

C# syntax

```
public NullableSByte GetNullableSByteValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableShortArrayValue method

Gets an array of short values from this WSResult.

Visual Basic syntax

```
Public Function GetNullableShortArrayValue(
    ByVal elementName As String
) As NullableShort()
```

C# syntax

```
public NullableShort[] GetNullableShortArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetNullableShortValue method

Gets a short value from this WSResult.

Visual Basic syntax

```
Public Function GetNullableShortValue(
    ByVal childName As String
) As NullableShort
```

C# syntax

```
public NullableShort GetNullableShortValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetObjectArrayValue method

Gets an array of Object values from this WSResult.

Visual Basic syntax

```
Public Function GetObjectArrayValue(
    ByVal elementName As String
) As System.Object()
```

C# syntax

```
public System.Object[] GetObjectArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetObjectValue method

Gets an object value from this WSResult.

Visual Basic syntax

```
Public Function GetObjectValue(
    ByVal childName As String
) As System.Object
```

C# syntax

```
public System.Object GetObjectValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetRequestID method

Gets the request ID that this WSResult represents.

Visual Basic syntax

```
Public Function GetRequestID() As String
```

C# syntax

```
public string GetRequestID()
```

Returns

The request ID.

Remarks

This request ID should be persisted between runs of the application if it is desired to obtain a WSResult corresponding to a web service request in a run of the application different from when the request was made.

GetSByteArrayValue method

Gets an array of sbyte values from this WSResult.

Visual Basic syntax

```
Public Function GetSByteArrayValue(
    ByVal elementName As String
) As SByte()
```

C# syntax

```
public sbyte[] GetSByteArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetSByteValue method

Gets an sbyte value from this WSResult.

Visual Basic syntax

```
Public Function GetSByteValue(ByVal childName As String) As SByte
```

C# syntax

```
public sbyte GetSByteValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetShortArrayValue method

Gets an array of short values from this WSResult.

Visual Basic syntax

```
Public Function GetShortArrayValue(
    ByVal elementName As String
) As Short()
```

C# syntax

```
public short[] GetShortArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetShortValue method

Gets a short value from this WSResult.

Visual Basic syntax

```
Public Function GetShortValue(ByVal childName As String) As Short
```

C# syntax

```
public short GetShortValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetSingleArrayValue method

Gets an array of Single values from this WSResult.

Visual Basic syntax

```
Public Function GetSingleArrayValue(
    ByVal elementName As String
) As System.Single()
```

C# syntax

```
public System.Single[] GetSingleArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetSingleValue method

Gets a Single value from this WSResult.

Visual Basic syntax

```
Public Function GetSingleValue(
    ByVal childName As String
) As System.Single
```

C# syntax

```
public System.Single GetSingleValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetStatus method

Gets the status of this WSResult.

Visual Basic syntax

```
Public Function GetStatus() As WSStatus
```

C# syntax

```
public WSStatus GetStatus()
```

Returns

The status code.

See also

- "WSStatus enumeration" on page 353

GetStringArrayValue method

Gets an array of string values from this WSResult.

Visual Basic syntax

```
Public Function GetStringArrayValue(
    ByVal elementName As String
) As String()
```

C# syntax

```
public string[] GetStringArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetStringValue method

Gets a string value from this WSResult.

Visual Basic syntax

```
Public Function GetStringValue(ByVal childName As String) As String
```

C# syntax

```
public string GetStringValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetUIntArrayValue method

Gets an array of unsigned int values from this WSResult.

Visual Basic syntax

```
Public Function GetUIntArrayValue(
    ByVal elementName As String
) As UInteger()
```

C# syntax

```
public uint[] GetUIntArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetUIntValue method

Gets a unsigned int value from this WSResult.

Visual Basic syntax

```
Public Function GetUIntValue(ByVal childName As String) As UInteger
```

C# syntax

```
public uint GetUIntValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetULongArrayValue method

Gets an array of unsigned long values from this WSResult.

Visual Basic syntax

```
Public Function GetULongArrayValue(
    ByVal elementName As String
) As ULong()
```

C# syntax

```
public ulong[] GetULongArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetULongValue method

Gets a unsigned long value from this WSResult.

Visual Basic syntax

```
Public Function GetULongValue(ByVal childName As String) As ULong
```

C# syntax

```
public ulong GetULongValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetUShortArrayValue method

Gets an array of unsigned short values from this WSResult.

Visual Basic syntax

```
Public Function GetUShortArrayValue(
    ByVal elementName As String
) As UShort()
```

C# syntax

```
public ushort[] GetUShortArrayValue(string elementName)
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetUShortValue method

Gets a unsigned short value from this WSResult.

Visual Basic syntax

```
Public Function GetUShortValue(ByVal childName As String) As UShort
```

C# syntax

```
public ushort GetUShortValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

GetValue method

Gets the value of a complex type from this WSResult.

Visual Basic syntax

```
Public Function GetValue(ByVal childName As String) As Object
```

C# syntax

```
public object GetValue(string childName)
```

Parameters

- **childName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **iAnywhere.QAnywhere.WS.WSException** Thrown if there is a problem getting the value.

SetLogger method

Turns debug on or off.

Visual Basic syntax

```
Public Sub SetLogger(ByVal wsLogger As WSLogger)
```

C# syntax

```
public void SetLogger(WSLogger wsLogger)
```

WSStatus enumeration

This class defines codes for the status of a web service request.

Visual Basic syntax

```
Public Enum WSStatus
```

C# syntax

```
public enum WSStatus
```

Members

Member name	Description
STATUS_SUCCESS	The request was successful.
STATUS_ERROR	There was an error processing the request.
STATUS_QUEUED	The request has been queued for delivery to the server. The final status of the request is not known yet.

Member name	Description
STATUS_RESULT_AVAILABLE	The result of the request is available.

QAnywhere C++ API reference for clients

The QAnywhere C++ API does not support UltraLite databases.

Header file

```
qa.hpp
```

AcknowledgementMode class

Indicates how messages should be acknowledged by QAnywhere client applications.

Syntax

```
public class AcknowledgementMode
```

Members

All members of AcknowledgementMode class, including all inherited members.

Name	Description
"EXPLICIT_ACKNOWLEDGEMENT variable"	Indicates that received messages are acknowledged using one of the QAManager acknowledge methods.
"IMPLICIT_ACKNOWLEDGEMENT variable"	Indicates that all messages are acknowledged as soon as they are received by a client application.
"TRANSACTIONAL variable"	Indicates that messages are only acknowledged as part of the ongoing transaction.

Remarks

The IMPLICIT_ACKNOWLEDGEMENT and EXPLICIT_ACKNOWLEDGEMENT modes are assigned to a QAManager instance using the QAManager::open() method. The TRANSACTIONAL mode is implicitly assigned to QATransactionalManager instances.

For more information, see "Initializing a QAnywhere API" on page 52.

In implicit acknowledgement mode, messages are acknowledged as soon as they are received by a client application. In explicit acknowledgement mode, you must call one of the QAManager acknowledgement methods. In transactional mode, you must call the QATransactionalManager::commit() method to acknowledge all outstanding messages. The server propagates all status changes from client to client.

For more information, see “Receiving messages synchronously” on page 68 and “Receiving messages asynchronously” on page 70.

For transactional messaging, use the QATransactionalManager. In this case, you use the QATransactionalManager::commit method to acknowledge messages belonging to a transaction.

You can determine the mode of a QAManagerBase instance using the QAManagerBase::Mode property.

See also

- “QAManager class” on page 387
- “QATransactionalManager class” on page 457
- “QAManagerBase class” on page 394

EXPLICIT_ACKNOWLEDGEMENT variable

Indicates that received messages are acknowledged using one of the QAManager acknowledge methods.

Syntax

```
public static const qa_short EXPLICIT_ACKNOWLEDGEMENT;
```

IMPLICIT_ACKNOWLEDGEMENT variable

Indicates that all messages are acknowledged as soon as they are received by a client application.

Syntax

```
public static const qa_short IMPLICIT_ACKNOWLEDGEMENT;
```

Remarks

If you receive messages synchronously, messages are acknowledged as soon as the QAManagerBase::getMessage method returns. If you receive messages asynchronously, the message is acknowledged as soon as the event handling function returns.

TRANSACTIONAL variable

Indicates that messages are only acknowledged as part of the ongoing transaction.

Syntax

```
public static const qa_short TRANSACTIONAL;
```

Remarks

This mode is automatically assigned to QATransactionalManager instances.

MessageProperties class

Provides fields storing standard message property names.

Syntax

```
public class MessageProperties
```

Members

All members of MessageProperties class, including all inherited members.

Name	Description
"ADAPTER variable"	This property name refers to the currently active network adapter that is being used to connect to the QAnywhere server.
"ADAPTERS variable"	This property name refers to a delimited list of network adapters that can be used to connect to the QAnywhere server.
"DELIVERY_COUNT variable"	This property name refers to the number of attempts that have been made so far to deliver the message.
"IP variable"	This property name refers to the IP address of the currently active network adapter that is being used to connect to the QAnywhere server.
"MAC variable"	This property name refers to the MAC address of the currently active network adapter that is being used to connect to the QAnywhere server.
"MSG_TYPE variable"	This property name refers to MessageType enumeration values associated with a QAnywhere message.
"NETWORK_STATUS variable"	This property name refers to the state of the network connection.
"ORIGINATOR variable"	This property name refers to the message store ID of the originator of the message.
"RAS variable"	This property name refers to the currently active RAS name that is being used to connect to the QAnywhere server.
"RASNAMES variable"	This property name refers to a delimited list of RAS entry names that can be used to connect to the QAnywhere server.
"STATUS variable"	This property name refers to the current status of the message.
"STATUS_TIME variable"	This property name refers to the time at which the message received its current status.

Name	Description
“TRANSMISSION_STATUS variable”	This property name refers to the current transmission status of the message.

Remarks

The MessageProperties class provides standard message property names. You can pass MessageProperties fields to QAMessage methods used to get and set message properties.

For more information, see “QAnywhere messages” on page 13.

See also

- “QAMessage class” on page 429

Example

For example, assume you have the following QATextMessage instance:

```
QATextMessage * t_msg;
```

The following example gets the value corresponding to MessageProperties::MSG_TYPE using the QAMessage::getIntProperty method. The MessageType enumeration maps the integer result to an appropriate message type.

```
int msg_type;
t_msg->getIntProperty( MessageProperties::MSG_TYPE, &msg_type)
```

The following example, evaluates the message type and RAS names using MessageProperties::MSG_TYPE and MessageProperties::RASNAMES respectively.

```
void SystemQueueListener::onMessage(QAMessage * msg) {
       QATextMessage *        t_msg;
       TCHAR                buffer[512];
       int                    len;
       int                    msg_type;

       t_msg = msg->castToTextMessage();
       if( t_msg != NULL ) {
           t_msg->getIntProperty( MessageProperties::MSG_TYPE, &msg_type );

        if( msg_type == MessageType::NETWORK_STATUS_NOTIFICATION ) {
            // get RAS names using MessageProperties::RASNAMES
            len = t_msg-
>getStringProperty(MessageProperties::RASNAMES,buffer,sizeof(buffer));
        }
        //...
    }
}
```

ADAPTER variable

This property name refers to the currently active network adapter that is being used to connect to the QAnywhere server.

Syntax

```
public static const qa_string ADAPTER;
```

Remarks

It is used for system queue messages.

The value of this field is "ias_Network.Adapter".

Pass MessageProperties::ADAPTER as the first parameter to the QAMessage::getStringProperty method to access the associated message property.

For more information, see "Message properties" on page 659.

See also

- "getStringProperty method" on page 440

ADAPTERS variable

This property name refers to a delimited list of network adapters that can be used to connect to the QAnywhere server.

Syntax

```
public static const qa_string ADAPTERS;
```

Remarks

It is used for system queue messages.

The value of this field is "ias_Adapters".

Pass MessageProperties::ADAPTERS as the first parameter to the QAMessage::getStringProperty method to access the associated message property.

For more information, see "Message properties" on page 659.

See also

- "getStringProperty method" on page 440

DELIVERY_COUNT variable

This property name refers to the number of attempts that have been made so far to deliver the message.

Syntax

```
public static const qa_string DELIVERY_COUNT;
```

Remarks

The value of this field is "ias_DeliveryCount".

Pass MessageProperties::DELIVERY_COUNT as the first parameter in the QAMessage::setStringProperty method or the QAMessage::getStringProperty method to access the associated message property.

See also

- “setStringProperty method” on page 450
- “getStringProperty method” on page 440

IP variable

This property name refers to the IP address of the currently active network adapter that is being used to connect to the QAnywhere server.

Syntax

```
public static const qa_string IP;
```

Remarks

It is used for system queue messages.

The value of this field is "ias_Network.IP".

Pass MessageProperties::IP as the first parameter to the QAMessage::getStringProperty method to access the associated message property.

For more information, see “Message properties” on page 659.

See also

- “getStringProperty method” on page 440

MAC variable

This property name refers to the MAC address of the currently active network adapter that is being used to connect to the QAnywhere server.

Syntax

```
public static const qa_string MAC;
```

Remarks

It is used for system queue messages.

The value of this field is "ias_Network.MAC".

Pass MessageProperties::MAC as the first parameter to the QAMessage::getStringProperty method to access the associated message property.

For more information, see "Message properties" on page 659.

See also

- "getStringProperty method" on page 440

MSG_TYPE variable

This property name refers to MessageType enumeration values associated with a QAnywhere message.

Syntax

```
public static const qa_string MSG_TYPE;
```

Remarks

The value of this field is "ias_MessageType". Pass MessageProperties::MSG_TYPE as the first parameter in the QAMessage::setIntProperty method or the QAMessage::getIntProperty method to determine the associated property.

See also

- "MessageType class" on page 364
- "setIntProperty method" on page 447
- "getIntProperty method" on page 437

NETWORK_STATUS variable

This property name refers to the state of the network connection.

Syntax

```
public static const qa_string NETWORK_STATUS;
```

Remarks

The value of this field is "ias_NetworkStatus".

The value of this property is 1 if the network is accessible and 0 otherwise. The network status is used for system queue messages (for example, network status changes).

For more information, see "Message properties" on page 659.

Pass MessageProperties::NETWORK_STATUS as the first parameter in the QAMessage::setStringProperty method or the QAMessage::getStringProperty method to access the associated message property.

See also

- “setStringProperty method” on page 450
- “getStringProperty method” on page 440

ORIGINATOR variable

This property name refers to the message store ID of the originator of the message.

Syntax

```
public static const qa_string ORIGINATOR;
```

Remarks

The value of this field is "ias_Originator".

Pass MessageProperties::ORIGINATOR as the first parameter in the QAMessage::setStringProperty method or the QAMessage::getStringProperty method to access the associated message property.

See also

- “setStringProperty method” on page 450
- “getStringProperty method” on page 440

RAS variable

This property name refers to the currently active RAS name that is being used to connect to the QAnywhere server.

Syntax

```
public static const qa_string RAS;
```

Remarks

It is used for system queue messages.

The value of this field is "ias_Network.RAS".

Pass MessageProperties::RAS as the first parameter to the QAMessage::getStringProperty method to access the associated message property.

For more information, see “Message properties” on page 659.

See also

- “getStringProperty method” on page 440

RASNAMES variable

This property name refers to a delimited list of RAS entry names that can be used to connect to the QAnywhere server.

Syntax

```
public static const qa_string RASNAMES;
```

Remarks

It is used for system queue messages.

The value of this field is "ias_RASNames".

For more information, see "Message properties" on page 659.

Pass MessageProperties::RASNAMES as the first parameter in the QAMessage::setStringProperty method or the QAMessage::getStringProperty method to access the associated message property.

See also

- "setStringProperty method" on page 450
- "getStringProperty method" on page 440
- "setIntProperty method" on page 447
- "getIntProperty method" on page 437

STATUS variable

This property name refers to the current status of the message.

Syntax

```
public static const qa_string STATUS;
```

Remarks

For a list of values, see the StatusCodes. The value of this field is "ias_Status".

Pass MessageProperties::STATUS as the first parameter in the QAMessage::setIntProperty method or the QAMessage::getIntProperty method to access the associated message property.

See also

- "StatusCodes class" on page 464
- "setIntProperty method" on page 447
- "getIntProperty method" on page 437

STATUS_TIME variable

This property name refers to the time at which the message received its current status.

Syntax

```
public static const qa_string STATUS_TIME;
```

Remarks

It is in units that are natural for the platform. For Windows/PocketPC platforms, the timestamp is the SYSTEMTIME, converted to a FILETIME, which is copied to a qa_long value. It is a local time. The value of this field is "ias_StatusTime".

Pass MessageProperties::STATUS_TIME as the first parameter in the QAMessage::getLongProperty method to access the associated read-only message property.

See also

- “getLongProperty method” on page 437

TRANSMISSION_STATUS variable

This property name refers to the current transmission status of the message.

Syntax

```
public static const qa_string TRANSMISSION_STATUS;
```

Remarks

For a list of values, see the StatusCodes.

The value of this field is "ias_TransmissionStatus".

Pass MessageProperties::TRANSMISSION_STATUS as the first parameter in the QAMessage::setIntProperty method or the QAMessage::getIntProperty method to access the associated message property.

See also

- “StatusCodes class” on page 464
- “setIntProperty method” on page 447
- “getIntProperty method” on page 437

MessageStoreProperties class

The MessageStoreProperties class provides standard message property names.

Syntax

```
public class MessageStoreProperties
```

Members

All members of MessageStoreProperties class, including all inherited members.

Name	Description
"MAX_DELIVERY_ATTEMPTS variable"	This property name refers to the maximum number of times that a message can be received, without explicit acknowledgement, before its status is set to StatusCodes::UNRECEIVABLE.

Remarks

You can pass MessageStoreProperties fields to QAManagerBase methods used to get and set pre-defined or custom message store properties.

For more information, see "Client message store properties" on page 26.

MAX_DELIVERY_ATTEMPTS variable

This property name refers to the maximum number of times that a message can be received, without explicit acknowledgement, before its status is set to StatusCodes::UNRECEIVABLE.

Syntax

```
public static const qa_string MAX_DELIVERY_ATTEMPTS;
```

Remarks

The value of this field is "ias_MaxDeliveryAttempts".

See also

- "StatusCodes class" on page 464

MessageType class

Defines constant values for the MessageProperties::MSG_TYPE message property.

Syntax

```
public class MessageType
```

Members

All members of MessageType class, including all inherited members.

Name	Description
"NETWORK_STATUS_NOTIFICATION variable"	Identifies a QAnywhere system message used to notify QAnywhere client applications of network status changes.

Name	Description
“PUSH_NOTIFICATION variable”	Identifies a QAnywhere system message used to notify QAnywhere client applications of push notifications.
“REGULAR variable”	If no message type property exists then the message type is assumed to be REGULAR.

Remarks

The following example shows the onSystemMessage method which is used to handle QAnywhere system messages.

The message type is compared to MessageType.NETWORK_STATUS_NOTIFICATION.

```
  void SystemQueueListener::onMessage(QAMessage * msg) {
      QATextMessage *        t_msg;
      TCHAR                 buffer[512];
      int                    len;
      int                    msg_type;

      t_msg = msg->castToTextMessage();
      if( t_msg != NULL ) {
          t_msg->getIntProperty( MessageProperties::MSG_TYPE, &msg_type );

             if( msg_type == MessageType::NETWORK_STATUS_NOTIFICATION ) {
                 // get network names using MessageProperties::NETWORK
              len = t_msg-
>getStringProperty(MessageProperties::NETWORK,buffer,sizeof(buffer));
          }
          //...
      }
 }
```

NETWORK_STATUS_NOTIFICATION variable

Identifies a QAnywhere system message used to notify QAnywhere client applications of network status changes.

Syntax

```
public static const qa_int NETWORK_STATUS_NOTIFICATION;
```

Remarks

Network status changes apply to the device receiving the system message. Use the MessageProperties::ADAPTER, MessageProperties::NETWORK, and MessageProperties::NETWORK_STATUS fields to identify new network status information.

For more information, see “Predefined message properties” on page 659.

PUSH_NOTIFICATION variable

Identifies a QAnywhere system message used to notify QAnywhere client applications of push notifications.

Syntax

```
public static const qa_int PUSH_NOTIFICATION;
```

Remarks

If you use the on-demand QAnywhere Agent policy, a typical response is to call the QAManagerBase::triggerSendReceive() method to receive messages waiting with the central message server.

For more information, see "Predefined message properties" on page 659.

REGULAR variable

If no message type property exists then the message type is assumed to be REGULAR.

Syntax

```
public static const qa_int REGULAR;
```

Remarks

This type of message is not treated specially by the message system.

QABinaryMessage class

A QABinaryMessage object is used to send a message containing a stream of uninterpreted bytes.

Syntax

```
public class QABinaryMessage : QAMessage
```

Base classes

- "QAMessage class" on page 429

Members

All members of QABinaryMessage class, including all inherited members.

Name	Description
"QABinaryMessage deconstructor"	Virtual destructor.
"beginEnumPropertyNames method"	Begins an enumeration of message property names.

Name	Description
"castToBinaryMessage method"	Casts this QAMessage to a QABinaryMessage.
"castToTextMessage method"	Casts this QAMessage to a QATextMessage.
"clearProperties method"	Clears a message's properties.
"endEnumPropertyNames method"	Frees the resources associated with a message property name enumeration.
"getAddress method"	Gets the destination address for the QAMessage instance.
"getBodyLength method"	Returns the size of the message body in bytes.
"getBooleanProperty method"	Gets the value of the qa_bool property with the specified name.
"getByteProperty method"	Gets the value of the qa_byte property with the specified name.
"getDoubleProperty method"	Gets the value of the qa_double property with the specified name.
"getExpiration method"	Gets the message's expiration time.
"getFloatProperty method"	Gets the value of the qa_float property with the specified name.
"getInReplyToID method"	Gets the ID of the message that this message is in reply to.
"getIntProperty method"	Gets the value of the qa_int property with the specified name.
"getLongProperty method"	Gets the value of the qa_long property with the specified name.
"getMessageID method"	Gets the message ID.
"getPriority method"	Gets the message priority level.
"getPropertyType method"	Returns the type of a property with the given name.
"getRedelivered method"	Indicates whether the message has been previously received but not acknowledged.
"getReplyToAddress method"	Gets the address to which a reply to this message should be sent.

Name	Description
“getShortProperty method”	Gets the value of the qa_short property with the specified name.
“getStringProperty method”	Gets the value of the qa_string property with the specified name.
“getTimestamp method”	Gets the message timestamp.
“getTimestampAsString method”	Gets the message timestamp as a formatted string.
“nextPropertyName method”	Returns the message property name for the given enumeration, returning -1 if there are no more property names.
“propertyExists method”	Indicates whether a property value exists.
“readBinary method”	Reads a specified number of bytes starting from the unread portion of the QABinaryMessage instance's message body.
“readBoolean method”	Reads a boolean value starting from the unread portion of the QABinaryMessage instance's message body.
“readByte method”	Reads a signed 8-bit value starting from the unread portion of the QABinaryMessage instance's message body.
“readChar method”	Reads a character value starting from the unread portion of the QABinaryMessage instance's message body.
“readDouble method”	Reads a double value starting from the unread portion of the QABinaryMessage instance's message body.
“readFloat method”	Reads a float value starting from the unread portion of the QABinaryMessage instance's message body.
“readInt method”	Reads a signed 32-bit integer value starting from the unread portion of the QABinaryMessage instance's message body.
“readLong method”	Reads a signed 64-bit integer value starting from the unread portion of the QABinaryMessage instance's message body.
“readShort method”	Reads a signed 16-bit value starting from the unread portion of the QABinaryMessage instance's message body.
“readString method”	Reads a string value starting from the unread portion of the QABinaryMessage instance's message body.
“reset method”	Resets a message so that the reading of values starts from the beginning of the message body.

Name	Description
“setAddress method”	Sets the destination address for this message.
“setBooleanProperty method”	Sets the qa_bool property with the specified name to the specified value.
“setByteProperty method”	Sets a qa_byte property with the specified name to the specified value.
“setDoubleProperty method”	Sets the qa_double property with the specified name to the specified value.
“setFloatProperty method”	Sets the qa_float property with the specified name to the specified value.
“setInReplyToID method”	Sets the In-Reply-To ID for the message.
“setIntProperty method”	Sets the qa_int property with the specified name to the specified value.
“setLongProperty method”	Sets the qa_long property with the specified name to the specified value.
“setMessageID method”	Sets the message ID.
“setPriority method”	Sets the priority level for this message.
“setRedelivered method”	Sets an indication of whether this message was redelivered.
“setReplyToAddress method”	Sets the address to which a reply to this message should be sent.
“setShortProperty method”	Sets e qa_short property with the specified name to the specified value.
“setStringProperty method”	Sets a qa_string property with the specified name to the specified value.
“setTimestamp method”	Sets the message timestamp.
“writeBinary method”	Appends a byte array value to the QABinaryMessage instance's message body.
“writeBoolean method”	Appends a boolean value to the QABinaryMessage instance's message body.
“writeByte method”	Appends a byte value to the QABinaryMessage instance's message body.

Name	Description
“writeChar method”	Appends a char value to the QABinaryMessage instance's message body.
“writeDouble method”	Appends a double value to the QABinaryMessage instance's message body.
“writeFloat method”	Appends a float value to the QABinaryMessage instance's message body.
“writeInt method”	Appends an integer value to the QABinaryMessage instance's message body.
“writeLong method”	Appends a long value to the QABinaryMessage instance's message body.
“writeShort method”	Appends a short value to the QABinaryMessage instance's message body.
“writeString method”	Appends a string value to the QABinaryMessage instance's message body.
“DEFAULT_PRIORITY variable”	The default message priority.
“DEFAULT_TIME_TO_LIVE variable”	The default message time-to-live value.

Remarks

It inherits from the QAMessage class and adds a bytes message body. QABinaryMessage provides a variety of methods to read from and write to the bytes message body.

When the message is first created, the body of the message is write-only. After a message has been sent, the client that sent it can retain and modify it without affecting the message that has been sent. The same message object can be sent multiple times.

When a message is received, the provider has called the QABinaryMessage::reset method so that the message body is in read-only mode and reading of values starts from the beginning of the message body. If a client attempts to write a message in read-only mode, a COMMON_MSG_NOT_WRITEABLE_ERROR is set.

Example

The following example uses the QABinaryMessage::writeString method to write the string "Q" followed by the string "Anywhere" to a QABinaryMessage instance's message body.

```
// Create a binary message instance.
QABinaryMessage * binary_message;
binary_message = qa_manager->createBinaryMessage();

// Set optional message properties.
binary_message->setReplyToAddress( "my-queue-name" );
```

```
// Write to the message body.
binary_message->writeString("Q");
binary_message->writeString("Anywhere");

// Put the message in the local database, ready for sending.

if( !qa_manager->putMessage( "store-id\\queue-name", msg ) ) {
    handleError();
}
```

On the receiving end, the first QABinaryMessage::readString() invocation returns "Q" and the next QABinaryMessage::readString() invocation returns "Anywhere".

The message is sent by the QAnywhere Agent.

For more information, see "Determining when message transmission should occur on the client" on page 46 and "Writing QAnywhere client applications" on page 49.

QABinaryMessage deconstructor

Virtual destructor.

Syntax

`public virtual` **`~QABinaryMessage`**`()`

getBodyLength method

Returns the size of the message body in bytes.

Syntax

`public virtual qa_long` **`getBodyLength`**`()`

Returns

The size of the message body in bytes.

readBinary method

Reads a specified number of bytes starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

`public virtual qa_int` **`readBinary`**`(qa_bytes` *`value`*`, qa_int` *`length`*`)`

Parameters

- **value** The buffer into which the data is read.
- **length** The maximum number of bytes to read.

Returns

The total number of bytes read into the buffer, or -1 if there is no more data because the end of the stream has been reached.

See also

- "writeBinary method" on page 376

readBoolean method

Reads a boolean value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

```
public virtual qa_bool readBoolean(qa_bool * value)
```

Parameters

- **value** The destination of the qa_bool value read from the bytes message stream.

Returns

True if and only if the operation succeeded.

See also

- "writeBoolean method" on page 376

readByte method

Reads a signed 8-bit value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

```
public virtual qa_bool readByte(qa_byte * value)
```

Parameters

- **value** The destination of the qa_byte value read from the bytes message stream.

Returns

True if and only if the operation succeeded.

See also

- “writeByte method” on page 376

readChar method

Reads a character value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

```
public virtual qa_bool readChar(qa_char * value)
```

Parameters

- **value** The destination of the qa_char value read from the bytes message stream.

Returns

The character value read.

See also

- “writeChar method” on page 377

readDouble method

Reads a double value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

```
public virtual qa_bool readDouble(qa_double * value)
```

Parameters

- **value** The destination of the double value read from the bytes message stream.

Returns

True if and only if the operation succeeded.

See also

- “writeDouble method” on page 377

readFloat method

Reads a float value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

```
public virtual qa_bool readFloat(qa_float * value)
```

Parameters

- **value** The destination of the float value read from the bytes message stream.

Returns

True if and only if the operation succeeded.

See also

- “writeFloat method” on page 378

readInt method

Reads a signed 32-bit integer value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

```
public virtual qa_bool readInt(qa_int * value)
```

Parameters

- **value** The destination of the qa_int value read from the bytes message stream.

Returns

True if and only if the operation succeeded.

See also

- “writeInt method” on page 378

readLong method

Reads a signed 64-bit integer value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

```
public virtual qa_bool readLong(qa_long * value)
```

Parameters

- **value** The destination of the long value read from the bytes message stream.

Returns

True if and only if the operation succeeded.

See also

- “writeLong method” on page 378

readShort method

Reads a signed 16-bit value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

```
public virtual qa_bool readShort(qa_short * value)
```

Parameters

- **value** The destination of the qa_short value read from the bytes message stream.

Returns

True if and only if the operation succeeded.

See also

- “writeShort method” on page 379

readString method

Reads a string value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

```
public virtual qa_int readString(qa_string dest, qa_int maxLen)
```

Parameters

- **dest** The destination of the qa_string value read from the bytes message stream.
- **maxLen** The maximum number of characters to read, including the null terminator character.

Returns

The total number of non-null qa_chars read into the buffer, -1 if there is no more data or an error occurred, or -2 if the buffer is too small.

See also

- “writeString method” on page 379

reset method

Resets a message so that the reading of values starts from the beginning of the message body.

Syntax

```
public virtual void reset()
```

Remarks

The reset method also puts the QABinaryMessage message body in read-only mode.

writeBinary method

Appends a byte array value to the QABinaryMessage instance's message body.

Syntax

```
public virtual void writeBinary(
    qa_const_bytes value,
    qa_int offset,
    qa_int length
)
```

Parameters

- **value** The byte array value to write to the message body.
- **offset** The offset within the byte array to begin writing.
- **length** The number of bytes to write.

See also

- "readBinary method" on page 371

writeBoolean method

Appends a boolean value to the QABinaryMessage instance's message body.

Syntax

```
public virtual void writeBoolean(qa_bool value)
```

Parameters

- **value** The boolean value to write to the message body.

Remarks

The boolean is represented as a one-byte value. True is represented as 1; false is represented as 0.

See also

- "readBoolean method" on page 372

writeByte method

Appends a byte value to the QABinaryMessage instance's message body.

Syntax

```
public virtual void writeByte(qa_byte value)
```

Parameters

- **value** The byte array value to write to the message body.

Remarks

The byte is represented as a one-byte value.

See also

- "readByte method" on page 372

writeChar method

Appends a char value to the QABinaryMessage instance's message body.

Syntax

```
public virtual void writeChar(qa_char value)
```

Parameters

- **value** the char value to write to the message body.

Remarks

The char parameter is represented as a two-byte value and the high order byte is appended first.

See also

- "readChar method" on page 373

writeDouble method

Appends a double value to the QABinaryMessage instance's message body.

Syntax

```
public virtual void writeDouble(qa_double value)
```

Parameters

- **value** The double value to write to the message body.

Remarks

The double parameter is converted to a representive eight-byte long value. Higher order bytes are appended first.

See also

- "readDouble method" on page 373

writeFloat method

Appends a float value to the QABinaryMessage instance's message body.

Syntax

```
public virtual void writeFloat(qa_float value)
```

Parameters

- **value** The float value to write to the message body.

Remarks

The float parameter is converted to a representative 4-byte integer and the higher order bytes are appended first.

See also

- "readFloat method" on page 373

writeInt method

Appends an integer value to the QABinaryMessage instance's message body.

Syntax

```
public virtual void writeInt(qa_int value)
```

Parameters

- **value** the int value to write to the message body.

Remarks

The integer parameter is represented as a four-byte value and higher order bytes are appended first.

See also

- "readInt method" on page 374

writeLong method

Appends a long value to the QABinaryMessage instance's message body.

Syntax

```
public virtual void writeLong(qa_long value)
```

Parameters

- **value** The long value to write to the message body.

Remarks

The long parameter is represented as an eight-byte value and higher order bytes are appended first.

See also

- "readLong method" on page 374

writeShort method

Appends a short value to the QABinaryMessage instance's message body.

Syntax

```
public virtual void writeShort(qa_short value)
```

Parameters

- **value** The short value to write to the message body.

Remarks

The short parameter is represented as a two-byte value and the higher order byte is appended first.

See also

- "readShort method" on page 375

writeString method

Appends a string value to the QABinaryMessage instance's message body.

Syntax

```
public virtual void writeString(qa_const_string value)
```

Parameters

- **value** The string value to write to the message body.

Remarks

Note
The receving application needs to invoke QABinaryMessage::readString for each writeString invocation.

Note
The UTF-8 representation of the string can be at most 32767 bytes.

See also

- "readString method" on page 375

QAError class

This class defines error constants associated with a QAnywhere client application.

Syntax

```
public class QAError
```

Members

All members of QAError class, including all inherited members.

Name	Description
"COMMON_ALREADY_OPEN_ERROR variable"	The QAManager is already open.
"COMMON_GET_INIT_FILE_ERROR variable"	Unable to access the client properties file.
"COMMON_GET_PROPERTY_ERROR variable"	Error retrieving the property.
"COMMON_GETQUEUEDEPTH_ERROR variable"	Error getting queue depth.
"COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG variable"	Cannot use QAManager-Base.getQueueDepth on a given destination when fil-ter is ALL.
"COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID variable"	Cannot use QAManager-Base.getQueueDepth when the message store ID has not been set.
"COMMON_INIT_ERROR variable"	Initialization error.
"COMMON_INIT_THREAD_ERROR variable"	Error initializing the back-ground thread.
"COMMON_INVALID_PROPERTY variable"	There is an invalid property in the client properties file.
"COMMON_MSG_ACKNOWLEDGE_ERROR variable"	Error acknowledging the message.

Name	Description
“COMMON_MSG_CANCEL_ERROR variable”	Error canceling message.
“COMMON_MSG_CANCEL_ERROR_SENT variable”	Error canceling message.
“COMMON_MSG_NOT_WRITEABLE_ERROR variable”	You cannot write to a message as it is in read-only mode.
“COMMON_MSG_RETRIEVE_ERROR variable”	Error retrieving a message from the client message store.
“COMMON_MSG_STORE_ERROR variable”	Error storing a message in the client message store.
“COMMON_MSG_STORE_NOT_INITIALIZED variable”	The message store has not been initialized for messaging.
“COMMON_MSG_STORE_TOO_LARGE variable”	The message store is too large relative to the free disk space on the device.
“COMMON_NO_DEST_ERROR variable”	No destination.
“COMMON_NO_IMPLEMENTATION variable”	The function is not implemented.
“COMMON_NOT_OPEN_ERROR variable”	The QAManager is not open.
“COMMON_OPEN_ERROR variable”	Error opening a connection to the message store.
“COMMON_OPEN_LOG_FILE_ERROR variable”	Error opening the log file.
“COMMON_OPEN_MAXTHREADS_ERROR variable”	Cannot open the QAManager because the maximum number of concurrent server requests is not high enough.
“COMMON_SELECTOR_SYNTAX_ERROR variable”	The given selector has a syntax error.
“COMMON_SET_PROPERTY_ERROR variable”	Error setting the property.
“COMMON_TERMINATE_ERROR variable”	Termination error.

Name	Description
"COMMON_UNEXPECTED_EOM_ERROR variable"	Unexpected end of message reached.
"COMMON_UNREPRESENTABLE_TIMESTAMP variable"	The timestamp is outside of the acceptable range.
"QA_NO_ERROR variable"	No error.

Remarks

A QAError object is used internally by the QAManager object to keep track of errors associated with messaging operations. The application programmer should not need to create an instance of this class. The error constants should be used by the application programmer to interpret error codes returned by QAManager::getLastError

See also

- "getLastErrorMsg method" on page 408

Example

Assume your QAManager instance is called qa_mgr. The following example, uses the QAManager::getLastError method to compare the last error code to QAError::QA_NO_ERROR.

```
if (qa_mgr->getLastError() != QAError::QA_NO_ERROR) {
    // Process error.
}
```

COMMON_ALREADY_OPEN_ERROR variable

The QAManager is already open.

Syntax

```
public static const qa_int COMMON_ALREADY_OPEN_ERROR;
```

COMMON_GET_INIT_FILE_ERROR variable

Unable to access the client properties file.

Syntax

```
public static const qa_int COMMON_GET_INIT_FILE_ERROR;
```

COMMON_GET_PROPERTY_ERROR variable

Error retrieving the property.

Syntax

```
public static const qa_int COMMON_GET_PROPERTY_ERROR;
```

COMMON_GETQUEUEDEPTH_ERROR variable

Error getting queue depth.

Syntax

```
public static const qa_int COMMON_GETQUEUEDEPTH_ERROR;
```

COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG variable

Cannot use QAManagerBase.getQueueDepth on a given destination when filter is ALL.

Syntax

```
public static const qa_int COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG;
```

COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID variable

Cannot use QAManagerBase.getQueueDepth when the message store ID has not been set.

Syntax

```
public static const qa_int COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID;
```

COMMON_INIT_ERROR variable

Initialization error.

Syntax

```
public static const qa_int COMMON_INIT_ERROR;
```

COMMON_INIT_THREAD_ERROR variable

Error initializing the background thread.

Syntax

```
public static const qa_int COMMON_INIT_THREAD_ERROR;
```

COMMON_INVALID_PROPERTY variable

There is an invalid property in the client properties file.

Syntax

```
public static const qa_int COMMON_INVALID_PROPERTY;
```

COMMON_MSG_ACKNOWLEDGE_ERROR variable

Error acknowledging the message.

Syntax

```
public static const qa_int COMMON_MSG_ACKNOWLEDGE_ERROR;
```

COMMON_MSG_CANCEL_ERROR variable

Error canceling message.

Syntax

```
public static const qa_int COMMON_MSG_CANCEL_ERROR;
```

COMMON_MSG_CANCEL_ERROR_SENT variable

Error canceling message.

Syntax

```
public static const qa_int COMMON_MSG_CANCEL_ERROR_SENT;
```

Remarks

Cannot cancel a message that has already been sent.

COMMON_MSG_NOT_WRITEABLE_ERROR variable

You cannot write to a message as it is in read-only mode.

Syntax

```
public static const qa_int COMMON_MSG_NOT_WRITEABLE_ERROR;
```

COMMON_MSG_RETRIEVE_ERROR variable

Error retrieving a message from the client message store.

Syntax

```
public static const qa_int COMMON_MSG_RETRIEVE_ERROR;
```

COMMON_MSG_STORE_ERROR variable

Error storing a message in the client message store.

Syntax

```
public static const qa_int COMMON_MSG_STORE_ERROR;
```

COMMON_MSG_STORE_NOT_INITIALIZED variable

The message store has not been initialized for messaging.

Syntax

```
public static const qa_int COMMON_MSG_STORE_NOT_INITIALIZED;
```

COMMON_MSG_STORE_TOO_LARGE variable

The message store is too large relative to the free disk space on the device.

Syntax

```
public static const qa_int COMMON_MSG_STORE_TOO_LARGE;
```

COMMON_NO_DEST_ERROR variable

No destination.

Syntax

```
public static const qa_int COMMON_NO_DEST_ERROR;
```

COMMON_NO_IMPLEMENTATION variable

The function is not implemented.

Syntax

```
public static const qa_int COMMON_NO_IMPLEMENTATION;
```

COMMON_NOT_OPEN_ERROR variable

The QAManager is not open.

Syntax

```
public static const qa_int COMMON_NOT_OPEN_ERROR;
```

COMMON_OPEN_ERROR variable

Error opening a connection to the message store.

Syntax

```
public static const qa_int COMMON_OPEN_ERROR;
```

COMMON_OPEN_LOG_FILE_ERROR variable

Error opening the log file.

Syntax

```
public static const qa_int COMMON_OPEN_LOG_FILE_ERROR;
```

COMMON_OPEN_MAXTHREADS_ERROR variable

Cannot open the QAManager because the maximum number of concurrent server requests is not high enough.

Syntax

```
public static const qa_int COMMON_OPEN_MAXTHREADS_ERROR;
```

Remarks

For more information, see "-gn dbsrv12 server option" [*SQL Anywhere Server - Database Administration*].

COMMON_SELECTOR_SYNTAX_ERROR variable

The given selector has a syntax error.

Syntax

```
public static const qa_int COMMON_SELECTOR_SYNTAX_ERROR;
```

COMMON_SET_PROPERTY_ERROR variable

Error setting the property.

Syntax

```
public static const qa_int COMMON_SET_PROPERTY_ERROR;
```

COMMON_TERMINATE_ERROR variable

Termination error.

Syntax

```
public static const qa_int COMMON_TERMINATE_ERROR;
```

COMMON_UNEXPECTED_EOM_ERROR variable

Unexpected end of message reached.

Syntax

```
public static const qa_int COMMON_UNEXPECTED_EOM_ERROR;
```

COMMON_UNREPRESENTABLE_TIMESTAMP variable

The timestamp is outside of the acceptable range.

Syntax

```
public static const qa_int COMMON_UNREPRESENTABLE_TIMESTAMP;
```

QA_NO_ERROR variable

No error.

Syntax

```
public static const qa_int QA_NO_ERROR;
```

QAManager class

The QAManager class derives from QAManagerBase and manages non-transactional QAnywhere messaging operations.

Syntax

```
public class QAManager : QAManagerBase
```

Base classes

- “QAManagerBase class” on page 394

Members

All members of QAManager class, including all inherited members.

Name	Description
“acknowledge method”	Acknowledges that the client application successfully received a QAnywhere message.
“acknowledgeAll method”	Acknowledges that the client application successfully received all unacknowledged QAnywhere messages.
“acknowledgeUntil method”	Acknowledges the given QAMessage instance and all unacknowledged messages received before the given message.
“beginEnumStorePropertyNames method”	Begins an enumeration of message store property names.
“browseClose method”	Frees the resources associated with a browse operation.
“browseMessages method”	Begins a browse of messages queued in the message store.
“browseMessagesByID method”	Begins a browse of the message that is queued in the message store, with the given message ID.
“browseMessagesByQueue method”	Begins a browse of messages queued in the message store for the given queue.
“browseMessagesBySelector method”	Begins a browse of messages queued in the message store that satisfy the given selector.
“browseNextMessage method”	Returns the next message for the given browse operation, returning null if there are no more messages.
“cancelMessage method”	Cancels the message with the given message ID.
“close method”	Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.
“createBinaryMessage method”	Creates a QABinaryMessage instance.
“createTextMessage method”	Creates a QATextMessage instance.

Name	Description
“deleteMessage method”	Deletes a QAMessage object.
“endEnumStorePropertyNames method”	Frees the resources associated with a message store property name enumeration.
“getAllQueueDepth method”	Returns the total depth of all queues, based on a given filter.
“getBooleanStoreProperty method”	Gets a boolean value for a pre-defined or custom message store property.
“getByteStoreProperty method”	Gets a byte value for a pre-defined or custom message store property.
“getDoubleStoreProperty method”	Gets a double value for a pre-defined or custom message store property.
“getFloatStoreProperty method”	Gets a float value for a pre-defined or custom message store property.
“getIntStoreProperty method”	Gets an int value for a pre-defined or custom message store property.
“getLastError method”	The error code associated with the last excecuted QAManagerBase method.
“getLastErrorMsg method”	The error text associated with the last executed QAManagerBase method.
“getLastNativeError method”	The native error code associated with the last excecuted QAManagerBase method.
“getLongStoreProperty method”	Gets a long value for a pre-defined or custom message store property.
“getMessage method”	Returns the next available QAMessage sent to the specified address.
“getMessageBySelector method”	Returns the next available QAMessage sent to the specified address that satisfies the given selector.
“getMessageBySelectorNoWait method”	Returns the next available QAMessage sent to the given address that satisfies the given selector.
“getMessageBySelectorTimeout method”	Returns the next available QAMessage sent to the given address that satisfies the given selector.

Name	Description
"getMessageNoWait method"	Returns the next available QAMessage sent to the given address.
"getMessageTimeout method"	Returns the next available QAMessage sent to the given address.
"getMode method"	Returns the QAManager acknowledgement mode for received messages.
"getQueueDepth method"	Returns the depth of a queue, based on a given filter.
"getShortStoreProperty method"	Gets a short value for a pre-defined or custom message store property.
"getStringStoreProperty method"	Gets a string value for a pre-defined or custom message store property.
"nextStorePropertyName method"	Returns the message store property name for the given enumeration.
"open method"	Opens the QAManager with the given AcknowledgementMode value.
"putMessage method"	Puts a message into the queue for the given destination.
"putMessageTimeToLive method"	Puts a message into the queue for the given destination and a given time-to-live in milliseconds.
"recover method"	Force all unacknowledged messages into a state of unreceived.
"setBooleanStoreProperty method"	Sets a pre-defined or custom message store property to a boolean value.
"setByteStoreProperty method"	Sets a pre-defined or custom message store property to a byte value.
"setDoubleStoreProperty method"	Sets a pre-defined or custom message store property to a double value.
"setFloatStoreProperty method"	Sets a pre-defined or custom message store property to a float value.
"setIntStoreProperty method"	Sets a pre-defined or custom message store property to a int value.

Name	Description
"setLongStoreProperty method"	Sets a pre-defined or custom message store property to a long value.
"setMessageListener method"	Sets a message listener class to receive QAnywhere messages asynchronously.
"setMessageListenerBySelector method"	Sets a message listener class to receive QAnywhere messages asynchronously, with a message selector.
"setProperty method"	Allows you to set QAnywhere manager configuration properties programmatically.
"setShortStoreProperty method"	Sets a pre-defined or custom message store property to a short value.
"setStringStoreProperty method"	Sets a pre-defined or custom message store property to a string value.
"start method"	Starts the QAManagerBase for receiving incoming messages in message listeners.
"stop method"	Stops the QAManagerBase's reception of incoming messages.
"triggerSendReceive method"	Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

Remarks

For a detailed description of derived behavior, see QAManagerBase.

The QAManager can be configured for implicit or explicit acknowledgement as defined in the AcknowledgementMode enumeration. To acknowledge messages as part of a transaction, use QATransactionalManager.

Use the QAManagerFactory to create QAManager and QATransactionalManager objects.

See also

- "QAManagerFactory class" on page 424
- "QAManagerBase class" on page 394
- "QATransactionalManager class" on page 457
- "AcknowledgementMode class" on page 354

acknowledge method

Acknowledges that the client application successfully received a QAnywhere message.

Syntax

```
public virtual qa_bool acknowledge(QAMessage * msg)
```

Parameters

- **msg** The message to acknowledge.

Returns

True if and only if the operation succeeded.

Remarks

> **Note**
> When a QAMessage is acknowledged, its MessageProperties::STATUS property changes to StatusCodes.RECEIVED. When a QAMessage status changes to StatusCodes.RECEIVED, it can be deleted using the default delete rule.

For more information about delete rules, see "Message delete rules" on page 743.

See also

- "acknowledgeAll method" on page 392
- "acknowledgeUntil method" on page 393

acknowledgeAll method

Acknowledges that the client application successfully received all unacknowledged QAnywhere messages.

Syntax

```
public virtual qa_bool acknowledgeAll()
```

Returns

True if and only if the operation succeeded.

Remarks

> **Note**
> When a QAMessage is acknowledged, its MessageProperties::STATUS property changes to StatusCodes.RECEIVED. When a QAMessage status changes to StatusCodes.RECEIVED, it can be deleted using the default delete rule.

For more information about delete rules, see "Message delete rules" on page 743.

See also

- "acknowledge method" on page 392
- "acknowledgeUntil method" on page 393

acknowledgeUntil method

Acknowledges the given QAMessage instance and all unacknowledged messages received before the given message.

Syntax

```
public virtual qa_bool acknowledgeUntil(QAMessage * msg)
```

Parameters

- **msg** The last message to acknowledge. All earlier unacknowledged messages are also acknowledged.

Returns

True if and only if the operation succeeded.

Remarks

Note
When a QAMessage is acknowledged, its MessageProperties::STATUS property changes to StatusCodes.RECEIVED. When a QAMessage status changes to StatusCodes.RECEIVED, it can be deleted using the default delete rule.

For more information about delete rules, see "Message delete rules" on page 743.

See also

- "acknowledge method" on page 392
- "acknowledgeAll method" on page 392

open method

Opens the QAManager with the given AcknowledgementMode value.

Syntax

```
public virtual qa_bool open(qa_short mode)
```

Parameters

- **mode** The acknowledgement mode.

Returns

True if and only if the operation succeeded.

Remarks

The open method must be the first method called after creating a QAManager.

If a database connection error is detected, you can re-open a QAManager by calling the close function followed by the open function. When re-opening a QAManager, you do not need to re-create it, reset the properties, or reset the message listeners. The properties of the QAManager cannot be changed after the first open, and subsequent open calls must supply the same acknowledgement mode.

See also

- "AcknowledgementMode class" on page 354

recover method

Force all unacknowledged messages into a state of unreceived.

Syntax

```
public virtual qa_bool recover()
```

Returns

True if and only if the operation succeeded.

Remarks

That is, these messages must be received again using QAManager::getMessage().

QAManagerBase class

This class acts as a base class for QATransactionalManager and QAManager, which manage transactional and non-transactional messaging, respectively.

Syntax

```
public class QAManagerBase
```

Derived classes

- "QAManager class" on page 387
- "QATransactionalManager class" on page 457

Members

All members of QAManagerBase class, including all inherited members.

Name	Description
"beginEnumStorePropertyNames method"	Begins an enumeration of message store property names.

Name	Description
“browseClose method”	Frees the resources associated with a browse operation.
“browseMessages method”	Begins a browse of messages queued in the message store.
“browseMessagesByID method”	Begins a browse of the message that is queued in the message store, with the given message ID.
“browseMessagesByQueue method”	Begins a browse of messages queued in the message store for the given queue.
“browseMessagesBySelector method”	Begins a browse of messages queued in the message store that satisfy the given selector.
“browseNextMessage method”	Returns the next message for the given browse operation, returning null if there are no more messages.
“cancelMessage method”	Cancels the message with the given message ID.
“close method”	Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.
“createBinaryMessage method”	Creates a QABinaryMessage instance.
“createTextMessage method”	Creates a QATextMessage instance.
“deleteMessage method”	Deletes a QAMessage object.
“endEnumStorePropertyNames method”	Frees the resources associated with a message store property name enumeration.
“getAllQueueDepth method”	Returns the total depth of all queues, based on a given filter.
“getBooleanStoreProperty method”	Gets a boolean value for a pre-defined or custom message store property.
“getByteStoreProperty method”	Gets a byte value for a pre-defined or custom message store property.
“getDoubleStoreProperty method”	Gets a double value for a pre-defined or custom message store property.
“getFloatStoreProperty method”	Gets a float value for a pre-defined or custom message store property.
“getIntStoreProperty method”	Gets an int value for a pre-defined or custom message store property.

Name	Description
"getLastError method"	The error code associated with the last excecuted QAManagerBase method.
"getLastErrorMsg method"	The error text associated with the last executed QAManagerBase method.
"getLastNativeError method"	The native error code associated with the last excecuted QAManagerBase method.
"getLongStoreProperty method"	Gets a long value for a pre-defined or custom message store property.
"getMessage method"	Returns the next available QAMessage sent to the specified address.
"getMessageBySelector method"	Returns the next available QAMessage sent to the specified address that satisfies the given selector.
"getMessageBySelectorNoWait method"	Returns the next available QAMessage sent to the given address that satisfies the given selector.
"getMessageBySelectorTimeout method"	Returns the next available QAMessage sent to the given address that satisfies the given selector.
"getMessageNoWait method"	Returns the next available QAMessage sent to the given address.
"getMessageTimeout method"	Returns the next available QAMessage sent to the given address.
"getMode method"	Returns the QAManager acknowledgement mode for received messages.
"getQueueDepth method"	Returns the depth of a queue, based on a given filter.
"getShortStoreProperty method"	Gets a short value for a pre-defined or custom message store property.
"getStringStoreProperty method"	Gets a string value for a pre-defined or custom message store property.
"nextStorePropertyName method"	Returns the message store property name for the given enumeration.
"putMessage method"	Puts a message into the queue for the given destination.

Name	Description
"putMessageTimeToLive method"	Puts a message into the queue for the given destination and a given time-to-live in milliseconds.
"setBooleanStoreProperty method"	Sets a pre-defined or custom message store property to a boolean value.
"setByteStoreProperty method"	Sets a pre-defined or custom message store property to a byte value.
"setDoubleStoreProperty method"	Sets a pre-defined or custom message store property to a double value.
"setFloatStoreProperty method"	Sets a pre-defined or custom message store property to a float value.
"setIntStoreProperty method"	Sets a pre-defined or custom message store property to a int value.
"setLongStoreProperty method"	Sets a pre-defined or custom message store property to a long value.
"setMessageListener method"	Sets a message listener class to receive QAnywhere messages asynchronously.
"setMessageListenerBySelector method"	Sets a message listener class to receive QAnywhere messages asynchronously, with a message selector.
"setProperty method"	Allows you to set QAnywhere manager configuration properties programmatically.
"setShortStoreProperty method"	Sets a pre-defined or custom message store property to a short value.
"setStringStoreProperty method"	Sets a pre-defined or custom message store property to a string value.
"start method"	Starts the QAManagerBase for receiving incoming messages in message listeners.
"stop method"	Stops the QAManagerBase's reception of incoming messages.
"triggerSendReceive method"	Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

Remarks

Use the QAManagerBase::start() method to allow a QAManagerBase instance to listen for messages. There must be only a single instance of QAManagerBase per thread in your application.

You can use instances of this class to create and manage QAnywhere messages. Use the QAManagerBase::createBinaryMessage() method and the QAManagerBase::createTextMessage() method to create appropriate QAMessage instances. QAMessage instances provide a variety of methods to set message content and properties. To send QAnywhere messages, use the QAManager::putMessage() to place the addressed message in the local message store queue. The message is transmitted by the QAnywhere Agent based on its transmission policies or when you call the QAManagerBase::triggerSendReceive().

For more information about qaagent transmission policies, see "Determining when message transmission should occur on the client" on page 46.

Messages are released from memory when you close a QAManagerBase instance using the QAManagerBase::close().

You can use QAManagerBase::getLastError, QAManagerBase::getLastNativeError, and QAManagerBase::getLastErrorMessage to return error information when a QAException occurs. QAManagerBase also provides methods to set and get message store properties.

For more information, see "Client message store properties" on page 26 and the MessageStoreProperties.

See also

- "QATransactionalManager class" on page 457
- "QAManager class" on page 387

beginEnumStorePropertyNames method

Begins an enumeration of message store property names.

Syntax

```
public virtual qa_store_property_enum_handle
beginEnumStorePropertyNames( )
```

Returns

A handle that is supplied to QAManagerBase::nextStorePropertyName.

Remarks

The handle returned by this method is supplied to the QAManagerBase::nextStorePropertyName. This method and the QAManagerBase::nextStorePropertyName can be used to enumerate the message store property names at the time this method was called. Message store properties cannot be set between the QAManagerBase::beginEnumStorePropertyNames and the QAManagerBase::endEnumStorePropertyNames calls.

See also

- “nextStorePropertyName method” on page 415
- “beginEnumStorePropertyNames method” on page 398
- “endEnumStorePropertyNames method” on page 404

browseClose method

Frees the resources associated with a browse operation.

Syntax

```
public virtual void browseClose(qa_browse_handle handle)
```

Parameters

- **handle** A handle returned by one of the begin browse operations.

browseMessages method

Begins a browse of messages queued in the message store.

Syntax

```
public virtual qa_browse_handle browseMessages()
```

Returns

A handle that is supplied to QAManagerBase::browseNextMessage

Remarks

The handle returned by this method is supplied to QAManagerBase::browseNextMessage. This method and the QAManagerBase::browseNextMessage can be used to enumerate the messages in the message store at the time this method was called.

The messages are just being browsed, so they cannot be acknowledged. Use QAManagerBase::getMessage to receive messages so they can be acknowledged.

See also

- “browseNextMessage method” on page 401
- “browseMessagesByQueue method” on page 400
- “browseMessagesByID method” on page 399
- “browseClose method” on page 399

browseMessagesByID method

Begins a browse of the message that is queued in the message store, with the given message ID.

Syntax

```
public virtual qa_browse_handle browseMessagesByID(
    qa_const_string msgid
)
```

Parameters

- **msgid** The message ID.

Returns

A handle that is supplied to browseNextMessage.

Remarks

The handle returned by this method is supplied to QAManagerBase::browseNextMessage. This method and QAManagerBase::browseNextMessage can be used to enumerate the messages in the message store at the time this method was called.

The messages are just being browsed, so they cannot be acknowledged. Use QAManagerBase::getMessage to receive messages so they can be acknowledged.

See also

- "browseNextMessage method" on page 401
- "browseMessagesByQueue method" on page 400
- "browseMessages method" on page 399
- "browseClose method" on page 399

browseMessagesByQueue method

Begins a browse of messages queued in the message store for the given queue.

Syntax

```
public virtual qa_browse_handle browseMessagesByQueue(
    qa_const_string address
)
```

Parameters

- **address** The queue in which to browse.

Returns

A handle that is supplied to browseNextMessage.

Remarks

The handle returned by this method is supplied to QAManagerBase::browseNextMessage. This method and QAManagerBase::browseNextMessage can be used to enumerate the messages in the message store at the time this method was called.

The messages are just being browsed, so they cannot be acknowledged. Use QAManagerBase::getMessage to receive messages so they can be acknowledged.

See also

- "browseNextMessage method" on page 401
- "browseMessagesByID method" on page 399
- "browseMessages method" on page 399
- "browseClose method" on page 399

browseMessagesBySelector method

Begins a browse of messages queued in the message store that satisfy the given selector.

Syntax

```
public virtual qa_browse_handle browseMessagesBySelector(
    qa_const_string selector
)
```

Parameters

- **selector** The selector.

Returns

A handle that is supplied to browseNextMessage.

Remarks

The handle returned by this method is supplied to QAManagerBase::browseNextMessage. This method and QAManagerBase::browseNextMessage can be used to enumerate the messages in the message store at the time this method was called.

The messages are just being browsed, so they cannot be acknowledged.

Use QAManagerBase::getMessage to receive messages so they can be acknowledged.

See also

- "browseNextMessage method" on page 401
- "browseMessagesByID method" on page 399
- "browseMessagesByQueue method" on page 400
- "browseMessages method" on page 399
- "browseClose method" on page 399

browseNextMessage method

Returns the next message for the given browse operation, returning null if there are no more messages.

Syntax

```
public virtual QAMessage * browseNextMessage(qa_browse_handle handle)
```

Parameters

- **handle** A handle returned by one of the begin browse operations.

Returns

The next message, or qa_null if there are no more messages.

Remarks

To obtain the handle to browsed messages, use QAManagerBase::browseMessages or other QAManagerBase methods which allow you to browse messages by queue or message ID.

See also

- “browseMessages method” on page 399
- “browseMessagesByQueue method” on page 400
- “browseMessagesByID method” on page 399
- “browseClose method” on page 399

cancelMessage method

Cancels the message with the given message ID.

Syntax

```
public virtual qa_bool cancelMessage(qa_const_string msgid)
```

Parameters

- **msgid** The ID of the message to cancel.

Returns

True if and only if the operation succeeded.

Remarks

The cancelMessage method puts a message into a canceled state before it is transmitted. With the default delete rules of the QAnywhere Agent, canceled messages are eventually deleted from the message store.

The cancelMessage method fails if the message is already in a final state, or if it has been transmitted to the central messaging server.

For more information about delete rules, see “Message delete rules” on page 743.

close method

Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.

Syntax

```
public virtual qa_bool close()
```

Returns

True if and only if the operation succeeded.

Remarks

Subsequent calls to close() are ignored. When an instance of QAManagerBase is closed, it cannot be re-opened; you must create and open a new QAManagerBase instance in this case.

If a database connection error is detected, you can re-open a QAManager by calling the close method followed by the open method. When re-opening a QAManager, you do not need to re-create it, reset the properties, or reset the message listeners. The properties of the QAManager cannot be changed after the first open, and subsequent open calls must supply the same acknowledgement mode.

See also

- “open method” on page 393

createBinaryMessage method

Creates a QABinaryMessage instance.

Syntax

```
public virtual QABinaryMessage * createBinaryMessage()
```

Returns

A new QABinaryMessage instance.

Remarks

A QABinaryMessage instance is used to send a message containing a message body of uninterpreted bytes.

See also

- “QABinaryMessage class” on page 366

createTextMessage method

Creates a QATextMessage instance.

Syntax

```
public virtual QATextMessage * createTextMessage()
```

Returns

A new QATextMessage instance.

Remarks

A QATextMessage object is used to send a message containing a string message body.

See also

- "QATextMessage class" on page 452

deleteMessage method

Deletes a QAMessage object.

Syntax

```
public virtual void deleteMessage(QAMessage * msg)
```

Parameters

- **msg** The message to delete.

Remarks

By default, messages created by QAManagerBase::createTextMessage or QAManagerBase::createBinaryMessage are deleted automatically when the QAManagerBase is closed. This method allows more control over when messages are deleted.

endEnumStorePropertyNames method

Frees the resources associated with a message store property name enumeration.

Syntax

```
public virtual void endEnumStorePropertyNames(
    qa_store_property_enum_handle h
)
```

Parameters

- **h** A handle returned by beginEnumStorePropertyNames.

See also

- "beginEnumStorePropertyNames method" on page 398

getAllQueueDepth method

Returns the total depth of all queues, based on a given filter.

Syntax

```
public virtual qa_int getAllQueueDepth(qa_short filter)
```

Parameters

- **filter** A filter indicating incoming messages, outgoing messages, or all messages.

Returns

The number of messages, or -1 if an error occurs.

Remarks

The incoming depth of a queue is the number of incoming messages which have not been received (for example, using QAManagerBase::getMessage). The outgoing depth of a queue is the number of outgoing messages (including uncommitted) that have not been transmitted to the server.

See also

- "QueueDepthFilter class" on page 462

getBooleanStoreProperty method

Gets a boolean value for a pre-defined or custom message store property.

Syntax

```
public virtual qa_bool getBooleanStoreProperty(
    qa_const_string name,
    qa_bool * value
)
```

Parameters

- **name** The pre-defined or custom property name.

- **value** The destination for the boolean value.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

getByteStoreProperty method

Gets a byte value for a pre-defined or custom message store property.

Syntax

```
public virtual qa_bool getByteStoreProperty(
    qa_const_string name,
    qa_byte * value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the byte value.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

getDoubleStoreProperty method

Gets a double value for a pre-defined or custom message store property.

Syntax

```
public virtual qa_bool getDoubleStoreProperty(
    qa_const_string name,
    qa_double * value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the double value.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

getFloatStoreProperty method

Gets a float value for a pre-defined or custom message store property.

Syntax

```
public virtual qa_bool getFloatStoreProperty(
    qa_const_string name,
    qa_float * value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the float value.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

getIntStoreProperty method

Gets an int value for a pre-defined or custom message store property.

Syntax

```
public virtual qa_bool getIntStoreProperty(
    qa_const_string name,
    qa_int * value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the int value.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

getLastError method

The error code associated with the last excecuted QAManagerBase method.

Syntax

```
public virtual qa_int getLastError()
```

Returns

The error code.

Remarks

0 indicates no error.

See also

- “getLastNativeError method” on page 408
- “getLastErrorMsg method” on page 408
- “QAError class” on page 380

getLastErrorMsg method

The error text associated with the last executed QAManagerBase method.

Syntax

```
public virtual qa_string getLastErrorMsg()
```

Returns

The error message.

Remarks

This method returns null if QAManagerBase::getLastError returns 0. You can retrieve this property after catching a QAError.

See also

- “getLastError method” on page 408
- “getLastNativeError method” on page 408
- “QAError class” on page 380

getLastNativeError method

The native error code associated with the last excecuted QAManagerBase method.

Syntax

```
public virtual an_sql_code getLastNativeError()
```

Returns

The native error code.

Remarks

0 indicates no error.

See also

- “getLastError method” on page 408
- “getLastErrorMsg method” on page 408
- “QAError class” on page 380

getLongStoreProperty method

Gets a long value for a pre-defined or custom message store property.

Syntax

```
public virtual qa_bool getLongStoreProperty(
    qa_const_string name,
    qa_long * value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the long value.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

getMessage method

Returns the next available QAMessage sent to the specified address.

Syntax

```
public virtual QAMessage * getMessage(qa_const_string address)
```

Parameters

- **address** The destination.

Returns

The next QAMessage, or null if no message is available.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If there is no message available, this call blocks indefinitely until a message is available. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

getMessageBySelector method

Returns the next available QAMessage sent to the specified address that satisfies the given selector.

Syntax

```
public virtual QAMessage * getMessageBySelector(
    qa_const_string address,
    qa_const_string selector
)
```

Parameters

- **address** The destination.
- **selector** The selector.

Returns

The next QAMessage, or null if no message is available.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If there is no message available, this call blocks indefinitely until a message is available. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

getMessageBySelectorNoWait method

Returns the next available QAMessage sent to the given address that satisfies the given selector.

Syntax

```
public virtual QAMessage * getMessageBySelectorNoWait(
    qa_const_string address,
    qa_const_string selector
)
```

Parameters

- **address** The destination.
- **selector** The selector.

Returns

The next message, or qa_null if no message is available.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If no message is available, this method returns immediately. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

getMessageBySelectorTimeout method

Returns the next available QAMessage sent to the given address that satisfies the given selector.

Syntax

```
public virtual QAMessage * getMessageBySelectorTimeout(
    qa_const_string address,
    qa_const_string selector,
    qa_long timeout
)
```

Parameters

- **address** The destination.
- **selector** The selector.
- **timeout** the maximum time, in milliseconds, to wait

Returns

The next QAMessage, or null if no message is available.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If no message is available, this method waits for the specified timeout and then returns. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

getMessageNoWait method

Returns the next available QAMessage sent to the given address.

Syntax

```
public virtual QAMessage * getMessageNoWait(qa_const_string address)
```

Parameters

- **address** The destination.

Returns

The next message, or qa_null if no message is available.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If no message is available, this method returns immediately. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

getMessageTimeout method

Returns the next available QAMessage sent to the given address.

Syntax

```
public virtual QAMessage * getMessageTimeout(
    qa_const_string address,
    qa_long timeout
)
```

Parameters

- **address** The destination
- **timeout** The maximum time, in milliseconds, to wait

Returns

The next QAMessage, or null if no message is available.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If no message is available, this method waits for the specified timeout and then returns. Use this method to receive messages synchronously.

For more information about receiving messages asynchronously (using a message event handler), see "Receiving messages asynchronously" on page 70.

getMode method

Returns the QAManager acknowledgement mode for received messages.

Syntax

```
public virtual qa_short getMode()
```

Returns

The acknowledgement mode.

Remarks

For a list of values, see the AcknowledgementMode class.

AcknowledgementMode::EXPLICIT_ACKNOWLEDGEMENT and AcknowledgementMode::IMPLICIT_ACKNOWLEDGEMENT apply to QAManager instances; AcknowledgementMode::TRANSACTIONAL is the mode for QATransactionalManager instances.

See also

- "AcknowledgementMode class" on page 354

getQueueDepth method

Returns the depth of a queue, based on a given filter.

Syntax

```
public virtual qa_int getQueueDepth(
    qa_const_string address,
    qa_short filter
)
```

Parameters

- **address** The queue name.
- **filter** A filter indicating incoming messages, outgoing messages, or all messages.

Returns

The number of messages in the queue, or -1 if an error occurs.

Remarks

The incoming depth of the queue is the number of incoming messages which have not been received (for example, using QAManagerBase::getMessage). The outgoing depth of a queue is the number of outgoing messages (including uncommitted) that have not been transmitted to the server.

If getQueueDepth is called with the LOCAL filter and a queue is specified, it returns the number of unreceived local messages that are addressed to that queue. If a queue is not specified, it returns the total number of unreceived local messages in the message store, excluding system messages.

See also

- “QueueDepthFilter class” on page 462

getShortStoreProperty method

Gets a short value for a pre-defined or custom message store property.

Syntax

```
public virtual qa_bool getShortStoreProperty(
    qa_const_string name,
    qa_short * value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the short value.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

getStringStoreProperty method

Gets a string value for a pre-defined or custom message store property.

Syntax

```
public virtual qa_int getStringStoreProperty(
    qa_const_string name,
    qa_string address,
        qa_int maxlen
    )
```

Parameters

- **name** The pre-defined or custom property name.
- **address** The destination for the qa_string value.
- **maxlen** The maximum number of qa_chars of the value to copy, including the null terminator character.

Returns

The number of non-null qa_chars actually copied, or -1 if the operation failed.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

nextStorePropertyName method

Returns the message store property name for the given enumeration.

Syntax

```
public virtual qa_int nextStorePropertyName(
    qa_store_property_enum_handle h,
    qa_string buffer,
    qa_int bufferLen
)
```

Parameters

- **h** A handle returned by beginEnumStorePropertyNames.
- **buffer** The buffer into which to write the property name.
- **bufferLen** The length of the buffer to store the property name. This length must include space for the null terminator.

Returns

The length of the property name, or -1 if there are no more property names. property names

Remarks

If there are no more property names, returns -1.

See also

- "beginEnumStorePropertyNames method" on page 398

putMessage method

Puts a message into the queue for the given destination.

Syntax

```
public virtual qa_bool putMessage(
    qa_const_string address,
    QAMessage * msg
)
```

Parameters

- **address** The destination.
- **msg** The message.

Returns

True if and only if the operation succeeded.

putMessageTimeToLive method

Puts a message into the queue for the given destination and a given time-to-live in milliseconds.

Syntax

```
public virtual qa_bool putMessageTimeToLive(
    qa_const_string address,
    QAMessage * msg,
    qa_long ttl
)
```

Parameters

- **address** The destination.
- **msg** The message.
- **ttl** The time-to-live, in milliseconds.

Returns

True if and only if the operation succeeded.

setBooleanStoreProperty method

Sets a pre-defined or custom message store property to a boolean value.

Syntax

```
public virtual qa_bool setBooleanStoreProperty(
    qa_const_string name,
    qa_bool value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The qa_bool value of the property.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to set pre-defined or user-defined client. store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

setByteStoreProperty method

Sets a pre-defined or custom message store property to a byte value.

Syntax

```
public virtual qa_bool setByteStoreProperty(
    qa_const_string name,
    qa_byte value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The qa_byte value of the property.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

setDoubleStoreProperty method

Sets a pre-defined or custom message store property to a double value.

Syntax

```
public virtual qa_bool setDoubleStoreProperty(
    qa_const_string name,
    qa_double value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The qa_double value of the property.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

setFloatStoreProperty method

Sets a pre-defined or custom message store property to a float value.

Syntax

```
public virtual qa_bool setFloatStoreProperty(
    qa_const_string name,
    qa_float value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The qa_float value of the property.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

setIntStoreProperty method

Sets a pre-defined or custom message store property to a int value.

Syntax

```
public virtual qa_bool setIntStoreProperty(
    qa_const_string name,
    qa_int value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The qa_int value of the property.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

setLongStoreProperty method

Sets a pre-defined or custom message store property to a long value.

Syntax

```
public virtual qa_bool setLongStoreProperty(
    qa_const_string name,
    qa_long value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The qa_long value of the property.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see “Client message store properties” on page 26.

setMessageListener method

Sets a message listener class to receive QAnywhere messages asynchronously.

Syntax

```
public virtual void setMessageListener(
    qa_const_string address,
    QAMessageListener * listener
)
```

Parameters

- **address** The destination address that the listener applies to.
- **listener** The message listener to associate with destination address.

Remarks

The listener is an instance of a class implementing QAMessageListener::onMessage, the only method defined in the QAMessageListener interface. QAMessageListener::onMessage accepts a single QAMessage parameter.

The setMessageListener address parameter specifies a local queue name used to receive the message. You can only have one listener assigned to a given queue.

If you want to listen for QAnywhere system messages, including push notifications and network status changes, specify "system" as the queue name. Use this method to receive message asynchronously.

For more information, see “Receiving messages asynchronously” on page 70 and “System queue” on page 58.

setMessageListenerBySelector method

Sets a message listener class to receive QAnywhere messages asynchronously, with a message selector.

Syntax

```
public virtual void setMessageListenerBySelector(
    qa_const_string address,
    qa_const_string selector,
    QAMessageListener * listener
)
```

Parameters

- **address** The destination address that the listener applies to.
- **selector** The selector to be used to filter the messages to be received.
- **listener** The message listener to associate with destination address.

Remarks

The listener is an instance of a class implementing QAMessageListener::onMessage, the only method defined in the QAMessageListener interface. QAMessageListener::onMessage accepts a single QAMessage parameter.

The setMessageListener address parameter specifies a local queue name used to receive the message. You can only have one listener assigned to a given queue. The selector parameter specifies a selector to be used to filter the messages to be received on the given address.

If you want to listen for QAnywhere system messages, including push notifications and network status changes, specify "system" as the queue name. Use this method to receive message asynchronously.

For more information, see “Receiving messages asynchronously” on page 70 and “System queue” on page 58.

setProperty method

Allows you to set QAnywhere manager configuration properties programmatically.

Syntax

```
public virtual qa_bool setProperty(
    qa_const_string name,
    qa_const_string value
)
```

Parameters

- **name** The pre-defined or custom QAnywhere Manager configuration property name.
- **value** The value of the QAnywhere Manager configuration property.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to override default QAnywhere manager configuration properties by specifying a property name and value.

For a list of QAnywhere manager configuration properties, see “QAnywhere manager configuration properties” on page 81.

You can also set QAnywhere manager configuration properties using a properties file and the QAManagerFactory::createQAManager method.

For more information, see "Setting QAnywhere manager configuration properties in a file" on page 82.

Note
You must set required properties before calling QAManager::open() or QATransactionalManager::open().

setShortStoreProperty method

Sets a pre-defined or custom message store property to a short value.

Syntax

```
public virtual qa_bool setShortStoreProperty(
    qa_const_string name,
    qa_short value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The qa_short value of the property.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

setStringStoreProperty method

Sets a pre-defined or custom message store property to a string value.

Syntax

```
public virtual qa_bool setStringStoreProperty(
    qa_const_string name,
    qa_const_string value
)
```

Parameters

- **name** The pre-defined or custom property name.

- **value** The qa_string value of the property.

Returns

True if and only if the operation succeeded.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

For more information, see "Client message store properties" on page 26.

start method

Starts the QAManagerBase for receiving incoming messages in message listeners.

Syntax

```
public virtual qa_bool start()
```

Returns

True if and only if the operation succeeded.

Remarks

The QAManagerBase does not need to be started if there are no message listeners set, that is, if messages are received with the getMessage methods. It is not recommended to use the getMessage methods as well as message listeners for receiving messages. Use one or the other of the asynchronous (message listener) or synchronous (getMessage) models.

Any calls to start beyond the first without an intervening QAManagerBase::stop() call are ignored.

See also

- "stop method" on page 423

stop method

Stops the QAManagerBase's reception of incoming messages.

Syntax

```
public virtual qa_bool stop()
```

Returns

True if and only if the operation succeeded.

Remarks

The messages are not lost. They are not received until the manager is started again. Any calls to stop beyond the first without an intervening QAManagerBase::start() are ignored.

See also

- “start method” on page 423

triggerSendReceive method

Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

Syntax

```
public virtual qa_bool triggerSendReceive()
```

Returns

True if and only if the operation succeeded.

Remarks

A call to triggerSendReceive results in immediate message synchronization between a QAnywhere Agent and the central messaging server. A manual triggerSendReceive call results in immediate message transmission, independent of the QAnywhere Agent transmission policies. QAnywhere Agent transmission policies determine how message transmission occurs. For example, message transmission can occur automatically at regular intervals, when your client receives a push notification, or when you call the QAManagerBase::putMessage to send a message.

For more information, see “Determining when message transmission should occur on the client” on page 46.

See also

- “putMessage method” on page 416

QAManagerFactory class

This class acts as a factory class for creating QATransactionalManager and QAManager objects.

Syntax

```
public class QAManagerFactory
```

Members

All members of QAManagerFactory class, including all inherited members.

Name	Description
"createQAManager method"	Returns a new QAManager instance with the specified properties.
"createQATransactionalManager method"	Returns a new QATransactionalManager instance with the specified properties.
"deleteQAManager method"	Destroys a QAManager, freeing its resources.
"deleteQATransactionalManager method"	Destroys a QATransactionalManager instance, freeing its resources.
"getLastError method"	The error code associated with the last excecuted QAManagerFactory method.
"getLastErrorMsg method"	The error text associated with the last executed QAManagerFactory method.
"getLastNativeError method"	The native error code associated with the last excecuted QAManagerFactory method.

Remarks

You can only have one instance of QAManagerFactory.

See also

- "QAManager class" on page 387
- "QATransactionalManager class" on page 457

createQAManager method

Returns a new QAManager instance with the specified properties.

Syntax

```
public virtual QAManager * createQAManager(qa_const_string iniFile)
```

Parameters

- **iniFile** The path of the properties file.

Returns

The QAManager instance.

Remarks

If the properties file parameter is null, the QAManager is created using default properties. You can use the QAManager::setProperty() method to set QAnywhere Manager properties programmatically after you create the QAManager.

For a list of QAnywhere Manager configuration properties, see "QAnywhere manager configuration properties" on page 81.

See also

- "QAManager class" on page 387

createQATransactionalManager method

Returns a new QATransactionalManager instance with the specified properties.

Syntax

```
public virtual QATransactionalManager * createQATransactionalManager(
    qa_const_string iniFile
)
```

Parameters

- **iniFile** The path of the properties file.

Returns

The QATransactionalManager instance.

Remarks

If the properties file parameter is null, the QATransactionalManager is created using default properties. You can use the QATransactionalManager::setProperty() method to set QAnywhere Manager properties programmatically after you create the QATransactionalManager.

For a list of QAnywhere Manager configuration properties, see "QAnywhere manager configuration properties" on page 81.

See also

- "QATransactionalManager class" on page 457

deleteQAManager method

Destroys a QAManager, freeing its resources.

Syntax

```
public virtual void deleteQAManager(QAManager * mgr)
```

Parameters

- **mgr** The QAManager instance to destroy.

Remarks

It is not necessary to use this method, since all created QAManager's are destroyed when QAnywhereFactory_term() is called. It is provided as a convenience for when it is desirable to free resources in a timely manner.

For more information, see "Shutting down QAnywhere" on page 80.

deleteQATransactionalManager method

Destroys a QATransactionalManager instance, freeing its resources.

Syntax

```
public virtual void deleteQATransactionalManager(
    QATransactionalManager * mgr
)
```

Parameters

- **mgr** The QATransactionalManager instance to destroy.

Remarks

It is not necessary to use this method, since all created QATransactionalManager instances are destroyed when QAnywhereFactory_term() is called. It is provided as a convenience for when it is desirable to free resources in a timely manner.

For more information, see "Shutting down QAnywhere" on page 80

getLastError method

The error code associated with the last excecuted QAManagerFactory method.

Syntax

```
public virtual qa_int getLastError()
```

Returns

The error code.

Remarks

0 indicates no error.

For a list of values, see the QAError.

See also

- “getLastNativeError method” on page 428
- “getLastErrorMsg method” on page 428

getLastErrorMsg method

The error text associated with the last executed QAManagerFactory method.

Syntax

```
public virtual qa_string getLastErrorMsg()
```

Returns

The error message.

Remarks

This method returns null if QAManagerFactory::getLastError returns 0.

You can retrieve this property after catching a QAError.

See also

- “getLastError method” on page 427
- “getLastNativeError method” on page 428
- “QAError class” on page 380

getLastNativeError method

The native error code associated with the last excecuted QAManagerFactory method.

Syntax

```
public virtual an_sql_code getLastNativeError()
```

Returns

The native error code.

Remarks

0 indicates no error.

See also

- “getLastError method” on page 427
- “getLastErrorMsg method” on page 428

QAMessage class

QAMessage provides an interface to set message properties and header fields.

Syntax

```
public class QAMessage
```

Derived classes

- “QABinaryMessage class” on page 366
- “QATextMessage class” on page 452

Members

All members of QAMessage class, including all inherited members.

Name	Description
“beginEnumPropertyNames method”	Begins an enumeration of message property names.
“castToBinaryMessage method”	Casts this QAMessage to a QABinaryMessage.
“castToTextMessage method”	Casts this QAMessage to a QATextMessage.
“clearProperties method”	Clears a message's properties.
“endEnumPropertyNames method”	Frees the resources associated with a message property name enumeration.
“getAddress method”	Gets the destination address for the QAMessage instance.
“getBooleanProperty method”	Gets the value of the qa_bool property with the specified name.
“getByteProperty method”	Gets the value of the qa_byte property with the specified name.
“getDoubleProperty method”	Gets the value of the qa_double property with the specified name.
“getExpiration method”	Gets the message's expiration time.
“getFloatProperty method”	Gets the value of the qa_float property with the specified name.
“getInReplyToID method”	Gets the ID of the message that this message is in reply to.
“getIntProperty method”	Gets the value of the qa_int property with the specified name.

Name	Description
“getLongProperty method”	Gets the value of the qa_long property with the specified name.
“getMessageID method”	Gets the message ID.
“getPriority method”	Gets the message priority level.
“getPropertyType method”	Returns the type of a property with the given name.
“getRedelivered method”	Indicates whether the message has been previously received but not acknowledged.
“getReplyToAddress method”	Gets the address to which a reply to this message should be sent.
“getShortProperty method”	Gets the value of the qa_short property with the specified name.
“getStringProperty method”	Gets the value of the qa_string property with the specified name.
“getTimestamp method”	Gets the message timestamp.
“getTimestampAsString method”	Gets the message timestamp as a formatted string.
“nextPropertyName method”	Returns the message property name for the given enumeration, returning -1 if there are no more property names.
“propertyExists method”	Indicates whether a property value exists.
“setAddress method”	Sets the destination address for this message.
“setBooleanProperty method”	Sets the qa_bool property with the specified name to the specified value.
“setByteProperty method”	Sets a qa_byte property with the specified name to the specified value.
“setDoubleProperty method”	Sets the qa_double property with the specified name to the specified value.
“setFloatProperty method”	Sets the qa_float property with the specified name to the specified value.
“setInReplyToID method”	Sets the In-Reply-To ID for the message.

Name	Description
"setIntProperty method"	Sets the qa_int property with the specified name to the specified value.
"setLongProperty method"	Sets the qa_long property with the specified name to the specified value.
"setMessageID method"	Sets the message ID.
"setPriority method"	Sets the priority level for this message.
"setRedelivered method"	Sets an indication of whether this message was redelivered.
"setReplyToAddress method"	Sets the address to which a reply to this message should be sent.
"setShortProperty method"	Sets e qa_short property with the specified name to the specified value.
"setStringProperty method"	Sets a qa_string property with the specified name to the specified value.
"setTimestamp method"	Sets the message timestamp.
"DEFAULT_PRIORITY variable"	The default message priority.
"DEFAULT_TIME_TO_LIVE variable"	The default message time-to-live value.

Remarks

The derived classes QABinaryMessage and QATextMessage provide specialized methods to read and write to the message body. You can use QAMessage methods to set predefined or custom message properties.

For a list of pre-defined property names, see the MessageProperties.

For more information about setting message properties and header fields, see "QAnywhere messages" on page 13.

beginEnumPropertyNames method

Begins an enumeration of message property names.

Syntax

```
public virtual qa_property_enum_handle beginEnumPropertyNames()
```

Returns

A handle that is supplied to nextPropertyName.

Remarks

The handle returned by this method is supplied to nextPropertyName. This method and nextPropertyName can be used to enumerate the message property names at the time this method was called. Message properties cannot be set between beginEnumPropertyNames and endEnumPropertyNames.

castToBinaryMessage method

Casts this QAMessage to a QABinaryMessage.

Syntax

```
public virtual QABinaryMessage * castToBinaryMessage()
```

Returns

A pointer to the QABinaryMessage, or NULL if this message is not an instance of QABinaryMessage.

Remarks

You can also use the conversion operator to convert this QAMessage to a QABinaryMessage.

To convert a QAMessage to a QABinaryMessage using the conversion operator, do the following:

```
QAMessage *msg;
QABinaryMessage *bmsg;
...
bmsg = (QABinaryMessage *)(*msg);
```

castToTextMessage method

Casts this QAMessage to a QATextMessage.

Syntax

```
public virtual QATextMessage * castToTextMessage()
```

Returns

A pointer to the QATextMessage, or NULL if this message is not an instance of QATextMessage.

Remarks

You can also use the conversion operator to convert this QAMessage to a QATextMessage.

For example, to convert a QAMessage to a QATextMessage using the conversion operator, do the following:

```
QAMessage *msg;
QATextMessage *bmsg;
...
bmsg = (QATextMessage *)(*msg);
```

clearProperties method

Clears a message's properties.

Syntax

```
public virtual void clearProperties()
```

Remarks

Note
The message's header fields and body are not cleared.

endEnumPropertyNames method

Frees the resources associated with a message property name enumeration.

Syntax

```
public virtual void endEnumPropertyNames(qa_property_enum_handle h)
```

Parameters

- **h** A handle returned by beginEnumPropertyNames.

getAddress method

Gets the destination address for the QAMessage instance.

Syntax

```
public virtual qa_const_string getAddress()
```

Returns

The destination address.

Remarks

When a message is sent, this field is ignored. After completion of the send method, the field holds the destination address specified in QAManagerBase::putMessage().

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

getBooleanProperty method

Gets the value of the qa_bool property with the specified name.

Syntax

```
public virtual qa_bool getBooleanProperty(
    qa_const_string name,
    qa_bool * value
)
```

Parameters

- **name** The name of the property to get.
- **value** The destination for the qa_bool value.

Returns

True if and only if the operation succeeded.

Remarks

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “MessageProperties class” on page 356

getByteProperty method

Gets the value of the qa_byte property with the specified name.

Syntax

```
public virtual qa_bool getByteProperty(
    qa_const_string name,
    qa_byte * value
)
```

Parameters

- **name** The name of the property to get.
- **value** The destination for the qa_byte value.

Returns

True if and only if the operation succeeded.

Remarks

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “MessageProperties class” on page 356

getDoubleProperty method

Gets the value of the qa_double property with the specified name.

Syntax

```
public virtual qa_bool getDoubleProperty(
    qa_const_string name,
    qa_double * value
)
```

Parameters

- **name** The name of the property to get.
- **value** The destination for the qa_double value.

Returns

True if and only if the operation succeeded.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

getExpiration method

Gets the message's expiration time.

Syntax

```
public virtual qa_long getExpiration()
```

Returns

The expiration time.

Remarks

When a message is sent, the Expiration header field is left unassigned. After the send method completes, the Expiration header holds the expiration time of the message.

This property is read-only because the expiration time of a message is set by adding the time-to-live argument of QAManagerBase::putMessageTimeToLive to the current time.

The expiration time is in units that are natural for the platform. For Windows/PocketPC platforms, expiration is a SYSTEMTIME, converted to a FILETIME, which is copied to an qa_long value.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "getTimestamp method" on page 442

getFloatProperty method

Gets the value of the qa_float property with the specified name.

Syntax

```
public virtual qa_bool getFloatProperty(
    qa_const_string name,
    qa_float * value
)
```

Parameters

- **name** The name of the property to get.
- **value** The destination for the qa_float value.

Returns

True if and only if the operation succeeded.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

getInReplyToID method

Gets the ID of the message that this message is in reply to.

Syntax

```
public virtual qa_const_string getInReplyToID()
```

Returns

The In-Reply-To ID.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

getIntProperty method

Gets the value of the qa_int property with the specified name.

Syntax

```
public virtual qa_bool getIntProperty(
    qa_const_string name,
    qa_int * value
)
```

Parameters

- **name** The name of the property to get.
- **value** The destination for the qa_int value.

Returns

True if and only if the operation succeeded.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

getLongProperty method

Gets the value of the qa_long property with the specified name.

Syntax

```
public virtual qa_bool getLongProperty(
    qa_const_string name,
    qa_long * value
)
```

Parameters

- **name** The name of the property to get.
- **value** The destination for the qa_long value.

Returns

True if and only if the operation succeeded.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- “MessageProperties class” on page 356

getMessageID method

Gets the message ID.

Syntax

```
public virtual qa_const_string getMessageID()
```

Returns

The message ID.

Remarks

The MessageID header field contains a value that uniquely identifies each message sent by the QAnywhere client.

When a message is sent using QAManagerBase::putMessage method, the MessageID header is null and can be ignored. When the send method returns, it contains an assigned value.

A MessageID is a qa_string value that should function as a unique key for identifying messages in a historical repository.

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

getPriority method

Gets the message priority level.

Syntax

```
public virtual qa_int getPriority()
```

Returns

The message priority.

Remarks

The QAnywhere client API defines ten levels of priority value, with 0 as the lowest priority and 9 as the highest. Clients should consider priorities 0-4 as gradations of normal priority and priorities 5-9 as gradations of expedited priority.

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

getPropertyType method

Returns the type of a property with the given name.

Syntax

```
public virtual qa_short getPropertyType(qa_const_string name)
```

Parameters

- **name** The name of the property.

Returns

The type of the property.

Remarks

One of PROPERTY_TYPE_BOOLEAN, PROPERTY_TYPE_BYTE, PROPERTY_TYPE_SHORT, PROPERTY_TYPE_INT, PROPERTY_TYPE_LONG, PROPERTY_TYPE_FLOAT, PROPERTY_TYPE_DOUBLE, PROPERTY_TYPE_STRING, PROPERTY_TYPE_UNKNOWN.

getRedelivered method

Indicates whether the message has been previously received but not acknowledged.

Syntax

```
public virtual qa_bool getRedelivered()
```

Returns

True if and only if the message was redelivered.

Remarks

The Redelivered header is set by a receiving QAManager when it detects that a message being received was received before.

For example, an application receives a message using a QAManager opened with AcknowledgementMode::EXPLICIT_ACKNOWLEDGEMENT, and shuts down without acknowledging the message. When the application starts again and receives the same message the Redelivered header is true.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

getReplyToAddress method

Gets the address to which a reply to this message should be sent.

Syntax

```
public virtual qa_const_string getReplyToAddress()
```

Returns

The reply-to address.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

getShortProperty method

Gets the value of the qa_short property with the specified name.

Syntax

```
public virtual qa_bool getShortProperty(
    qa_const_string name,
    qa_short * value
)
```

Parameters

- **name** The name of the property to get.
- **value** The destination for the qa_short value.

Returns

True if and only if the operation succeeded.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

getStringProperty method

Gets the value of the qa_string property with the specified name.

Overload list

Name	Description
"getStringProperty(qa_const_string, qa_int, qa_string, qa_int) method"	Gets the value of the qa_string property (starting at offset) with the specified name.
"getStringProperty(qa_const_string, qa_string, qa_int) method"	Gets the value of the qa_string property with the specified name.

getStringProperty(qa_const_string, qa_int, qa_string, qa_int) method

Gets the value of the qa_string property (starting at offset) with the specified name.

Syntax

```
public virtual qa_int getStringProperty(
    qa_const_string name,
    qa_int offset,
    qa_string dest,
    qa_int maxlen
)
```

Parameters

- **name** The name of the property to get.
- **offset** The starting offset into the property value from which to copy.
- **dest** The destination for the qa_string value.
- **maxlen** The maximum number of qa_chars of the value to copy. This value includes the null terminator qa_char.

Returns

The number of non-null qa_chars actually copied, or -1 if the operation failed.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

getStringProperty(qa_const_string, qa_string, qa_int) method

Gets the value of the qa_string property with the specified name.

Syntax

```
public virtual qa_int getStringProperty(
    qa_const_string name,
    qa_string dest,
    qa_int maxlen
)
```

Parameters

- **name** The name of the property to get.
- **dest** The destination for the qa_string value.
- **maxlen** The maximum number of qa_chars of the value to copy. This value includes the null terminator qa_char.

Returns

The number of non-null qa_chars actually copied, or -1 if the operation failed.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

getTimestamp method

Gets the message timestamp.

Syntax

```
public virtual qa_long getTimestamp()
```

Returns

The message timestamp.

Remarks

This Timestamp header field contains the time a message was created. It is a coordinated universal time (UTC).

It is not the time the message was actually transmitted, because the actual send may occur later due to transactions or other client-side queuing of messages. It is in units that are natural for the platform. For Windows/PocketPC platforms, the timestamp is a SYSTEMTIME, converted to a FILETIME, which is copied to a qa_long value.

To convert a timestamp ts to SYSTEMTIME for displaying to a user, run the following code:

```
SYSTEMTIME stime;
FILETIME   ftime;
ULARGE_INTEGER time;
time.QuadPart = ts;
memcpy(&ftime, &time, sizeof(FILETIME));
FileTimeToSystemTime(&ftime, &stime);
```

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

getTimestampAsString method

Gets the message timestamp as a formatted string.

Syntax

```
public virtual qa_int getTimestampAsString(
    qa_string buffer,
    qa_int bufferLen
)
```

Parameters

- **buffer** The buffer for the formatted timestamp.
- **bufferLen** The size of the buffer.

Returns

The number of non-null qa_chars written to the buffer.

Remarks

The format is: "dow, MMM dd, yyyy hh:mm:ss.nnn GMT".

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

nextPropertyName method

Returns the message property name for the given enumeration, returning -1 if there are no more property names.

Syntax

```
public virtual qa_int nextPropertyName(
    qa_property_enum_handle h,
    qa_string buffer,
      qa_int bufferLen
  )
```

Parameters

- **h** A handle returned by beginEnumPropertyNames.
- **buffer** The buffer into which to write the property name.
- **bufferLen** The length of the buffer to store the property name. This length must include space for the null terminator

Returns

The length of the property name, or -1 if there are no more property names.

propertyExists method

Indicates whether a property value exists.

Syntax

```
public virtual qa_bool propertyExists(qa_const_string name)
```

Parameters

- **name** The name of the property.

Returns

True if and only if the property exists.

setAddress method

Sets the destination address for this message.

Syntax

```
public virtual void setAddress(qa_const_string destination)
```

Parameters

- **destination** The destination address.

Remarks

This method can be used to change the value for a message that has been received.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

setBooleanProperty method

Sets the qa_bool property with the specified name to the specified value.

Syntax

```
public virtual void setBooleanProperty(
    qa_const_string name,
    qa_bool value
)
```

Parameters

- **name** the name of the property to set.
- **value** the qa_bool value of the property.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

setByteProperty method

Sets a qa_byte property with the specified name to the specified value.

Syntax

```
public virtual void setByteProperty(qa_const_string name, qa_byte value)
```

Parameters

- **name** The name of the property to set.
- **value** The qa_byte value of the property.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

setDoubleProperty method

Sets the qa_double property with the specified name to the specified value.

Syntax

```
public virtual void setDoubleProperty(
    qa_const_string name,
    qa_double value
)
```

Parameters

- **name** The name of the property to set.
- **value** The qa_double value of the property.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

setFloatProperty method

Sets the qa_float property with the specified name to the specified value.

Syntax

```
public virtual void setFloatProperty(
    qa_const_string name,
    qa_float value
)
```

Parameters

- **name** The name of the property to set.
- **value** The qa_float value of the property.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

setInReplyToID method

Sets the In-Reply-To ID for the message.

Syntax

```
public virtual void setInReplyToID(qa_const_string id)
```

Parameters

- **id**   The In-Reply-To ID.

Remarks

A client can use the InReplyToID header field to link one message with another. A typical use is to link a response message with its request message.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

setIntProperty method

Sets the qa_int property with the specified name to the specified value.

Syntax

```
public virtual void setIntProperty(qa_const_string name, qa_int value)
```

Parameters

- **name**   The name of the property to set.
- **value**   The qa_int value of the property.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

setLongProperty method

Sets the qa_long property with the specified name to the specified value.

Syntax

```
public virtual void setLongProperty(qa_const_string name, qa_long value)
```

Parameters

- **name**   The name of the property to set.
- **value**   The qa_long value of the property.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- "MessageProperties class" on page 356

setMessageID method

Sets the message ID.

Syntax

```
public virtual void setMessageID(qa_const_string id)
```

Parameters

- **id** The message ID.

Remarks

This method can be used to change the value for a message that has been received.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

setPriority method

Sets the priority level for this message.

Syntax

```
public virtual void setPriority(qa_int priority)
```

Parameters

- **priority** The message priority.

Remarks

This method can be used to change the value for a message that has been received.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

setRedelivered method

Sets an indication of whether this message was redelivered.

Syntax

```
public virtual void setRedelivered(qa_bool redelivered)
```

Parameters

- **redelivered** The redelivered indication.

Remarks

This method can be used to change the value for a message that has been received.

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

setReplyToAddress method

Sets the address to which a reply to this message should be sent.

Syntax

```
public virtual void setReplyToAddress(qa_const_string replyTo)
```

Parameters

- **replyTo** The reply-to address.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

setShortProperty method

Sets e qa_short property with the specified name to the specified value.

Syntax

```
public virtual void setShortProperty(
    qa_const_string name,
    qa_short value
)
```

Parameters

- **name** The name of the property to set.

- **value** The qa_short value of the property.

Remarks

For more information about getting and setting message headers and properties, see "QAnywhere messages" on page 13.

See also

- “MessageProperties class” on page 356

setStringProperty method

Sets a qa_string property with the specified name to the specified value.

Syntax

```
public virtual void setStringProperty(
    qa_const_string name,
    qa_const_string value
)
```

Parameters

- **name** The name of the property to set.
- **value** The qa_string value of the property.

Remarks

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “MessageProperties class” on page 356

setTimestamp method

Sets the message timestamp.

Syntax

```
public virtual void setTimestamp(qa_long timestamp)
```

Parameters

- **timestamp** The message timestamp, a coordinated universal time (UTC).

Remarks

This method can be used to change the value for a message that has been received.

For more information about getting and setting message headers and properties, see “QAnywhere messages” on page 13.

See also

- “getTimestamp method” on page 442

DEFAULT_PRIORITY variable

The default message priority.

Syntax

```
public static const qa_int DEFAULT_PRIORITY;
```

Remarks

This value is 4. This is normal priority as values 0-4 are gradations of normal priority and values 5-9 are gradations of expedited priority.

DEFAULT_TIME_TO_LIVE variable

The default message time-to-live value.

Syntax

```
public static const qa_long DEFAULT_TIME_TO_LIVE;
```

Remarks

This value is 0, which indicates that the message does not expire.

QAMessageListener class

A QAMessageListener object is used to receive asynchronously delivered messages.

Syntax

```
public class QAMessageListener
```

Members

All members of QAMessageListener class, including all inherited members.

Name	Description
"QAMessageListener deconstructor"	Virtual destructor.
"onMessage method"	Passes a message to the listener.

QAMessageListener deconstructor

Virtual destructor.

Syntax

```
public virtual ~QAMessageListener()
```

onMessage method

Passes a message to the listener.

Syntax

```
public virtual void onMessage(QAMessage * message)
```

Parameters

- **message** The message passed to the listener.

QATextMessage class

QATextMessage inherits from the QAMessage class and adds a text message body.

Syntax

```
public class QATextMessage : QAMessage
```

Base classes

- “QAMessage class” on page 429

Members

All members of QATextMessage class, including all inherited members.

Name	Description
“beginEnumPropertyNames method”	Begins an enumeration of message property names.
“castToBinaryMessage method”	Casts this QAMessage to a QABinaryMessage.
“castToTextMessage method”	Casts this QAMessage to a QATextMessage.
“clearProperties method”	Clears a message's properties.
“endEnumPropertyNames method”	Frees the resources associated with a message property name enumeration.
“getAddress method”	Gets the destination address for the QAMessage instance.
“getBooleanProperty method”	Gets the value of the qa_bool property with the specified name.

Name	Description
“getByteProperty method”	Gets the value of the qa_byte property with the specified name.
“getDoubleProperty method”	Gets the value of the qa_double property with the specified name.
“getExpiration method”	Gets the message's expiration time.
“getFloatProperty method”	Gets the value of the qa_float property with the specified name.
“getInReplyToID method”	Gets the ID of the message that this message is in reply to.
“getIntProperty method”	Gets the value of the qa_int property with the specified name.
“getLongProperty method”	Gets the value of the qa_long property with the specified name.
“getMessageID method”	Gets the message ID.
“getPriority method”	Gets the message priority level.
“getPropertyType method”	Returns the type of a property with the given name.
“getRedelivered method”	Indicates whether the message has been previously received but not acknowledged.
“getReplyToAddress method”	Gets the address to which a reply to this message should be sent.
“getShortProperty method”	Gets the value of the qa_short property with the specified name.
“getStringProperty method”	Gets the value of the qa_string property with the specified name.
“getText method”	Gets the string containing this message's data.
“getTextLength method”	Returns the text length.
“getTimestamp method”	Gets the message timestamp.
“getTimestampAsString method”	Gets the message timestamp as a formatted string.
“nextPropertyName method”	Returns the message property name for the given enumeration, returning -1 if there are no more property names.

Name	Description
“propertyExists method”	Indicates whether a property value exists.
“readText method”	Reads the requested length of text from the current text position into a buffer.
“reset method”	Repositions the current text position to the beginning.
“setAddress method”	Sets the destination address for this message.
“setBooleanProperty method”	Sets the qa_bool property with the specified name to the specified value.
“setByteProperty method”	Sets a qa_byte property with the specified name to the specified value.
“setDoubleProperty method”	Sets the qa_double property with the specified name to the specified value.
“setFloatProperty method”	Sets the qa_float property with the specified name to the specified value.
“setInReplyToID method”	Sets the In-Reply-To ID for the message.
“setIntProperty method”	Sets the qa_int property with the specified name to the specified value.
“setLongProperty method”	Sets the qa_long property with the specified name to the specified value.
“setMessageID method”	Sets the message ID.
“setPriority method”	Sets the priority level for this message.
“setRedelivered method”	Sets an indication of whether this message was redelivered.
“setReplyToAddress method”	Sets the address to which a reply to this message should be sent.
“setShortProperty method”	Sets e qa_short property with the specified name to the specified value.
“setStringProperty method”	Sets a qa_string property with the specified name to the specified value.
“setText method”	Sets the string containing this message's data.
“setTimestamp method”	Sets the message timestamp.

Name	Description
“writeText method”	Concatenates text to the current text.
“DEFAULT_PRIORITY variable”	The default message priority.
“DEFAULT_TIME_TO_LIVE variable”	The default message time-to-live value.

Remarks

QATextMessage provides methods to read from and write to the text message body.

When the message is first created, the body of the message is in write-only mode. After a message has been sent, the client that sent it can retain and modify it without affecting the message that has been sent. The same message object can be sent multiple times.

When a message is received, the provider has called QATextMessage::reset so that the message body is in read-only mode and reading of values starts from the beginning of the message body. If a client attempts to write a message in read-only mode, a COMMON_MSG_NOT_WRITEABLE_ERROR is set.

See also

- “QABinaryMessage class” on page 366

getText method

Gets the string containing this message's data.

Syntax

```
public virtual qa_string getText()
```

Returns

A string containing the message's data.

Remarks

The default value is null.

If the message exceeds the maximum size specified by the QAManager::MAX_IN_MEMORY_MESSAGE_SIZE property, this function returns null. In this case, use the QATextMessage::readText method to read the text.

For more information about QAManager properties, see “QAnywhere manager configuration properties” on page 81.

getTextLength method

Returns the text length.

Syntax

```
public virtual qa_long getTextLength()
```

Returns

The text length.

Remarks

Note
If the text length is non-zero and getText() returns qa_null then the text does not fit in memory, and must be read in pieces using the readText.

readText method

Reads the requested length of text from the current text position into a buffer.

Syntax

```
public virtual qa_int readText(qa_string string, qa_int length)
```

Parameters

- **string** The destination for the text.
- **length** The maximum number of qa_chars to read into the destination. buffer, including the null termination character.

Returns

The actual number of non-null qa_chars read, or -1 if the entire text stream has been read.

reset method

Repositions the current text position to the beginning.

Syntax

```
public virtual void reset()
```

setText method

Sets the string containing this message's data.

Syntax

```
public virtual void setText(qa_const_string string)
```

Parameters

- **string** A string containing the message data to set.

writeText method

Concatenates text to the current text.

Syntax

```
public virtual void writeText(
    qa_const_string string,
    qa_int offset,
    qa_int length
)
```

Parameters

- **string** The source text to concatenate.
- **offset** The offset into the source text at which to start reading.
- **length** The number of qa_chars of the source text to read.

QATransactionalManager class

This class is the manager for transactional messaging.

Syntax

```
public class QATransactionalManager : QAManagerBase
```

Base classes

- "QAManagerBase class" on page 394

Members

All members of QATransactionalManager class, including all inherited members.

Name	Description
"beginEnumStorePropertyNames method"	Begins an enumeration of message store property names.
"browseClose method"	Frees the resources associated with a browse operation.
"browseMessages method"	Begins a browse of messages queued in the message store.
"browseMessagesByID method"	Begins a browse of the message that is queued in the message store, with the given message ID.

Name	Description
“browseMessagesByQueue method”	Begins a browse of messages queued in the message store for the given queue.
“browseMessagesBySelector method”	Begins a browse of messages queued in the message store that satisfy the given selector.
“browseNextMessage method”	Returns the next message for the given browse operation, returning null if there are no more messages.
“cancelMessage method”	Cancels the message with the given message ID.
“close method”	Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.
“commit method”	Commits the current transaction and begins a new transaction.
“createBinaryMessage method”	Creates a QABinaryMessage instance.
“createTextMessage method”	Creates a QATextMessage instance.
“deleteMessage method”	Deletes a QAMessage object.
“endEnumStorePropertyNames method”	Frees the resources associated with a message store property name enumeration.
“getAllQueueDepth method”	Returns the total depth of all queues, based on a given filter.
“getBooleanStoreProperty method”	Gets a boolean value for a pre-defined or custom message store property.
“getByteStoreProperty method”	Gets a byte value for a pre-defined or custom message store property.
“getDoubleStoreProperty method”	Gets a double value for a pre-defined or custom message store property.
“getFloatStoreProperty method”	Gets a float value for a pre-defined or custom message store property.
“getIntStoreProperty method”	Gets an int value for a pre-defined or custom message store property.
“getLastError method”	The error code associated with the last excecuted QAManagerBase method.

Name	Description
“getLastErrorMsg method”	The error text associated with the last executed QAManagerBase method.
“getLastNativeError method”	The native error code associated with the last excecuted QAManagerBase method.
“getLongStoreProperty method”	Gets a long value for a pre-defined or custom message store property.
“getMessage method”	Returns the next available QAMessage sent to the specified address.
“getMessageBySelector method”	Returns the next available QAMessage sent to the specified address that satisfies the given selector.
“getMessageBySelectorNoWait method”	Returns the next available QAMessage sent to the given address that satisfies the given selector.
“getMessageBySelectorTimeout method”	Returns the next available QAMessage sent to the given address that satisfies the given selector.
“getMessageNoWait method”	Returns the next available QAMessage sent to the given address.
“getMessageTimeout method”	Returns the next available QAMessage sent to the given address.
“getMode method”	Returns the QAManager acknowledgement mode for received messages.
“getQueueDepth method”	Returns the depth of a queue, based on a given filter.
“getShortStoreProperty method”	Gets a short value for a pre-defined or custom message store property.
“getStringStoreProperty method”	Gets a string value for a pre-defined or custom message store property.
“nextStorePropertyName method”	Returns the message store property name for the given enumeration.
“open method”	Opens a QATransactionalManager intance.
“putMessage method”	Puts a message into the queue for the given destination.
“putMessageTimeToLive method”	Puts a message into the queue for the given destination and a given time-to-live in milliseconds.

Name	Description
“rollback method”	Rolls back the current transaction and begins a new transaction.
“setBooleanStoreProperty method”	Sets a pre-defined or custom message store property to a boolean value.
“setByteStoreProperty method”	Sets a pre-defined or custom message store property to a byte value.
“setDoubleStoreProperty method”	Sets a pre-defined or custom message store property to a double value.
“setFloatStoreProperty method”	Sets a pre-defined or custom message store property to a float value.
“setIntStoreProperty method”	Sets a pre-defined or custom message store property to a int value.
“setLongStoreProperty method”	Sets a pre-defined or custom message store property to a long value.
“setMessageListener method”	Sets a message listener class to receive QAnywhere messages asynchronously.
“setMessageListenerBySelector method”	Sets a message listener class to receive QAnywhere messages asynchronously, with a message selector.
“setProperty method”	Allows you to set QAnywhere manager configuration properties programmatically.
“setShortStoreProperty method”	Sets a pre-defined or custom message store property to a short value.
“setStringStoreProperty method”	Sets a pre-defined or custom message store property to a string value.
“start method”	Starts the QAManagerBase for receiving incoming messages in message listeners.
“stop method”	Stops the QAManagerBase's reception of incoming messages.
“triggerSendReceive method”	Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

Remarks

The QATransactionalManager class derives from QAManagerBase and manages transactional QAnywhere messaging operations.

For a detailed description of derived behavior, see QAManagerBase.

The QATransactionalManager can only be used for transactional acknowledgement. Use the QATransactionalManager::commit() method to commit all QAManagerBase::putMessage() and QAManagerBase::getMessage() invocations.

For more information, see "Implementing transactional messaging" on page 63

See also

- "QATransactionalManager class" on page 457

commit method

Commits the current transaction and begins a new transaction.

Syntax

```
public virtual qa_bool commit()
```

Returns

True if and only if the commit operation was successful.

Remarks

This method commits all QAManagerBase::putMessage() and QAManagerBase::getMessage() invocations.

Note
The first transaction begins with the call to QATransactionalManager::open().

See also

- "QATransactionalManager class" on page 457

open method

Opens a QATransactionalManager intance.

Syntax

```
public virtual qa_bool open()
```

Returns

True if and only if the operation was successful.

Remarks

The open method must be the first method called after creating a manager.

See also

- "QATransactionalManager class" on page 457

rollback method

Rolls back the current transaction and begins a new transaction.

Syntax

```
public virtual qa_bool rollback()
```

Returns

True if and only if the open operation was successful.

Remarks

This method rolls back all uncommitted QAManagerBase::putMessage() and QAManagerBase::getMessage() invocations.

See also

- "QATransactionalManager class" on page 457

QueueDepthFilter class

QueueDepthFilter values for queue depth methods of QAManagerBase.

Syntax

```
public class QueueDepthFilter
```

Members

All members of QueueDepthFilter class, including all inherited members.

Name	Description
"ALL variable"	Count both incoming and outgoing messages.
"INCOMING variable"	Count only incoming messages.
"LOCAL variable"	Count only local messages.
"OUTGOING variable"	Count only outgoing messages.

ALL variable

Count both incoming and outgoing messages.

Syntax

```
public static const qa_short ALL;
```

Remarks

System messages and expired messages are not included in any queue depth counts.

INCOMING variable

Count only incoming messages.

Syntax

```
public static const qa_short INCOMING;
```

Remarks

An incoming message is defined as a message whose originator is different than the agent ID of the message store.

LOCAL variable

Count only local messages.

Syntax

```
public static const qa_short LOCAL;
```

Remarks

A local message is defined as a message whose originator and target are the agent ID of the message store.

OUTGOING variable

Count only outgoing messages.

Syntax

```
public static const qa_short OUTGOING;
```

Remarks

An outgoing message is defined as a message whose originator is the agent ID of the message store, and whose destination is not the agent ID of the message store.

StatusCodes class

This interface defines a set of codes for the status of a message.

Syntax

```
public class StatusCodes
```

Members

All members of StatusCodes class, including all inherited members.

Name	Description
“CANCELED variable”	The message has been canceled.
“EXPIRED variable”	The message has expired, that is the message was not received before its expiration time passed.
“FINAL variable”	This constant is used to determine if a message has achieved a final state.
“LOCAL variable”	The message is addressed to the local message store and will not be transmitted to the server.
“PENDING variable”	The message has been sent but not received and acknowledged.
“RECEIVED variable”	The message has been received and acknowledged by the receiver.
“RECEIVING variable”	The message is in the process of being received, or it was received but not acknowledged.
“TRANSMITTED variable”	The message has been transmitted to the server.
“TRANSMITTING variable”	The message is in the process of being transmitted to the server.
“UNRECEIVABLE variable”	The message has been marked as unreceivable.
“UNTRANSMITTED variable”	The message has not been transmitted to the server.

CANCELED variable

The message has been canceled.

Syntax

```
public static const qa_int CANCELED;
```

Remarks

This code has value 40. This code applies to MessageProperties::STATUS.

EXPIRED variable

The message has expired, that is the message was not received before its expiration time passed.

Syntax

```
public static const qa_int EXPIRED;
```

Remarks

This code has value 30. This code applies to MessageProperties::STATUS.

FINAL variable

This constant is used to determine if a message has achieved a final state.

Syntax

```
public static const qa_int FINAL;
```

Remarks

A message has achieved a final state if and only if its status is greater than this constant.

This code has value 20. This code applies to MessageProperties::STATUS.

LOCAL variable

The message is addressed to the local message store and will not be transmitted to the server.

Syntax

```
public static const qa_int LOCAL;
```

Remarks

This code has value 2. This code applies to MessageProperties::TRANSMISSION_STATUS.

PENDING variable

The message has been sent but not received and acknowledged.

Syntax

```
public static const qa_int PENDING;
```

Remarks

This code has value 1. This code applies to MessageProperties::STATUS.

RECEIVED variable

The message has been received and acknowledged by the receiver.

Syntax

```
public static const qa_int RECEIVED;
```

Remarks

This code has value 60. This code applies to MessageProperties::STATUS.

RECEIVING variable

The message is in the process of being received, or it was received but not acknowledged.

Syntax

```
public static const qa_int RECEIVING;
```

Remarks

This code has value 10. This code applies to MessageProperties::STATUS.

TRANSMITTED variable

The message has been transmitted to the server.

Syntax

```
public static const qa_int TRANSMITTED;
```

Remarks

This code has value 1. This code applies to MessageProperties::TRANSMISSION_STATUS.

TRANSMITTING variable

The message is in the process of being transmitted to the server.

Syntax

```
public static const qa_int TRANSMITTING;
```

Remarks

This code has value 3. This code applies to MessageProperties::TRANSMISSION_STATUS.

UNRECEIVABLE variable

The message has been marked as unreceivable.

Syntax

```
public static const qa_int UNRECEIVABLE;
```

Remarks

The message is either malformed, or there were too many failed attempts to deliver it.

This code has value 50. This code applies to MessageProperties::STATUS.

UNTRANSMITTED variable

The message has not been transmitted to the server.

Syntax

```
public static const qa_int UNTRANSMITTED;
```

Remarks

This code has value 0. This code applies to MessageProperties::TRANSMISSION_STATUS.

QAnywhere Java API reference for clients

Package (for regular clients)

```
ianywhere.qanywhere.client
```

Package (for standalone clients)

```
ianywhere.qanywhere.standaloneclient
```

AcknowledgementMode interface

Indicates how messages should be acknowledged by QAnywhere client applications.

Syntax

```
public interface AcknowledgementMode
```

Members

All members of AcknowledgementMode interface, including all inherited members.

Name	Description
"EXPLICIT_ACKNOWLEDGEMENT variable"	Indicates that received messages are acknowledged using one of the QAManager acknowledge methods.
"IMPLICIT_ACKNOWLEDGEMENT variable"	Indicates that all messages are acknowledged as soon as they are received by a client application.
"TRANSACTIONAL variable"	This mode indicates that messages are only acknowledged as part of the on going transaction.

Remarks

The implicit and explicit acknowledgement modes are assigned to a QAManager instance using the QAManager.open(short) method.

With implicit acknowledgement, messages are acknowledged as soon as they are received by a client application. With explicit acknowledgement, you must call one of the QAManager acknowledgement methods. The server propagates all status changes from client to client.

See also

- "QAManager interface" on page 507
- "QATransactionalManager interface" on page 575
- "QAManagerBase interface" on page 514

EXPLICIT_ACKNOWLEDGEMENT variable

Indicates that received messages are acknowledged using one of the QAManager acknowledge methods.

Syntax

```
final short AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT
```

See also

- "QAManager interface" on page 507

IMPLICIT_ACKNOWLEDGEMENT variable

Indicates that all messages are acknowledged as soon as they are received by a client application.

Syntax

```
final short AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT
```

Remarks

If you receive messages synchronously, messages are acknowledged as soon as the QAManagerBase.getMessage(String) method returns. If you receive messages asynchronously, the message is acknowledged as soon as the event handling method returns.

See also

- "getMessage method" on page 525

TRANSACTIONAL variable

This mode indicates that messages are only acknowledged as part of the on going transaction.

Syntax

```
final short AcknowledgementMode.TRANSACTIONAL
```

Remarks

This mode is automatically assigned to QATransactionalManager instances.

See also

- "QATransactionalManager interface" on page 575

MessageProperties interface

Provides fields storing standard message property names.

Syntax

```
public interface MessageProperties
```

Members

All members of MessageProperties interface, including all inherited members.

Name	Description
"ADAPTER variable"	For "system" queue messages, the network adapter that is being used to connect to the QAnywhere server.
"ADAPTERS variable"	This property name refers to a delimited list of network adapters that can be used to connect to the QAnywhere server.
"DELIVERY_COUNT variable"	This property name refers to the number of attempts that have been made so far to deliver the message.

Name	Description
“IP variable”	For "system" queue messages, the IP address of the network adapter that is being used to connect to the QAnywhere server.
“MAC variable”	For "system" queue messages, the MAC address of the network adapter that is being used to connect to the QAnywhere server.
“MSG_TYPE variable”	This property name refers to MessageType enumeration values associated with a QAnywhere message.
“NETWORK_STATUS variable”	This property name refers to the state of the network connection.
“ORIGINATOR variable”	This property name refers to the message store ID of the originator of the message.
“RAS variable”	For "system" queue messages, the RAS entry name that is being used to connect to the QAnywhere server.
“RASNAMES variable”	For "system" queue messages, a delimited list of RAS entry names that can be used to connect to the QAnywhere server.
“STATUS variable”	This property name refers to the current status of the message.
“STATUS_TIME variable”	This property name refers to the time at which the message assumed its current status.
“TRANSMISSION_STATUS variable”	This property name refers to the current transmission status of the message.

Remarks

The MessageProperties class provides standard message property names. You can pass MessageProperties fields to QAMessage methods used to get and set message properties.

For example, assume you have the following QAMessage instance:

```
QAMessage msg = mgr.createTextMessage();
```

The following example gets the value corresponding to MessageProperties.MSG_TYPE using the QAMessage.getIntProperty(String) method. The MessageType enumeration maps the integer result to an appropriate message type.

```
int msg_type = t_msg.getIntProperty( MessageProperties.MSG_TYPE );
```

The following example shows the onSystemMessage(QAMessage) method, which is used to handle QAnywhere system messages.

The message type is evaluated using MessageProperties.MSG_TYPE variable and the QAMessage.getIntProperty(String) method.

A delimited list of RAS entry names is obtained using MessageProperties.RASNAMES and the QAMessage.getStringProperty(String) method.

```
private void onSystemMessage(QAMessage msg) {
  QATextMessage    t_msg;
  int              msg_type;
  String           network_adapters;
  String           network_names;
  String           network_info;

  t_msg = (QATextMessage)msg;
  if( t_msg != null ) {
      // Evaluate the message type.
      msg_type =
(MessageType)t_msg.getIntProperty( MessageProperties.MSG_TYPE );
      if( msg_type == MessageType.NETWORK_STATUS_NOTIFICATION ) {
          // Handle network status notification.
          network_info = "";
          network_adapters =
t_msg.getStringProperty( MessageProperties.ADAPTERS );
          if( network_adapters != null && network_adapters.length > 0) {
            network_info += network_adapters;
          }
          network_names =
t_msg.getStringProperty( MessageProperties.RASNAMES );

           //...
      }
  }
}
```

ADAPTER variable

For "system" queue messages, the network adapter that is being used to connect to the QAnywhere server.

Syntax

`final String` **`MessageProperties.ADAPTER`**

Remarks

The value of this field is "ias_Network.Adapter".

You can pass MessageProperties.ADAPTER in the QAMessage.getStringProperty(String) method to access the associated property.

This property is read-only.

See also

- "MessageProperties interface" on page 469
- "getStringProperty method" on page 560

ADAPTERS variable

This property name refers to a delimited list of network adapters that can be used to connect to the QAnywhere server.

Syntax

```
final String MessageProperties.ADAPTERS
```

Remarks

It is used for system queue messages.

You can pass MessageProperties.ADAPTERS in the QAMessage.getStringProperty(String) method to access the associated property. This property is read-only.

See also

- "MessageProperties interface" on page 469
- "getStringProperty method" on page 560

DELIVERY_COUNT variable

This property name refers to the number of attempts that have been made so far to deliver the message.

Syntax

```
final String MessageProperties.DELIVERY_COUNT
```

IP variable

For "system" queue messages, the IP address of the network adapter that is being used to connect to the QAnywhere server.

Syntax

```
final String MessageProperties.IP
```

Remarks

The value of this field is "ias_Network.IP".

You can pass MessageProperties.IP in the QAMessage.getStringProperty(String) method to access the associated property.

This property is read-only.

See also

- “MessageProperties interface” on page 469
- “getStringProperty method” on page 560

MAC variable

For "system" queue messages, the MAC address of the network adapter that is being used to connect to the QAnywhere server.

Syntax

```
final String MessageProperties.MAC
```

Remarks

The value of this field is "ias_Network.MAC".

You can pass MessageProperties.MAC in the QAMessage.getStringProperty(String) method to access the associated property.

This property is read-only.

See also

- “MessageProperties interface” on page 469
- “getStringProperty method” on page 560

MSG_TYPE variable

This property name refers to MessageType enumeration values associated with a QAnywhere message.

Syntax

```
final String MessageProperties.MSG_TYPE
```

Remarks

The value of this field is "ias_MessageType".

You can pass MessageProperties.MSG_TYPE in the QAMessage.getIntProperty(String) method to access the associated property.

This property is read-only.

See also

- “MessageProperties interface” on page 469
- “getIntProperty method” on page 556

NETWORK_STATUS variable

This property name refers to the state of the network connection.

Syntax

```
final String MessageProperties.NETWORK_STATUS
```

Remarks

The value is 1 if the network is accessible and 0 otherwise. The network status is used for system queue messages (for example, network status changes).

You can pass MessageProperties.NETWORK_STATUS in the QAMessage.getIntProperty(String) method to access the associated property.

This property is read-only.

See also

- "MessageProperties interface" on page 469
- "getIntProperty method" on page 556

ORIGINATOR variable

This property name refers to the message store ID of the originator of the message.

Syntax

```
final String MessageProperties.ORIGINATOR
```

RAS variable

For "system" queue messages, the RAS entry name that is being used to connect to the QAnywhere server.

Syntax

```
final String MessageProperties.RAS
```

Remarks

The value of this field is "ias_Network.RAS".

You can pass MessageProperties.RAS in the QAMessage.getStringProperty(String) method to access the associated property.

This property is read-only.

See also

- “MessageProperties interface” on page 469
- “getStringProperty method” on page 560

RASNAMES variable

For "system" queue messages, a delimited list of RAS entry names that can be used to connect to the QAnywhere server.

Syntax

```
final String MessageProperties.RASNAMES
```

Remarks

The value of this field is "ias_RASNames".

You can pass MessageProperties.RASNAMES in the QAMessage.getStringProperty(String) method to access the associated property.

This property is read-only.

See also

- “MessageProperties interface” on page 469
- “getStringProperty method” on page 560

STATUS variable

This property name refers to the current status of the message.

Syntax

```
final String MessageProperties.STATUS
```

See also

- “StatusCodes interface” on page 581

STATUS_TIME variable

This property name refers to the time at which the message assumed its current status.

Syntax

```
final String MessageProperties.STATUS_TIME
```

Remarks

If you pass MessageProperties.STATUS_TIME to the QAMessage.getProperty method, it returns a java.util.Date instance.

See also

- "getProperty method" on page 557

TRANSMISSION_STATUS variable

This property name refers to the current transmission status of the message.

Syntax

```
final String MessageProperties.TRANSMISSION_STATUS
```

See also

- "StatusCodes interface" on page 581

MessageStoreProperties interface

This class defines constant values for useful message store property names.

Syntax

```
public interface MessageStoreProperties
```

Members

All members of MessageStoreProperties interface, including all inherited members.

Name	Description
"MAX_DELIVERY_ATTEMPTS variable"	This property name refers to the maximum number of times that a message can be received without being acknowledged before its status is set to StatusCodes.UNRECEIVABLE.

Remarks

The MessageStoreProperties class provides standard message property names. You can pass MessageStoreProperties fields to QAManagerBase methods used to get and set pre-defined or custom message store properties.

See also

- "QAManagerBase interface" on page 514

MAX_DELIVERY_ATTEMPTS variable

This property name refers to the maximum number of times that a message can be received without being acknowledged before its status is set to StatusCodes.UNRECEIVABLE.

Syntax

```
final String MessageStoreProperties.MAX_DELIVERY_ATTEMPTS
```

See also

- "UNRECEIVABLE variable" on page 585

MessageType interface

Defines constant values for the MessageProperties.MSG_TYPE message property.

Syntax

```
public interface MessageType
```

Members

All members of MessageType interface, including all inherited members.

Name	Description
"NETWORK_STATUS_NOTIFICATION variable"	Identifies a QAnywhere system message used to notify QAnywhere client applications of network status changes.
"PUSH_NOTIFICATION variable"	Identifies a QAnywhere system message used to notify QAnywhere client applications of push notifications.
"REGULAR variable"	If no message type property exists, the message type is assumed to be REGULAR.

Remarks

The following example shows the onSystemMessage(QAMessage) method, which is used to handle QAnywhere system messages. The message type is compared to MessageType.NETWORK_STATUS_NOTIFICATION.

```
private void onSystemMessage(QAMessage msg)
{
  QATextMessage    t_msg;
  int              msg_type;
  String           network_adapters;
  String           network_names;
  String           network_info;
```

```
        t_msg = (QATextMessage)msg;
        if( t_msg != null )
        {
            // Evaluate message type.
            msg_type = t_msg.getIntProperty( MessageProperties.MSG_TYPE );
            if( msg_type == MessageType.NETWORK_STATUS_NOTIFICATION )
            {
                // Handle network status notification.

            }
        }
      }
```

NETWORK_STATUS_NOTIFICATION variable

Identifies a QAnywhere system message used to notify QAnywhere client applications of network status changes.

Syntax

`final int` **`MessageType.NETWORK_STATUS_NOTIFICATION`**

Remarks

Network status changes apply to the device receiving the system message. Use the MessageProperties.ADAPTER, MessageProperties.NETWORK, and MessageProperties.NETWORK_STATUS fields to identify new network status information.

PUSH_NOTIFICATION variable

Identifies a QAnywhere system message used to notify QAnywhere client applications of push notifications.

Syntax

`final int` **`MessageType.PUSH_NOTIFICATION`**

Remarks

If you use the on-demand QAnywhere Agent policy, a typical response is to call the QAManagerBase.triggerSendReceive() method to receive messages waiting with the central message server.

REGULAR variable

If no message type property exists, the message type is assumed to be REGULAR.

Syntax

`final int` **`MessageType.REGULAR`**

Remarks

This type of message is not treated specially by the message system.

PropertyType interface

QAMessage property type enumeration, corresponding naturally to the Java types.

Syntax

```
public interface PropertyType
```

Members

All members of PropertyType interface, including all inherited members.

Name	Description
"PROPERTY_TYPE_BOOLEAN variable"	Indicates a boolean property.
"PROPERTY_TYPE_BYTE variable"	Indicates a signed byte property.
"PROPERTY_TYPE_DOUBLE variable"	Indicates a double property.
"PROPERTY_TYPE_FLOAT variable"	Indicates a float property.
"PROPERTY_TYPE_INT variable"	Indicates an int property.
"PROPERTY_TYPE_LONG variable"	Indicates an long property.
"PROPERTY_TYPE_SHORT variable"	Indicates a short property.
"PROPERTY_TYPE_STRING variable"	Indicates a String property.
"PROPERTY_TYPE_UNKNOWN variable"	Indicates an unknown property type, usually because the property is unknown.

See also

- "QAMessage interface" on page 550

PROPERTY_TYPE_BOOLEAN variable

Indicates a boolean property.

Syntax

```
final short PropertyType.PROPERTY_TYPE_BOOLEAN
```

PROPERTY_TYPE_BYTE variable

Indicates a signed byte property.

Syntax

```
final short PropertyType.PROPERTY_TYPE_BYTE
```

PROPERTY_TYPE_DOUBLE variable

Indicates a double property.

Syntax

```
final short PropertyType.PROPERTY_TYPE_DOUBLE
```

PROPERTY_TYPE_FLOAT variable

Indicates a float property.

Syntax

```
final short PropertyType.PROPERTY_TYPE_FLOAT
```

PROPERTY_TYPE_INT variable

Indicates an int property.

Syntax

```
final short PropertyType.PROPERTY_TYPE_INT
```

PROPERTY_TYPE_LONG variable

Indicates an long property.

Syntax

```
final short PropertyType.PROPERTY_TYPE_LONG
```

PROPERTY_TYPE_SHORT variable

Indicates a short property.

Syntax

```
final short PropertyType.PROPERTY_TYPE_SHORT
```

PROPERTY_TYPE_STRING variable

Indicates a String property.

Syntax

```
final short PropertyType.PROPERTY_TYPE_STRING
```

PROPERTY_TYPE_UNKNOWN variable

Indicates an unknown property type, usually because the property is unknown.

Syntax

```
final short PropertyType.PROPERTY_TYPE_UNKNOWN
```

QABinaryMessage interface

A QABinaryMessage object is used to send a message containing a stream of uninterpreted bytes.

Syntax

```
public interface QABinaryMessage
```

Base classes

- “QAMessage interface” on page 550

Members

All members of QABinaryMessage interface, including all inherited members.

Name	Description
“clearProperties method”	Clear all the properties of the message.
“getAddress method”	Returns the destination address for the QAMessage instance.
“getBodyLength method”	Returns the size of the message body in bytes.
“getBooleanProperty method”	Gets a boolean message property.
“getByteProperty method”	Gets a signed byte message property.
“getDoubleProperty method”	Gets a double message property.
“getExpiration method”	Returns the message's expiration value, or null if the message does not expire or has not yet been sent.

Name	Description
“getFloatProperty method”	Gets a float message property.
“getInReplyToID method”	Returns the message ID of the message to which this message is a reply.
“getIntProperty method”	Gets an int message property.
“getLongProperty method”	Gets a long message property.
“getMessageID method”	Returns the globally unique message ID of the message.
“getPriority method”	Returns the priority of the message (ranging from 0 to 9).
“getProperty method”	Gets a message property.
“getPropertyNames method”	Gets an enumerator over the property names of the message.
“getPropertyType method”	Returns the property type of the given property.
“getRedelivered method”	Indicates whether the message has been previously received but not acknowledged.
“getReplyToAddress method”	Returns the reply-to address of this message.
“getShortProperty method”	Gets a short message property.
“getStringProperty method”	Gets a String message property.
“getTimestamp method”	Returns the message timestamp, which is the time the message was created.
“propertyExists method”	Indicates whether the given property has been set for this message.
“readBinary method”	Reads some number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.
“readBoolean method”	Reads a boolean value starting from the unread portion of the QABinaryMessage instance's message body.
“readByte method”	Reads a signed byte value starting from the unread portion of a QABinaryMessage message body.
“readChar method”	Reads a char value starting from the unread portion of a QABinaryMessage message body.

Name	Description
“readDouble method”	Reads a double value starting from the unread portion of a QABinaryMessage message body.
“readFloat method”	Reads a float value starting from the unread portion of a QA-BinaryMessage message body.
“readInt method”	Reads an integer value starting from the unread portion of a QABinaryMessage message body.
“readLong method”	Reads a long value starting from the unread portion of a QA-BinaryMessage message body.
“readShort method”	Reads a short value starting from the unread portion of a QABinaryMessage message body.
“readString method”	Reads a string value starting from the unread portion of a QABinaryMessage message body.
“reset method”	Resets a message so that the reading of values starts from the beginning of the message body.
“setBooleanProperty method”	Sets a boolean property.
“setByteProperty method”	Sets a signed byte property.
“setDoubleProperty method”	Sets a double property.
“setFloatProperty method”	Sets a float property.
“setInReplyToID method”	Sets the in reply to ID, which identifies the message this message is a reply to.
“setIntProperty method”	Sets an int property.
“setLongProperty method”	Sets a long property.
“setPriority method”	Sets the priority of the message (ranging from 0 to 9).
“setProperty method”	Sets a property.
“setReplyToAddress method”	Sets the reply-to address.
“setShortProperty method”	Sets a short property.
“setStringProperty method”	Sets a string property.

Name	Description
“writeBinary method”	Appends a byte array value to the QABinaryMessage instance's message body.
“writeBoolean method”	Appends a boolean value to the QABinaryMessage instance's message body.
“writeByte method”	Appends a signed byte value to the QABinaryMessage instance's message body.
“writeChar method”	Appends a char value to the QABinaryMessage instance's message body.
“writeDouble method”	Appends a double value to the QABinaryMessage instance's message body.
“writeFloat method”	Appends a float value to the QABinaryMessage instance's message body.
“writeInt method”	Appends an integer value to the QABinaryMessage instance's message body.
“writeLong method”	Appends a long value to the QABinaryMessage instance's message body.
“writeShort method”	Appends a short value to the QABinaryMessage instance's message body.
“writeString method”	Appends a string value to the QABinaryMessage instance's message body.
“DEFAULT_PRIORITY variable”	The default message priority.
“DEFAULT_TIME_TO_LIVE variable”	The default time-to-live value.

Remarks

QABinaryMessage inherits from the QAMessage class and adds a bytes message body. QABinaryMessage provides a variety of functions to read from and write to the bytes message body.

When the message is first created, the body of the message is in write-only mode. After a message has been sent, the client that sent it can retain and modify it without affecting the message that has been sent. The same message object can be sent multiple times.

When a message is received, the provider has called QABinaryMessage.reset() so that the message body is in read-only mode and reading of values starts from the beginning of the message body.

The following example uses the QABinaryMessage.writeString(String) to write the string "Q" followed by the string "Anywhere" to a QABinaryMessage instance's message body.

```
// Create a binary message instance.
QABinaryMessage binary_message;
binary_message = qa_manager.createBinaryMessage();

// Set optional message properties.
binary_message.setReplyToAddress("my-queue-name");

// Write to the message body.
binary_message.writeString("Q");
binary_message.writeString("Anywhere");

// Put the message in the local database, ready for sending.
try {
    qa_manager.putMessage( "store-id\\queue-name", binary_message );
}
catch ( QAException e ) {
    handleError();
}
```

Note
On the receiving end, the first QABinaryMessage.readString() invocation returns "Q" and the next QABinaryMessage.readString() invocation returns "Anywhere".

The message is sent by the QAnywhere Agent.

See also

- "QAMessage interface" on page 550
- "readString method" on page 491

getBodyLength method

Returns the size of the message body in bytes.

Syntax

long **QABinaryMessage.getBodyLength**() throws **QAException**

Returns

The size of the message body in bytes.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the size of the message body.

readBinary method

Reads some number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.

Overload list

Name	Description
"readBinary(byte[]) method"	Reads some number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.
"readBinary(byte[], int) method"	Reads up to length number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.
"readBinary(byte[], int, int) method"	Reads up to length number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest starting at dest[offset].

readBinary(byte[]) method

Reads some number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.

Syntax

```
int QABinaryMessage.readBinary(byte[] dest) throws QAException
```

Parameters

- **dest** The byte array to hold the read bytes.

Returns

The number of bytes read from the message body, or -1 if there are no more bytes available.

Exceptions

- **"QAException class"** Thrown if there was an error reading bytes from the message.

Remarks

The readBinary(dest) method has the same effect as: readBinary(dest,0,dest.length)

See also

- "writeBinary method" on page 492

readBinary(byte[], int) method

Reads up to length number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest.

Syntax

```
int QABinaryMessage.readBinary(
    byte[] dest,
        int length
    ) throws QAException
```

Parameters

- **dest** The byte array to hold the read bytes.
- **length** The maximum number of bytes to read.

Returns

The number of bytes read from the message body, or -1 if there are no more bytes available.

Exceptions

- **"QAException class"** Thrown if there was an error reading bytes from the message.

Remarks

The readBinary(dest, len) method has the same effect as: readBinary(dest,0,len)

See also

- "writeBinary method" on page 492

readBinary(byte[], int, int) method

Reads up to length number of bytes starting from the unread portion of a QABinaryMessage instance body and stores them into the array dest starting at dest[offset].

Syntax

```
    int QABinaryMessage.readBinary(
        byte[] dest,
        int offset,
        int length
    ) throws QAException
```

Parameters

- **dest** The byte array to hold the read bytes.
- **offset** The start offset of the destination array.
- **length** The maximum number of bytes to read.

Returns

The number of bytes read from the message body, or -1 if there are no more bytes available.

Exceptions

- **"QAException class"** Thrown if there was an error reading bytes from the message.

Remarks

If dest is null, a NullPointerException is thrown.

If offset is negative, or length is negative, or offset+length is greater than the length of dest, then an IndexOutOfBoundsException is thrown.

See also

- “writeBinary method” on page 492

readBoolean method

Reads a boolean value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

```
boolean QABinaryMessage.readBoolean() throws QAException
```

Returns

The boolean value read from the message body.

Exceptions

- **“QAException class”** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- “writeBoolean method” on page 494

readByte method

Reads a signed byte value starting from the unread portion of a QABinaryMessage message body.

Syntax

```
byte QABinaryMessage.readByte() throws QAException
```

Returns

The signed byte value read from the message body.

Exceptions

- **“QAException class”** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- “writeByte method” on page 494

readChar method

Reads a char value starting from the unread portion of a QABinaryMessage message body.

Syntax

```
char QABinaryMessage.readChar() throws QAException
```

Returns

The character value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "writeChar method" on page 495

readDouble method

Reads a double value starting from the unread portion of a QABinaryMessage message body.

Syntax

```
double QABinaryMessage.readDouble() throws QAException
```

Returns

The double value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "writeDouble method" on page 495

readFloat method

Reads a float value starting from the unread portion of a QABinaryMessage message body.

Syntax

```
float QABinaryMessage.readFloat() throws QAException
```

Returns

The float value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "writeFloat method" on page 496

readInt method

Reads an integer value starting from the unread portion of a QABinaryMessage message body.

Syntax

```
int QABinaryMessage.readInt() throws QAException
```

Returns

The int value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "writeInt method" on page 496

readLong method

Reads a long value starting from the unread portion of a QABinaryMessage message body.

Syntax

```
long QABinaryMessage.readLong() throws QAException
```

Returns

The long value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "writeLong method" on page 497

readShort method

Reads a short value starting from the unread portion of a QABinaryMessage message body.

Syntax

```
short QABinaryMessage.readShort() throws QAException
```

Returns

The short value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "writeShort method" on page 497

readString method

Reads a string value starting from the unread portion of a QABinaryMessage message body.

Syntax

```
String QABinaryMessage.readString() throws QAException
```

Returns

The string value read from the message body.

Exceptions

- **"QAException class"** Thrown if there was a conversion error reading the value or if there is no more input.

See also

- "writeString method" on page 497

reset method

Resets a message so that the reading of values starts from the beginning of the message body.

Syntax

```
void QABinaryMessage.reset() throws QAException
```

Exceptions

- **“QAException class”** Thrown if there is a problem resetting the message.

Remarks

The reset method also puts the QABinaryMessage message body in read-only mode.

writeBinary method

Appends a byte array value to the QABinaryMessage instance's message body.

Overload list

Name	Description
“writeBinary(byte[]) method”	Appends a byte array value to the QABinaryMessage instance's message body.
“writeBinary(byte[], int) method”	Appends length bytes from a byte array to the QABinaryMessage instance's message body.
“writeBinary(byte[], int, int) method”	Appends length bytes from a byte array starting at the given offset to the QABinaryMessage instance's message body.

writeBinary(byte[]) method

Appends a byte array value to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeBinary(byte[] val) throws QAException
```

Parameters

- **val** The byte array value to write to the message body.

Exceptions

- **“QAException class”** Thrown if there is a problem appending the byte array to the message body.

Remarks

The writeBinary(val) method has the same effect as: writeBinary(val,0,val.length)

See also

- “readBinary method” on page 485

writeBinary(byte[], int) method

Appends length bytes from a byte array to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeBinary(
    byte[] val,
    int length
) throws QAException
```

Parameters

- **val** The byte array value to write to the message body.
- **length** The number of bytes to write.

Exceptions

- **“QAException class”** Thrown if there is a problem appending the byte array to the message body.

Remarks

The writeBinary(val,len) method has the same effect as: writeBinary(val,0,len)

See also

- “readBinary method” on page 485

writeBinary(byte[], int, int) method

Appends length bytes from a byte array starting at the given offset to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeBinary(
    byte[] val,
    int offset,
    int length
) throws QAException
```

Parameters

- **val** The byte array value to write to the message body.
- **offset** The offset within the byte array to begin writing.
- **length** The number of bytes to write.

Exceptions

- **“QAException class”** Thrown if there is a problem appending the byte array to the message body.

Remarks

If val is null, a NullPointerException is thrown. If offset is negative, or length is negative, or length+offset is greater than the length of val then an IndexOutOfBoundsException is thrown.

See also

- "readBinary method" on page 485

writeBoolean method

Appends a boolean value to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeBoolean(boolean val) throws QAException
```

Parameters

- **val** The boolean value to write to the message body.

Exceptions

- **"QAException class"** Thrown if there is a problem appending the boolean value to the message body.

Remarks

The boolean is represented as a one byte value. True is represented as 1; false is represented as 0.

See also

- "readBoolean method" on page 488

writeByte method

Appends a signed byte value to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeByte(byte val) throws QAException
```

Parameters

- **val** The signed byte value to write to the message body.

Exceptions

- **"QAException class"** Thrown if there is a problem appending the signed byte value to the message body.

Remarks

The signed byte is represented as a one byte value.

See also

- "readByte method" on page 488

writeChar method

Appends a char value to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeChar(char val) throws QAException
```

Parameters

- **val** The char value to write to the message body.

Exceptions

- **"QAException class"** Thrown if there is a problem appending the char value to the message body.

Remarks

The char is represented as a two byte value and the high order byte is appended first.

See also

- "readChar method" on page 488

writeDouble method

Appends a double value to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeDouble(double val) throws QAException
```

Parameters

- **val** the double value to write to the message body.

Exceptions

- **"QAException class"** Thrown if there is a problem appending the double value to the message body.

Remarks

The double is converted to a representative 8-byte long and higher order bytes are appended first.

See also

- “readDouble method” on page 489

writeFloat method

Appends a float value to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeFloat(float val) throws QAException
```

Parameters

- **val** The float value to write to the message body.

Exceptions

- **“QAException class”** Thrown if there is a problem appending the float value to the message body.

Remarks

The float is converted to a representative 4-byte integer and the higher order bytes are appended first.

See also

- “readFloat method” on page 489

writeInt method

Appends an integer value to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeInt(int val) throws QAException
```

Parameters

- **val** The int value to write to the message body.

Exceptions

- **“QAException class”** Thrown if there is a problem appending the integer value to the message body.

Remarks

The integer parameter is represented as a 4 byte value and higher order bytes are appended first.

See also

- “readInt method” on page 490

writeLong method

Appends a long value to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeLong(long val) throws QAException
```

Parameters

- **val** The long value to write to the message body.

Exceptions

- **"QAException class"** Thrown if there is a problem appending the long value to the message body.

Remarks

The long parameter is represented using 8-bytes value and higher order bytes are appended first.

See also

- "readLong method" on page 490

writeShort method

Appends a short value to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeShort(short val) throws QAException
```

Parameters

- **val** The short value to write to the message body.

Exceptions

- **"QAException class"** Thrown if there is a problem appending the short value to the message body.

Remarks

The short parameter is represented as a two byte value and the higher order byte is appended first.

See also

- "readShort method" on page 491

writeString method

Appends a string value to the QABinaryMessage instance's message body.

Syntax

```
void QABinaryMessage.writeString(String val) throws QAException
```

Parameters

- **val** The string value to write to the message body.

Exceptions

- **"QAException class"** Thrown if there is a problem appending the string value to the message body.

Remarks

> **Note**
> The receiving application needs to invoke QABinaryMessage.readString for each writeString invocation.

> **Note**
> The UTF-8 representation of the string to be written can be at most 32767 bytes.

See also

- "readString method" on page 491

QAException class

Encapsulates QAnywhere client application exceptions.

Syntax

```
public class QAException
```

Members

All members of QAException class, including all inherited members.

Name	Description
"getDetailedMessage method"	Returns the detailed text description of the exception.
"getErrorCode method"	Returns the error code of the last exception.
"getNativeErrorCode method"	Returns the native error code of the last exception.
"COMMON_ALREADY_OPEN_ERROR variable"	The QAManager is already open.

Name	Description
"COMMON_GET_INIT_FILE_ERROR variable"	Unable to access the client properties file.
"COMMON_GET_PROPERTY_ERROR variable"	Error retrieving property from message store.
"COMMON_GETQUEUEDEPTH_ERROR variable"	Error getting the queue depth.
"COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG variable"	Cannot use QAManager-Base.getQueueDepth on a given destination when fil-ter is ALL.
"COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID variable"	Cannot use QAManager-Base.getQueueDepth when the message store ID has not been set.
"COMMON_INIT_ERROR variable"	Initialization error.
"COMMON_INIT_THREAD_ERROR variable"	Error initializing the back-ground thread.
"COMMON_INVALID_PROPERTY variable"	There is an invalid property in the client properties file.
"COMMON_MSG_ACKNOWLEDGE_ERROR variable"	Error acknowledging the message.
"COMMON_MSG_CANCEL_ERROR variable"	Error cancelling message.
"COMMON_MSG_CANCEL_ERROR_SENT variable"	Error cancelling message.
"COMMON_MSG_NOT_WRITEABLE_ERROR variable"	You cannot write to a mes-sage that is in read-only mode.
"COMMON_MSG_RETRIEVE_ERROR variable"	Error retrieving a message from the client message store.
"COMMON_MSG_STORE_ERROR variable"	Error storing a message in the client message store.

Name	Description
"COMMON_MSG_STORE_NOT_INITIALIZED variable"	The message store has not been initialized for messaging.
"COMMON_MSG_STORE_TOO_LARGE variable"	The message store is too large relative to the free disk space on the device.
"COMMON_NO_DEST_ERROR variable"	No destination.
"COMMON_NO_IMPLEMENTATION variable"	The method is not implemented.
"COMMON_NOT_OPEN_ERROR variable"	The QAManager is not open.
"COMMON_OPEN_ERROR variable"	Error opening a connection to the message store.
"COMMON_OPEN_LOG_FILE_ERROR variable"	Error opening the log file.
"COMMON_OPEN_MAXTHREADS_ERROR variable"	Cannot open the QAManager because the maximum number of concurrent server requests is not high enough (see database server -gn option).
"COMMON_REOPEN_ERROR variable"	Error re-opening connection to message store.
"COMMON_SELECTOR_SYNTAX_ERROR variable"	The given selector has a syntax error.
"COMMON_SET_PROPERTY_ERROR variable"	Error storing property to message store.
"COMMON_TERMINATE_ERROR variable"	Termination error.
"COMMON_UNEXPECTED_EOM_ERROR variable"	Unexpected end of message reached.
"COMMON_UNREPRESENTABLE_TIMESTAMP variable"	The timestamp is outside of the acceptable range.
"QA_NO_ERROR variable"	No error.

Remarks

You can use the QAException class to catch QAnywhere exceptions.

The following example catches a QAnywhere exception:

```
    try
    {
        _qaManager = QAManagerFactory.getInstance().CreateQAManager();
        _qaManager.open( AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT );
        _qaManager.start();
    }
    catch( QAException e )
    {
        // Handle exception.
        System.err.println("Error code: " + e.getErrorCode() );
        System.err.println("Error message: " + e.getMessage() );
    }
  }
```

getDetailedMessage method

Returns the detailed text description of the exception.

Syntax

abstract String **QAException.getDetailedMessage**()

Returns

The detailed text description of the exception.

getErrorCode method

Returns the error code of the last exception.

Syntax

abstract int **QAException.getErrorCode**()

Returns

The error code of the last exception.

getNativeErrorCode method

Returns the native error code of the last exception.

Syntax

abstract int **QAException.getNativeErrorCode**()

Returns

The native error code of the last exception.

COMMON_ALREADY_OPEN_ERROR variable

The QAManager is already open.

Syntax

```
final int QAException.COMMON_ALREADY_OPEN_ERROR
```

See also

- "QAManager interface" on page 507

COMMON_GET_INIT_FILE_ERROR variable

Unable to access the client properties file.

Syntax

```
final int QAException.COMMON_GET_INIT_FILE_ERROR
```

COMMON_GET_PROPERTY_ERROR variable

Error retrieving property from message store.

Syntax

```
final int QAException.COMMON_GET_PROPERTY_ERROR
```

COMMON_GETQUEUEDEPTH_ERROR variable

Error getting the queue depth.

Syntax

```
final int QAException.COMMON_GETQUEUEDEPTH_ERROR
```

See also

- "getQueueDepth method" on page 530

COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG variable

Cannot use QAManagerBase.getQueueDepth on a given destination when filter is ALL.

Syntax

```
final int QAException.COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG
```

See also

- "getQueueDepth method" on page 530

COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID variable

Cannot use QAManagerBase.getQueueDepth when the message store ID has not been set.

Syntax

```
final int QAException.COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID
```

See also

- "getQueueDepth method" on page 530

COMMON_INIT_ERROR variable

Initialization error.

Syntax

```
final int QAException.COMMON_INIT_ERROR
```

COMMON_INIT_THREAD_ERROR variable

Error initializing the background thread.

Syntax

```
final int QAException.COMMON_INIT_THREAD_ERROR
```

COMMON_INVALID_PROPERTY variable

There is an invalid property in the client properties file.

Syntax

```
final int QAException.COMMON_INVALID_PROPERTY
```

COMMON_MSG_ACKNOWLEDGE_ERROR variable

Error acknowledging the message.

Syntax

```
final int QAException.COMMON_MSG_ACKNOWLEDGE_ERROR
```

COMMON_MSG_CANCEL_ERROR variable

Error cancelling message.

Syntax

```
final int QAException.COMMON_MSG_CANCEL_ERROR
```

COMMON_MSG_CANCEL_ERROR_SENT variable

Error cancelling message.

Syntax

```
final int QAException.COMMON_MSG_CANCEL_ERROR_SENT
```

Remarks

You cannot cancel a message that has already been sent.

COMMON_MSG_NOT_WRITEABLE_ERROR variable

You cannot write to a message that is in read-only mode.

Syntax

```
final int QAException.COMMON_MSG_NOT_WRITEABLE_ERROR
```

COMMON_MSG_RETRIEVE_ERROR variable

Error retrieving a message from the client message store.

Syntax

```
final int QAException.COMMON_MSG_RETRIEVE_ERROR
```

COMMON_MSG_STORE_ERROR variable

Error storing a message in the client message store.

Syntax

```
final int QAException.COMMON_MSG_STORE_ERROR
```

COMMON_MSG_STORE_NOT_INITIALIZED variable

The message store has not been initialized for messaging.

Syntax

```
final int QAException.COMMON_MSG_STORE_NOT_INITIALIZED
```

COMMON_MSG_STORE_TOO_LARGE variable

The message store is too large relative to the free disk space on the device.

Syntax

```
final int QAException.COMMON_MSG_STORE_TOO_LARGE
```

COMMON_NO_DEST_ERROR variable

No destination.

Syntax

```
final int QAException.COMMON_NO_DEST_ERROR
```

COMMON_NO_IMPLEMENTATION variable

The method is not implemented.

Syntax

```
final int QAException.COMMON_NO_IMPLEMENTATION
```

COMMON_NOT_OPEN_ERROR variable

The QAManager is not open.

Syntax

```
final int QAException.COMMON_NOT_OPEN_ERROR
```

See also

- “QAManager interface” on page 507

COMMON_OPEN_ERROR variable

Error opening a connection to the message store.

Syntax

```
final int QAException.COMMON_OPEN_ERROR
```

COMMON_OPEN_LOG_FILE_ERROR variable

Error opening the log file.

Syntax

```
final int QAException.COMMON_OPEN_LOG_FILE_ERROR
```

COMMON_OPEN_MAXTHREADS_ERROR variable

Cannot open the QAManager because the maximum number of concurrent server requests is not high enough (see database server -gn option).

Syntax

```
final int QAException.COMMON_OPEN_MAXTHREADS_ERROR
```

COMMON_REOPEN_ERROR variable

Error re-opening connection to message store.

Syntax

```
final int QAException.COMMON_REOPEN_ERROR
```

COMMON_SELECTOR_SYNTAX_ERROR variable

The given selector has a syntax error.

Syntax

```
final int QAException.COMMON_SELECTOR_SYNTAX_ERROR
```

COMMON_SET_PROPERTY_ERROR variable

Error storing property to message store.

Syntax

```
final int QAException.COMMON_SET_PROPERTY_ERROR
```

COMMON_TERMINATE_ERROR variable

Termination error.

Syntax

```
final int QAException.COMMON_TERMINATE_ERROR
```

COMMON_UNEXPECTED_EOM_ERROR variable

Unexpected end of message reached.

Syntax

```
final int QAException.COMMON_UNEXPECTED_EOM_ERROR
```

COMMON_UNREPRESENTABLE_TIMESTAMP variable

The timestamp is outside of the acceptable range.

Syntax

```
final int QAException.COMMON_UNREPRESENTABLE_TIMESTAMP
```

QA_NO_ERROR variable

No error.

Syntax

```
final int QAException.QA_NO_ERROR
```

QAManager interface

QAManager manages non-transactional QAnywhere messaging operations.

Syntax

```
public interface QAManager
```

Base classes

- “QAManagerBase interface” on page 514

Members

All members of QAManager interface, including all inherited members.

Name	Description
“acknowledge method”	Acknowledges that the client application successfully received a QAnywhere message.
“acknowledgeAll method”	Acknowledges that the client application successfully received QAnywhere messages.
“acknowledgeUntil method”	Acknowledges the given QAMessage instance and all unacknowledged messages received before the given message.
“browseMessages method”	Browses all available messages in the message store.
“browseMessagesByID method”	Browse the message with the given message ID.
“browseMessagesByQueue method”	Browses the available messages waiting that have been sent to the given address.
“browseMessagesBySelector method”	Browse messages queued in the message store that satisfy the given selector.
“cancelMessage method”	Cancels the message with the given message ID.
“close method”	Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.
“createBinaryMessage method”	Creates a QABinaryMessage object.
“createTextMessage method”	Creates a QATextMessage object.
“getBooleanStoreProperty method”	Gets a boolean value for a pre-defined or custom message store property.
“getByteStoreProperty method”	Gets a signed byte value for a pre-defined or custom message store property.
“getDoubleStoreProperty method”	Gets a double value for a pre-defined or custom message store property.
“getFloatStoreProperty method”	Gets a float value for a pre-defined or custom message store property.
“getIntStoreProperty method”	Gets a int value for a pre-defined or custom message store property.
“getLongStoreProperty method”	Gets a long value for a pre-defined or custom message store property.

Name	Description
"getMessage method"	Returns the next available QAMessage sent to the specified address.
"getMessageBySelector method"	Returns the next available QAMessage sent to the specified address that satisfies the given selector.
"getMessageBySelectorNoWait method"	Returns the next available QAMessage sent to the given address that satisfies the given selector.
"getMessageBySelectorTimeout method"	Returns the next available QAMessage sent to the given address that satisfies the given selector.
"getMessageNoWait method"	Returns the next available QAMessage sent to the given address.
"getMessageTimeout method"	Returns the next available QAMessage sent to the given address.
"getMode method"	Returns the QAManager acknowledgement mode for received messages.
"getQueueDepth method"	Returns the total depth of all queues, based on a given filter.
"getShortStoreProperty method"	Gets a short value for a pre-defined or custom message store property.
"getStoreProperty method"	Gets an Object representing a message store property.
"getStorePropertyNames method"	Gets an enumerator over the message store property names.
"getStringStoreProperty method"	Gets a string value for a pre-defined or custom message store property.
"open method"	Opens the QAManager with the given AcknowledgementMode value.
"propertyExists method"	Tests if there currently exists a value for the given the property.
"putMessage method"	Prepares a message to send to another QAnywhere client.
"putMessageTimeToLive method"	Prepares a message to send to another QAnywhere client.
"recover method"	Forces all unacknowledged messages into a status of StatusCodes.PENDING.
"reOpen method"	Reopens the QAManagerBase.

Name	Description
"setBooleanStoreProperty method"	Sets a pre-defined or custom message store property to a boolean value.
"setByteStoreProperty method"	Sets a pre-defined or custom message store property to a sbyte value.
"setDoubleStoreProperty method"	Sets a pre-defined or custom message store property to a double value.
"setFloatStoreProperty method"	Sets a pre-defined or custom message store property to a float value.
"setIntStoreProperty method"	Sets a pre-defined or custom message store property to a int value.
"setLongStoreProperty method"	Sets a pre-defined or custom message store property to a long value.
"setMessageListener method"	Registers a QAMessageListener object to receive QAnywhere messages asynchronously.
"setMessageListener2 method"	Registers a QAMessageListener2 object to receive QAnywhere messages asynchronously.
"setMessageListenerBySelector method"	Registers a QAMessageListener object to receive QAnywhere messages asynchronously, with a message selector.
"setMessageListenerBySelector2 method"	Registers a QAMessageListener2 object to receive QAnywhere messages asynchronously, with a message selector.
"setProperty method"	Allows you to set QAnywhere Manager configuration properties programmatically.
"setShortStoreProperty method"	Sets a pre-defined or custom message store property to a short value.
"setStoreProperty method"	Sets a pre-defined or custom message store property to a System.Object value.
"setStringStoreProperty method"	Sets a pre-defined or custom message store property to a String value.
"start method"	Starts the QAManagerBase for receiving incoming messages.
"stop method"	Halts the QAManagerBase's reception of incoming messages.

Name	Description
"triggerSendReceive method"	Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

Remarks

It derives from QAManagerBase.

For a detailed description of derived behavior, see QAManagerBase.

The QAManager instance can be configured for implicit or explicit acknowledgement, as defined in the AcknowledgementMode class. To acknowledge messages as part of a transaction, use QATransactionalManager.

Use the QAManagerFactory class to create QAManager and QATransactionalManager objects.

See also

- "AcknowledgementMode interface" on page 467
- "QAManagerFactory class" on page 545
- "QATransactionalManager interface" on page 575

acknowledge method

Acknowledges that the client application successfully received a QAnywhere message.

Syntax

```
void QAManager.acknowledge(QAMessage msg) throws QAException
```

Parameters

- **msg** The message to acknowledge.

Exceptions

- **"QAException class"** Thrown if there is a problem acknowledging the message.

Remarks

Note
When a QAMessage is acknowledged, its status property changes to StatusCodes.RECEIVED. It can then be deleted using the default delete rule.

See also

- "RECEIVED variable" on page 584
- "acknowledgeUntil method" on page 512
- "acknowledgeAll method" on page 512

acknowledgeAll method

Acknowledges that the client application successfully received QAnywhere messages.

Syntax

```
void QAManager.acknowledgeAll() throws QAException
```

Exceptions

- **"QAException class"** Thrown if there is a problem acknowledging the messages.

Remarks

All unacknowledged messages are acknowledged.

Note
When a QAMessage is acknowledged, its status property changes to StatusCodes.RECEIVED. It can then be deleted using the default delete rule.

See also

- "RECEIVED variable" on page 584
- "acknowledge method" on page 511
- "acknowledgeUntil method" on page 512

acknowledgeUntil method

Acknowledges the given QAMessage instance and all unacknowledged messages received before the given message.

Syntax

```
void QAManager.acknowledgeUntil(QAMessage msg) throws QAException
```

Parameters

- **msg** The last message to acknowledge. All earlier unacknowledged messages are also acknowledged.

Exceptions

- **"QAException class"** Thrown if there is a problem acknowledging the messages.

Remarks

Note
When a QAMessage is acknowledged, its status property changes to StatusCodes.RECEIVED. It can then be deleted using the default delete rule.

See also

- “QAMessage interface” on page 550
- “RECEIVED variable” on page 584
- “acknowledge method” on page 511
- “acknowledgeAll method” on page 512

open method

Opens the QAManager with the given AcknowledgementMode value.

Syntax

```
void QAManager.open(short mode) throws QAException
```

Parameters

- **mode** The acknowledgement mode, one of AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT or AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT.

Exceptions

- **“QAException class”** Thrown if there is a problem opening the QAManager instance.

Remarks

The open(short) method must be the first method called after creating a QAManager.

If a database connection error is detected, you can re-open a QAManager by calling the close method followed by the open method. When re-opening a QAManager, you do not need to re-create it, reset the properties, or reset the message listeners. The properties of the QAManager cannot be changed after the first open, and subsequent open calls must supply the same acknowledgement mode.

See also

- “AcknowledgementMode interface” on page 467
- “EXPLICIT_ACKNOWLEDGEMENT variable” on page 468
- “IMPLICIT_ACKNOWLEDGEMENT variable” on page 468

recover method

Forces all unacknowledged messages into a status of StatusCodes.PENDING.

Syntax

```
void QAManager.recover() throws QAException
```

Exceptions

- **“QAException class”** Thrown if there is a problem recovering.

Remarks

These messages must be received again using QAManagerBase.getMessage(String).

See also

- “getMessage method” on page 525

QAManagerBase interface

This class acts as a base class for QATransactionalManager and QAManager, which manage transactional and non-transactional messaging, respectively.

Syntax

```
public interface QAManagerBase
```

Derived classes

- “QAManager interface” on page 507
- “QATransactionalManager interface” on page 575

Members

All members of QAManagerBase interface, including all inherited members.

Name	Description
“browseMessages method”	Browses all available messages in the message store.
“browseMessagesByID method”	Browse the message with the given message ID.
“browseMessagesByQueue method”	Browses the available messages waiting that have been sent to the given address.
“browseMessagesBySelector method”	Browse messages queued in the message store that satisfy the given selector.
“cancelMessage method”	Cancels the message with the given message ID.
“close method”	Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.
“createBinaryMessage method”	Creates a QABinaryMessage object.
“createTextMessage method”	Creates a QATextMessage object.
“getBooleanStoreProperty method”	Gets a boolean value for a pre-defined or custom message store property.

Name	Description
“getByteStoreProperty method”	Gets a signed byte value for a pre-defined or custom message store property.
“getDoubleStoreProperty method”	Gets a double value for a pre-defined or custom message store property.
“getFloatStoreProperty method”	Gets a float value for a pre-defined or custom message store property.
“getIntStoreProperty method”	Gets a int value for a pre-defined or custom message store property.
“getLongStoreProperty method”	Gets a long value for a pre-defined or custom message store property.
“getMessage method”	Returns the next available QAMessage sent to the specified address.
“getMessageBySelector method”	Returns the next available QAMessage sent to the specified address that satisfies the given selector.
“getMessageBySelectorNoWait method”	Returns the next available QAMessage sent to the given address that satisfies the given selector.
“getMessageBySelectorTimeout method”	Returns the next available QAMessage sent to the given address that satisfies the given selector.
“getMessageNoWait method”	Returns the next available QAMessage sent to the given address.
“getMessageTimeout method”	Returns the next available QAMessage sent to the given address.
“getMode method”	Returns the QAManager acknowledgement mode for received messages.
“getQueueDepth method”	Returns the total depth of all queues, based on a given filter.
“getShortStoreProperty method”	Gets a short value for a pre-defined or custom message store property.
“getStoreProperty method”	Gets an Object representing a message store property.
“getStorePropertyNames method”	Gets an enumerator over the message store property names.
“getStringStoreProperty method”	Gets a string value for a pre-defined or custom message store property.

Name	Description
"propertyExists method"	Tests if there currently exists a value for the given the property.
"putMessage method"	Prepares a message to send to another QAnywhere client.
"putMessageTimeToLive method"	Prepares a message to send to another QAnywhere client.
"reOpen method"	Reopens the QAManagerBase.
"setBooleanStoreProperty method"	Sets a pre-defined or custom message store property to a boolean value.
"setByteStoreProperty method"	Sets a pre-defined or custom message store property to a sbyte value.
"setDoubleStoreProperty method"	Sets a pre-defined or custom message store property to a double value.
"setFloatStoreProperty method"	Sets a pre-defined or custom message store property to a float value.
"setIntStoreProperty method"	Sets a pre-defined or custom message store property to a int value.
"setLongStoreProperty method"	Sets a pre-defined or custom message store property to a long value.
"setMessageListener method"	Registers a QAMessageListener object to receive QAnywhere messages asynchronously.
"setMessageListener2 method"	Registers a QAMessageListener2 object to receive QAnywhere messages asynchronously.
"setMessageListenerBySelector method"	Registers a QAMessageListener object to receive QAnywhere messages asynchronously, with a message selector.
"setMessageListenerBySelector2 method"	Registers a QAMessageListener2 object to receive QAnywhere messages asynchronously, with a message selector.
"setProperty method"	Allows you to set QAnywhere Manager configuration properties programmatically.
"setShortStoreProperty method"	Sets a pre-defined or custom message store property to a short value.
"setStoreProperty method"	Sets a pre-defined or custom message store property to a System.Object value.

Name	Description
"setStringStoreProperty method"	Sets a pre-defined or custom message store property to a String value.
"start method"	Starts the QAManagerBase for receiving incoming messages.
"stop method"	Halts the QAManagerBase's reception of incoming messages.
"triggerSendReceive method"	Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

Remarks

Use the QAManagerBase.start() method to allow a QAManagerBase instance to listen for messages. An instance of QAManagerBase must be used only on the thread that created it.

You can use instances of this class to create and manage QAnywhere messages. Use the QAManagerBase.createBinaryMessage() and QAManagerBase.createTextMessage() methods to create appropriate QAMessage instances. QAMessage instances provide a variety of methods to set message content and properties. To send QAnywhere messages, use the QAManagerBase.putMessage(String, QAMessage) method to place the addressed message in the local message store queue. The message is transmitted by the QAnywhere Agent based on its transmission policies or when you call QAManagerBase.triggerSendReceive().

QAManagerBase also provides methods to set and get message store properties.

See also

- "QATransactionalManager interface" on page 575
- "QAManager interface" on page 507

browseMessages method

Browses all available messages in the message store.

Syntax

```
java.util.Enumeration QAManagerBase.browseMessages() throws QAException
```

Returns

An enumerator over the available messages.

Exceptions

- **"QAException class"** Thrown if there is a problem browsing the messages.

Remarks

The messages are just being browsed, so they cannot be acknowledged.

Use the QAManagerBase.getMessage(String) method to receive messages so that they can be acknowledged.

See also

- "browseMessagesByQueue method" on page 518
- "browseMessagesByID method" on page 518
- "getMessage method" on page 525

browseMessagesByID method

Browse the message with the given message ID.

Syntax

```
java.util.Enumeration QAManagerBase.browseMessagesByID(
    String id
) throws QAException
```

Parameters

- **id** The message ID of the message.

Returns

An enumerator containing 0 or 1 messages.

Exceptions

- **"QAException class"** Thrown if there is a problem browsing the messages.

Remarks

The message is just being browsed, so it cannot be acknowledged. Use QAManagerBase.getMessage(String) to receive messages so that they can be acknowledged.

See also

- "browseMessagesByQueue method" on page 518
- "browseMessages method" on page 517
- "getMessage method" on page 525

browseMessagesByQueue method

Browses the available messages waiting that have been sent to the given address.

Syntax

```
java.util.Enumeration QAManagerBase.browseMessagesByQueue(
    String address
) throws QAException
```

Parameters

- **address** The address of the messages.

Returns

An enumerator over the available messages.

Exceptions

- **"QAException class"** Thrown if there is a problem browsing the messages.

Remarks

The messages are just being browsed, so they cannot be acknowledged.

Use the QAManagerBase.getMessage(String) method to receive messages so they can be acknowledged.

See also

- "browseMessagesByID method" on page 518
- "browseMessages method" on page 517
- "getMessage method" on page 525

browseMessagesBySelector method

Browse messages queued in the message store that satisfy the given selector.

Syntax

```
java.util.Enumeration QAManagerBase.browseMessagesBySelector(
    String selector
) throws QAException
```

Parameters

- **selector** The selector.

Returns

An enumerator over the available messages.

Exceptions

- **"QAException class"** Thrown if there is a problem browsing the messages.

Remarks

The message is just being browsed, so it cannot be acknowledged. Use QAManagerBase.getMessage(String) to receive messages so that they can be acknowledged.

See also

- "browseMessagesByQueue method" on page 518
- "browseMessages method" on page 517
- "browseMessagesByID method" on page 518
- "getMessage method" on page 525

cancelMessage method

Cancels the message with the given message ID.

Syntax

```
boolean QAManagerBase.cancelMessage(String id) throws QAException
```

Parameters

- **id** The message ID of the message to cancel.

Exceptions

- **"QAException class"** Thrown if there is a problem cancelling the message.

Remarks

Puts a message into a canceled state before it is transmitted.

With the default delete rules of the QAnywhere Agent, canceled messages are eventually deleted from the message store.

Fails if the message is already in a final state, or if the message has been transmitted to the central messaging server.

close method

Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.

Syntax

```
void QAManagerBase.close() throws QAException
```

Exceptions

- **"QAException class"** Thrown if there is a problem closing the QAManagerBase instance.

Remarks

Additional calls to close() following the first are ignored. This method cannot be called in a message/exception listener.

If a database connection error is detected, you can re-open a QAManager by calling the close method followed by the open method. When re-opening a QAManager, you do not need to re-create it, reset the properties, or reset the message listeners. The properties of the QAManager cannot be changed after the first open, and subsequent open calls must supply the same acknowledgement mode.

createBinaryMessage method

Creates a QABinaryMessage object.

Syntax

QABinaryMessage **QAManagerBase.createBinaryMessage**() throws **QAException**

Returns

A new QABinaryMessage instance.

Exceptions

- **“QAException class”** Thrown if there is a problem creating the message.

Remarks

A QABinaryMessage object is used to send a message containing a message body of uninterpreted bytes.

See also

- “QABinaryMessage interface” on page 481

createTextMessage method

Creates a QATextMessage object.

Syntax

QATextMessage **QAManagerBase.createTextMessage**() throws **QAException**

Returns

A new QATextMessage instance.

Exceptions

- **“QAException class”** Thrown if there is a problem creating the message.

Remarks

A QATextMessage object is used to send a message containing a string message body.

See also

- “QATextMessage interface” on page 569

getBooleanStoreProperty method

Gets a boolean value for a pre-defined or custom message store property.

Syntax

```
boolean QAManagerBase.getBooleanStoreProperty(
    String name
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.

Returns

The boolean property value.

Exceptions

- **“QAException class”** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- “MessageStoreProperties interface” on page 476

getByteStoreProperty method

Gets a signed byte value for a pre-defined or custom message store property.

Syntax

```
byte QAManagerBase.getByteStoreProperty(String name) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.

Returns

The signed byte property value.

Exceptions

- **“QAException class”** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

getDoubleStoreProperty method

Gets a double value for a pre-defined or custom message store property.

Syntax

```
double QAManagerBase.getDoubleStoreProperty(
    String name
) throws QAException
```

Parameters

- **name** the pre-defined or custom property name.

Returns

The double property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

getFloatStoreProperty method

Gets a float value for a pre-defined or custom message store property.

Syntax

```
float QAManagerBase.getFloatStoreProperty(
    String name
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.

Returns

The float property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

getIntStoreProperty method

Gets a int value for a pre-defined or custom message store property.

Syntax

```
int QAManagerBase.getIntStoreProperty(String name) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.

Returns

The integer property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

getLongStoreProperty method

Gets a long value for a pre-defined or custom message store property.

Syntax

```
long QAManagerBase.getLongStoreProperty(String name) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.

Returns

The long property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

getMessage method

Returns the next available QAMessage sent to the specified address.

Syntax

```
QAMessage QAManagerBase.getMessage(String address) throws QAException
```

Parameters

- **address** This address specifies the queue name used by the QAnywhere client to receive messages.

Returns

The next QAMessage, or null if no message is available.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If there is no message available, this call blocks indefinitely until a message is available. Use this method to receive messages synchronously.

See also

- "QAMessage interface" on page 550

getMessageBySelector method

Returns the next available QAMessage sent to the specified address that satisfies the given selector.

Syntax

```
QAMessage QAManagerBase.getMessageBySelector(
    String address,
    String selector
) throws QAException
```

Parameters

- **address** This address specifies the queue name used by the QAnywhere client to receive messages.
- **selector** The selector.

Returns

The next QAMessage, or null if no message is available.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If there is no message available, this call blocks indefinitely until a message is available.

Use this method to receive messages synchronously.

See also

- "QAMessage interface" on page 550

getMessageBySelectorNoWait method

Returns the next available QAMessage sent to the given address that satisfies the given selector.

Syntax

```
QAMessage QAManagerBase.getMessageBySelectorNoWait(
    String address,
    String selector
) throws QAException
```

Parameters

- **address** This address specifies the queue name used by the QAnywhere client to receive messages.
- **selector** The selector.

Returns

The next available QAMessage or null there is no available message.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If no message is available, this method returns immediately.

Use this method to receive messages synchronously.

See also

- "QAMessage interface" on page 550

getMessageBySelectorTimeout method

Returns the next available QAMessage sent to the given address that satisfies the given selector.

Syntax

```
QAMessage QAManagerBase.getMessageBySelectorTimeout(
    String address,
    String selector,
    long timeout
) throws QAException
```

Parameters

- **address** This address specifies the queue name used by the QAnywhere client to receive messages.
- **selector** The selector.
- **timeout** The time to wait, in milliseconds, for a message to become available.

Returns

The next available QAMessage, or null if no message is available.

Exceptions

- **“QAException class”** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If no message is available, this method waits for the specified timeout and then returns.

Use this method to receive messages synchronously.

See also

- “QAMessage interface” on page 550

getMessageNoWait method

Returns the next available QAMessage sent to the given address.

Syntax

```
QAMessage QAManagerBase.getMessageNoWait(
    String address
) throws QAException
```

Parameters

- **address** This address specifies the queue name used by the QAnywhere client to receive messages.

Returns

The next available QAMessage or null there is no available message.

Exceptions

- **“QAException class”** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If no message is available, this method returns immediately.

Use this method to receive messages synchronously.

See also

- “QAMessage interface” on page 550

getMessageTimeout method

Returns the next available QAMessage sent to the given address.

Syntax

```
QAMessage QAManagerBase.getMessageTimeout(
    String address,
    long timeout
) throws QAException
```

Parameters

- **address** This address specifies the queue name used by the QAnywhere client to receive messages.
- **timeout** The time to wait, in milliseconds, for a message to become available.

Returns

The next QAMessage, or null if no message is available.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message.

Remarks

The address parameter specifies a local queue name. The address can be in the form 'store-id\queue-name' or 'queue-name'. If no message is available, this method waits for the specified timeout and then returns. Use this method to receive messages synchronously.

See also

- "QAMessage interface" on page 550

getMode method

Returns the QAManager acknowledgement mode for received messages.

Syntax

```
short QAManagerBase.getMode() throws QAException
```

Returns

The QAManager acknowledgement mode for received messages.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the QAManager acknowledgement mode.

Remarks

For a list of return values, see AcknowledgementMode.

AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT and AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT apply to QAManager instances. AcknowledgementMode.TRANSACTIONAL is the mode for QATransactionalManager instances.

See also

- “EXPLICIT_ACKNOWLEDGEMENT variable” on page 468
- “IMPLICIT_ACKNOWLEDGEMENT variable” on page 468
- “QAManager interface” on page 507
- “QATransactionalManager interface” on page 575

getQueueDepth method

Returns the total depth of all queues, based on a given filter.

Overload list

Name	Description
“getQueueDepth(short) method”	Returns the total depth of all queues, based on a given filter.
“getQueueDepth(String, short) method”	Returns the depth of a queue, based on a given filter.

getQueueDepth(short) method

Returns the total depth of all queues, based on a given filter.

Syntax

```
int QAManagerBase.getQueueDepth(short filter) throws QAException
```

Parameters

- **filter** A filter indicating incoming messages, outgoing messages, or all messages.

Returns

The number of messages in all queues for the given filter.

Exceptions

- **“QAException class”** Thrown if there was an error.

Remarks

The incoming depth of the queue is the number of incoming messages that have not been received (for example, using the QAManagerBase.getMessage(String) method). The outgoing depth of a queue is the number of outgoing messages (including uncommitted) that have not been transmitted to the server.

For a list of possible filter values, see QueueDepthFilter.

See also

- “getMessage method” on page 525

getQueueDepth(String, short) method

Returns the depth of a queue, based on a given filter.

Syntax

```
int QAManagerBase.getQueueDepth(
    String queue,
    short filter
) throws QAException
```

Parameters

- **filter** A filter indicating incoming messages, outgoing messages, or all messages.
- **queue** The queue name.

Returns

The number of messages.

Exceptions

- **"QAException class"** Thrown if there was an error.

Remarks

The incoming depth of the queue is the number of incoming messages that have not been received (for example, using the QAManagerBase.getMessage(String) method). The outgoing depth of a queue is the number of outgoing messages (including uncommitted) that have not been transmitted to the server.

For a list of possible filter values, see QueueDepthFilter.

getShortStoreProperty method

Gets a short value for a pre-defined or custom message store property.

Syntax

```
short QAManagerBase.getShortStoreProperty(
    String name
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.

Returns

The short property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error or message store error getting the property value or if the property does not exist.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

getStoreProperty method

Gets an Object representing a message store property.

Syntax

```
Object QAManagerBase.getStoreProperty(String name) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.

Returns

The property value.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the property.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

getStorePropertyNames method

Gets an enumerator over the message store property names.

Syntax

```
java.util.Enumeration QAManagerBase.getStorePropertyNames()
    throws QAException
```

Returns

An enumerator over the message store property names.

Exceptions

- **“QAException class”** Thrown if there is a problem retrieving the enumerator.

getStringStoreProperty method

Gets a string value for a pre-defined or custom message store property.

Syntax

```
String QAManagerBase.getStringStoreProperty(
    String name
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.

Returns

The string property value or null if the property does not exist.

Exceptions

- **“QAException class”** Thrown if there is a problem retrieving the string value.

Remarks

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- “MessageStoreProperties interface” on page 476

propertyExists method

Tests if there currently exists a value for the given the property.

Syntax

```
boolean QAManagerBase.propertyExists(String name) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.

Returns

true if the message store has a value mapped to the property. false otherwise.

Exceptions

- **“QAException class”** Thrown if there is a problem retrieving the property value.

Remarks

You can use this method to determine if a given property name currently has a value mapped to it by the message store.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- “MessageStoreProperties interface” on page 476

putMessage method

Prepares a message to send to another QAnywhere client.

Syntax

```
void QAManagerBase.putMessage(
    String address,
    QAMessage msg
) throws QAException
```

Parameters

- **address** The address of the message specifying the destination queue name.

- **msg** The message to put in the local message store for transmission.

Exceptions

- **“QAException class”** Thrown if there is a problem putting the message.

Remarks

This method inserts a message and a destination address into your local message store. The time of message transmission depends on QAnywhere Agent transmission policies.

The address takes the form 'id\queue-name', where 'id' is the destination message store id and 'queue-name' identifies a queue that is used by the destination QAnywhere client to listen for or receive messages.

See also

- “putMessageTimeToLive method” on page 534

putMessageTimeToLive method

Prepares a message to send to another QAnywhere client.

Syntax

```
void QAManagerBase.putMessageTimeToLive(
    String address,
    QAMessage msg,
    long ttl
) throws QAException
```

Parameters

- **address** The address of the message specifying the destination queue name.
- **msg** The message to put.
- **ttl** The delay, in milliseconds, before the message expires if it has not been delivered. A value of 0 indicates the message does not expire.

Exceptions

- **"QAException class"** Thrown if there is a problem putting the message.

Remarks

This method inserts a message and a destination address into your local message store. The time of message transmission depends on QAnywhere Agent transmission policies. However, if the next message transmission time exceeds the given time-to-live value, the message expires.

The address takes the form 'id\queue-name', where 'id' is the destination message store id and 'queue-name' identifies a queue that is used by the destination QAnywhere client to listen for or receive messages.

reOpen method

Reopens the QAManagerBase.

Syntax

```
void QAManagerBase.reOpen() throws QAException
```

Exceptions

- **"QAException class"** Thrown if there is a problem reopening the QAManagerBase instance.

Remarks

This re-establishes connections to the message store, without releasing any resources. This method may called in a message or exception listener, and in that case it is not necessary to call start() again. This method simply executes close() then open() if not called in a listener, and in that case start() must be called to restart receiving of messages.

setBooleanStoreProperty method

Sets a pre-defined or custom message store property to a boolean value.

Syntax

```
void QAManagerBase.setBooleanStoreProperty(
    String name,
    boolean value
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The boolean property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the message store property.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

setByteStoreProperty method

Sets a pre-defined or custom message store property to a sbyte value.

Syntax

```
void QAManagerBase.setByteStoreProperty(
    String name,
    byte value
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The sbyte property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the message store property.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

setDoubleStoreProperty method

Sets a pre-defined or custom message store property to a double value.

Syntax

```
void QAManagerBase.setDoubleStoreProperty(
    String name,
    double value
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The double property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the message store property.

Remarks

You can use this method to set pre-defined or user-defined client. store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

setFloatStoreProperty method

Sets a pre-defined or custom message store property to a float value.

Syntax

```
void QAManagerBase.setFloatStoreProperty(
    String name,
    float value
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The float property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the message store property.

Remarks

You can use this method to set pre-defined or user-defined client store properties. For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

setIntStoreProperty method

Sets a pre-defined or custom message store property to a int value.

Syntax

```
void QAManagerBase.setIntStoreProperty(
    String name,
    int value
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The int property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the message store property.

Remarks

You can use this method to set pre-defined or user-defined client store properties. For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

setLongStoreProperty method

Sets a pre-defined or custom message store property to a long value.

Syntax

```
void QAManagerBase.setLongStoreProperty(
    String name,
    long value
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The long property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the message store property.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

setMessageListener method

Registers a QAMessageListener object to receive QAnywhere messages asynchronously.

Syntax

```
void QAManagerBase.setMessageListener(
    String address,
    QAMessageListener listener
) throws QAException
```

Parameters

- **address** The address of a local queue name used to receive messages, or system to listen for QAnywhere system messages.
- **listener** The listener.

Exceptions

- **"QAException class"** Thrown if there is a problem registering the QAMessageListener object.

Remarks

The address parameter specifies a local queue name used to receive the message. You can only have one listener object assigned to a given queue. If you want to listen for QAnywhere system messages, including push notifications and network status changes, specify "system" as the queue name.

Use this method to receive messages asynchronously.

See also

- "QAMessageListener interface" on page 566

setMessageListener2 method

Registers a QAMessageListener2 object to receive QAnywhere messages asynchronously.

Syntax

```
void QAManagerBase.setMessageListener2(
     String address,
     QAMessageListener2 listener
) throws QAException
```

Parameters

- **address** The address of a local queue name used to receive messages, or system to listen for QAnywhere system messages.
- **listener** The listener.

Exceptions

- **"QAException class"** Thrown if there is a problem registering the QAMessageListener2 object.

Remarks

The address parameter specifies a local queue name used to receive the message. You can only have one listener object assigned to a given queue. If you want to listen for QAnywhere system messages, including push notifications and network status changes, specify "system" as the queue name.

Use this method to receive messages asynchronously.

See also

- "QAMessageListener2 interface" on page 568

setMessageListenerBySelector method

Registers a QAMessageListener object to receive QAnywhere messages asynchronously, with a message selector.

Syntax

```
void QAManagerBase.setMessageListenerBySelector(
     String address,
     String selector,
     QAMessageListener listener
) throws QAException
```

Parameters

- **address** The address of a local queue name used to receive messages, or system to listen for QAnywhere system messages.
- **selector** The selector to be used to filter the messages to be received.

- **listener** The listener.

Exceptions

- **“QAException class”** Thrown if there is a problem registering the QAMessageListener object, such as because there is already a listener object assigned to the given queue.

Remarks

The address parameter specifies a local queue name used to receive the message. You can only have one listener object assigned to a given queue. The selector parameter specifies a selector to be used to filter the messages to be received on the given address. If you want to listen for QAnywhere system messages, including push notifications and network status changes, specify "system" as the queue name.

Use this method to receive messages asynchronously.

setMessageListenerBySelector2 method

Registers a QAMessageListener2 object to receive QAnywhere messages asynchronously, with a message selector.

Syntax

```
void QAManagerBase.setMessageListenerBySelector2(
     String address,
     String selector,
     QAMessageListener2 listener
) throws QAException
```

Parameters

- **address** The address of a local queue name used to receive messages, or system to listen for QAnywhere system messages.

- **selector** The selector to be used to filter the messages to be received.

- **listener** The listener.

Exceptions

- **“QAException class”** Thrown if there is a problem registering the QAMessageListener2 object.

Remarks

The address parameter specifies a local queue name used to receive the message. You can only have one listener object assigned to a given queue. The selector parameter specifies a selector to be used to filter the messages to be received on the given address. If you want to listen for QAnywhere system messages, including push notifications and network status changes, specify "system" as the queue name.

Use this method to receive messages asynchronously.

See also

- “QAMessageListener2 interface” on page 568

setProperty method

Allows you to set QAnywhere Manager configuration properties programmatically.

Syntax

```
void QAManagerBase.setProperty(
    String name,
    String val
) throws QAException
```

Parameters

- **name** The QAnywhere Manager configuration property name.
- **val** The QAnywhere Manager configuration property value.

Exceptions

- **“QAException class”** Thrown if there is a problem setting the property to the value.

Remarks

You can use this method to override default QAnywhere Manager configuration properties by specifying a property name and value. For a list of properties, see MessageStoreProperties.

You can also set QAnywhere Manager configuration properties using a properties file and the QAManagerFactory.CreateQAManager method. For more information, see Setting properties using a properties files and the QAManagerFactory.CreateQAManager method.

Note
You must set required properties before calling QAManager.Open or QATransactionalManager.Open().

See also

- “MessageStoreProperties interface” on page 476

setShortStoreProperty method

Sets a pre-defined or custom message store property to a short value.

Syntax

```
void QAManagerBase.setShortStoreProperty(
    String name,
    short value
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The short property value.

Exceptions

- **“QAException class”** Thrown if there is a problem setting the message store property.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- “MessageStoreProperties interface” on page 476

setStoreProperty method

Sets a pre-defined or custom message store property to a System.Object value.

Syntax

```
void QAManagerBase.setStoreProperty(
    String name,
    Object value
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The property value.

Exceptions

- **“QAException class”** Thrown if there is a problem setting the message store property to the value.

Remarks

The property type must correspond to one of the acceptable primitive types, or String. You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- “MessageStoreProperties interface” on page 476

setStringStoreProperty method

Sets a pre-defined or custom message store property to a String value.

Syntax

```
void QAManagerBase.setStringStoreProperty(
    String name,
    String value
) throws QAException
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The String property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the message store property to a string value.

Remarks

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties.

See also

- "MessageStoreProperties interface" on page 476

start method

Starts the QAManagerBase for receiving incoming messages.

Syntax

```
void QAManagerBase.start() throws QAException
```

Exceptions

- **"QAException class"** Thrown if there is a problem starting the QAManagerBase instance.

Remarks

Any calls to this method beyond the first without an intervening QAManagerBase.stop() call are ignored.

See also

- "stop method" on page 544

stop method

Halts the QAManagerBase's reception of incoming messages.

Syntax

```
void QAManagerBase.stop() throws QAException
```

Exceptions

- **"QAException class"** Thrown if there is a problem stopping the QAManagerBase instance.

Remarks

The messages are not lost. They just are not received until the manager is started again. Any calls to stop() beyond the first without an intervening QAManagerBase.start() call are ignored.

See also

- "start method" on page 544

triggerSendReceive method

Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

Syntax

```
void QAManagerBase.triggerSendReceive() throws QAException
```

Exceptions

- **"QAException class"** Thrown if there is a problem triggering the send/receive.

Remarks

A call to this method results in immediate message synchronization between a QAnywhere Agent and the central messaging server. A manual triggerSendReceive() call results in immediate message transmission, independent of the QAnywhere Agent transmission policies.

QAnywhere Agent transmission policies determine how message transmission occurs. For example, message transmission can occur automatically at regular intervals, when your client receives a push notification, or when you call the QAManagerBase.putMessage() method to send a message.

See also

- "putMessage method" on page 534

QAManagerFactory class

This class acts as a factory class for creating QATransactionalManager and QAManager objects.

Syntax

```
public class QAManagerFactory
```

Members

All members of QAManagerFactory class, including all inherited members.

Name	Description
"createQAManager method"	Returns a new QAManager instance with the specified properties.
"createQATransactionalManager method"	Returns a new QATransactionalManager instance with the specified properties.
"getInstance method"	Returns the singleton QAManagerFactory instance.

Remarks

You can only have one instance of QAManagerFactory.

See also

- "QAManager interface" on page 507
- "QATransactionalManager interface" on page 575

createQAManager method

Returns a new QAManager instance with the specified properties.

Overload list

Name	Description
"createQAManager() method"	Returns a new QAManager instance with default properties.
"createQAManager(Hashtable) method"	Returns a new QAManager instance with the specified properties as a Hashtable.
"createQAManager(String) method"	Returns a new QAManager instance with the specified properties.

createQAManager() method

Returns a new QAManager instance with default properties.

Syntax

```
abstract QAManager QAManagerFactory.createQAManager() throws QAException
```

Returns

A new QAManager instance.

Exceptions

- **"QAException class"** Thrown if there is a problem creating the manager.

See also

- "QAManager interface" on page 507

createQAManager(Hashtable) method

Returns a new QAManager instance with the specified properties as a Hashtable.

Syntax

```
abstract QAManager QAManagerFactory.createQAManager(
    java.util.Hashtable properties
) throws QAException
```

Parameters

- **properties** A Hashtable for configuring the QAManager instance.

Returns

A new QAManager instance.

Exceptions

- **"QAException class"** Thrown if there is a problem creating the manager.

See also

- "QAManager interface" on page 507

createQAManager(String) method

Returns a new QAManager instance with the specified properties.

Syntax

```
abstract QAManager QAManagerFactory.createQAManager(
    String iniFile
) throws QAException
```

Parameters

- **iniFile** A properties file for configuring the QAManager instance, or null to create the QAManager instance using default properties.

Returns

A new QAManager instance.

Exceptions

- **“QAException class”** Thrown if there is a problem creating the manager.

Remarks

If the iniFile parameter is null, the QAManager is created using default properties. You can use the QAManagerBase set property methods to set QAManager properties programmatically after you create the instance.

See also

- “QAManager interface” on page 507

createQATransactionalManager method

Returns a new QATransactionalManager instance with the specified properties.

Overload list

Name	Description
“createQATransactionalManager() method”	Returns a new QATransactionalManager instance with default properties.
“createQATransactionalManager(Hashtable) method”	Returns a new QATransactionalManager instance with the specified properties.
“createQATransactionalManager(String) method”	Returns a new QATransactionalManager instance with the specified properties.

createQATransactionalManager() method

Returns a new QATransactionalManager instance with default properties.

Syntax

```
abstract QATransactionalManager
QAManagerFactory.createQATransactionalManager()
    throws QAException
```

Returns

A new QATransactionalManager.

Exceptions

- **“QAException class”** Thrown if there is a problem creating the manager.

See also

- “QATransactionalManager interface” on page 575

createQATransactionalManager(Hashtable) method

Returns a new QATransactionalManager instance with the specified properties.

Syntax

```
abstract QATransactionalManager
QAManagerFactory.createQATransactionalManager(
    java.util.Hashtable properties
) throws QAException
```

Parameters

- **properties** A hashtable for configuring the QATransactionalManager instance.

Returns

The configured QATransactionalManager.

Exceptions

- **"QAException class"** Thrown if there is a problem creating the manager.

See also

- "QATransactionalManager interface" on page 575

createQATransactionalManager(String) method

Returns a new QATransactionalManager instance with the specified properties.

Syntax

```
abstract QATransactionalManager
QAManagerFactory.createQATransactionalManager(
    String iniFile
) throws QAException
```

Parameters

- **iniFile** A properties file for configuring the QATransactionalManager instance.

Returns

The configured QATransactionalManager.

Exceptions

- **"QAException class"** Thrown if there is a problem creating the manager.

Remarks

If the iniFile parameter is null, the QATransactionalManager is created using default properties. You can use the QAManagerBase set property methods to set QATransactionalManager properties programmatically after you create the instance.

See also

- “QATransactionalManager interface” on page 575

getInstance method

Returns the singleton QAManagerFactory instance.

Syntax

```
QAManagerFactory QAManagerFactory.getInstance() throws QAException
```

Returns

The singleton QAManagerFactory instance.

Exceptions

- **“QAException class”** Thrown if there is a problem creating the manager factory.

QAMessage interface

QAMessage provides an interface to set message properties and header fields.

Syntax

```
public interface QAMessage
```

Derived classes

- “QABinaryMessage interface” on page 481
- “QATextMessage interface” on page 569

Members

All members of QAMessage interface, including all inherited members.

Name	Description
“clearProperties method”	Clear all the properties of the message.
“getAddress method”	Returns the destination address for the QAMessage instance.
“getBooleanProperty method”	Gets a boolean message property.
“getByteProperty method”	Gets a signed byte message property.
“getDoubleProperty method”	Gets a double message property.

Name	Description
“getExpiration method”	Returns the message's expiration value, or null if the message does not expire or has not yet been sent.
“getFloatProperty method”	Gets a float message property.
“getInReplyToID method”	Returns the message ID of the message to which this message is a reply.
“getIntProperty method”	Gets an int message property.
“getLongProperty method”	Gets a long message property.
“getMessageID method”	Returns the globally unique message ID of the message.
“getPriority method”	Returns the priority of the message (ranging from 0 to 9).
“getProperty method”	Gets a message property.
“getPropertyNames method”	Gets an enumerator over the property names of the message.
“getPropertyType method”	Returns the property type of the given property.
“getRedelivered method”	Indicates whether the message has been previously received but not acknowledged.
“getReplyToAddress method”	Returns the reply-to address of this message.
“getShortProperty method”	Gets a short message property.
“getStringProperty method”	Gets a String message property.
“getTimestamp method”	Returns the message timestamp, which is the time the message was created.
“propertyExists method”	Indicates whether the given property has been set for this message.
“setBooleanProperty method”	Sets a boolean property.
“setByteProperty method”	Sets a signed byte property.
“setDoubleProperty method”	Sets a double property.
“setFloatProperty method”	Sets a float property.
“setInReplyToID method”	Sets the in reply to ID, which identifies the message this message is a reply to.

Name	Description
“setIntProperty method”	Sets an int property.
“setLongProperty method”	Sets a long property.
“setPriority method”	Sets the priority of the message (ranging from 0 to 9).
“setProperty method”	Sets a property.
“setReplyToAddress method”	Sets the reply-to address.
“setShortProperty method”	Sets a short property.
“setStringProperty method”	Sets a string property.
“DEFAULT_PRIORITY variable”	The default message priority.
“DEFAULT_TIME_TO_LIVE variable”	The default time-to-live value.

Remarks

The derived classes QABinaryMessage and QATextMessage provide specialized functions to read and write to the message body. You can use QAMessage functions to set predefined or custom message properties.

For a list of pre-defined property names, see the MessageProperties.

See also

- “QABinaryMessage interface” on page 481
- “QATextMessage interface” on page 569

clearProperties method

Clear all the properties of the message.

Syntax

```
void QAMessage.clearProperties() throws QAException
```

Exceptions

- **“QAException class”** Thrown if there is a problem clearing the message properties.

getAddress method

Returns the destination address for the QAMessage instance.

Syntax

```
String QAMessage.getAddress() throws QAException
```

Returns

The destination address for the QAMessage instance.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the destination address.

Remarks

When a message is sent, this field is ignored. After completion of a send operation, the field holds the destination address specified in QAManagerBase.putMessage(String, QAMessage).

getBooleanProperty method

Gets a boolean message property.

Syntax

```
boolean QAMessage.getBooleanProperty(String name) throws QAException
```

Parameters

- **name** The property name.

Returns

The property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "MessageProperties interface" on page 469

getByteProperty method

Gets a signed byte message property.

Syntax

```
byte QAMessage.getByteProperty(String name) throws QAException
```

Parameters

- **name** The property name.

Returns

The property value.

Exceptions

- **“QAException class”** Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- “MessageProperties interface” on page 469

getDoubleProperty method

Gets a double message property.

Syntax

```
double QAMessage.getDoubleProperty(String name) throws QAException
```

Parameters

- **name** The property name.

Returns

The property value.

Exceptions

- **“QAException class”** Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- “MessageProperties interface” on page 469

getExpiration method

Returns the message's expiration value, or null if the message does not expire or has not yet been sent.

Syntax

```
java.util.Date QAMessage.getExpiration() throws QAException
```

Returns

The message's expiration value, or null if the message does not expire or has not yet been sent.

Exceptions

- **“QAException class”** Thrown if there is a problem getting the expiration.

Remarks

When a message is sent, the expiration is left unassigned. After the send operation completes, it holds the expiration time of the message.

This is a read-only property because the expiration time of a message is set by adding the time-to-live argument of QAManagerBase.putMessageTimeToLive(String, QAMessage, long) to the current time.

See also

- "putMessageTimeToLive method" on page 534

getFloatProperty method

Gets a float message property.

Syntax

```
float QAMessage.getFloatProperty(String name) throws QAException
```

Parameters

- **name** The property name.

Returns

The property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "MessageProperties interface" on page 469

getInReplyToID method

Returns the message ID of the message to which this message is a reply.

Syntax

```
String QAMessage.getInReplyToID() throws QAException
```

Returns

The message ID of the message to which this message is a reply, or null if this message is not a reply.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message ID of the message to which this message is a reply.

getIntProperty method

Gets an int message property.

Syntax

```
int QAMessage.getIntProperty(String name) throws QAException
```

Parameters

- **name** The property name.

Returns

The property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "MessageProperties interface" on page 469

getLongProperty method

Gets a long message property.

Syntax

```
long QAMessage.getLongProperty(String name) throws QAException
```

Parameters

- **name** The property name.

Returns

The property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "MessageProperties interface" on page 469

getMessageID method

Returns the globally unique message ID of the message.

Syntax

```
String QAMessage.getMessageID() throws QAException
```

Returns

The message ID of the message, or null if the message has not yet been put.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message ID.

Remarks

This property is null until a message is put.

When a message is sent using QAManagerBase.putMessage(String, QAMessage) the message ID is null and can be ignored. When the send method returns, it contains an assigned value.

See also

- "putMessage method" on page 534

getPriority method

Returns the priority of the message (ranging from 0 to 9).

Syntax

```
int QAMessage.getPriority() throws QAException
```

Returns

The priority of the message.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the message priority.

getProperty method

Gets a message property.

Syntax

```
Object QAMessage.getProperty(String name) throws QAException
```

Parameters

- **name** The property name.

Returns

The property value, or null if the property does not exist.

Exceptions

- **"QAException class"** Thrown if there is a conversion error getting the property value.

getPropertyNames method

Gets an enumerator over the property names of the message.

Syntax

```
java.util.Enumeration QAMessage.getPropertyNames() throws QAException
```

Returns

An enumerator over the message property names.

Exceptions

- **"QAException class"** Thrown if there is a problem getting the enumerator over the property names of the message.

getPropertyType method

Returns the property type of the given property.

Syntax

```
short QAMessage.getPropertyType(String name) throws QAException
```

Parameters

- **name** The property name.

Returns

The property type.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the property type.

See also

- "PropertyType interface" on page 479

getRedelivered method

Indicates whether the message has been previously received but not acknowledged.

Syntax

```
boolean QAMessage.getRedelivered() throws QAException
```

Returns

True if the message has been previously received but not acknowledged.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the redelivered status.

Remarks

Redelivered is set by a receiving QAManager when it detects that a message being received was received before.

For example, an application receives a message using a QAManager opened with AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT and shuts down without acknowledging the message. When the application starts again and receives the same message, the message will be marked as redelivered.

getReplyToAddress method

Returns the reply-to address of this message.

Syntax

```
String QAMessage.getReplyToAddress() throws QAException
```

Returns

The reply-to address of this message, or null if it does not exist.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the reply-to address.

getShortProperty method

Gets a short message property.

Syntax

```
short QAMessage.getShortProperty(String name) throws QAException
```

Parameters

- **name** the property name.

Returns

The property value.

Exceptions

- **"QAException class"** Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "MessageProperties interface" on page 469

getStringProperty method

Gets a String message property.

Syntax

```
String QAMessage.getStringProperty(String name) throws QAException
```

Parameters

- **name** The property name.

Returns

The property value, or null if the property does not exist.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the message property.

See also

- "MessageProperties interface" on page 469

getTimestamp method

Returns the message timestamp, which is the time the message was created.

Syntax

```
java.util.Date QAMessage.getTimestamp() throws QAException
```

Returns

The message timestamp.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the message timestamp.

propertyExists method

Indicates whether the given property has been set for this message.

Syntax

```
boolean QAMessage.propertyExists(String name) throws QAException
```

Parameters

- **name** The property name

Returns

True if the property exists.

Exceptions

- **“QAException class”** Thrown if there is a problem checking if the property has been set.

setBooleanProperty method

Sets a boolean property.

Syntax

```
void QAMessage.setBooleanProperty(
    String name,
    boolean value
) throws QAException
```

Parameters

- **name** The property name.
- **value** The property value.

Exceptions

- **“QAException class”** Thrown if there is a problem setting the property.

See also

- “MessageProperties interface” on page 469

setByteProperty method

Sets a signed byte property.

Syntax

```
void QAMessage.setByteProperty(
    String name,
        byte value
    ) throws QAException
```

Parameters

- **name** The property name.
- **value** The property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the property.

See also

- "MessageProperties interface" on page 469

setDoubleProperty method

Sets a double property.

Syntax

```
    void QAMessage.setDoubleProperty(
        String name,
        double value
    ) throws QAException
```

Parameters

- **name** The property name.
- **value** The property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the property.

See also

- "MessageProperties interface" on page 469

setFloatProperty method

Sets a float property.

Syntax

```
    void QAMessage.setFloatProperty(
        String name,
        float value
    ) throws QAException
```

Parameters

- **name** The property name.
- **value** The property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the property.

See also

- "MessageProperties interface" on page 469

setInReplyToID method

Sets the in reply to ID, which identifies the message this message is a reply to.

Syntax

```
void QAMessage.setInReplyToID(String id) throws QAException
```

Parameters

- **id** The ID of the message this message is in reply to.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the in reply to ID.

setIntProperty method

Sets an int property.

Syntax

```
void QAMessage.setIntProperty(String name, int value) throws QAException
```

Parameters

- **name** The property name.
- **value** The property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the property.

See also

- "MessageProperties interface" on page 469

setLongProperty method

Sets a long property.

Syntax

```
void QAMessage.setLongProperty(
    String name,
    long value
) throws QAException
```

Parameters

- **name** The property name.
- **value** The property value.

Exceptions

- **“QAException class”** Thrown if there is a problem setting the property.

See also

- “MessageProperties interface” on page 469

setPriority method

Sets the priority of the message (ranging from 0 to 9).

Syntax

```
void QAMessage.setPriority(int priority) throws QAException
```

Parameters

- **priority** The priority of the message.

Exceptions

- **“QAException class”** Thrown if there is a problem setting the priority.

setProperty method

Sets a property.

Syntax

```
void QAMessage.setProperty(String name, Object value) throws QAException
```

Parameters

- **name** The property name.

- **value** The property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the property.

Remarks

The property type must correspond to one of the acceptable primitive types, or String.

See also

- "MessageProperties interface" on page 469

setReplyToAddress method

Sets the reply-to address.

Syntax

```
void QAMessage.setReplyToAddress(String address) throws QAException
```

Parameters

- **address** The reply-to address.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the reply-to address.

setShortProperty method

Sets a short property.

Syntax

```
void QAMessage.setShortProperty(
    String name,
    short value
) throws QAException
```

Parameters

- **name** The property name.

- **value** The property value.

Exceptions

- **"QAException class"** Thrown if there is a problem setting the property.

See also

- “MessageProperties interface” on page 469

setStringProperty method

Sets a string property.

Syntax

```
void QAMessage.setStringProperty(
    String name,
    String value
) throws QAException
```

Parameters

- **name** The property name.
- **value** The property value.

Exceptions

- **“QAException class”** Thrown if there is a problem setting the property.

See also

- “MessageProperties interface” on page 469

DEFAULT_PRIORITY variable

The default message priority.

Syntax

```
final int QAMessage.DEFAULT_PRIORITY
```

DEFAULT_TIME_TO_LIVE variable

The default time-to-live value.

Syntax

```
final long QAMessage.DEFAULT_TIME_TO_LIVE
```

QAMessageListener interface

To listen for messages, implement this interface and register your implementation by calling QAMangerBase.setMessageListener(String,QAMessageListener).

Syntax

```
public interface QAMessageListener
```

Members

All members of QAMessageListener interface, including all inherited members.

Name	Description
"onException method"	This method is called whenever an exception occurs while listening for messages.
"onMessage method"	This method is called whenever a message is received.

See also

- "setMessageListener method" on page 539

onException method

This method is called whenever an exception occurs while listening for messages.

Syntax

```
void QAMessageListener.onException(
    QAException exception,
    QAMessage message
)
```

Parameters

- **exception** The exception that occurred.

- **message** If the exception occurred after the message was passed to onMessage(QAMessage), the message that was processed. Otherwise, null.

Remarks

Note that this method cannot be used to automatically close the QAManagerBase instance, as the QAManagerBase.close() method blocks until all message listeners are finished processing.

See also

- "QAManagerBase interface" on page 514
- "close method" on page 520

onMessage method

This method is called whenever a message is received.

Syntax

```
void QAMessageListener.onMessage(QAMessage message) throws QAException
```

Parameters

- **message** The message that was received.

QAMessageListener2 interface

To listen for messages, implement this interface and register your implementation by calling QAMangerBase.

Syntax

```
public interface QAMessageListener2
```

Members

All members of QAMessageListener2 interface, including all inherited members.

Name	Description
"onException method"	This method is called whenever an exception occurs while listening for messages.
"onMessage method"	This method is called whenever a message is received.

Remarks

setMessageListener2(String,QAMessageListener2).

See also

- "setMessageListener2 method" on page 540

onException method

This method is called whenever an exception occurs while listening for messages.

Syntax

```
void QAMessageListener2.onException(
    QAManagerBase mgr,
    QAException exception,
    QAMessage message
)
```

Parameters

- **mgr** The QAManagerBase that processed the message.

- **exception** The exception that occurred.

- **message** If the exception occurred after the message was passed to onMessage(QAMessage), the message that was processed. Otherwise, null.

Remarks

Note that this method cannot be used to automatically close the QAManagerBase instance, as the QAManagerBase.close() method blocks until all message listeners are finished processing.

See also

- "QAManagerBase interface" on page 514
- "close method" on page 520

onMessage method

This method is called whenever a message is received.

Syntax

```
void QAMessageListener2.onMessage(
    QAManagerBase mgr,
    QAMessage message
) throws QAException
```

Parameters

- **mgr** The QAManagerBase that received the message.

- **message** The message that was received.

See also

- "QAManagerBase interface" on page 514

QATextMessage interface

QATextMessage inherits from the QAMessage class and adds a text message body, and methods to read from and write to the text message body.

Syntax

```
public interface QATextMessage
```

Base classes

- "QAMessage interface" on page 550

Members

All members of QATextMessage interface, including all inherited members.

Name	Description
"clearProperties method"	Clear all the properties of the message.
"getAddress method"	Returns the destination address for the QAMessage instance.
"getBooleanProperty method"	Gets a boolean message property.
"getByteProperty method"	Gets a signed byte message property.
"getDoubleProperty method"	Gets a double message property.
"getExpiration method"	Returns the message's expiration value, or null if the message does not expire or has not yet been sent.
"getFloatProperty method"	Gets a float message property.
"getInReplyToID method"	Returns the message ID of the message to which this message is a reply.
"getIntProperty method"	Gets an int message property.
"getLongProperty method"	Gets a long message property.
"getMessageID method"	Returns the globally unique message ID of the message.
"getPriority method"	Returns the priority of the message (ranging from 0 to 9).
"getProperty method"	Gets a message property.
"getPropertyNames method"	Gets an enumerator over the property names of the message.
"getPropertyType method"	Returns the property type of the given property.
"getRedelivered method"	Indicates whether the message has been previously received but not acknowledged.
"getReplyToAddress method"	Returns the reply-to address of this message.
"getShortProperty method"	Gets a short message property.
"getStringProperty method"	Gets a String message property.
"getText method"	Returns the message text.
"getTextLength method"	Returns the length, in characters, of the message.
"getTimestamp method"	Returns the message timestamp, which is the time the message was created.

Name	Description
“propertyExists method”	Indicates whether the given property has been set for this message.
“readText method”	Returns unread text from the message.
“reset method”	Resets the text position of the message to the beginning.
“setBooleanProperty method”	Sets a boolean property.
“setByteProperty method”	Sets a signed byte property.
“setDoubleProperty method”	Sets a double property.
“setFloatProperty method”	Sets a float property.
“setInReplyToID method”	Sets the in reply to ID, which identifies the message this message is a reply to.
“setIntProperty method”	Sets an int property.
“setLongProperty method”	Sets a long property.
“setPriority method”	Sets the priority of the message (ranging from 0 to 9).
“setProperty method”	Sets a property.
“setReplyToAddress method”	Sets the reply-to address.
“setShortProperty method”	Sets a short property.
“setStringProperty method”	Sets a string property.
“setText method”	Overwrites the message text.
“writeText method”	Appends text to the text of the message.
“DEFAULT_PRIORITY variable”	The default message priority.
“DEFAULT_TIME_TO_LIVE variable”	The default time-to-live value.

Remarks

When the message is first created, the body of the message is in write-only mode. After a message has been sent, the client that sent it can retain and modify it without affecting the message that has been sent. The same message object can be sent multiple times.

When a message is received, the provider has called QATextMessage.reset() so that the message body is in read-only mode and reading values starts from the beginning of the message body.

See also

- “onMessage method” on page 567

getText method

Returns the message text.

Syntax

```
String QATextMessage.getText() throws QAException
```

Returns

The message text, or null .

Exceptions

- **“QAException class”** Thrown if there is a problem retrieving the message text.

Remarks

If the message text exceeds the maximum size specified by the QAManager.MAX_IN_MEMORY_MESSAGE_SIZE property, this method returns null. In this case, use the QATextMessage.readText(int) method to read the text.

See also

- “readText method” on page 572

getTextLength method

Returns the length, in characters, of the message.

Syntax

```
long QATextMessage.getTextLength() throws QAException
```

Returns

The length in characters of the message.

Exceptions

- **“QAException class”** Thrown if there is a problem retrieving the length of the message.

readText method

Returns unread text from the message.

Syntax

```
String QATextMessage.readText(int maxLength) throws QAException
```

Parameters

- **maxLength** The maximum number of characters to read.

Returns

The text.

Exceptions

- **"QAException class"** Thrown if there is a problem retrieving the unread text.

Remarks

Any additional unread text must be read by subsequent calls to this method. Text is read from the beginning of any unread text.

reset method

Resets the text position of the message to the beginning.

Syntax

```
void QATextMessage.reset() throws QAException
```

Exceptions

- **"QAException class"** Thrown if there is a problem resetting the text position of the message.

setText method

Overwrites the message text.

Syntax

```
void QATextMessage.setText(String value) throws QAException
```

Parameters

- **value** The text to write to the message body.

Exceptions

- **"QAException class"** Thrown if there is a problem overwriting the message text.

writeText method

Appends text to the text of the message.

Overload list

Name	Description
"writeText(String) method"	Appends text to the text of the message.
"writeText(String, int) method"	Appends text to the text of the message.
"writeText(String, int, int) method"	Appends text to the text of the message.

writeText(String) method

Appends text to the text of the message.

Syntax

```
void QATextMessage.writeText(String value) throws QAException
```

Parameters

- **value** The text to append.

Exceptions

- **"QAException class"** Thrown if there is a problem appending the message text.

writeText(String, int) method

Appends text to the text of the message.

Syntax

```
void QATextMessage.writeText(
    String value,
    int length
) throws QAException
```

Parameters

- **value** The text to append.
- **length** The number of characters of text to append.

Exceptions

- **"QAException class"** Thrown if there is a problem appending the message text.

writeText(String, int, int) method

Appends text to the text of the message.

Syntax

```
void QATextMessage.writeText(
    String value,
    int offset,
    int length
) throws QAException
```

Parameters

- **value** The text to append.
- **offset** The offset into value of the text to append.
- **length** The number of characters of text to append.

Exceptions

- **"QAException class"** Thrown if there is a problem appending the message text.

QATransactionalManager interface

The QATransactionalManager class derives from QAManagerBase and manages transactional QAnywhere messaging operations.

Syntax

```
public interface QATransactionalManager
```

Base classes

- "QAManagerBase interface" on page 514

Members

All members of QATransactionalManager interface, including all inherited members.

Name	Description
"browseMessages method"	Browses all available messages in the message store.
"browseMessagesByID method"	Browse the message with the given message ID.
"browseMessagesByQueue method"	Browses the available messages waiting that have been sent to the given address.
"browseMessagesBySelector method"	Browse messages queued in the message store that satisfy the given selector.
"cancelMessage method"	Cancels the message with the given message ID.

Name	Description
“close method”	Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.
“commit method”	Commits the current transaction and begins a new transaction.
“createBinaryMessage method”	Creates a QABinaryMessage object.
“createTextMessage method”	Creates a QATextMessage object.
“getBooleanStoreProperty method”	Gets a boolean value for a pre-defined or custom message store property.
“getByteStoreProperty method”	Gets a signed byte value for a pre-defined or custom message store property.
“getDoubleStoreProperty method”	Gets a double value for a pre-defined or custom message store property.
“getFloatStoreProperty method”	Gets a float value for a pre-defined or custom message store property.
“getIntStoreProperty method”	Gets a int value for a pre-defined or custom message store property.
“getLongStoreProperty method”	Gets a long value for a pre-defined or custom message store property.
“getMessage method”	Returns the next available QAMessage sent to the specified address.
“getMessageBySelector method”	Returns the next available QAMessage sent to the specified address that satisfies the given selector.
“getMessageBySelectorNoWait method”	Returns the next available QAMessage sent to the given address that satisfies the given selector.
“getMessageBySelectorTimeout method”	Returns the next available QAMessage sent to the given address that satisfies the given selector.
“getMessageNoWait method”	Returns the next available QAMessage sent to the given address.
“getMessageTimeout method”	Returns the next available QAMessage sent to the given address.

Name	Description
“getMode method”	Returns the QAManager acknowledgement mode for received messages.
“getQueueDepth method”	Returns the total depth of all queues, based on a given filter.
“getShortStoreProperty method”	Gets a short value for a pre-defined or custom message store property.
“getStoreProperty method”	Gets an Object representing a message store property.
“getStorePropertyNames method”	Gets an enumerator over the message store property names.
“getStringStoreProperty method”	Gets a string value for a pre-defined or custom message store property.
“open method”	Opens a QATransactionalManager instance.
“propertyExists method”	Tests if there currently exists a value for the given the property.
“putMessage method”	Prepares a message to send to another QAnywhere client.
“putMessageTimeToLive method”	Prepares a message to send to another QAnywhere client.
“reOpen method”	Reopens the QAManagerBase.
“rollback method”	Rolls back the current transaction and begins a new transaction.
“setBooleanStoreProperty method”	Sets a pre-defined or custom message store property to a boolean value.
“setByteStoreProperty method”	Sets a pre-defined or custom message store property to a sbyte value.
“setDoubleStoreProperty method”	Sets a pre-defined or custom message store property to a double value.
“setFloatStoreProperty method”	Sets a pre-defined or custom message store property to a float value.
“setIntStoreProperty method”	Sets a pre-defined or custom message store property to a int value.
“setLongStoreProperty method”	Sets a pre-defined or custom message store property to a long value.

Name	Description
"setMessageListener method"	Registers a QAMessageListener object to receive QAnywhere messages asynchronously.
"setMessageListener2 method"	Registers a QAMessageListener2 object to receive QAnywhere messages asynchronously.
"setMessageListenerBySelector method"	Registers a QAMessageListener object to receive QAnywhere messages asynchronously, with a message selector.
"setMessageListenerBySelector2 method"	Registers a QAMessageListener2 object to receive QAnywhere messages asynchronously, with a message selector.
"setProperty method"	Allows you to set QAnywhere Manager configuration properties programmatically.
"setShortStoreProperty method"	Sets a pre-defined or custom message store property to a short value.
"setStoreProperty method"	Sets a pre-defined or custom message store property to a System.Object value.
"setStringStoreProperty method"	Sets a pre-defined or custom message store property to a String value.
"start method"	Starts the QAManagerBase for receiving incoming messages.
"stop method"	Halts the QAManagerBase's reception of incoming messages.
"triggerSendReceive method"	Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

Remarks

For a detailed description of derived behavior, see QAManagerBase.

QATransactionalManager instances can only be used for transactional acknowledgement. Use the QATransactionalManager.commit() method to commit all QAManagerBase.putMessage(String, QAMessage) and QAManagerBase.getMessage(String) invocations.

See also

- "commit method" on page 579
- "putMessage method" on page 534
- "getMessage method" on page 525

commit method

Commits the current transaction and begins a new transaction.

Syntax

```
void QATransactionalManager.commit() throws QAException
```

Exceptions

- **“QAException class”** Thrown if there is a problem committing.

Remarks

This method commits all QAManagerBase.putMessage(String, QAMessage) and QAManagerBase.getMessage(String) invocations.

> **Note**
> The first transaction begins with the call to QATransactionalManager.open().

open method

Opens a QATransactionalManager instance.

Syntax

```
void QATransactionalManager.open() throws QAException
```

Exceptions

- **“QAException class”** Thrown if there is a problem opening the manager.

Remarks

This method must be the first method called after creating a manager.

rollback method

Rolls back the current transaction and begins a new transaction.

Syntax

```
void QATransactionalManager.rollback() throws QAException
```

Exceptions

- **“QAException class”** Thrown if there is a problem rolling back.

Remarks

This method rolls back all uncommitted QAManagerBase.putMessage(String, QAMessage) and QAManagerBase.getMessage(String) invocations.

QueueDepthFilter interface

Provides queue depth filter values for QAManagerBase.getQueueDepth(short) and QAManagerBase.getQueueDepth(String, short).

Syntax

```
public interface QueueDepthFilter
```

Members

All members of QueueDepthFilter interface, including all inherited members.

Name	Description
"ALL variable"	This filter specifies both incoming and outgoing messages.
"INCOMING variable"	This filter specifies only incoming messages.
"LOCAL variable"	This filter specifies only local messages.
"OUTGOING variable"	This filter specifies only outgoing messages.

See also

- "getQueueDepth method" on page 530

ALL variable

This filter specifies both incoming and outgoing messages.

Syntax

```
final short QueueDepthFilter.ALL
```

Remarks

System messages and expired messages are not included in any queue depth counts.

INCOMING variable

This filter specifies only incoming messages.

Syntax

```
final short QueueDepthFilter.INCOMING
```

Remarks

An incoming message is defined as a message whose originator is different than the agent ID of the message store.

LOCAL variable

This filter specifies only local messages.

Syntax

```
final short QueueDepthFilter.LOCAL
```

Remarks

A local message is defined as a message whose originator and target are the agent ID of the message store.

OUTGOING variable

This filter specifies only outgoing messages.

Syntax

```
final short QueueDepthFilter.OUTGOING
```

Remarks

An outgoing message is defined as a message whose originator is the agent ID of the message store, and whose destination is not the agent ID of the message store.

StatusCodes interface

This interface defines a set of codes for the status of a message.

Syntax

```
public interface StatusCodes
```

Members

All members of StatusCodes interface, including all inherited members.

Name	Description
"CANCELED variable"	The message has been canceled.

Name	Description
"EXPIRED variable"	The message has expired; the message was not received before its expiration time had passed.
"FINAL variable"	This constant is used to determine if a message has achieved a final state.
"LOCAL variable"	The message is addressed to the local message store and will not be transmitted to the server.
"PENDING variable"	The message has been sent but not received and acknowledged.
"RECEIVED variable"	The message has been received and acknowledged by the receiver.
"RECEIVING variable"	The message is in the process of being received, or it was received but not acknowledged.
"TRANSMITTED variable"	The message has been transmitted to the server.
"TRANSMITTING variable"	The message is in the process of being transmitted to the server.
"UNRECEIVABLE variable"	The message has been marked as unreceivable.
"UNTRANSMITTED variable"	The message has not been transmitted to the server.

CANCELED variable

The message has been canceled.

Syntax

```
final int StatusCodes.CANCELED
```

Remarks

This code applies to MessageProperties.STATUS.

See also

- "STATUS variable" on page 475

EXPIRED variable

The message has expired; the message was not received before its expiration time had passed.

Syntax

```
final int StatusCodes.EXPIRED
```

Remarks

This code applies to MessageProperties.STATUS.

See also

- "STATUS variable" on page 475

FINAL variable

This constant is used to determine if a message has achieved a final state.

Syntax

```
final int StatusCodes.FINAL
```

Remarks

A message has achieved a final state if and only if its status is greater than this constant.

This code applies to MessageProperties.STATUS.

See also

- "STATUS variable" on page 475

LOCAL variable

The message is addressed to the local message store and will not be transmitted to the server.

Syntax

```
final int StatusCodes.LOCAL
```

Remarks

This code applies to MessageProperties.TRANSMISSION_STATUS.

See also

- "TRANSMISSION_STATUS variable" on page 476

PENDING variable

The message has been sent but not received and acknowledged.

Syntax

```
final int StatusCodes.PENDING
```

Remarks

This code applies to MessageProperties.STATUS.

See also

- “STATUS variable” on page 475

RECEIVED variable

The message has been received and acknowledged by the receiver.

Syntax

```
final int StatusCodes.RECEIVED
```

Remarks

This code applies to MessageProperties.STATUS.

See also

- “STATUS variable” on page 475

RECEIVING variable

The message is in the process of being received, or it was received but not acknowledged.

Syntax

```
final int StatusCodes.RECEIVING
```

Remarks

This code applies to MessageProperties.STATUS.

See also

- “STATUS variable” on page 475

TRANSMITTED variable

The message has been transmitted to the server.

Syntax

```
final int StatusCodes.TRANSMITTED
```

Remarks

This code applies to MessageProperties.TRANSMISSION_STATUS.

See also

- “TRANSMISSION_STATUS variable” on page 476

TRANSMITTING variable

The message is in the process of being transmitted to the server.

Syntax

```
final int StatusCodes.TRANSMITTING
```

Remarks

This code applies to MessageProperties.TRANSMISSION_STATUS.

See also

- “TRANSMISSION_STATUS variable” on page 476

UNRECEIVABLE variable

The message has been marked as unreceivable.

Syntax

```
final int StatusCodes.UNRECEIVABLE
```

Remarks

The message is either malformed, or there were too many failed attempts to deliver it.

This code applies to MessageProperties.STATUS.

See also

- “STATUS variable” on page 475

UNTRANSMITTED variable

The message has not been transmitted to the server.

Syntax

```
final int StatusCodes.UNTRANSMITTED
```

Remarks

This code applies to MessageProperties.TRANSMISSION_STATUS.

See also

- "TRANSMISSION_STATUS variable" on page 476

QAnywhere Java API reference for web services

Package

`ianywhere.qanywhere.ws`

WSBase class

This is the base class for the main web service proxy class generated by the mobile web service compiler.

Syntax

```
public class WSBase
```

Members

All members of WSBase class, including all inherited members.

Name	Description
"WSBase constructor"	Constructor with configuration property file.
"clearRequestProperties method"	Clears all request properties that have been set for this WSBase.
"getResult method"	Gets a WSResult object that represents the results of a web service request.
"getServiceID method"	Gets the service ID for this instance of WSBase.
"setListener method"	Sets a listener for the results of a given web service request.
"setProperty method"	Sets a configuration property for this instance of WSBase.
"setQAManager method"	Sets the QAManagerBase that is used by this web service client to do web service requests.
"setRequestProperty method"	Sets a request property for webservice requests made by this instance of WSBase.
"setServiceID method"	Sets a user-defined ID for this instance of WSBase.

WSBase constructor

Constructor with configuration property file.

Overload list

Name	Description
"WSBase() constructor"	Constructor.
"WSBase(String) constructor"	Constructor with configuration property file.

WSBase() constructor

Constructor.

Syntax

```
WSBase.WSBase() throws WSException
```

Exceptions

- **"WSException class"** Thrown if there is a problem constructing the WSBase.

WSBase(String) constructor

Constructor with configuration property file.

Syntax

```
WSBase.WSBase(String iniFile) throws WSException
```

Parameters

- **iniFile** A file containing configuration properties.

Exceptions

- **"WSException class"** Thrown if there is a problem constructing the WSBase.

Remarks

Valid configuration properties are:

LOG_FILE a file to which to log runtime information.

LOG_LEVEL a value between 0 and 6 that controls the verbosity of information logged, with 6 being the highest verbosity.

WS_CONNECTOR_ADDRESS the address of the web service connector in the MobiLink server. The default WS_CONNECTOR_ADDRESS is "ianywhere.connector.webservices\\".

clearRequestProperties method

Clears all request properties that have been set for this WSBase.

Syntax

```
void WSBase.clearRequestProperties()
```

getResult method

Gets a WSResult object that represents the results of a web service request.

Syntax

```
WSResult WSBase.getResult(String requestID) throws QAException
```

Parameters

- **requestID** The ID of the web service request.

Returns

A WSResult instance representing the results of the web service request.

See also

- "WSStatus class" on page 618

getServiceID method

Gets the service ID for this instance of WSBase.

Syntax

```
String WSBase.getServiceID()
```

Returns

The service ID.

setListener method

Sets a listener for the results of a given web service request.

Overload list

Name	Description
"setListener(String, WSListener) method"	Sets a listener for the results of a given web service request.

Name	Description
"setListener(WSListener) method"	Sets a listener for the results of all web service requests made by this instance of WSBase.

setListener(String, WSListener) method

Sets a listener for the results of a given web service request.

Syntax

```
void WSBase.setListener(
    String requestID,
    WSListener listener
) throws QAException
```

Parameters

- **requestID** The ID of the web service request to which to listen for results.
- **listener** The listener object that gets called when the result of the given web service request is available.

Remarks

Listeners are typically used to get results of the asyncXYZ methods of the service.

To remove a listener, call setListener with *null* as the listener.

Note
This method replaces the listener set by any previous call to setListener.

setListener(WSListener) method

Sets a listener for the results of all web service requests made by this instance of WSBase.

Syntax

```
void WSBase.setListener(WSListener listener) throws QAException
```

Parameters

- **listener** The listener object that gets called when the result of a web service request is available.

Remarks

Listeners are typically used to get results of the asyncXYZ methods of the service.

To remove a listener, call setListener with *null* as the listener.

Note
This method replaces the listener set by any previous call to setListener.

setProperty method

Sets a configuration property for this instance of WSBase.

Syntax

```
void WSBase.setProperty(String property, String val) throws WSException
```

Parameters

- **property** The property name to set.
- **val** The property value.

Remarks

Configuration properties must be set before any asynchronous or synchronous web service request is made; after which this method has no effect.

Valid configuration properties are:

LOG_FILE a file to which to log runtime information.

LOG_LEVEL a value between 0 and 6 that controls the verbosity of information logged, with 6 being the highest verbosity.

WS_CONNECTOR_ADDRESS the address of the web service connector in the MobiLink server. The default is: "ianywhere.connector.webservices\\".

setQAManager method

Sets the QAManagerBase that is used by this web service client to do web service requests.

Syntax

```
void WSBase.setQAManager(QAManagerBase mgr)
```

Parameters

- **mgr** The QAManagerBase to use.

Remarks

> **Note**
> If you use an EXPLICIT_ACKNOWLEDGEMENT QAManager, you can acknowledge the result of an asynchronous web service request by calling the acknowledge() method of WSResult. The result of a synchronous web service request is automatically acknowledged, even in the case of an EXPLICIT_ACKNOWLEDGEMENT QAManager. If you use an IMPLICIT_ACKNOWLEDGEMENT QAManager, the result of any web service request is acknowledged automatically.

setRequestProperty method

Sets a request property for webservice requests made by this instance of WSBase.

Syntax

```
void WSBase.setRequestProperty(String name, Object value)
```

Parameters

- **name** The property name to set.
- **value** The property value.

Remarks

A request property is set on each QAMessage that is sent by this WSBase, until the property is cleared. A request property is cleared by setting it to a null value. The type of the message property is determined by the class of the value parameter. For example, if value is an instance of Integer, then setIntProperty is used to set the property on the QAMessage.

setServiceID method

Sets a user-defined ID for this instance of WSBase.

Syntax

```
void WSBase.setServiceID(String serviceID)
```

Parameters

- **serviceID** The service ID.

Remarks

The service ID should be set to a value unique to this instance of WSBase. It is used internally to form a queue name for sending and receiving web service requests. Therefore, the service ID should be persisted between application sessions, in order to retrieve results of web service requests made in a previous session.

WSException class

This class represents an exception that occurred during processing of a web service request.

Syntax

```
public class WSException
```

Derived classes

- “WSFaultException class” on page 595

Members

All members of WSException class, including all inherited members.

Name	Description
“WSException constructor”	Constructs a new exception with the specified error message.
“getErrorCode method”	Gets the error code associated with this exception.
“WS_STATUS_HTTP_ERROR variable”	Error code indicating that there was an error in the web service HTTP request made by the web services connector.
“WS_STATUS_HTTP_OK variable”	Error code indicating that the webservice HTTP request by the web services connector was successful.
“WS_STATUS_HTTP_RETRIES_EXCEEDED variable”	Error code indicating that the number of HTTP retries was exceeded the web services connector.
“WS_STATUS_SOAP_PARSE_ERROR variable”	Error code indicating that there was an error in the web services runtime or in the webservices connector in parsing a SOAP response or request.

WSException constructor

Constructs a new exception with the specified error message.

Overload list

Name	Description
"WSException(Exception) constructor"	Constructs a new exception.
"WSException(String) constructor"	Constructs a new exception with the specified error message.
"WSException(String, int) constructor"	Constructs a new exception with the specified error message and error code.

WSException(Exception) constructor

Constructs a new exception.

Syntax

```
WSException.WSException(Exception exception)
```

Parameters

- **exception** The exception.

WSException(String) constructor

Constructs a new exception with the specified error message.

Syntax

```
WSException.WSException(String msg)
```

Parameters

- **msg** The error message.

WSException(String, int) constructor

Constructs a new exception with the specified error message and error code.

Syntax

```
WSException.WSException(String msg, int errorCode)
```

Parameters

- **msg** The error message.
- **errorCode** The error code.

getErrorCode method

Gets the error code associated with this exception.

Syntax

```
int WSException.getErrorCode()
```

Returns

The error code associated with this exception.

WS_STATUS_HTTP_ERROR variable

Error code indicating that there was an error in the web service HTTP request made by the web services connector.

Syntax

```
final int WSException.WS_STATUS_HTTP_ERROR
```

WS_STATUS_HTTP_OK variable

Error code indicating that the webservice HTTP request by the web services connector was successful.

Syntax

```
final int WSException.WS_STATUS_HTTP_OK
```

WS_STATUS_HTTP_RETRIES_EXCEEDED variable

Error code indicating that the number of HTTP retries was exceeded the web services connector.

Syntax

```
final int WSException.WS_STATUS_HTTP_RETRIES_EXCEEDED
```

WS_STATUS_SOAP_PARSE_ERROR variable

Error code indicating that there was an error in the web services runtime or in the webservices connector in parsing a SOAP response or request.

Syntax

```
final int WSException.WS_STATUS_SOAP_PARSE_ERROR
```

WSFaultException class

This class represents a SOAP Fault exception from the web service connector.

Syntax

```
public class WSFaultException
```

Base classes

- “WSException class” on page 592

Members

All members of WSFaultException class, including all inherited members.

Name	Description
“WSFaultException constructor”	Constructs a new exception with the specified error message.
“getErrorCode method”	Gets the error code associated with this exception.
“WSException constructor”	Constructs a new exception with the specified error message.
“WS_STATUS_HTTP_ERROR variable”	Error code indicating that there was an error in the web service HTTP request made by the web services connector.
“WS_STATUS_HTTP_OK variable”	Error code indicating that the webservice HTTP request by the web services connector was successful.
“WS_STATUS_HTTP_RETRIES_EXCEEDED variable”	Error code indicating that the number of HTTP retries was exceeded the web services connector.
“WS_STATUS_SOAP_PARSE_ERROR variable”	Error code indicating that there was an error in the web services runtime or in the webservices connector in parsing a SOAP response or request.

WSFaultException constructor

Constructs a new exception with the specified error message.

Syntax

```
WSFaultException.WSFaultException(String msg)
```

Parameters

- **msg** The error message.

WSListener interface

This class represents a listener for results of web service requests.

Syntax

```
public interface WSListener
```

Members

All members of WSListener interface, including all inherited members.

Name	Description
"onException method"	Called when an exception occurs during processing of the result of an asynchronous web service request.
"onResult method"	Called with the result of an asynchronous web service request.

onException method

Called when an exception occurs during processing of the result of an asynchronous web service request.

Syntax

```
void WSListener.onException(WSException e, WSResult wsResult)
```

Parameters

- **e** The WSException that occurred during processing of the result.
- **wsResult** A WSResult, from which the request ID may be obtained. Values of this WSResult are not defined.

See also

- "WSException class" on page 592
- "WSResult class" on page 597

onResult method

Called with the result of an asynchronous web service request.

Syntax

```
void WSListener.onResult(WSResult wsResult)
```

Parameters

- **wsResult** The WSResult describing the result of a web service request.

See also

- "WSResult class" on page 597

WSResult class

This class represents the results of a web service request.

Syntax

```
public class WSResult
```

Members

All members of WSResult class, including all inherited members.

Name	Description
"acknowledge method"	Acknowledges that this WSResult has been processed.
"getArrayValue method"	Gets an array of complex types value from this WSResult.
"getBigDecimalArrayValue method"	Gets a BigDecimal array value from this WSResult.
"getBigDecimalValue method"	Gets a BigDecimal value from this WSResult.
"getBigIntegerArrayValue method"	Gets a BigInteger array value from this WSResult.
"getBigIntegerValue method"	Gets a BigInteger value from this WSResult.
"getBooleanArrayValue method"	Gets a java.lang.Boolean array value from this WSResult.
"getBooleanValue method"	Gets a java.lang.Boolean value from this WSResult.
"getByteArrayValue method"	Gets a java.lang.Byte array value from this WSResult.
"getByteValue method"	Gets a java.lang.Byte value from this WSResult.
"getCharacterArrayValue method"	Gets a java.lang.Character array value from this WSResult.
"getCharacterValue method"	Gets a java.lang.Character value from this WSResult.

Name	Description
“getDoubleArrayValue method”	Gets a java.lang.Double array value from this WSResult.
“getDoubleValue method”	Gets a java.lang.Double value from this WSResult.
“getErrorMessage method”	Gets the error message.
“getFloatArrayValue method”	Gets a java.lang.Float array value from this WSResult.
“getFloatValue method”	Gets a java.lang.Float value from this WSResult.
“getIntegerArrayValue method”	Gets a java.lang.Integer array value from this WSResult.
“getIntegerValue method”	Gets a java.lang.Integer value from this WSResult.
“getLongArrayValue method”	Gets a java.lang.Long array value from this WSResult.
“getLongValue method”	Gets a java.lang.Long value from this WSResult.
“getObjectArrayValue method”	Gets an array of complex types value from this WSResult.
“getObjectValue method”	Gets value of a complex type from this WSResult.
“getPrimitiveBooleanArrayValue method”	Gets a boolean array value from this WSResult.
“getPrimitiveBooleanValue method”	Gets a boolean value from this WSResult.
“getPrimitiveByteArrayValue method”	Gets a byte array value from this WSResult.
“getPrimitiveByteValue method”	Gets a byte value from this WSResult.
“getPrimitiveCharArrayValue method”	Gets a char array value from this WSResult.
“getPrimitiveCharValue method”	Gets a char value from this WSResult.
“getPrimitiveDoubleArrayValue method”	Gets a double array value from this WSResult.
“getPrimitiveDoubleValue method”	Gets a double value from this WSResult.
“getPrimitiveFloatArrayValue method”	Gets a float array value from this WSResult.
“getPrimitiveFloatValue method”	Gets a float value from this WSResult.
“getPrimitiveIntArrayValue method”	Gets an int array value from this WSResult.
“getPrimitiveIntValue method”	Gets an int value from this WSResult.
“getPrimitiveLongArrayValue method”	Gets a long array value from this WSResult.

Name	Description
“getPrimitiveLongValue method”	Gets a long value from this WSResult.
“getPrimitiveShortArrayValue method”	Gets a short array value from this WSResult.
“getPrimitiveShortValue method”	Gets a short value from this WSResult.
“getRequestID method”	Gets the request ID that this WSResult represents.
“getShortArrayValue method”	Gets a java.lang.Short array value from this WSResult.
“getShortValue method”	Gets a java.lang.Short value from this WSResult.
“getStatus method”	Gets the status of this WSResult.
“getStringArrayValue method”	Gets a String array value from this WSResult.
“getStringValue method”	Gets a String value from this WSResult.
“getValue method”	Gets the value of a complex type from this WSResult.

Remarks

A WSResult object is obtained in one of three ways:

- It is passed to the WSListener.onResult.
- It is returned by an asyncXYZ method of the service proxy generated by the compiler.
- It is obtained by calling WSBase.getResult with a specific request ID.

acknowledge method

Acknowledges that this WSResult has been processed.

Syntax

```
void WSResult.acknowledge() throws WSException, QAException
```

Remarks

This method is only useful when an EXPLICIT_ACKNOWLEDGEMENT QAManager is being used.

getArrayValue method

Gets an array of complex types value from this WSResult.

Syntax

```
WSSerializable[] WSResult.getArrayValue(
    String parentName
) throws WSException
```

Parameters

- **parentName**   The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"**   Thrown if there is a problem getting the value.

getBigDecimalArrayValue method

Gets a BigDecimal array value from this WSResult.

Syntax

```
BigDecimal[] WSResult.getBigDecimalArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName**   The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"**   Thrown if there is a problem getting the value.

getBigDecimalValue method

Gets a BigDecimal value from this WSResult.

Syntax

```
BigDecimal WSResult.getBigDecimalValue(
    String elementName
) throws WSException
```

Parameters

- **elementName**   The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getBigIntegerArrayValue method

Gets a BigInteger array value from this WSResult.

Syntax

```
BigInteger[] WSResult.getBigIntegerArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getBigIntegerValue method

Gets a BigInteger value from this WSResult.

Syntax

```
BigInteger WSResult.getBigIntegerValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getBooleanArrayValue method

Gets a java.lang.Boolean array value from this WSResult.

Syntax

```
Boolean[] WSResult.getBooleanArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getBooleanValue method

Gets a java.lang.Boolean value from this WSResult.

Syntax

```
Boolean WSResult.getBooleanValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getByteArrayValue method

Gets a java.lang.Byte array value from this WSResult.

Syntax

```
Byte[] WSResult.getByteArrayValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getByteValue method

Gets a java.lang.Byte value from this WSResult.

Syntax

```
Byte WSResult.getByteValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getCharacterArrayValue method

Gets a java.lang.Character array value from this WSResult.

Syntax

```
Character[] WSResult.getCharacterArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getCharacterValue method

Gets a java.lang.Character value from this WSResult.

Syntax

```
Character WSResult.getCharacterValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getDoubleArrayValue method

Gets a java.lang.Double array value from this WSResult.

Syntax

```
Double[] WSResult.getDoubleArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getDoubleValue method

Gets a java.lang.Double value from this WSResult.

Syntax

```
Double WSResult.getDoubleValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getErrorMessage method

Gets the error message.

Syntax

```
String WSResult.getErrorMessage()
```

Returns

The error message.

getFloatArrayValue method

Gets a java.lang.Float array value from this WSResult.

Syntax

```
Float[] WSResult.getFloatArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getFloatValue method

Gets a java.lang.Float value from this WSResult.

Syntax

```
Float WSResult.getFloatValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getIntegerArrayValue method

Gets a java.lang.Integer array value from this WSResult.

Syntax

```
Integer[] WSResult.getIntegerArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getIntegerValue method

Gets a java.lang.Integer value from this WSResult.

Syntax

```
Integer WSResult.getIntegerValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getLongArrayValue method

Gets a java.lang.Long array value from this WSResult.

Syntax

```
Long[] WSResult.getLongArrayValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getLongValue method

Gets a java.lang.Long value from this WSResult.

Syntax

```
Long WSResult.getLongValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getObjectArrayValue method

Gets an array of complex types value from this WSResult.

Syntax

```
Object[] WSResult.getObjectArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName**   The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"**   Thrown if there is a problem getting the value.

getObjectValue method

Gets value of a complex type from this WSResult.

Syntax

```
Object WSResult.getObjectValue(String elementName) throws WSException
```

Parameters

- **elementName**   The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"**   Thrown if there is a problem getting the value.

getPrimitiveBooleanArrayValue method

Gets a boolean array value from this WSResult.

Syntax

```
boolean[] WSResult.getPrimitiveBooleanArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName**   The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getPrimitiveBooleanValue method

Gets a boolean value from this WSResult.

Syntax

```
boolean WSResult.getPrimitiveBooleanValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getPrimitiveByteArrayValue method

Gets a byte array value from this WSResult.

Syntax

```
byte[] WSResult.getPrimitiveByteArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getPrimitiveByteValue method

Gets a byte value from this WSResult.

Syntax

```
byte WSResult.getPrimitiveByteValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getPrimitiveCharArrayValue method

Gets a char array value from this WSResult.

Syntax

```
char[] WSResult.getPrimitiveCharArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getPrimitiveCharValue method

Gets a char value from this WSResult.

Syntax

```
char WSResult.getPrimitiveCharValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getPrimitiveDoubleArrayValue method

Gets a double array value from this WSResult.

Syntax

```
double[] WSResult.getPrimitiveDoubleArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getPrimitiveDoubleValue method

Gets a double value from this WSResult.

Syntax

```
double WSResult.getPrimitiveDoubleValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getPrimitiveFloatArrayValue method

Gets a float array value from this WSResult.

Syntax

```
float[] WSResult.getPrimitiveFloatArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getPrimitiveFloatValue method

Gets a float value from this WSResult.

Syntax

```
float WSResult.getPrimitiveFloatValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getPrimitiveIntArrayValue method

Gets an int array value from this WSResult.

Syntax

```
int[] WSResult.getPrimitiveIntArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getPrimitiveIntValue method

Gets an int value from this WSResult.

Syntax

```
int WSResult.getPrimitiveIntValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getPrimitiveLongArrayValue method

Gets a long array value from this WSResult.

Syntax

```
long[] WSResult.getPrimitiveLongArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getPrimitiveLongValue method

Gets a long value from this WSResult.

Syntax

```
long WSResult.getPrimitiveLongValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getPrimitiveShortArrayValue method

Gets a short array value from this WSResult.

Syntax

```
short[] WSResult.getPrimitiveShortArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getPrimitiveShortValue method

Gets a short value from this WSResult.

Syntax

```
short WSResult.getPrimitiveShortValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getRequestID method

Gets the request ID that this WSResult represents.

Syntax

```
String WSResult.getRequestID()
```

Returns

The request ID.

Remarks

This request ID should be persisted between runs of the application if it is desired to obtain a WSResult corresponding to a web service request in a run of the application different from when the request was made.

getShortArrayValue method

Gets a java.lang.Short array value from this WSResult.

Syntax

```
Short[] WSResult.getShortArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getShortValue method

Gets a java.lang.Short value from this WSResult.

Syntax

```
Short WSResult.getShortValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

getStatus method

Gets the status of this WSResult.

Syntax

```
int WSResult.getStatus() throws QAException, WSException
```

Returns

The status code.

See also

- “WSStatus class” on page 618

getStringArrayValue method

Gets a String array value from this WSResult.

Syntax

```
String[] WSResult.getStringArrayValue(
    String elementName
) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getStringValue method

Gets a String value from this WSResult.

Syntax

```
String WSResult.getStringValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **"WSException class"** Thrown if there is a problem getting the value.

getValue method

Gets the value of a complex type from this WSResult.

Syntax

```
Object WSResult.getValue(String elementName) throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Returns

The value.

Exceptions

- **“WSException class”** Thrown if there is a problem getting the value.

WSStatus class

This class defines codes for the status of a web service request.

Syntax

```
public class WSStatus
```

Members

All members of WSStatus class, including all inherited members.

Name	Description
“STATUS_ERROR variable”	There was an error processing the request.
“STATUS_QUEUED variable”	The request has been queued for delivery to the server.
“STATUS_RESULT_AVAILABLE variable”	The result of the request is available.
“STATUS_SUCCESS variable”	The request was successful.

STATUS_ERROR variable

There was an error processing the request.

Syntax

```
final int WSStatus.STATUS_ERROR
```

STATUS_QUEUED variable

The request has been queued for delivery to the server.

Syntax

```
final int WSStatus.STATUS_QUEUED
```

Remarks

The final status of the request is not known yet.

STATUS_RESULT_AVAILABLE variable

The result of the request is available.

Syntax

```
final int WSStatus.STATUS_RESULT_AVAILABLE
```

STATUS_SUCCESS variable

The request was successful.

Syntax

```
final int WSStatus.STATUS_SUCCESS
```

QAnywhere SQL API reference

Message properties, headers, and content

This section documents QAnywhere SQL stored procedures that help you set message headers, message content, and message properties.

Message headers

You can use the following stored procedures to get and set message header information.

See "Message headers" on page 656.

ml_qa_getaddress

Returns the QAnywhere address of the message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Return value

The QAnywhere message address as VARCHAR(128). QAnywhere message addresses take the form *id \queue-name*.

You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- “Setting up SQL applications” on page 56
- “QAnywhere message addresses” on page 58
- “ml_qa_createmessage” on page 649
- “ml_qa_getmessage” on page 650

Example

In the following example, a message is received and its address is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @addr varchar(128);
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @addr = ml_qa_getaddress( @msgid );
    message 'message to address ' || @addr || ' received';
    commit;
end
```

ml_qa_getexpiration

Returns the expiration time of the message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Return value

The expiration time as TIMESTAMP. Returns null if there is no expiration.

Remarks

After completion of ml_qa_putmessage, a message expires if it is not received by the intended recipient in the specified time. The message may then be deleted using default QAnywhere delete rules.

You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- “Setting up SQL applications” on page 56
- “Message delete rules” on page 743
- “Sending QAnywhere messages” on page 61
- “ml_qa_setexpiration” on page 626
- “ml_qa_createmessage” on page 649
- “ml_qa_getmessage” on page 650

Example

In the following example, a message is received and the message expiration is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @expires timestamp;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @expires = ml_qa_getexpiration( @msgid );
    message 'message would have expired at ' || @expires || ' if it had not
been received';
    commit;
end
```

ml_qa_getinreplytoid

Returns the in-reply-to ID for the message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Return value

The in-reply-to ID as VARCHAR(128).

Remarks

A client can use the InReplyToID header field to link one message with another. A typical use is to link a response message with its request message.

The in-reply-to ID is the ID of the message that this message is replying to.

You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- “Setting up SQL applications” on page 56
- “ml_qa_setinreplytoid” on page 627
- “ml_qa_createmessage” on page 649
- “ml_qa_getmessage” on page 650

Example

In the following example, a message is received and the in-reply-to-id of the message is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @inreplytoid varchar(128);
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @inreplytoid = ml_qa_getinreplytoid( @msgid );
    message 'message is likely a reply to the message with id ' ||
@inreplytoid;
    commit;
end
```

ml_qa_getpriority

Returns the priority level of the message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Return value

The priority level as INTEGER.

Remarks

The QAnywhere API defines ten levels of priority value, with 0 as the lowest priority and 9 as the highest. Clients should consider priorities 0-4 as gradations of normal priority and priorities 5-9 as gradations of expedited priority.

You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- “Setting up SQL applications” on page 56
- “ml_qa_setpriority” on page 628
- “ml_qa_createmessage” on page 649
- “ml_qa_getmessage” on page 650

Example

In the following example, a message is received and the priority of the message is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @priority integer;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @priority = ml_qa_getpriority( @msgid );
    message 'a message with priority ' || @priority || ' has been received';
    commit;
end
```

ml_qa_getredelivered

Returns a value indicating whether this message has previously been received but not acknowledged.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Return value

The redelivered value as BIT. A value of **1** indicates that the message is being redelivered; **0** indicates that it is not being redelivered.

Remarks

A message may be redelivered if it was previously received but not acknowledged. For example, the message was received but the application receiving the message did not complete processing the message content before it crashed. In these cases, QAnywhere marks the message as redelivered to alert the receiver that the message might be partly processed.

For example, assume that the receipt of a message occurs in three steps:

1. An application using a non-transactional QAnywhere manager receives the message.

2. The application writes the message content and message ID to a database table called T1, and commits the change.

3. The application acknowledges the message.

If the application fails between steps 1 and 2 or between steps 2 and 3, the message is redelivered when the application restarts.

If the failure occurs between steps 1 and 2, you should process the redelivered message by running steps 2 and 3. If the failure occurs between steps 2 and 3, then the message is already processed and you only need to acknowledge it.

To determine what happened when the application fails, you can have the application call ml_qa_getredelivered to check if the message has been previously redelivered. Only messages that are redelivered need to be looked up in table T1. This is more efficient than having the application access the received message's message ID to check whether the message is in the table T1, because application failures are rare.

You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650

Example

In the following example, a message is received; if the message was previously delivered but not received, the message ID is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @redelivered bit;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @redelivered = ml_qa_getredelivered( @msgid );
    if @redelivered = 1 then
        message 'message with message ID ' || @msgid || ' has been
redelivered';
    end if;
    commit;
end
```

ml_qa_getreplytoaddress

Returns the address to which a reply to this message should be sent.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Return value

The reply address as VARCHAR(128).

Remarks

You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- “Setting up SQL applications” on page 56
- “ml_qa_setreplytoaddress” on page 628
- “ml_qa_createmessage” on page 649
- “ml_qa_getmessage” on page 650

Example

In the following example, if the received message has a reply-to address, then a message is sent to the reply-to-address with the content 'message received':

```
begin
    declare @msgid varchar(128);
    declare @rmsgid varchar(128);
    declare @replytoaddr varchar(128);
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @replytoaddr = ml_qa_getreplytoaddress( @msgid );
    if @replytoaddr is not null then
        set @rmsgid = ml_qa_createmessage();
        call ml_qa_settextcontent( @rmsgid, 'message received' );
        call ml_qa_putmessage( @rmsgid, @replytoaddr );
    end if;
    commit;
end
```

ml_qa_gettimestamp

Returns the creation time of the message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Return value

The message creation time as TIMESTAMP.

Remarks

The Timestamp header field contains the time a message was created. It is a coordinated universal time (UTC). It is not the time the message was actually transmitted, because the actual send may occur later due to transactions or other client-side queuing of messages.

You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650

Example

In the following example, a message is received and the creation time of the message is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @ts timestamp;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @ts = ml_qa_gettimestamp( @msgid );
    message 'message received with create time: ' || @ts ;
    commit;
end
```

ml_qa_setexpiration

Sets the expiration time for a message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Expiration	TIMESTAMP

Remarks

You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getexpiration" on page 620
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650

Example

In the following example, a message is created so that if it is not delivered within the next 3 days it expires:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setexpiration( @msgid, dateadd( day, 3, current timestamp ) );
    call ml_qa_settextcontent( @msgid, 'time-limited offer' );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_setinreplytoid

Sets the in-reply-to ID of this message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	in-reply-to ID	VARCHAR(128)

Remarks

An in-reply-to ID is similar to the in-reply-to IDs that are used by email systems to track replies.

Typically you set the in-reply-to ID to be the message ID of the message to which this message is replying, if any.

A client can use the InReplyToID header field to link one message with another. A typical use is to link a response message with its request message.

You cannot alter this header after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getinreplytoid" on page 621
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650

Example

In the following example, when a message is received that contains a reply-to-address, a reply message is created and sent containing the message ID in the in-reply-to-id:

```
begin
    declare @msgid varchar(128);
    declare @rmsgid varchar(128);
    declare @replyaddr varchar(128);
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @replyaddr = ml_qa_getreplyaddress( @msgid );
    if @replyaddr is not null then
        set @rmsgid = ml_qa_createmessage();
        call ml_qa_settextcontent( @rmsgid, 'message received' );
        call ml_qa_setinreplytoid( @rmsgid, @msgid );
        call ml_qa_putmessage( @rmsgid, @replyaddr );
    end if;
    commit;
end
```

ml_qa_setpriority

Sets the priority of a message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Priority	INTEGER

Remarks

The QAnywhere API defines ten levels of priority value, with 0 as the lowest priority and 9 as the highest. Clients should consider priorities 0-4 as gradations of normal priority and priorities 5-9 as gradations of expedited priority.

You cannot alter this header after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getpriority" on page 622
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650

Example

The following example sends a high priority message:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setpriority( @msgid, 9 );
    call ml_qa_settextcontent( @msgid, 'priority content' );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_setreplytoaddress

Sets the reply-to address of the message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Item	Description	Remarks
2	Reply address	VARCHAR(128)

Remarks

You cannot alter this header after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getreplytoaddress" on page 624
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650

Example

In the following example, a reply-to-address is added to a message. The recipient of the message can then use that reply-to-address to create a reply.

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setreplytoaddress( @msgid, 'myaddress' );
    call ml_qa_settextcontent( @msgid, 'some content' );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

Message properties

You can use the following stored procedures to get and set your custom message properties, or to get predefined message properties.

See "Message properties" on page 659.

ml_qa_getbooleanproperty

Returns the specified message property as a SQL BIT data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)

Return value

The property value as BIT.

Remarks

If the message property value is out of range, then a SQL error with SQLSTATE 22003 occurs.

You can read this property after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_setbooleanproperty" on page 637
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is received and the value of the boolean property mybooleanproperty is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @prop bit;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @prop = ml_qa_getbooleanproperty( @msgid, 'mybooleanproperty' );
    message 'message property mybooleanproperty is set to ' || @prop;
    commit;
end
```

ml_qa_getbyteproperty

Returns the specified message property as a SQL TINYINT data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)

Return value

The property value as TINYINT.

Remarks

If the message property value is out of range, then a SQL error with SQLSTATE 22003 occurs.

You can read this property after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_setbyteproperty" on page 638
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is received and the value of byte property mybyteproperty is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @prop tinyint;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @prop = ml_qa_getbyteproperty( @msgid, 'mybyteproperty' );
    message 'message property mybyteproperty is set to ' || @prop;
    commit;
end
```

ml_qa_getdoubleproperty

Returns the specified message property as a SQL DOUBLE data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)

Return value

The property value as DOUBLE.

Remarks

If the message property value is out of range, then a SQL error with SQLSTATE 22003 occurs.

You can read this property after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_setdoubleproperty" on page 639
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is received and the value of double property mydoubleproperty is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @prop double;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @prop = ml_qa_getdoubleproperty( @msgid, 'mydoubleproperty' );
    message 'message property mydoubleproperty is set to ' || @prop;
    commit;
end
```

ml_qa_getfloatproperty

Returns the specified message property as a SQL FLOAT data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)

Return value

The property value as FLOAT.

Remarks

If the message property value is out of range, then a SQL error with SQLSTATE 22003 occurs.

You can read this property after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_setfloatproperty" on page 639
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is received and the value of float property myfloatproperty is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @prop float;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @prop = ml_qa_getfloatproperty( @msgid, 'myfloatproperty' );
    message 'message property myfloatproperty is set to ' || @prop;
    commit;
end
```

ml_qa_getintproperty

Returns the specified message property as a SQL INTEGER data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)

Return value

The property value as INTEGER.

Remarks

If the message property value is out of range, then a SQL error with SQLSTATE 22003 occurs.

You can read this property after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_setintproperty" on page 640
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is received and the value of integer property myintproperty is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @prop integer;
```

```
        set @msgid = ml_qa_getmessage( 'myaddress' );
        set @prop = ml_qa_getintproperty( @msgid, 'myintproperty' );
        message 'message property myintproperty is set to ' || @prop;
        commit;
    end
```

ml_qa_getlongproperty

Returns the specified message property as a SQL BIGINT data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128

Return value

The property value as BIGINT.

Remarks

If the message property value is out of range, then a SQL error with SQLSTATE 22003 occurs.

You can read this property after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_setlongproperty" on page 641
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

ml_qa_getpropertynames

Retrieves the property names of the specified message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Remarks

This stored procedure opens a result set over the property names of the specified message. The message ID parameter must be that of a message that has been received.

The result set is a single VARCHAR(128) column, where each row contains the name of a message property. QAnywhere reserved property names (those with the prefix "ias_" or "QA") are not returned.

You can read this property after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- “Setting up SQL applications” on page 56
- “ml_qa_createmessage” on page 649
- “ml_qa_getmessage” on page 650
- “Custom message properties” on page 661

Example

The following example declares a cursor over the result set of property names for a message that has the message ID msgid. It then gets a message that has the address clientid\queuename; opens a cursor to access the property names of the message; and finally fetches the next property name.

```
begin
 declare prop_name_cursor cursor for
  call ml_qa_getpropertynames( @msgid );
 declare @msgid varchar(128);
 declare @name varchar(128);

 set @msgid = ml_qa_getmessage( 'clientid\queuename' );
 open prop_name_cursor;
 lp: loop
  fetch next prop_name_cursor into name;
  if sqlcode <> 0 then leave lp end if;
  ...
 end loop;
 close prop_name_cursor;
end
```

ml_qa_getshortproperty

Returns the specified message property as a SQL SMALLINT data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)

Return value

The property value as SMALLINT.

Remarks

If the message property value is out of range, then a SQL error with SQLSTATE 22003 occurs.

You can read this property after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_setshortproperty" on page 642
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is received and the value of the short property myshortproperty is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @prop smallint;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @prop = ml_qa_getshortproperty( @msgid, 'myshortproperty' );
    message 'message property myshortproperty is set to ' || @prop;
    commit;
end
```

ml_qa_getstringproperty

Returns the specified message property as a SQL LONG VARCHAR data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)

Return value

The property value as LONG VARCHAR.

Remarks

If the message property value is out of range, then a SQL error with SQLSTATE 22003 occurs.

You can read this property after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_setstringproperty" on page 643
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is received and the value of the string property mystringproperty is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @prop long varchar;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @prop = ml_qa_getstringproperty( @msgid, 'mystringproperty' );
    message 'message property mystringproperty is set to ' || @prop;
    commit;
end
```

ml_qa_setbooleanproperty

Sets the specified message property from a SQL BIT data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)
3	Property value	BIT

Remarks

You cannot alter this property after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getbooleanproperty" on page 629
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is created, the boolean properties mybooleanproperty1 and mybooleanproperty2 are set, and the message is sent to the address clientid\queuename:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setbooleanproperty( @msgid, 'mybooleanproperty1', 0 );
    call ml_qa_setbooleanproperty( @msgid, 'mybooleanproperty2', 1 );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_setbyteproperty

Sets the specified message property from a SQL TINYINT data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)
3	Property value	TINYINT

Remarks

You cannot alter this property after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getbyteproperty" on page 630
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is created, the byte properties mybyteproperty1 and mybyteproperty2 are set, and the message is sent to the address clientid\queuename:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setbyteproperty( @msgid, 'mybyteproperty1', 0 );
    call ml_qa_setbyteproperty( @msgid, 'mybyteproperty2', 255 );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_setdoubleproperty

Sets the specified message property from a SQL DOUBLE data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)
3	Property value	DOUBLE

Remarks

You cannot alter this property after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getdoubleproperty" on page 631
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is created, the double properties mydoubleproperty1 and mydoubleproperty2 are set, and the message is sent to the address clientid\queuename:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setdoubleproperty( @msgid, 'mydoubleproperty1', -12.34e-56 );
    call ml_qa_setdoubleproperty( @msgid, 'mydoubleproperty2', 12.34e56 );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_setfloatproperty

Sets the specified message property from a SQL FLOAT data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Item	Description	Remarks
2	Property name	VARCHAR(128)
3	Property value	FLOAT

Remarks

You cannot alter this property after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getfloatproperty" on page 632
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is created, the float properties myfloatproperty1 and myfloatproperty2 are set, and the message is sent to the address clientid\queuename:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setfloatproperty( @msgid, 'myfloatproperty1', -1.3e-5 );
    call ml_qa_setfloatproperty( @msgid, 'myfloatproperty2', 1.3e5 );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_setintproperty

Sets the specified message property from a SQL INTEGER data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)
3	Property value	INTEGER

Remarks

You cannot alter this property after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getintproperty" on page 633
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is created, the integer properties myintproperty1 and myintproperty2 are set, and the message is sent to the address clientid\queuename:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setintproperty( @msgid, 'myintproperty1', -1234567890 );
    call ml_qa_setintproperty( @msgid, 'myintproperty2',  1234567890 );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_setlongproperty

Sets the specified message property from a SQL BIGINT data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)
3	Property value	BIGINT

Remarks

You cannot alter this property after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getlongproperty" on page 634
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is created, the long properties mylongproperty1 and mylongproperty2 are set, and the message is sent to the address clientid\queuename:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setlongproperty( @msgid, 'mylongproperty1',
-12345678900987654321 );
    call ml_qa_setlongproperty( @msgid, 'mylongproperty2',
12345678900987654321 );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_setshortproperty

Sets the specified message property from a SQL SMALLINT data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)
3	Property value	SMALLINT

Remarks

You cannot alter this property after the message has been sent.

See also

- “Setting up SQL applications” on page 56
- “ml_qa_getshortproperty” on page 635
- “ml_qa_createmessage” on page 649
- “ml_qa_getmessage” on page 650
- “Custom message properties” on page 661

Example

In the following example, a message is created, the short properties myshortproperty1 and myshortproperty2 are set, and the message is sent to the address clientid\queuename:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setshortproperty( @msgid, 'myshortproperty1', -12345 );
    call ml_qa_setshortproperty( @msgid, 'myshortproperty2',  12345 );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_setstringproperty

Sets the specified message property from a SQL LONG VARCHAR data type.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Property name	VARCHAR(128)
3	Property value	LONG VARCHAR

Remarks

You cannot alter this property after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getstringproperty" on page 636
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "Custom message properties" on page 661

Example

In the following example, a message is created, the string properties mystringproperty1 and mystringproperty2 are set, and the message is sent to the address clientid\queuename:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setstringproperty( @msgid, 'mystringproperty1', 'c:\\temp' );
    call ml_qa_setstringproperty( @msgid, 'mystringproperty2',  'first line
\nsecond line' );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

Message content

You can use the following stored procedures to get and set message content.

ml_qa_getbinarycontent

Returns the message content of a binary message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Return value

The message content as LONG BINARY.

If the message has text content rather than binary content, this stored procedure returns null.

You can read this content after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- “Setting up SQL applications” on page 56
- “ml_qa_setbinarycontent” on page 646
- “ml_qa_createmessage” on page 649
- “ml_qa_getmessage” on page 650
- “ml_qa_getcontentclass” on page 644

Example

In the following example, a message's encrypted content is decrypted and output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @content long binary;
    declare @plaintext long varchar;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @content = ml_qa_getbinarycontent( @msgid );
    set @plaintext = decrypt( @content, 'mykey' );
    message 'message content decrypted: ' || @plaintext;
    commit;
end
```

ml_qa_getcontentclass

Returns the message type (text or binary).

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Return value

The content class as INTEGER.

The return value can be:

- **1** indicates that the message content is binary and should be read using the stored procedure ml_qa_getbinarycontent.
- **2** indicates that the message content is text and should be read using the stored procedure ml_qa_gettextcontent.

Remarks

You can read this content after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "ml_qa_getbinarycontent" on page 643
- "ml_qa_gettextcontent" on page 645

Example

In the following example, a message is received and the content is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @contentclass integer;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @contentclass = ml_qa_getcontentclass( @msgid );
    if @contentclass = 1 then
        message 'message  binary is ' || ml_qa_getbinarycontent( @msgid );
    elseif @contentclass = 2 then
        message 'message  text is ' || ml_qa_gettextcontent( @msgid );
    end if;
    commit;
end
```

ml_qa_gettextcontent

Returns the message content of a text message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.

Return value

The text content as LONG VARCHAR.

If the message has binary content rather than text content, this stored procedure returns null.

Remarks

You can read this content after a message is received and until a rollback or commit occurs; after that you cannot read it.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_settextcontent" on page 647
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650
- "ml_qa_getcontentclass" on page 644

Example

In the following example, the content of a message is output to the database server messages window:

```
begin
    declare @msgid varchar(128);
    declare @content long binary;
    set @msgid = ml_qa_getmessage( 'myaddress' );
    set @content = ml_qa_gettextcontent( @msgid );
    message 'message content: ' || @content ;
    commit;
end
```

ml_qa_setbinarycontent

Sets the binary content of the message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Content	LONG BINARY

You cannot alter this content after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getbinarycontent" on page 643
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650

Example

In the following example, a message is created with encrypted content and sent:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_setbinarycontent( @msgid, encrypt( 'my secret message',
'mykey' ) );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_settextcontent

Sets the text content of the message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Content	LONG VARCHAR

Remarks

You cannot alter this content after the message has been sent.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_gettextcontent" on page 645
- "ml_qa_createmessage" on page 649
- "ml_qa_getmessage" on page 650

Example

In the following example, a message is created and then set with the given content:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_settextcontent( @msgid, 'my simple message' );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

Message store properties

You can use the following stored procedures to get and set properties for client message stores.

For more information about message store properties, see "Client message store properties" on page 26.

ml_qa_getstoreproperty

Returns a client message store property.

Parameters

Item	Description	Remarks
1	Property name	VARCHAR(128)

Return value

The property value as LONG VARCHAR.

Remarks

Client message store properties are readable from every connection to this client message store.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_setstoreproperty" on page 648

Example

The following example gets the current synchronization policy of this message store and outputs it to the database server messages window:

```
begin
    declare @policy varchar(128);
    set @policy = ml_qa_getstoreproperty( 'policy' );
    message 'the current policy for synchronizing this message store is ' ||
@policy;
end
```

ml_qa_setstoreproperty

Sets a client message store property.

Parameters

Item	Description	Remarks
1	Property name	VARCHAR(128)
2	Property value	SMALLINT

Remarks

Client message store properties are readable from every connection to this client message store. The values are synchronized up to the server, as well, where they can be used in transmission rules.

See also

- “Setting up SQL applications” on page 56
- “ml_qa_getstoreproperty” on page 648

Example

The following example sets the synchronization policy to automatic for the message store:

```
begin
    call ml_qa_setstoreproperty( 'policy', 'automatic' );
    commit;
end
```

Message management

You can use the following stored procedures to manage your QAnywhere client transactions.

ml_qa_createmessage

Returns the message ID of a new message.

Return value

The message ID of the new message.

Remarks

Use this stored procedure to create a message. Once created, you can associate content, properties, and headers with this message and then send the message.

You can associate content, properties, and headers using any of the QAnywhere stored procedures starting with ml_qa_set. For example, use ml_qa_setbinarycontent or ml_qa_settextcontent to create a binary or text message.

See also

- “Setting up SQL applications” on page 56
- “Message headers” on page 619
- “Message properties” on page 629
- “Message content” on page 643

Example

The following example creates a message, sets the message content, and sends the message to the address clientid\queuename:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_settextcontent( @msgid, 'some content' );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_getmessage

Returns the message ID of the next message that is queued for the given address, blocking until one is queued.

Parameters

Item	Description	Remarks
1	Address	VARCHAR(128)

Return value

The message ID as VARCHAR(128).

Returns null if there is no queued message for this address.

Remarks

Use this stored procedure to check synchronously whether there is a message waiting for the specified QAnywhere message address. Use the Listener if you want a SQL procedure to be called asynchronously when a message is available for a specified QAnywhere address.

This stored procedure blocks until a message is queued.

For information about avoiding blocking, see "ml_qa_getmessagenowait" on page 651 or "ml_qa_getmessagetimeout" on page 652.

The message corresponding to the returned message ID is not considered to be received until the current transaction is committed. Once the receive is committed, the message cannot be received again by this or any other QAnywhere API. Similarly, a rollback of the current transaction means that the message is not received, so subsequent calls to ml_qa_getmessage may return the same message ID.

The properties and content of the received message can be read by the various ml_qa_get stored procedures until a commit or rollback is executed on the current transaction. Once a commit or rollback is executed on the current transaction, the message data is no longer readable. Before committing, you should store any data you need from the message as tabular data or in SQL variables.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getmessagenowait" on page 651
- "ml_qa_getmessagetimeout" on page 652
- "Message headers" on page 619
- "Message properties" on page 629
- "Message content" on page 643

Example

The following example displays the content of all messages sent to the address myaddress:

```
begin
    declare @msgid varchar(128);
    loop
        set @msgid = ml_qa_getmessage( 'myaddress' );
        message 'a message with content ' || ml_qa_gettextcontent( @msgid )
|| ' has been received';
        commit;
    end loop;
end
```

ml_qa_getmessagenowait

Returns the message ID of the next message that is currently queued for the given address.

Parameters

Item	Description	Remarks
1	Address	VARCHAR(128)

Return value

The message ID as VARCHAR(128).

Returns the message ID of the next message that is queued for the given address. Returns null if there is no queued message for this address.

Remarks

Use this stored procedure to check synchronously whether there is a message waiting for the specified QAnywhere message address. Use the Listener if you want a SQL procedure to be called asynchronously when a message is available for a specified QAnywhere address.

For information about blocking until a message is available, see "ml_qa_getmessage" on page 650 and "ml_qa_getmessagetimeout" on page 652.

The message corresponding to the returned message is not considered to be received until the current transaction is committed. Once the receive is committed, the message cannot be received again by this or any other QAnywhere API. Similarly, a rollback of the current transaction means that the message is not received, so subsequent calls to ml_qa_getmessage may return the same message ID.

The properties and content of the received message can be read by the various ml_qa_get stored procedures until a commit or rollback is executed on the current transaction. Once a commit or rollback is executed on the current transaction, the message data is no longer readable. Before committing, you should store any data you need from the message as tabular data or in SQL variables.

See also

- "Setting up SQL applications" on page 56
- "QAnywhere message addresses" on page 58
- "Listeners" [*MobiLink - Server-Initiated Synchronization*]
- "ml_qa_getmessagetimeout" on page 652
- "Message headers" on page 619
- "Message properties" on page 629
- "Message content" on page 643

Example

The following example displays the content of all messages that are queued at the address myaddress until all such messages are read (it is generally more efficient to commit after the last message has been read, rather than after each message is read):

```
begin
    declare @msgid varchar(128);
    loop
        set @msgid = ml_qa_getmessagenowait( 'myaddress' );
        if @msgid is null then leave end if;
        message 'a message with content ' || ml_qa_gettextcontent( @msgid )
|| ' has been received';
    end loop;
    commit;
end
```

ml_qa_getmessagetimeout

Waits for the specified timeout period to return the message ID of the next message that is queued for the given address.

Parameters

Item	Description	Remarks
1	Address	VARCHAR(128)
2	Timeout in milliseconds	INTEGER

Return value

The message ID as VARCHAR(128).

Returns null if there is no queued message for this address within the timeout period.

Remarks

Use this stored procedure to check synchronously whether there is a message waiting for the specified QAnywhere message address. Use the Listener if you want a SQL procedure to be called asynchronously when a message is available for a specified QAnywhere address.

The message corresponding to the returned message is not considered to be received until the current transaction is committed. Once the receive is committed, the message cannot be received again by this or any other QAnywhere API. Similarly, a rollback of the current transaction means that the message is not received, so subsequent calls to ml_qa_getmessage may return the same message ID.

The properties and content of the received message can be read by the various ml_qa_get stored procedures until a commit or rollback is executed on the current transaction. Once a commit or rollback is executed on the current transaction, the message data is no longer readable. Before committing, you should store any data you need from the message as tabular data or in SQL variables.

See also

- "Setting up SQL applications" on page 56
- "ml_qa_getmessage" on page 650
- "ml_qa_getmessagenowait" on page 651

Example

The following example outputs the content of all messages sent to the address myaddress to the database server messages window, and updates the database server messages window every 10 seconds if no message has been received:

```
begin
    declare @msgid varchar(128);
    loop
        set @msgid = ml_qa_getmessagetimeout( 'myaddress', 10000 );
        if @msgid is null then
            message 'waiting for a message...';
        else
          message 'a message with content ' || ml_qa_gettextcontent( @msgid )
|| ' has been received';
        commit;
        end if;
    end loop;
end
```

ml_qa_grant_messaging_permissions

Grants permission to other users to use QAnywhere stored procedures.

Parameters

Item	Description	Remarks
1	Database user ID	VARCHAR(128)

Remarks

Only users with DBA privilege automatically have permission to execute the QAnywhere stored procedures. Other users must be granted permission by having a user with DBA privileges run this stored procedure.

This procedure adds the user to a group called ml_qa_message_group and gives them execute permissions on all QAnywhere stored procedures.

See also

- "Setting up SQL applications" on page 56

Example

For example, to grant messaging permissions to a user with the database ID user1, execute the following code:

```
call dbo.ml_qa_grant_messaging_permissions( 'user1' )
```

ml_qa_listener_queue

Create a stored procedure named **ml_qa_listener_*queue*** (where *queue* is the name of a message queue) to receive messages asynchronously.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from the QAnywhere Listener.

Remarks

Note
This procedure is different from all the other QAnywhere stored procedures in that the stored procedure is not provided. If you create a stored procedure named **ml_qa_listener_*queue***, where *queue* is a message queue, then it is used by QAnywhere.

Although messages can be received synchronously on a connection, it is often convenient to receive messages asynchronously. You can create a stored procedure that is called when a message has been queued on a particular address. The name of this procedure must be **ml_qa_listener_*queue***, where *queue* is the message queue. When this procedure exists, the procedure is called whenever a message is queued on the given address.

This procedure is called from a separate connection. As long as a SQL error does not occur while this procedure is executing, the message is automatically acknowledged and committed.

Note
Do not commit or rollback within this procedure.

The queue name is part of the QAnywhere address. For more information, see "QAnywhere message addresses" on page 58.

See also

- “Setting up SQL applications” on page 56
- “Receiving messages asynchronously” on page 70
- “Receiving messages synchronously” on page 68
- “ml_qa_createmessage” on page 649
- “ml_qa_getmessage” on page 650

Example

The following example creates a procedure that is called whenever a message is queued on the address named executesql. In this example, the procedure assumes that the content of the message is a SQL statement that it can execute against the current database.

```
CREATE PROCEDURE ml_qa_listener_executesql(IN @msgid VARCHAR(128))
begin
 DECLARE @execstr LONG VARCHAR;
 SET @execstr = ml_qa_gettextcontent( @msgid );
 EXECUTE IMMEDIATE @execstr;
end
```

ml_qa_putmessage

Sends a message.

Parameters

Item	Description	Remarks
1	Message ID	VARCHAR(128). You can obtain the message ID from ml_qa_createmessage or ml_qa_getmessage.
2	Address	VARCHAR(128)

Remarks

The message ID you specify must have been previously created using ml_qa_createmessage. Only content, properties and headers associated with the message ID before the call to ml_qa_putmessage are sent with the message. Any added after the ml_qa_putmessage are ignored.

A commit is required before the message is actually queued for sending.

See also

- “Setting up SQL applications” on page 56
- “ml_qa_createmessage” on page 649
- “ml_qa_getmessage” on page 650

Example

In the following example, a message is created with the content 'a simple message' and sent to the address clientid\queuename:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_settextcontent( @msgid, 'a simple message' );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    commit;
end
```

ml_qa_triggersendreceive

Triggers a synchronization of messages with the MobiLink server.

Remarks

Normally, message synchronization is handled by the QAnywhere Agent. However, if the synchronization policy is on demand, then it is the application's responsibility to trigger the synchronization of messages. You can do so using this stored procedure. The trigger does not take effect until the current transaction is committed.

See also

- "Setting up SQL applications" on page 56

Example

In the following example, a message is sent and the transmission of the message is immediately initiated:

```
begin
    declare @msgid varchar(128);
    set @msgid = ml_qa_createmessage();
    call ml_qa_settextcontent( @msgid, 'my simple message' );
    call ml_qa_putmessage( @msgid, 'clientid\queuename' );
    call ml_qa_triggersendreceive();
    commit;
end
```

Message headers and properties

Message headers

All QAnywhere messages support the same set of header fields. Header fields contain values that are used by both clients and providers to identify and route messages.

The following message headers are predefined. How you use them depends on the type of client application you have.

- **Message ID** Read-only. The message ID of the new message. This header has a value only after the message is sent. See:

  - .NET API: "MessageID property" on page 287
  - C++ API: "getMessageID method" on page 438 and "setMessageID method" on page 448
  - Java API: "getMessageID method" on page 556
  - SQL API: "ml_qa_createmessage" on page 649 and "ml_qa_getmessage" on page 650

- **Message creation timestamp** Read-only. The Timestamp header field contains the time a message was created. It is a coordinated universal time (UTC). It is not the time the message was actually transmitted, because the actual send may occur later due to transactions or other client-side queuing of messages. You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it. See:

  - .NET API: "Timestamp property" on page 289
  - C++ API: "getTimestamp method" on page 442 and "setTimestamp method" on page 450
  - Java API: "getTimestamp method" on page 560
  - SQL API: "ml_qa_gettimestamp" on page 625

- **Reply-to address** Read-write. The reply address as VARCHAR(128) or null if it does not exist. You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it. See:

  - .NET API: "ReplyToAddress property" on page 289
  - C++ API: "getReplyToAddress method" on page 439 and "setReplyToAddress method" on page 449
  - Java API: "getReplyToAddress method" on page 559 and "setReplyToAddress method" on page 565
  - SQL API: "ml_qa_getreplytoaddress" on page 624 and "ml_qa_setreplytoaddress" on page 628

- **Message address** Read-only. The QAnywhere message address as VARCHAR(128). QAnywhere message addresses take the form *id\queue-name*. You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it. See:

  - .NET API: "Address property" on page 286
  - C++ API: "getAddress method" on page 433
  - Java API: "getAddress method" on page 552
  - SQL API: "ml_qa_getaddress" on page 619

- **Redelivered state of message** Read-only. The redelivered value as BIT. A value of 1 indicates that the message is being redelivered; 0 indicates that it is not being redelivered.

  A message may be redelivered if it was previously received but not acknowledged. For example, the message was received but the application receiving the message did not complete processing the message content before it crashed. In these cases, QAnywhere marks the message as redelivered to alert the receiver that the message might be partly processed.

  For example, assume that the receipt of a message occurs in three steps:

1. An application using a non-transactional QAnywhere manager receives the message.

2. The application writes the message content and message ID to a database table called T1, and commits the change.

3. The application acknowledges the message.

If the application fails between steps 1 and 2 or between steps 2 and 3, the message is redelivered when the application restarts.

If the failure occurs between steps 1 and 2, you should process the redelivered message by running steps 2 and 3. If the failure occurs between steps 2 and 3, then the message is already processed and you only need to acknowledge it.

To determine what happened when the application fails, you can have the application call ml_qa_getredelivered to check if the message has been previously redelivered. Only messages that are redelivered need to be looked up in table T1. This is more efficient than having the application access the received message's message ID to check whether the message is in the table T1, because application failures are rare.

You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it.

See:

- .NET API: “Redelivered property” on page 288
- C++ API: “getRedelivered method” on page 439 and “setRedelivered method” on page 448
- Java API: “getRedelivered method” on page 558
- SQL API: “ml_qa_getredelivered” on page 623

- **Expiration of message** Read-only except in the SQL API, where it is read-write. The expiration time as TIMESTAMP. Returns null if there is no expiration. A message expires if it is not received by the intended recipient in the specified time. The message may then be deleted using default QAnywhere delete rules. You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it. See:

    - .NET API: “Expiration property” on page 286
    - C++ API: “getExpiration method” on page 435
    - Java API: “getExpiration method” on page 554
    - SQL API: “ml_qa_getexpiration” on page 620 and “ml_qa_setexpiration” on page 626

- **Priority of message** Read-write. The QAnywhere API defines ten levels of priority value, with 0 as the lowest priority and 9 as the highest. Clients should consider priorities 0-4 as gradations of normal priority and priorities 5-9 as gradations of expedited priority. You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it. See:

    - .NET API: “Priority property” on page 288
    - C++ API: “getPriority method” on page 438
    - Java API: “getPriority method” on page 557
    - SQL API: “ml_qa_getpriority” on page 622

- **Message ID of a message for which this message is a reply** Read-write. The in-reply-to ID as VARCHAR(128). A client can use the InReplyToID header field to link one message with another. A typical use is to link a response message with its request message. The in-reply-to ID is the ID of the message that this message is replying to. You can read this header after a message is received and until a rollback or commit occurs; after that you cannot read it. See:
  - .NET API: "InReplyToID property" on page 287
  - C++ API: "getInReplyToID method" on page 436
  - Java API: "getInReplyToID method" on page 555
  - SQL API: "ml_qa_getinreplytoid" on page 621

Some message headers can be used in transmission rules. See "Variables defined by the rule engine" on page 738.

See also

- .NET API: "QAMessage interface" on page 271
- C++ API: "QAMessage class" on page 429
- Java API: "QAMessage interface" on page 550
- SQL API: "Message headers" on page 619

Message properties

Each message contains a built-in facility for supporting application-defined property values. These message properties allow you to implement application-defined message filtering.

Message properties are name-value pairs that you can optionally insert into messages to provide structure. For example, in the .NET API the predefined message property ias_Originator, identified by the constant MessageProperties.ORIGINATOR, provides the message store ID that sent the message. Message properties can be used in transmission rules to determine the suitability of a message for transmission.

There are two types of message property:

- **Predefined message properties** These message properties are always prefixed with ias_ or IAS_.

- **Custom message properties** These are message properties that you defined. You cannot prefix them with ias_ or IAS_.

In either case, you access message store properties using get and set methods and pass the name of the predefined or custom property as the first parameter.

See "Managing message properties" on page 662.

Predefined message properties

Some message properties have been predefined for your convenience. Predefined properties can be read but should not be set. The predefined message properties are:

- **ias_Adapters** For network status notification messages, a list of network adapters that can be used to connect to the MobiLink server. The list is a string and is delimited by a vertical bar.

- **ias_DeliveryCount** Int. The number of attempts that have been made so far to deliver the message.

- **ias_MessageType** Int. Indicates the type of the message. The message types can be:

Value	Message type	Description
0	REGULAR	If a message does not have the ias_MessageType property set, it is a regular message.
13	PUSH_NOTIFICATION	When a push notification is received from the server, a message of type PUSH_NOTIFICATION is sent to the system queue. See "Notifications of push notification" on page 60.
14	NETWORK_STATUS_NOTIFICATION	When there is a change in network status, a message of this type is sent to the system queue. See "Network status notifications" on page 59.

- **ias_RASNames** String. For network status notification messages, a list of RAS entry names that can be used to connect to the MobiLink server. The list is delimited by a vertical bar.

- **ias_NetworkStatus** Int. For network status notification messages, the state of the network connection. The value is 1 if connected, 0 otherwise.

- **ias_Originator** String. The message store ID of the originator of the message.

- **ias_Status** Int. The current status of the message. This property is not supported in the SQL API. The values can be:

Status Code	Description
1	Pending - The message has been sent but not received.
10	Receiving - The message is in the process of being received, or it was received but not acknowledged.
20	Final - The message has achieved a final state.
30	Expired - The message was not received before its expiration time has passed.
40	Cancelled - The message has been canceled.
50	Unreceivable - The message is either malformed, or there were too many failed attempts to deliver it.
60	Received - The message has been received and acknowledged.

There are constants for the status values. See:

- .NET API: "StatusCodes enumeration" on page 305
- C++ API: "StatusCodes class" on page 464
- Java API: "StatusCodes interface" on page 581

- **ias_StatusTime** The time at which the message became its current status. It is in units that are natural for the platform. It is a local time. In the C++ API, for Windows and PocketPC platforms, the timestamp is the SYSTEMTIME, converted to a FILETIME, which is copied to a qa_long value. This property is not supported in the SQL API.

API	This property returns...
.NET	DateTime
C++	string
Java	java.util.Date object

Message property constants

The QAnywhere APIs for .NET, C++, and Java provide constants for specifying message properties. See:

- .NET API: "MessageProperties class" on page 179
- C++ API: "MessageProperties class" on page 356
- Java API: "MessageProperties interface" on page 469

Custom message properties

QAnywhere allows you to define message properties using the C++, Java, or .NET APIs. Custom message properties allow you to create name-value pairs that you associate with an object. For example:

```
msg.SetStringProperty("Product", "widget");
msg.SetFloatProperty("Price",1.00);
msg.SetIntProperty("Quantity",10);
```

Message property names are case insensitive. You can use a sequence of letters, digits and underscores, but the first character must be a letter. The following names are reserved and may not be used as message property names:

- NULL
- TRUE
- FALSE
- NOT
- AND
- OR
- BETWEEN
- LIKE
- IN
- IS
- ESCAPE
- Any name beginning with **ias_**

Managing message properties

The following QAMessage methods can be used to manage message properties.

Note
You can get and set custom properties, but should only get predefined properties.

.NET methods to manage message properties

- Object GetProperty(String name)
- void SetProperty(String name, Object value)
- boolean GetBooleanProperty(String name)
- void SetBooleanProperty(String name, boolean value)
- byte GetByteProperty(String name)
- void SetByteProperty(String name, byte value)
- short GetShortProperty(String name)
- void SetShortProperty(String name, short value)
- int GetIntProperty(String name)
- void SetIntProperty(String name, int value)
- long GetLongProperty(String name)
- void SetLongProperty(String name, long value)
- float GetFloatProperty(String name)
- void SetFloatProperty(String name, float value)
- double GetDoubleProperty(String name)
- void SetDoubleProperty(String name, double value)
- String GetStringProperty(String name)
- void SetStringProperty(String name, String value)
- IEnumerator GetPropertyNames()
- void ClearProperties()
- PropertyType GetPropertyType(string propName)
- bool PropertyExists(string propName)

See “QAMessage interface” on page 271.

C++ methods to manage message properties

- qa_bool getBooleanProperty(qa_const_string name, qa_bool * value)
- qa_bool setBooleanProperty(qa_const_string name, qa_bool value)
- qa_bool getByteProperty(qa_const_string name, qa_byte * value)
- qa_bool setByteProperty(qa_const_string name, qa_byte value)
- qa_bool getShortProperty(qa_const_string name, qa_short * value)
- qa_bool setShortProperty(qa_const_string name, qa_short value)
- qa_bool getIntProperty(qa_const_string name, qa_int * value)
- qa_bool setIntProperty(qa_const_string name, qa_int value)
- qa_bool getLongProperty(qa_const_string name, qa_long * value)
- qa_bool setLongProperty(qa_const_string name, qa_long value)
- qa_bool getFloatProperty(qa_const_string name, qa_float * value)
- qa_bool setFloatProperty(qa_const_string name, qa_float value)
- qa_bool getDoubleProperty(qa_const_string name, qa_double * value)
- qa_bool setDoubleProperty(qa_const_string name, qa_double value)
- qa_int getStringProperty(qa_const_string name, qa_string value, qa_int len)
- qa_bool setStringProperty(qa_const_string name, qa_const_string value)
- void QAMessage::clearProperties()
- qa_short QAMessage::getPropertyType(qa_const_string name)
- qa_bool QAMessage::propertyExists(qa_const_string name)

See “QAMessage class” on page 429.

Java methods to manage message properties

- void clearProperties()
- boolean getBooleanProperty(String name)
- void setBooleanProperty(String name, boolean value)
- byte getByteProperty(String name)
- void setByteProperty(String name, byte value)
- double getDoubleProperty(String name)
- void setDoubleProperty(String name, double value)
- java.util.Date getExpiration() void setFloatProperty(String name, float value)
- float getFloatProperty(String name)
- int getIntProperty(String name)
- void setIntProperty(String name, int value)
- long getLongProperty(String name)
- void setLongProperty(String name, long value)
- Object getProperty(String name)
- void setProperty(String name, Object value)
- java.util.Enumeration getPropertyNames()
- short getPropertyType(String name)
- short getShortProperty(String name)
- void setShortProperty(String name, short value)
- String getStringProperty(String name)
- void setStringProperty(String name, String value)
- boolean propertyExists(String name)

See “QAMessage interface” on page 550.

SQL stored procedures to manage message properties

- ml_qa_getbooleanproperty
- ml_qa_getbyteproperty
- ml_qa_getdoubleproperty
- ml_qa_getfloatproperty
- ml_qa_getintproperty
- ml_qa_getlongproperty
- ml_qa_getpropertynames
- ml_qa_getshortproperty
- ml_qa_getstringproperty
- ml_qa_setbooleanproperty
- ml_qa_setbyteproperty
- ml_qa_setdoubleproperty
- ml_qa_setfloatproperty
- ml_qa_setfloatproperty
- ml_qa_setintproperty
- ml_qa_setlongproperty
- ml_qa_setshortproperty
- ml_qa_setstringproperty

See “Message properties” on page 629.

Example

```
// C++ example.
QAManagerFactory factory;
QAManager * mgr = factory->createQAManager( NULL );
mgr->open(AcknowledgementMode::EXPLICIT_ACKNOWLEDGEMENT);
QAMessage * msg = mgr->createTextMessage();
msg->setStringProperty( "tm_Subject", "Some message subject." );
mgr->putMessage( "myqueue", mgr );

// C# example.
QAManager mgr = QAManagerFactory.Instance.CreateQAManager(null);
mgr.Open(AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT);
QAMessage msg = mgr.CreateTextMessage();
msg.SetStringProperty( "tm_Subject", "Some message subject." );
mgr.PutMessage( "myqueue", msg );

// Java example
QAManager mgr = QAManagerFactory.getInstance().createQAManager(null);
mgr.open(AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT);
QAMessage msg = mgr.createTextMessage();
msg.setStringProperty("tm_Subject", "Some message subject.");
mgr.putMessage("myqueue", mgr);

-- SQL example
begin
    DECLARE @msgid VARCHAR(128);
    SET @msgid = ml_qa_createmessage();
    CALL ml_qa_setfloatproperty( @msgid, 'myfloatproperty1', -1.3e-5 );
    CALL ml_qa_setfloatproperty( @msgid, 'myfloatproperty2', 1.3e5 );
    CALL ml_qa_putmessage( @msgid, 'clientid\queuename' );
    COMMIT;
end
```

Server management request reference

Server management request parent tags

Condition tag

Use the following condition subtags to filter the messages to include in the MessageDetailsRequest. You can specify as many of these tags as you want in the <condition> tag. If you use more than one of the same tag, then the values given are logically ORed together, whereas if you use two different tags, the values are logically ANDed together.

<condition> subtags	Description
<address>	Selects messages that are addressed to the specified address.
<archived>	Returns the details of messages in the archive message store.
<customRule>	Selects messages based on rules.

<condition> subtags	**Description**
<kind>	Filters either binary or text messages. For example, `<kind>`*text*`</kind>` filters text messages, and `<kind>`*binary*`</kind>` filters binary messages.
<messageId>	Selects the message with a particular message ID.
<originator>	Selects messages that originated from the specified client.
<priority>	Selects messages that currently have the priority specified.
<property>	Selects messages that have the specified message property. To check a property name and value, use the syntax `<property>`*property-name=property-value*`</property>`. To check the existence of a property, use the format `<property>`*property-name*`</property>`.
<status>	Selects messages that currently have the status specified.

CustomRule tag

To construct more complex condition statements, use the <customRule> tag as a subtag to the <condition> tag (and other tags). This tag takes as its data a server rule similar to those used for server transmission rules. You can construct these queries in the same manner as the condition part of a transmission rule. See "Condition syntax" on page 734.

Example

The following condition selects messages following the search criteria: priority is set to 4; the originator name is like'%sender%'; and the status is greater than or equal to 20.

```
<condition>
 <priority>4</priority>
 <customRule>ias_Originator LIKE '%sender%' AND ias_Status &gt;= 20</
customRule>
</condition>
```

Schedule tag

You can optionally set up server management requests to run on a schedule. Use the following <schedule> subtags to define the schedule on which the request runs.

<schedule> sub-tags	**Description**
<starttime>	Defines the time of day at which the server begins generating reports. For example: `<starttime>09:00:00</starttime>`

<between>	Contains two subtags, starttime and endtime, which define an interval during which the server generates reports. May not be used in the same schedule as start-time. For example:
	
	`<between>`
	`  <starttime>Mon Jan 16 09:00:00 EST 2006</starttime>`
	`  <endtime>Mon Jan 17 09:00:00 EST 2006</endtime>`
	`</between>`

<everyhour>	Defines the interval between subsequent reports in hours. May not be used in the same schedule as everyminute or everysecond. For example, the following re-quest generates a report every two hours starting at 9 AM:
	
	`<schedule>`
	`  <starttime>09:00:00</starttime>`
	`  <everyhour>2</everyhour>`
	`</schedule>`

<everyminute>	Defines the interval between subsequent reports in minutes. May not be used in the same schedule as everyhour or everysecond.
	
	`<schedule>`
	`  <everyminute>10</everyminute>`
	`</schedule>`

<everysecond>	Defines the interval between subsequent reports in seconds. May not be used in the same schedule as everyhour or everyminute.
	
	`<schedule>`
	`  <everysecond>45</everysecond>`
	`</schedule>`

<ondayofweek>	Each tag contains one day of the week in which the schedule is active. For exam-ple, the following schedule runs on Mondays and Tuesdays:
	
	`<schedule>`
	`  <ondayofweek>Monday</ondayofweek>`
	`  <ondayofweek>Tuesday</ondayofweek>`
	`</schedule>`

<ondayofmonth>	Each tag contains one day of the month on which the schedule is active. For exam-ple, the following schedule runs on the 15th of the month:
	
	`<schedule>`
	`  <ondayofmonth>15</ondayofmonth>`
	`</schedule>`

<schedule> sub-tags	**Description**
<startdate>	The date on which the schedule becomes active. For example: `<startdate>Mon Jan 16 2006</startdate>`

To modify a schedule, register a new server management request with the same requestId. To delete a schedule, register a server management request with the same requestId, but include the schedule tag `<schedule>`none`</schedule>`.

Notes

- Each tag, except for the <ondayofweek> and <ondayofmonth> tags, can only be used once in a schedule.
- The <between> tag and the individual <starttime> tag may not both be used in the same schedule.
- Only one of <everysecond>, <everyminute>, and <everyhour> may be used in the same schedule.

Example

The following example creates a persistent schedule that reports on all the messages on the server including the ID and status of each message. It also overwrites any previous persistent requests assigned to the request ID dailyMessageStatus.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
  <MessageDetailsRequest>
   <request>
     <replyAddr>myclient\messageStatusQueue</replyAddr>
     <requestId>dailyMessageStatus</requestId>
     <schedule>
       <everyhour>24</everyhour>
     </schedule>
     <persistent/>
     <messageId/>
     <status/>
   </request>
  </MessageDetailsRequest>
</actions>
```

The following is an example of what the report might look like. It is sent to the address myclient \messageStatusQueue. It indicates that there are two messages on the server, one with status 60 (received) and one with status 1 (pending).

```
<?xml version="1.0" encoding="UTF-8"?>
<MessageDetailsReport>
   <requestId>dailyMessageStatus</requestId>
   <UTCDatetime>Mon Jan 16 15:03:04 EST 2007</UTCDatetime>
   <statusDescription>Scheduled report</statusDescription>
   <messageCount>2</messageCount>
   <message>
     <messageId>ID:26080b8927f83f9722357eab0a0628eb</messageId>
     <status>60</status>
   </message>
   <message>
     <messageId>ID:fe857fa8-a7d7-4266-985b-a1818a85d1a2</messageId>
```

```
        <status>1</status>
      </message>
   </MessageDetailsReport>
```

MessageDetailsReport tag

Each Message Details Report is an XML message containing the <MessageDetailsReport> tag, and is composed of a report header followed by optional <message> tags. The header of each report consists of the following tags:

<MessageDetailsReport> subtags	**Description**
<message>	The body of the report consists of a list of <message> tags whose subtags display the specific details of each message that satisfied the selection criteria. If no messages were selected, or no detail elements were specified in the original request, then no <message> tags are included in the report. Otherwise, each message has its own <message> tag.
<messageCount>	The number of messages that satisfy the selection criteria of the request.
<requestId>	The ID of the request that generated the report.
<statusDescription>	A brief description of the reason why this report was generated.
<UTCDateline>	The time and date that this report was generated.

Message tag

<message> subtags	**Description**
<address>	The address of the message. For example, myclient\myqueue.
<contentSize>	The size of the message content. If the message is a text message, this is the number of characters. If the message is binary, this is the number of bytes.
<expires>	The date and time when the message expires if it is not delivered.
<kind>	Indicates whether the message is binary (1) or text (2).
<messageId>	The message ID of the new message. See "Message headers" on page 656.
<originator>	The message store ID of the originator of the message.
<priority>	The priority of message: an integer between 0 and 9, where 0 indicates lowest priority and 9 indicates highest priority.

<message> subtags	**Description**
<property>	Properties of the message. See "Message properties" on page 659.
<status>	The current status of the message. The status codes are defined in "Predefined message properties" on page 659.
<statusTime>	The time at which the message became its current status. This is the local time.
<transmissionStatus>	The synchronization status of the message. This value can be one of: ● 0 - The message has not been transmitted to its intended recipient message store. ● 1 - The message has been transmitted to its intended recipient message store. ● 2 - The recipient and originating message stores are the same so no transmission is necessary. ● 3 - The message has been transmitted to its intended recipient, but that transmission has yet to be confirmed. There is a possibility that the message transmission was interrupted, and that QAnywhere may transmit the message again.

Examples

The following is an example of a message details report:

```
<?xml version="1.0" encoding="UTF-8"?>
<MessageDetailsReport>
 <requestId>testReport</requestId>
 <UTCDatetime>Mon Jan 16 15:03:04 EST 2006</UTCDatetime>
 <statusDescription>Scheduled report</statusDescription>
 <messageCount>1</messageCount>
 <message>
  <messageId>ID:26080b8927f83f9722357eab0a0628eb</messageId>
  <status>60</status>
  <property>
   <name>myPropName</name>
   <value>myPropVal</value>
  </property>
 </message>
</MessageDetailsReport>
```

The following condition selects messages following the search criteria: (msgId=ID:144... OR msgId=ID225...) AND (status=pending) AND (kind=textmessage) AND (contains the property 'myProp' with value 'myVal')

```
<condition>
 <messageId>ID:144d7e44dc2d7e1d</messageId>
 <messageId>ID:22578sd5dsd99s8e</messageId>
 <status>1</status>
 <kind>text</kind>
 <property>myProp=myVal</property>
</condition>
```

A one-time request is a request that has omitted the <schedule> tag. These requests are used to generate a single report and are deleted when the report has been sent. This request generates a single report that displays the message id, status, and target address of all messages with priority 9 currently on the server.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
 <MessageDetailsRequest>
  <request>
   <requestId>testRequest</client>
   <condition>
    <priority>9</priority>
   </condition>
   <messageId/>
   <status/>
   <address/>
  </request>
 </MessageDetailsRequest>
</actions>
```

The following sample message details request generates a report that includes the message ID and message status.

```
<?xml version="1.0" encoding="UTF-8"?>
<actions>
  <MessageDetailsRequest>
    <!-- ... -->
    <messageId />
    <status />
  </MessageDetailsRequest>
</actions>
```

Server management request DTD

The following is the complete definition of the server management request XML document type. This DTD is provided as a summary of the server management tags that are described in this section.

```
<!DOCTYPE actions [
<!ELEMENT actions (ActionsResponseId?,(CloseConnector|OpenConnector|
RestartRules|SetProperty
    |ClientStatusRequest|MessageDetailsRequest|CancelMessageRequest|
PauseConnector|ResumeConnector
    |CancelMessages|GetClientList)+)>
<!ELEMENT ActionsResponseId (#PCDATA)>
<!ELEMENT GetClientList EMPTY>
<!ELEMENT CloseConnector (client+)>
<!ELEMENT PauseConnector (client+)>
<!ELEMENT ResumeConnector (client+)>
<!ELEMENT OpenConnector (client+)>
<!ELEMENT RestartRules (client+)>
<!ELEMENT CancelMessages (client+)>
<!ELEMENT SetProperty (prop+)>
<!ELEMENT prop (client,name,value?)>
<!ELEMENT name (#PCDATA)>
<!ELEMENT value (#PCDATA)>
<!ELEMENT GetProperties (client+)>
<!ELEMENT ClientStatusRequest (requestId?,replyAddr?,client+,(schedule
+,persistent?)?,onEvent*)>
<!ELEMENT onEvent (#PCDATA)>
<!ELEMENT requestId (#PCDATA)>
<!ELEMENT client (#PCDATA)>
<!ELEMENT replyAddr (#PCDATA)>
<!ELEMENT persistent EMPTY>
<!ELEMENT MessageDetailsRequest (requestId?,replyAddr?,(schedule
+,persistent?)?,condition?,

getAddress?,getArchived?,getContentSize?,getExpires?,getKind?,getMessageId?,g
etOriginator?,

getPriority?,getProperties?,getStatus?,getStatusTime?,getTransmissionStatus?)
>
<!ELEMENT getAddress EMPTY>
<!ELEMENT getArchived EMPTY>
<!ELEMENT getContentSize EMPTY>
<!ELEMENT getExpires EMPTY>
<!ELEMENT getKind EMPTY>
<!ELEMENT getMessageId EMPTY>
<!ELEMENT getOriginator EMPTY>
<!ELEMENT getPriority EMPTY>
<!ELEMENT getProperties EMPTY>
<!ELEMENT getStatus EMPTY>
<!ELEMENT getStatusTime EMPTY>
<!ELEMENT getTransmissionStatus EMPTY>
<!ELEMENT CancelMessageRequest (requestId?,replyAddr?,report?,(schedule
+,persistent?)?,condition?,

getAddress?,getArchived?,getContentSize?,getExpires?,getKind?,getMessageId?,g
etOriginator?,

getPriority?,getProperties?,getStatus?,getStatusTime?,getTransmissionStatus?)
>
<!ELEMENT report EMPTY>
<!ELEMENT schedule (((startTime|
between)?,everyHour?,everyMinute?,everySecond?,onDayOfWeek*,
    onDayOfMonth*)?)>
<!ELEMENT between (startTime,endTime)>
<!ELEMENT startTime (#PCDATA)>
<!ELEMENT endTime (#PCDATA)>
<!ELEMENT everyHour (#PCDATA)>
<!ELEMENT everyMinute (#PCDATA)>
<!ELEMENT everySecond (#PCDATA)>
<!ELEMENT onDayOfWeek (#PCDATA)>
<!ELEMENT onDayOfMonth (#PCDATA)>
<!ELEMENT condition ((messageId|status|priority|address|originator|kind|
archived|
    customRule|property)+)>
<!ELEMENT archived EMPTY>
<!ELEMENT messageId (#PCDATA)>
<!ELEMENT status (#PCDATA)>
<!ELEMENT priority (#PCDATA)>
<!ELEMENT address (#PCDATA)>
<!ELEMENT originator (#PCDATA)>
<!ELEMENT kind (#PCDATA)>
<!ELEMENT customRule (#PCDATA)>
<!ELEMENT property (#PCDATA)>
]>
```

QAnywhere Agent utilities reference

qaagent utility

Sends and receives messages for all QAnywhere applications on a single client device. This utility should only be used when the client message store is a SQL Anywhere database.

External utilities, such as dbmlsync, that are used to synchronize message stores are not supported on QAnywhere.

Syntax

qaagent [*option* ...]

Option	Description
@data	Reads options from the specified environment variable or configuration file. See "@data qaagent option" on page 675.
-c *connection-string*	Specifies a connection string to the client message store. See "-c qaagent option" on page 676.
-cd *seconds*	Specifies the delay time between retry attempts to the database. See "-cd qaagent option" on page 677.
-cr *number-of-retries*	Specifies the number of retries to connect to the database after a connection failure. See "-cr qaagent option" on page 677.
-fd *seconds*	Specifies the delay time between retry attempts to the primary MobiLink server. See "-fd qaagent option" on page 678.
-fr *number-of-retries*	Specifies the number of retries to connect to the primary MobiLink server after a connection failure. See "-fr qaagent option" on page 678.
-id *id*	Specifies the ID of the client message store that the QAnywhere Agent is to connect to. See "-id qaagent option" on page 679.
-idl *download-size*	Specifies the maximum size of a download to use during a message transmission. See "-idl qaagent option" on page 680.
-iu *upload-size*	Specifies the maximum size of an upload to use during a message transmission. See "-iu qaagent option" on page 681.
-lp *number*	Specifies the port on which the Listener listens for notifications from the MobiLink server. The default is 5001. See "-lp qaagent option" on page 681.

Option	Description
-mn *password*	Specifies a new password for the MobiLink user. See "-mn qaagent option" on page 682.
-mp *password*	Specifies the password for the MobiLink user. See "-mp qaagent option" on page 682.
-mu *username*	Specifies the MobiLink user. See "-mu qaagent option" on page 683.
-o *logfile*	Specifies a file to which to log output messages. See "-o qaagent option" on page 683.
-on *size*	Specifies a maximum size for the QAnywhere Agent message log file, after which the file is renamed with the extension .old and a new file is started. See "-on qaagent option" on page 684.
-os *size*	Specifies a maximum size for the QAnywhere Agent message log file, after which a new log file with a new name is created and used. See "-os qaagent option" on page 684.
-ot *logfile*	Specifies a file to which to log output messages. See "-ot qaagent option" on page 685.
-pc{+|-}	Enables persistent connections for message transmission. See "-pc qaagent option" on page 686.
-policy *policy-type*	Specifies the transmission policy used by the QAnywhere Agent. See "-policy qaagent option" on page 686.
-push *mode*	Enables or disables push notifications. The default is enabled. See "-push qaagent option" on page 688.
-q	Starts the QAnywhere Agent in quiet mode with the window minimized in the system tray. See "-q qaagent option" on page 690.
-qi	Starts the QAnywhere Agent in quiet mode with the window completely hidden. See "-qi qaagent option" on page 690.
-si	Initializes the database for use as a client message store. See "-si qaagent option" on page 690.
-su	Upgrades a client message store to the current version without running dbunload/reload. See "-su qaagent option" on page 692.
-sur	Upgrades a client message store to the current version and performs dbunload/reload of the message store. See "-sur qaagent option" on page 693

Option	Description
-sv	Uses the SQL Anywhere Network Database Server as the database server. See "-sv qaagent option" on page 693.
-v [*levels*]	Specifies a level of verbosity. See "-v qaagent option" on page 694.
-wc *name*	Specifies the window class name that the QAnywhere Agent or UltraLite Agent is to start. See also "qastop utility" on page 717.
-x { **http**|**tcpip**|**tls**|**https** } [**(***keyword*=*value*;...**)**]	Specifies protocol options for communication with the MobiLink server. See "-x qaagent option" on page 695.
-xd	Specifies that the QAnywhere Agent should use dynamic addressing of the MobiLink server. See "-xd qaagent option" on page 696.

See also

- "Starting the QAnywhere agent" on page 44

@data qaagent option

Reads options from the specified environment variable or configuration file.

Syntax

qaagent @{ *filename* **|** *environment-variable* } ...

Remarks

With this option, you can put command line options in an environment variable or configuration file. If both exist with the name you specify, the environment variable is used.

See "Using configuration files" [*SQL Anywhere Server - Database Administration*].

If you want to protect passwords or other information in the configuration file, you can use the File Hiding utility to obfuscate the contents of the configuration file. See "File Hiding utility (dbfhide)" [*SQL Anywhere Server - Database Administration*].

This option is useful for Windows Mobile because command lines in shortcuts are limited to 256 characters.

Sybase Central equivalent

The QAnywhere plug-in to Sybase Central has a task called **Create An Agent Command File**. When you choose it, you are prompted to enter a file name and then a **Properties** window appears that helps you enter the command information. The file that is produced has a *.qaa* extension. The *.qaa* file extension is a Sybase Central convention; this file is the same as what you would create for the @data option. You can use the command file created by Sybase Central as your @data configuration file.

-c qaagent option

Specifies a string to connect to the client message store.

Syntax

qaagent -c *connection-string* **...**

Defaults

Connection parameter	Default value
uid	ml_qa_user
pwd	qanywhere

Remarks

The connection string must specify connection parameters in the form *keyword=value*, separated by semicolons, with no spaces between parameters.

DSNs are not typically used on client devices. ODBC is not used by qaagent.

The following are some of the connection parameters you may need to use:

- **dbf=*filename*** Connect to a message store with the specified file name. See "DatabaseFile (DBF) connection parameter" [*SQL Anywhere Server - Database Administration*].
- **dbn=*database-name*** Connect to a client message store that is already running by specifying a database name rather than a database file. See "DatabaseName (DBN) connection parameter" [*SQL Anywhere Server - Database Administration*].
- **server=*server-name*** Specify the name of the database server that is already running. The default value is the name of the database. See "ServerName (Server) connection parameter" [*SQL Anywhere Server - Database Administration*].
- **uid=*user*** Specify a database user ID to connect to the client message store. This parameter is required if you change the default UID or PWD connection parameters. See "Userid (UID) connection parameter" [*SQL Anywhere Server - Database Administration*].
- **pwd=*password*** Specify the password for the database user ID. This is required if you change the default UID or PWD connection parameters. See "Password (PWD) connection parameter" [*SQL Anywhere Server - Database Administration*].
- **dbkey=*key*** Specify the encryption key required to access the database. See "DatabaseKey (DBKEY) connection parameter" [*SQL Anywhere Server - Database Administration*].
- **start=*startline*** Specify the database server start line. If you do not specify the startline, the default for Windows Mobile is `start=dbsrv12 -m -gn 5`, and the default for other Windows platforms

is `start=dbsrv12 -m`. The -m option causes the contents of the transaction log to be deleted at checkpoints and is recommended. See:

- "StartLine (START) connection parameter" [*SQL Anywhere Server - Database Administration*]
- "-m dbeng12/dbsrv12 server option" [*SQL Anywhere Server - Database Administration*]
- "-gn dbsrv12 server option" [*SQL Anywhere Server - Database Administration*]

See also

- "Connection parameters" [*SQL Anywhere Server - Database Administration*]
- "SQL Anywhere database connections" [*SQL Anywhere Server - Database Administration*]

Example

```
qaagent -id Device1 -c "DBF=qanyclient.db" -x tcpip(host=hostname) -policy
automatic
```

-cd qaagent option

When specified in conjunction with the -cr option, this option specifies the delay between attempts to connect to the database.

Syntax

qaagent -cd *seconds* ...

Remarks

The default is a 10 second delay between retries.

If all retries fail, the QAnywhere Agent displays an error and waits to be shut down.

If a database connection fails during operation, the QAnywhere Agent goes through termination steps, including finalizing connections and terminating threads and external processes, and then re-starts.

You must use this option with the qaagent -cr option. The -cr option specifies how many times to retry the connection to the database, and the -cd option specifies the delay between retry attempts.

-cr qaagent option

Specifies the number of times that the QAnywhere Agent should retry the connection to the database.

Syntax

qaagent -cr *number-of-retries* ...

Remarks

The default number of retries is 3, with a 10 second delay between retries.

-fd qaagent option

When specified in conjunction with the -fr option, this option specifies the delay between attempts to connect to the MobiLink server.

Syntax

qaagent -fd *seconds* ...

Default

- If you specify -fr and do not specify -fd, the delay is 0 (no delay between retry attempts).
- If you do not specify -fr, the default is no retry attempts.

Remarks

You must use this option with the qaagent -fr option. The -fr option specifies how many times to retry the connection to the primary server, and the -fd option specifies the delay between retry attempts.

This option is typically used when you specify failover MobiLink servers with the -x option. By default, when you set up a failover MobiLink server, the QAnywhere Agent tries an alternate server immediately upon a failure to reach the primary server. You can use the -fr option to cause the QAnywhere Agent to try the primary server again before going to the alternate server, and you can use the -fd option to specify the amount of time between retries of the primary server.

It is recommended that you set this option to 10 seconds or less.

You cannot use this option with the qaagent -xd option.

See also

- "-fr qaagent option" on page 678
- "-x qaagent option" on page 695
- "Setting up a failover mechanism" on page 36

-fr qaagent option

Specifies the number of times that the QAnywhere Agent should retry the connection to the primary MobiLink server.

Syntax

qaagent -fr *number-of-retries* ...

Default

0 - the QAnywhere Agent does not attempt to retry the primary MobiLink server.

Remarks

By default, if the QAnywhere Agent is not able to connect to the MobiLink server, there is no error and messages are not sent. This option specifies that the QAnywhere Agent should retry the connection to the

MobiLink server, and specifies the number of times that it should retry before trying an alternate server or issuing an error if you have not specified an alternate server.

This option is typically used when you specify failover MobiLink servers with the -x option. By default when you set up a failover MobiLink server, the QAnywhere Agent tries an alternate server immediately upon a failure to reach the primary server. This option causes the QAnywhere Agent to try the primary server again before going to the alternate server.

In addition, you can use the -fd option to specify the amount of time between retries of the primary server.

You cannot use this option with the qaagent -xd option.

See also

- "-fd qaagent option" on page 678
- "-x qaagent option" on page 695
- "Setting up a failover mechanism" on page 36

-id qaagent option

Specifies the ID of the client message store that the QAnywhere Agent is to connect to.

Syntax

qaagent -id *id* ...

Default

The default value of the ID is the device name on which the Agent is running. You must use the -id option when the device names are not unique.

Remarks

Each client message store is represented by a unique sequence of characters called the message store ID. If you do not supply an ID when you first connect to the message store, the default is the device name. On subsequent connections, you must always specify the same message store ID with the -id option.

The message store ID corresponds to the MobiLink remote ID. It is required because in all MobiLink applications, each remote database must have a unique ID. See "Creating and registering MobiLink users" [*MobiLink - Client Administration*].

If you are starting a second instance of the qaagent on a device, the -id option must be used to specify a unique message store ID.

You cannot use the following characters in an ID:

- double quotes

- control characters

- double backslashes

The following additional constraints apply:

- The ID has a limit of 120 characters.
- You can use a single backslash only if it is used as an escape character.
- If your client message store database has the quoted_identifier database option set to Off, then your ID can only include alphanumeric characters and underscores, at signs, pounds, and dollar signs.

See also

- "Introduction to MobiLink users" [*MobiLink - Client Administration*]
- "Setting up the client message store" on page 23

-idl qaagent option

Specifies the incremental download size.

Syntax

qaagent -idl *download-size* [**K** | **M**] ...

Default

-1 - no maximum download size.

Remarks

This option specifies the size in bytes of the download part of a message transmission. Use the suffix K or M to specify units of kilobytes or megabytes, respectively.

When the QAnywhere Agent starts, it assigns the value specified by this option to the ias_MaxDownloadSize message store property. This message store property defines an upper bound on the size of a download. When a transmission is triggered, the server tags messages for delivery to the client until the total size of all messages reaches the limit set with this option. The server continues sending batches of messages until all queued messages have been delivered. Transmission rules are re-executed after each batch of messages is transmitted so that if a high priority messages gets queued during a transmission, it jumps to the front of the queue.

Messages queued for delivery that exceed the download threshold are broken into multiple smaller message parts. Each message part can be downloaded separately, resulting in the gradual download of the message over several synchronizations. The complete message arrives at its destination once all of its message parts have arrived.

The incremental download size is an approximation. The actual download size depends on many factors beyond the size of the message.

See also

- ias_MaxDownloadSize in "Predefined client message store properties" on page 718

-iu qaagent option

Specifies the incremental upload size.

Syntax

qaagent -iu *upload-size* [**K** | **M**] **...**

Default

256K

Remarks

This option specifies the size in bytes of the upload part of a message transmission. Use the suffix K or M to specify units of kilobytes or megabytes, respectively.

When the QAnywhere Agent starts, it assigns the value specified by this option to the ias_MaxUploadSize message store property. This message store property defines an upper bound on the size of an upload. When a transmission is triggered, the Agent tags messages for delivery to the server until the total size of all messages reaches the limit set with this option. When the limit is reached, these messages are sent to the server. As long as the messages arrive at the server and an acknowledgement is successfully sent from the server to the client, these messages are considered to be successfully delivered, even if the download phase of the transmission fails. The Agent continues sending batches of messages to the server until all queued messages have been delivered. Transmission rules are re-executed after each batch of messages is transmitted so that if a high priority messages gets queued during a transmission, it jumps to the front of the queue.

Messages that exceed the upload threshold are broken into multiple smaller message parts. Each message part can be uploaded separately, resulting in the gradual upload of the message over several synchronizations. The complete message arrives at its destination once all of its message parts have arrived.

The incremental upload size is an approximation. The actual upload size depends on many factors beyond the size of the message.

See also

- ias_MaxUploadSize in "Predefined client message store properties" on page 718

-lp qaagent option

Specifies the Listener port.

Syntax

qaagent -lp *number* **...**

Default

5001

Remarks

The port number on which the Listener listens for UDP notifications from the MobiLink server. Notifications are used to inform the QAnywhere Agent that a message is waiting. The UDP port is also used by the QAnywhere Agent to send control commands to the Listener.

See also

- "Scenario for messaging with push notifications" on page 6
- "-push qaagent option" on page 688

-mn qaagent option

Specifies a new password for the MobiLink user.

Syntax

qaagent -mp *password* ...

Default

None

Remarks

Use to change the password.

See also

- "MobiLink users" [*MobiLink - Client Administration*]
- "-mp qaagent option" on page 682
- "-mu qaagent option" on page 683

-mp qaagent option

Specifies the MobiLink password for the MobiLink user.

Syntax

qaagent -mp *password* ...

Default

None

Remarks

If the MobiLink server requires user authentication, use -mp to supply the MobiLink password.

See also

- "MobiLink users" [*MobiLink - Client Administration*]
- "-mu qaagent option" on page 683

-mu qaagent option

Specifies the MobiLink user name.

Syntax

qaagent -mu *username* ...

Default

The client message store ID

Remarks

The MobiLink user name is used for authentication with the MobiLink server.

If you specify a user name that does not exist, it is created for you.

All MobiLink user names must be registered in the server message store. See "Registering QAnywhere client user names" on page 30.

See also

- "MobiLink users" [*MobiLink - Client Administration*]
- "-id qaagent option" on page 679
- "-mp qaagent option" on page 682
- "Remote IDs" [*MobiLink - Client Administration*]

-o qaagent option

Sends output to the specified log file.

Syntax

qaagent -o *logfile* ...

Default

None

Remarks

The QAnywhere Agent logs output to the file name that you specify. If the file already exists, new log information is appended to the file. The SQL Anywhere synchronization client (dbmlsync) logs output to a file with the same name, but including the suffix *_sync*. The Listener utility (dblsn) logs output to a file with the same name, but including the suffix *_lsn*.

For example, if you specify the log file *c:\tmp\mylog.out*, then qaagent logs to *c:\tmp\mylog.out*, dbmlsync logs to *c:\tmp\mylog_sync.out*, and dblsn logs to *c:\tmp\mylog_lsn.out*.

See also

- "-ot qaagent option" on page 685
- "-on qaagent option" on page 684
- "-os qaagent option" on page 684
- "-v qaagent option" on page 694

-on qaagent option

Specifies a maximum size for the QAnywhere Agent message log file, after which the file is renamed with the extension *.old* and a new file is started.

Syntax

qaagent -on *size* [**k** | **m**] ...

Default

None

Remarks

The *size* is the maximum file size for the message log, in bytes. Use the suffix k or m to specify units of kilobytes or megabytes, respectively. The minimum size limit is 10k.

When the log file reaches the specified size, the QAnywhere Agent renames the output file with the extension *.old*, and starts a new one with the original name.

Notes
If the *.old* file already exists, it is overwritten. To avoid losing old log files, use the -os option instead.

This option cannot be used with the -os option.

See also

- "-o qaagent option" on page 683
- "-ot qaagent option" on page 685
- "-os qaagent option" on page 684
- "-v qaagent option" on page 694

-os qaagent option

Specifies a maximum size for the QAnywhere Agent message log file, after which a new log file with a new name is created and used.

Syntax

qaagent -os *size* [**k** | **m**] ...

Default

None

Remarks

The *size* is the maximum file size for logging output messages. The default units is bytes. Use the suffix k or m to specify units of kilobytes or megabytes, respectively. The minimum size limit is 10k.

Before the QAnywhere Agent logs output messages to a file, it checks the current file size. If the log message makes the file size exceed the specified size, the QAnywhere Agent renames the message log file to *yymmddxx.mls*. In this instance, *xx* are sequential characters ranging from 00 to 99, and *yymmdd* represents the current year, month, and day.

You can use this option to prune old message log files to free up disk space. The latest output is always appended to the file specified by -o or -ot.

Note
This option cannot be used with the -on option.

See also

- "-o qaagent option" on page 683
- "-ot qaagent option" on page 685
- "-on qaagent option" on page 684
- "-v qaagent option" on page 694

-ot qaagent option

Truncates the log file and appends output messages to it.

Syntax

qaagent -ot *logfile* ...

Default

None

Remarks

The QAnywhere Agent logs output to the file name that you specify. If the file exists, it is first truncated to a size of 0. The SQL Anywhere synchronization client (dbmlsync) logs output to a file with the same name, but including the suffix *_sync*. The Listener utility (dblsn) logs output to a file with the same name, but including the suffix *_lsn*.

For example, if you specify the log file *c:\tmp\mylog.out*, then qaagent logs to *c:\tmp\mylog.out*, dbmlsync logs to *c:\tmp\mylog_sync.out*, and dblsn logs to *c:\tmp\mylog_lsn.out*.

See also

- "-o qaagent option" on page 683
- "-on qaagent option" on page 684
- "-os qaagent option" on page 684
- "-v qaagent option" on page 694

-pc qaagent option

Maintains a persistent connection to the MobiLink server between synchronizations.

Syntax

qaagent -pc { **+** | **-** } ...

Default

-pc-

Remarks

Enabling persistent connections (-pc+) is useful when network coverage is good and there is heavy message traffic over QAnywhere. In this scenario, you can reduce the network overhead of setting up and taking down a TCP/IP connection every time a message transmission occurs.

Disabling persistent connections (-pc-) is useful in the following scenarios when the client device has a public IP address and is reachable by UDP or SMS:

- The client device is using dial-up networking and connection time charges are an issue.
- There is light message traffic over QAnywhere. Persistent TCP/IP connections consume network server resources, and so could have an impact on scalability.
- The client device network coverage is unreliable. You can use the automatic policy to transmit messages when connection is possible. Trying to maintain persistent connections in this environment is not useful and can waste CPU resources.

See also

- "-push qaagent option" on page 688
- "-pc+ dbmlsync option" [*MobiLink - Client Administration*]

-policy qaagent option

Specifies a policy that determines when message transmission occurs.

Syntax

qaagent -policy *policy-type* ...

policy-type: **ondemand** | **scheduled**[*interval-in-seconds*] | **automatic** | *rules-file*

Defaults

- The default policy type is automatic.
- The default interval for scheduled policies is 900 seconds (15 minutes).

Remarks

QAnywhere uses a policy to determine when message transmission occurs. The *policy-type* can be one of the following values:

- **ondemand** Only transmit messages when the QAnywhere client application makes the appropriate method call.

  The QAManager PutMessage() method causes messages to be queued locally. These messages are not transmitted to the server until the QAManager TriggerSendReceive() method is called. Similarly, messages waiting on the server are not sent to the client until TriggerSendReceive() is called by the client.

  When using the on demand policy, the application is responsible for causing a message transmission to occur when it receives a push notification from the server. A push notification causes a system message to be delivered to the QAnywhere client. In your application, you may choose to respond to this system message by calling TriggerSendReceive().

  For an example, see "System queue" on page 59.

- **scheduled** When a schedule is specified, every *n* seconds the Agent performs message transmission if any of the following conditions are met:

  - New messages were placed in the client message store since the previous time interval elapsed.

  - A message status change occurred since the previous time interval elapsed. This typically occurs when a message is acknowledged by the application. For more information about acknowledgement, see:

    - .NET: "AcknowledgementMode enumeration" on page 301
    - C++: "AcknowledgementMode class" on page 354
    - Java: "AcknowledgementMode interface" on page 467

  - A push notification was received since the previous time interval elapsed.

  - A network status change notification was received since the previous time interval elapsed.

  - Push notifications are disabled.

  You can call the trigger send/receive method to override the time interval. It forces message transmission to occur before the time interval elapses. See:

  - .NET: "TriggerSendReceive method" on page 264
  - C++: "triggerSendReceive method" on page 424
  - Java: "triggerSendReceive method" on page 545
  - SQL: "ml_qa_triggersendreceive" on page 656

- **automatic** Transmit messages when one of the events described below occurs.

  The QAnywhere Agent attempts to keep message queues as current as possible. Any of the following events cause messages queued on the client to be delivered to the server and messages queued on the server to be delivered to the client:

  - Invoking PutMessage().
  - Invoking TriggerSendReceive().
  - A push notification.

    For information about notifications, see "Scenario for messaging with push notifications" on page 6.
  - A message status change on the client. For example, a status change occurs when an application retrieves a message from a local queue which causes the message status to change from pending to received.

- ***rules-file*** Specifies a client transmission rules file. The transmission rules file can indicate a more complicated set of rules to determine when messages are transmitted.

  See "Client transmission rules" on page 740.

See also

- "Determining when message transmission should occur on the client" on page 46
- "Scenario for messaging with push notifications" on page 6

-push qaagent option

Specifies whether push notifications are enabled.

Syntax

qaagent -push *mode* ...

mode : **none** | **connected** | **disconnected** | **lwpoll**

Default

connected

Options

Mode	Description
none	Push notifications are disabled for this agent. The Listener (dblsn) is not started.

Mode	Description
connected	Push notifications are enabled for this agent over TCP/IP with persistent connection. The Listener (dblsn) is started by qaagent and attempts to maintain a persistent connection to the MobiLink server. This mode is useful when the client device does not have a public IP address or when the MobiLink server is behind a firewall that does not allow UDP messages out. This is the default.
disconnected	Push notifications are enabled for this agent over UDP without a persistent connection. The Listener (dblsn) is started by qaagent but does not maintain a persistent connection to the MobiLink server. Instead, a UDP listener receives push notifications from MobiLink. This mode is useful in the following scenarios when the client device has a public IP address and is reachable by UDP or SMS: ● The client device is using dial-up networking and connection time charges are an issue. ● There is light message traffic over QAnywhere. Persistent TCP/IP connections consume network server resources, and so could have an impact on scalability. ● The client device network coverage is unreliable. You can use the automatic policy to transmit messages when connection is possible. Trying to maintain persistent connections in this environment is not useful and can waste CPU resources.
lwpoll	Push notifications are enabled for this agent using light weight polling. The poll period for the light weight poll can be adjusted by including the desired interval in seconds in square brackets following **lwpoll**. For example, **`-push lwpoll`**`[`*`5`*`]` sets a QAnywhere agent to use light weight polling with an interval of 5 seconds between polls. If no interval is given, the default period is 60 seconds. Clients using light weight polling in a secure environment do not need to register a MobiLink user for the Listener, as required by other push notification modes.

Remarks

If you do not want to use notifications, set this option to none. You then do not have to deploy the *dblsn.exe* executable with your clients.

For a description of QAnywhere without notifications, see "Simple messaging scenario" on page 5.

If you are using UDP, you cannot use push notifications in disconnected mode with ActiveSync due to the limitations of the UDP implementation of ActiveSync.

See also

- "Using push notifications" on page 32
- "-pc qaagent option" on page 686
- "Starting the QAnywhere agent" on page 44
- "Notifications of push notification" on page 60
- "-lp qaagent option" on page 681

-q qaagent option

Starts the QAnywhere Agent in quiet mode with the window minimized in the system tray.

Syntax

qaagent -q ...

Default

None

Remarks

When you start the QAnywhere Agent in quiet mode with -q, the main window is minimized to the system tray. In addition, the database server for the message store is started with the -qi option.

See also

- “-qi qaagent option” on page 690

-qi qaagent option

Starts the QAnywhere Agent in quiet mode with the window completely hidden.

Syntax

qaagent -qi ...

Default

None

Remarks

When you start the QAnywhere Agent in quiet mode, on Windows desktop the main window is minimized to the system tray, and on Windows Mobile the main window is hidden. In addition, the database server for the message store is started with the -qi option.

Quiet mode is useful for some Windows Mobile applications because it prevents an application from being closed when Windows Mobile reaches its limit of 32 concurrent processes. Quiet mode allows the QAnywhere Agent to run like a service.

When in -qi quiet mode, you can only stop the QAnywhere Agent by typing **qastop**.

See also

- “qastop utility” on page 717
- “-q qaagent option” on page 690

-si qaagent option

Initializes the database for use as a client message store.

Syntax

qaagent -c "*connection-string*" -si ...

Default

None. You only use this option once, to initialize the client message store.

Remarks

Before using this option, you must create a SQL Anywhere database. When you use -si, the QAnywhere Agent initializes the database with database objects such as QAnywhere system tables; it then exits immediately.

When you run -si, you must specify a connection string with the -c option that indicates which database to initialize. The connection string specified in the -c option should also specify a user ID with DBA privileges. If you do not specify a user ID and password, the default user DBA with password SQL is used.

The -si option creates a database user named ml_qa_user and password qanywhere for the client message store. The user called ml_qa_user has permissions suitable for QAnywhere applications only. If you do not change this database user name and password, then you do not need to specify the pwd or uid in the -c option when you start qaagent. If you change either of them, then you must supply the uid and/or pwd in the -c option on the qaagent command line.

Note
You should change the default passwords. To change them, use the GRANT statement. See "Changing a password" [*SQL Anywhere Server - Database Administration*].

The -si option does not provide an ID for the client message store. You can assign an ID using the -id option when you run -si or the next time you run qaagent; or, if you do not do that, qaagent, by default, assigns the device name as the ID.

When a message store is created but is not set up with an ID, QAnywhere applications local to the message store can send and receive messages, but cannot exchange messages with remote QAnywhere applications. Once an ID is assigned, remote messaging may also occur.

The -si and -sil options of qaagent are mutually exclusive. You cannot run qaagent with -si on a database that has been initialized with -sil.

See also

- "Setting up the client message store" on page 23
- "Creating a secure client message store" on page 117

Examples

The following command connects to a database called *qaclient.db* and initializes it as a QAnywhere client message store. The QAnywhere Agent immediately exits when the initialization is complete.

```
qaagent -si -c "DBF=qaclient.db"
```

-sil qaagent option

Initializes a SQL Anywhere database for local application-to-application messaging.

Syntax

qaagent -c "*connection-string*" -sil ...

Default

None. You only use this option once, to initialize the client message store.

Remarks

This option allows you to use a synchronization database for local-only messaging.

> **Note**
> It is not possible to use a synchronization database for QAnywhere remote messaging. For remote QAnywhere messaging applications, the message store database must be dedicated to QAnywhere.

The -si and -sil options of qaagent are mutually exclusive. You cannot run qaagent with -sil on a database that has been initialized with -si.

See also

- "-si qaagent option" on page 690

Example

Following is an example of a command to initialize a database for local-only messaging:

```
qaagent -c "dbf=qanywhere.db" -sil
```

-su qaagent option

Upgrades a client message store to the current version.

Syntax

qaagent -su -c "*connection-string*" ...

Remarks

This option is useful if you want to perform custom actions after the unload/reload and before the qaagent upgrade. Use the -sur option if you are upgrading from a pre-10.0.0 message store and you want the Agent to automatically perform the unload/reload step for you.

If you are upgrading from a pre-10.0.0 message store, you must first manually unload and reload the message store.

This operation exits when the upgrade is complete.

This operation cannot be undone.

See also

- “-sur qaagent option” on page 693

Example

To upgrade from a version 9 database, first, unload and reload the database:

```
dbunload  -q  -c "UID=dba;PWD=sql;DBF=qanywhere.db" -ar
```

Next, run qaagent with the -su option:

```
qaagent -q -su -c "UID=dba;PWD=sql;DBF=qanywhere.db"
```

-sur qaagent option

Upgrades a client message store to the current version.

Syntax

qaagent -sur -c "*connection-string*" ...

Remarks

Specify the database to upgrade in the connection string. The -sur option automatically unloads the message store, reloads it, and upgrades it.

Automatic unload/reload is not supported on Windows Mobile. For Windows Mobile, you must first manually unload and reload the message store.

The unload/reload is necessary to upgrade message stores between major versions of the product. The unload/reload can be done manually along with the -su option. For example, if you need to perform custom actions after the reload and before the upgrade, use the -su option.

This operation exits when the upgrade is complete.

This operation cannot be undone.

See also

- “-su qaagent option” on page 692

Example

The following example unloads and reloads a version 9.0.2 SQL Anywhere database called qanywhere.db, making it useful with QAnywhere version 12.

```
qaagent -q -sur -c "UID=dba;PWD=sql;DBF=qanywhere.db"
```

-sv qaagent option

Informs the agent to use the SQL Anywhere network database server as the database server instead of using the personal database server.

Syntax

qaagent -sv -c "*connection-string*" ...

Remarks

By default, the qaagent connects to the personal database server using the dbeng12 application. When -sv is specified, the qaagent connects to the network database server using the dbsrv12 application.

See also

- "The SQL Anywhere database server" [*SQL Anywhere Server - Database Administration*]

-v qaagent option

Allows you to specify what information is logged to the QAnywhere Agent message log file and displayed in the QAnywhere Agent messages window.

Syntax

qaagent -v *levels* ...

Default

Minimal verbosity

Remarks

The -v option affects the message log files and messages window. You only have a message log file if you specify -o or -ot on the qaagent command line.

A high level of verbosity may affect performance and should normally be used in the development phase only.

If you specify -v alone, a minimal amount of information is logged.

The values of *levels* are as follows. You can use one or more of these options at once; for example, -vlm.

- **+** Turn on all logging options.
- **l** Show all MobiLink Listener logging. This causes the MobiLink Listener (dblsn) to start with verbosity level -v3. See the -v option in the "MobiLink Listener utility for Windows devices (dblsn)" [*MobiLink - Server-Initiated Synchronization*].
- **m** Show all dbmlsync logging. This causes the SQL Anywhere synchronization client (dbmlsync) to start with verbosity level -v+. See the dbmlsync "-v dbmlsync option" [*MobiLink - Client Administration*].
- **n** Show all network status change notifications. the QAnywhere Agent receives these notifications from the Listener utility.

- **p** Show all message push notifications. The QAnywhere Agent receives these notifications from the Listener utility via the MobiLink server, which includes a MobiLink Notifier.
- **q** Show the SQL that is used to represent the transmission rules.
- **s** Show all the message synchronizations that are initialized by QAnywhere Agent.

See also

- "-o qaagent option" on page 683
- "-ot qaagent option" on page 685
- "-on qaagent option" on page 684
- "-os qaagent option" on page 684

-x qaagent option

Specify the network protocol and the protocol options for communication with the MobiLink server.

Syntax

qaagent -x *protocol* [**(** *protocol-options*;... **)** ...]

protocol: **http**, **tcpip**, **https**, **tls**

protocol-options: *keyword***=***value*

Remarks

For a complete list of *protocol-options*, see "MobiLink client network protocol options" [*MobiLink - Client Administration*].

The -x option is required when the MobiLink server is not on the same device as the QAnywhere Agent.

You can specify -x multiple times. This allows you to set up failover to multiple MobiLink servers. When you set up failover, the QAnywhere Agent attempts to connect to the MobiLink servers in the order in which you enter them on the command line.

The QAnywhere Agent also has a Listener that receives notifications from the MobiLink server that messages are available at the server for transmission to the client. This Listener only uses the first MobiLink server that is specified, and does not fail over to others.

See also

- "MobiLink client network protocol options" [*MobiLink - Client Administration*]
- "Encrypting the communication stream" on page 118
- "Transport-layer security" [*SQL Anywhere Server - Database Administration*]
- "Setting up a failover mechanism" on page 36
- "-fd qaagent option" on page 678
- "-fr qaagent option" on page 678

-xd qaagent option

Specify that the QAnywhere Agent should use dynamic addressing of the MobiLink server.

Syntax

qaagent -xd

Remarks

When you specify -xd, the QAnywhere Agent can determine the protocol and address of the MobiLink server based on message store properties. This means that it can dynamically determine the address of a single MobiLink server, where the server address is dependent on the current network that is active for the device where the QAnywhere Agent is running.

The QAnywhere application must initialize message store properties that describe the communication protocol and address of the MobiLink server, and establish a relationship with the currently active network interface. As the mobile device switches between different networks, the QAnywhere Agent detects which network is active and automatically adjusts the communication protocol and address of the MobiLink server—without having to be restarted.

See also

- "Client message store properties" on page 26

Example

The following example sets properties so that the appropriate MobiLink address is used based on the type of network the device is on. For example, if the device is on a LAN the appropriate LAN address is used.

```
QAManager mgr;
...
mgr.SetStringStoreProperty( "LAN.CommunicationAddress",
"host=1.2.3.4;port=10997" );
mgr.SetStringStoreProperty( "LAN.CommunicationType", "tcpip" );
mgr.SetStringStoreProperty( "WAN.CommunicationAddress",
"host=5.6.7.8;port=7777" );
mgr.SetStringStoreProperty( "WAN.CommunicationType", "tcpip" );
mgr.SetStringStoreProperty( "EL3C589 Ethernet Adapter.type", "LAN" );
mgr.SetStringStoreProperty( "Acme Wireless Adapter.type", "WAN" );
```

qauagent utility

Sends and receives messages for all QAnywhere applications on a single client device. This utility should only be used when the client message store is an UltraLite database.

Note
The dbmlsync utility, which is designed to synchronize SQL Anywhere message stores, does not support UltraLite message stores.

Syntax

qauagent [*option* ...]

Option	Description
@data	Reads options from the specified environment variable or configuration file. See "@data qauagent option" on page 698.
-c *connection-string*	Specifies a connection string to the client message store. See "-c qauagent option" on page 699.
-cd *seconds*	Specifies the delay time between retry attempts to the database. See "-cd qauagent option" on page 700 on page 677.
-cr *number-of-retries*	Specifies the number of retries to connect to the database after a connection failure. See "-cr qauagent option" on page 701 on page 677.
-fd *seconds*	Specifies the delay time between retry attempts to the primary server. See "-fd qauagent option" on page 701.
-fr *number-of-retries*	Specifies the number of retries to connect to the primary server after a connection failure. See "-fr qauagent option" on page 701.
-id *id*	Specifies the ID of the client message store that the QAnywhere UltraLite Agent is to connect to. See "-id qauagent option" on page 702.
-idl *download-size*	Specifies the maximum size of a download to use during a message transmission. See "-idl qauagent option" on page 703.
-iu *upload-size*	Specifies the maximum size of an upload to use during a message transmission. See "-iu qauagent option" on page 704.
-lp *number*	Specifies the port on which the Listener listens for notifications from the MobiLink server. The default is 5001. See "-lp qauagent option" on page 705.
-mn *password*	Specifies a new password for the MobiLink user. See "-mn qauagent option" on page 705.
-mp *password*	Specifies the password for the MobiLink user. See "-mp qauagent option" on page 705.
-mu *username*	Specifies the MobiLink user. See "-mp qauagent option" on page 705.
-o *logfile*	Specifies a file to which to log output messages. See "-o qauagent option" on page 706.
-on *size*	Specifies a maximum size for the QAnywhere UltraLite Agent message log file, after which the file is renamed with the extension .old and a new file is started. See "-on qauagent option" on page 707.

Option	Description
-os *size*	Specifies a maximum size for the QAnywhere UltraLite Agent message log file, after which a new log file with a new name is created and used. See "-os qauagent option" on page 708.
-ot *logfile*	Specifies a file to which to log output messages. See "-ot qauagent option" on page 708.
-policy *policy-type*	Specifies the transmission policy used by the QAnywhere UltraLite Agent. See "-policy qauagent option" on page 709.
-push *mode*	Enables or disables push notifications. The default is enabled. See "-push qauagent option" on page 711.
-q	Starts the QAnywhere UltraLite Agent in quiet mode with the window minimized in the system tray. See "-q quagent option" on page 712.
-qi	Starts the QAnywhere UltraLite Agent in quiet mode with the window completely hidden. See "-qi qauagent option" on page 712.
-si	Initializes the database for use as a client message store. See "-si qauagent option" on page 713.
-su	Upgrades a client message store to the current version without running dbunload/reload. See "-su qauagent option" on page 714.
-v [*levels*]	Specifies a level of verbosity. See "-v qauagent option" on page 714.
-wc *name*	Specifies the window class name that the QAnywhere UltraLite Agent is to start. See also "qastop utility" on page 717.
-x { **http**|**tcpip**|**tls**|**https** } [**(***keyword*=*value*;...**)**]	Specifies protocol options for communication with the MobiLink server. See "-x qauagent option" on page 715.
-xd	Specifies that the QAnywhere UltraLite Agent should use dynamic addressing of the MobiLink server. See "-xd qauagent option" on page 716.

See also

- "Starting the QAnywhere agent" on page 44

@data qauagent option

Reads options from the specified environment variable or configuration file.

Syntax

qauagent @{ *filename* | *environment-variable* } ...

Remarks

With this option, you can put command line options in an environment variable or configuration file. If both exist with the name you specify, the environment variable is used.

See "Using configuration files" [*SQL Anywhere Server - Database Administration*].

If you want to protect passwords or other information in the configuration file, you can use the File Hiding utility to obfuscate the contents of the configuration file. See "File Hiding utility (dbfhide)" [*SQL Anywhere Server - Database Administration*].

This option is useful for Windows Mobile because command lines in shortcuts are limited to 256 characters.

Sybase Central equivalent

The QAnywhere 12 plug-in to Sybase Central has a task called **Create An Agent Command File**. When you choose it, you are prompted to enter a file name and then a **Properties** window appears that helps you enter the command information. The file that is produced has a *.qaa* extension. The *.qaa* file extension is a Sybase Central convention; this file is the same as what you would create for the @data option. You can use the command file created by Sybase Central as your @data configuration file.

-c qauagent option

Specifies a string to connect to the client message store.

Syntax

qauagent -c *connection-string* ...

Defaults

Connection parameter	Default value
uid	ml_qa_user
pwd	qanywhere

Remarks

The connection string must specify connection parameters in the form *keyword=value*, separated by semicolons, with no spaces between parameters.

DSNs are not typically used on client devices. ODBC is not used by qauagent.

The following are some of the connection parameters you may need to use:

- **dbf=*filename*** Connect to a message store with the specified file name. See "UltraLite DBF connection parameter" [*UltraLite - Database Management and Reference*].

- **dbn=*database-name*** Connect to a client message store that is already running by specifying a database name rather than a database file. See "UltraLite DBN connection parameter" [*UltraLite - Database Management and Reference*].

- **uid=*user*** Specify a database user ID to connect to the client message store. This parameter is required if you change the default UID or PWD connection parameters. See "UltraLite UID connection parameter" [*UltraLite - Database Management and Reference*].

- **pwd=*password*** Specify the password for the database user ID. This is required if you change the default UID or PWD connection parameters. See "UltraLite PWD connection parameter" [*UltraLite - Database Management and Reference*].

- **dbkey=*key*** Specify the encryption key required to access the database. See "UltraLite DBKEY connection parameter" [*UltraLite - Database Management and Reference*].

See also

- "Connection parameters" [*SQL Anywhere Server - Database Administration*]
- "SQL Anywhere database connections" [*SQL Anywhere Server - Database Administration*]

Example

```
qaagent -id Device1 -c "DBF=qanyclient.db" -x tcpip(host=hostname) -policy
automatic
```

-cd qaagent option

When specified in conjunction with the -cr option, this option specifies the delay between attempts to connect to the database.

Syntax

qaagent -cd *seconds* ...

Remarks

The default is a 10 second delay between retries.

If all retries fail, the QAnywhere Agent displays an error and waits to be shut down.

If a database connection fails during operation, the QAnywhere Agent goes through termination steps, including finalizing connections and terminating threads and external processes, and then re-starts.

You must use this option with the qaagent -cr option. The -cr option specifies how many times to retry the connection to the database, and the -cd option specifies the delay between retry attempts.

-cr qauagent option

Specifies the number of times that the QAnywhere UltraLite Agent should retry the connection to the database.

Syntax

qauagent -cr *number-of-retries* ...

Remarks

The default number of retries is 3, with a 10 second delay between retries.

-fd qauagent option

When specified in conjunction with the -fr option, this option specifies the delay between attempts to connect to the MobiLink server.

Syntax

qauagent -fd *seconds* ...

Default

- If you specify -fr and do not specify -fd, the delay is 0 (no delay between retry attempts).
- If you do not specify -fr, the default is no retry attempts.

Remarks

You must use this option with the qauagent -fr option. The -fr option specifies how many times to retry the connection to the primary server, and the -fd option specifies the delay between retry attempts.

This option is typically used when you specify failover MobiLink servers with the -x option. By default, when you set up a failover MobiLink server, the QAnywhere UltraLite Agent tries an alternate server immediately upon a failure to reach the primary server. You can use the -fr option to cause the QAnywhere UltraLite Agent to try the primary server again before going to the alternate server, and you can use the -fd option to specify the amount of time between retries of the primary server.

It is recommended that you set this option to 10 seconds or less.

You cannot use this option with the qauagent -xd option.

See also

- “-fr qauagent option” on page 701
- “-x qauagent option” on page 715
- “Setting up a failover mechanism” on page 36

-fr qauagent option

Specifies the number of times that the QAnywhere UltraLite Agent should retry the connection to the primary MobiLink server.

Syntax

qaagent -fr *number-of-retries* ...

Default

0 - the QAnywhere UltraLite Agent does not attempt to retry the primary MobiLink server.

Remarks

By default, if the QAnywhere UltraLite Agent is not able to connect to the MobiLink server, there is no error and messages are not sent. This option specifies that the QAnywhere UltraLite Agent should retry the connection to the MobiLink server, and specifies the number of times that it should retry before trying an alternate server or issuing an error if you have not specified an alternate server.

This option is typically used when you specify failover MobiLink servers with the -x option. By default when you set up a failover MobiLink server, the QAnywhere UltraLite Agent tries an alternate server immediately upon a failure to reach the primary server. This option causes the QAnywhere UltraLite Agent to try the primary server again before going to the alternate server.

In addition, you can use the -fd option to specify the amount of time between retries of the primary server.

You cannot use this option with the qauagent -xd option.

See also

- “-fd qauagent option” on page 701
- “-x qauagent option” on page 715
- “Setting up a failover mechanism” on page 36

-id qauagent option

Specifies the ID of the client message store that the QAnywhere UltraLite Agent is to connect to.

Syntax

qauagent -id *id* ...

Default

The default value of the ID is the device name on which the Agent is running. You must use the -id option when the device names are not unique.

Remarks

Each client message store is represented by a unique sequence of characters called the message store ID. If you do not supply an ID when you first connect to the message store, the default is the device name. On subsequent connections, you must always specify the same message store ID with the -id option.

The message store ID corresponds to the MobiLink remote ID. It is required because in all MobiLink applications, each remote database must have a unique ID. See "Creating and registering MobiLink users" [*MobiLink - Client Administration*].

If you are starting a second instance of the qauagent on a device, the -id option must be used to specify a unique message store ID.

You cannot use the following characters in an ID:

- double quotes
- control characters
- double backslashes

The following additional constraints apply:

- The ID has a limit of 120 characters.
- You can use a single backslash only if it is used as an escape character.
- If your client message store database has the quoted_identifier database option set to Off, then your ID can only include alphanumeric characters and underscores, at signs, pounds, and dollar signs.

See also

- "Introduction to MobiLink users" [*MobiLink - Client Administration*]
- "Setting up the client message store" on page 23

-idl qauagent option

Specifies the incremental download size.

Syntax

qauagent -idl *download-size* [**K** | **M**] **...**

Default

-1 - no maximum download size.

Remarks

This option specifies the size in bytes of the download part of a message transmission. Use the suffix K or M to specify units of kilobytes or megabytes, respectively.

When the QAnywhere UltraLite Agent starts, it assigns the value specified by this option to the ias_MaxDownloadSize message store property. This message store property defines an upper bound on the size of a download. When a transmission is triggered, the server tags messages for delivery to the client until the total size of all messages reaches the limit set with this option. The server continues sending batches of messages until all queued messages have been delivered. Transmission rules are re-executed after each batch of messages is transmitted so that if a high priority messages gets queued during a transmission, it jumps to the front of the queue.

Messages queued for delivery that exceed the download threshold are broken into multiple smaller message parts. Each message part can be downloaded separately, resulting in the gradual download of the message over several synchronizations. The complete message arrives at its destination once all of its message parts have arrived.

The incremental download size is an approximation. The actual download size depends on many factors beyond the size of the message.

See also

- ias_MaxDownloadSize in "Predefined client message store properties" on page 718

-iu qaagent option

Specifies the incremental upload size.

Syntax

qaagent -iu *upload-size* [**K** | **M**] ...

Default

256K

Remarks

This option specifies the size in bytes of the upload part of a message transmission. Use the suffix K or M to specify units of kilobytes or megabytes, respectively.

When the QAnywhere UltraLite Agent starts, it assigns the value specified by this option to the ias_MaxUploadSize message store property. This message store property defines an upper bound on the size of an upload. When a transmission is triggered, the Agent tags messages for delivery to the server until the total size of all messages reaches the limit set with this option. When the limit is reached, these messages are sent to the server. As long as the messages arrive at the server and an acknowledgement is successfully sent from the server to the client, these messages are considered to be successfully delivered, even if the download phase of the transmission fails. The Agent continues sending batches of messages to the server until all queued messages have been delivered. Transmission rules are re-executed after each batch of messages is transmitted so that if a high priority messages gets queued during a transmission, it jumps to the front of the queue.

Messages that exceed the upload threshold are broken into multiple smaller message parts. Each message part can be uploaded separately, resulting in the gradual upload of the message over several synchronizations. The complete message arrives at its destination once all of its message parts have arrived.

The incremental upload size is an approximation. The actual upload size depends on many factors beyond the size of the message.

See also

- ias_MaxUploadSize in "Predefined client message store properties" on page 718

-lp qauagent option

Specifies the Listener port.

Syntax

qauagent -lp *number* ...

Default

5001

Remarks

The port number on which the Listener listens for UDP notifications from the MobiLink server. Notifications are used to inform the QAnywhere UltraLite Agent that a message is waiting. The UDP port is also used by the QAnywhere UltraLite Agent to send control commands to the Listener.

See also

- "Scenario for messaging with push notifications" on page 6
- "-push qauagent option" on page 711

-mn qauagent option

Specifies a new password for the MobiLink user.

Syntax

qauagent -mp *password* ...

Default

None

Remarks

Use to change the password.

See also

- "MobiLink users" [*MobiLink - Client Administration*]
- "-mp qauagent option" on page 705
- "-mu qauagent option" on page 706

-mp qauagent option

Specifies the MobiLink password for the MobiLink user.

Syntax

qauagent -mp *password* ...

Default

None

Remarks

If the MobiLink server requires user authentication, use -mp to supply the MobiLink password.

See also

- "MobiLink users" [*MobiLink - Client Administration*]
- "-mu qauagent option" on page 706

-mu qauagent option

Specifies the MobiLink user name.

Syntax

qauagent -mu *username* ...

Default

The client message store ID

Remarks

The MobiLink user name is used for authentication with the MobiLink server.

If you specify a user name that does not exist, it is created for you.

All MobiLink user names must be registered in the server message store. See "Registering QAnywhere client user names" on page 30.

See also

- "MobiLink users" [*MobiLink - Client Administration*]
- "-id qauagent option" on page 702
- "-mp qauagent option" on page 705
- "Remote IDs" [*MobiLink - Client Administration*]

-o qauagent option

Sends output to the specified log file.

Syntax

qaagent -o *logfile* **...**

Default

None

Remarks

The QAnywhere UltraLite Agent logs output to the file name that you specify. If the file already exists, new log information is appended to the file. The Listener utility (dblsn) logs output to a file with the same name, but including the suffix *_lsn*.

For example, if you specify the log file *c:\tmp\mylog.out*, then qaagent logs to *c:\tmp\mylog.out*, and dblsn logs to *c:\tmp\mylog_lsn.out*.

See also

- "-ot qaagent option" on page 708
- "-on qaagent option" on page 707
- "-os qaagent option" on page 708
- "-v qaagent option" on page 714

-on qaagent option

Specifies a maximum size for the QAnywhere UltraLite Agent message log file, after which the file is renamed with the extension *.old* and a new file is started.

Syntax

qaagent -on *size* [**k** | **m**] **...**

Default

None

Remarks

The *size* is the maximum file size for the message log, in bytes. Use the suffix k or m to specify units of kilobytes or megabytes, respectively. The minimum size limit is 10k.

When the log file reaches the specified size, the QAnywhere UltraLite Agent renames the output file with the extension *.old*, and starts a new one with the original name.

Notes
If the *.old* file already exists, it is overwritten. To avoid losing old log files, use the -os option instead.

This option cannot be used with the -os option.

See also

- "-o qauagent option" on page 706
- "-ot qauagent option" on page 708
- "-os qauagent option" on page 708
- "-v qauagent option" on page 714

-os qauagent option

Specifies a maximum size for the QAnywhere UltraLite Agent message log file, after which a new log file with a new name is created and used.

Syntax

qauagent -os *size* [**k** | **m**] ...

Default

None

Remarks

The *size* is the maximum file size for logging output messages. The default units is bytes. Use the suffix k or m to specify units of kilobytes or megabytes, respectively. The minimum size limit is 10k.

Before the QAnywhere UltraLite Agent logs output messages to a file, it checks the current file size. If the log message makes the file size exceed the specified size, the QAnywhere UltraLite Agent renames the message log file to *yymmddxx.mls*. In this instance, *xx* are sequential characters ranging from 00 to 99, and *yymmdd* represents the current year, month, and day.

You can use this option to prune old message log files to free up disk space. The latest output is always appended to the file specified by -o or -ot.

Note
This option cannot be used with the -on option.

See also

- "-o qauagent option" on page 706
- "-ot qauagent option" on page 708
- "-on qauagent option" on page 707
- "-v qauagent option" on page 714

-ot qauagent option

Truncates the log file and appends output messages to it.

Syntax

qauagent -ot *logfile* ...

Default

None

Remarks

The QAnywhere UltraLite Agent logs output to the file name that you specify. If the file exists, it is first truncated to a size of 0. The Listener utility (dblsn) logs output to a file with the same name, but including the suffix *_lsn*.

For example, if you specify the log file *c:\tmp\mylog.out*, then qauagent logs to *c:\tmp\mylog.out*, and dblsn logs to *c:\tmp\mylog_lsn.out*.

See also

- "-o qauagent option" on page 706
- "-on qauagent option" on page 707
- "-os qauagent option" on page 708
- "-v qauagent option" on page 714

-policy qauagent option

Specifies a policy that determines when message transmission occurs.

Syntax

qauagent -policy *policy-type* ...

policy-type: **ondemand** | **scheduled**[*interval-in-seconds*] | **automatic** | *rules-file*

Defaults

- The default policy type is automatic.
- The default interval for scheduled policies is 900 seconds (15 minutes).

Remarks

QAnywhere uses a policy to determine when message transmission occurs. The *policy-type* can be one of the following values:

- **ondemand** Only transmit messages when the QAnywhere client application makes the appropriate method call.

  The QAManager PutMessage() method causes messages to be queued locally. These messages are not transmitted to the server until the QAManager TriggerSendReceive() method is called. Similarly, messages waiting on the server are not sent to the client until TriggerSendReceive() is called by the client.

  When using the on demand policy, the application is responsible for causing a message transmission to occur when it receives a push notification from the server. A push notification causes a system message to be delivered to the QAnywhere client. In your application, you may choose to respond to this system message by calling TriggerSendReceive().

For an example, see "System queue" on page 59.

- **scheduled** Transmit messages at a specified interval. The default value is 900 seconds (15 minutes).

  When a schedule is specified, every *n* seconds the Agent performs message transmission if any of the following conditions are met:

  - New messages were placed in the client message store since the previous time interval elapsed.
  - A message status change occurred since the previous time interval elapsed. This typically occurs when a message is acknowledged by the application.
  - A push notification was received since the previous time interval elapsed.
  - A network status change notification was received since the previous time interval elapsed.
  - Push notifications are disabled.

  You can call the trigger send/receive method to override the time interval. It forces message transmission to occur before the time interval elapses.

- **automatic** Transmit messages when one of the events described below occurs.

  The QAnywhere UltraLite Agent attempts to keep message queues as current as possible. Any of the following events cause messages queued on the client to be delivered to the server and messages queued on the server to be delivered to the client:

  - Invoking PutMessage().
  - Invoking TriggerSendReceive().
  - A push notification.

    For information about notifications, see "Scenario for messaging with push notifications" on page 6.

  - A message status change on the client. For example, a status change occurs when an application retrieves a message from a local queue which causes the message status to change from pending to received.

- ***rules-file*** Specifies a client transmission rules file. The transmission rules file can indicate a more complicated set of rules to determine when messages are transmitted.

  See "Client transmission rules" on page 740.

See also

- "Determining when message transmission should occur on the client" on page 46
- "Scenario for messaging with push notifications" on page 6

-push qauagent option

Specifies whether push notifications are enabled.

Syntax

qauagent -push *mode* ...

mode : **none** | **connected** | **disconnected** | **lwpoll**

Default

connected

Options

Mode	Description
none	Push notifications are disabled for this agent. The Listener (dblsn) is not started.
connected	Push notifications are enabled for this agent over TCP/IP with persistent connection. The Listener (dblsn) is started by qauagent and attempts to maintain a persistent connection to the MobiLink server. This mode is useful when the client device does not have a public IP address or when the MobiLink server is behind a firewall that does not allow UDP messages out. This is the default.
disconnected	Push notifications are enabled for this agent over UDP without a persistent connection. The Listener (dblsn) is started by qauagent but does not maintain a persistent connection to the MobiLink server. Instead, a UDP listener receives push notifications from MobiLink. This mode is useful in the following scenarios when the client device has a public IP address and is reachable by UDP or SMS: ● The client device is using dial-up networking and connection time charges are an issue. ● There is light message traffic over QAnywhere. Persistent TCP/IP connections consume network server resources, and so could have an impact on scalability. ● The client device network coverage is unreliable. You can use the automatic policy to transmit messages when connection is possible. Trying to maintain persistent connections in this environment is not useful and can waste CPU resources.
lwpoll	Push notifications are enabled for this agent using light weight polling. The poll period for the light weight poll can be adjusted by including the desired interval in seconds in square brackets following **lwpoll**. For example, **`-push lwpoll[`***`5`***`]`** sets a QAnywhere agent to use light weight polling with an interval of 5 seconds between polls. If no interval is given, the default period is 60 seconds. Clients using light weight polling in a secure environment do not need to register a MobiLink user for the Listener, as required by other push notification modes.

Remarks

If you do not want to use notifications, set this option to none. You then do not have to deploy the *dblsn.exe* executable with your clients.

For a description of QAnywhere without notifications, see "Simple messaging scenario" on page 5.

If you are using UDP, you cannot use push notifications in disconnected mode with ActiveSync due to the limitations of the UDP implementation of ActiveSync.

See also

- "Using push notifications" on page 32
- "Starting the QAnywhere agent" on page 44
- "Notifications of push notification" on page 60
- "-lp qauagent option" on page 705

-q qauagent option

Starts the QAnywhere UltraLite Agent in quiet mode with the window minimized in the system tray.

Syntax

qauagent -q ...

Default

None

Remarks

When you start the QAnywhere UltraLite Agent in quiet mode with -q, the main window is minimized to the system tray. In addition, the database server for the message store is started with the -qi option.

See also

- "-qi qauagent option" on page 712

-qi qauagent option

Starts the QAnywhere UltraLite Agent in quiet mode with the window completely hidden.

Syntax

qauagent -qi ...

Default

None

Remarks

When you start the QAnywhere UltraLite Agent in quiet mode, on Windows desktop the main window is minimized to the system tray, and on Windows Mobile the main window is hidden. In addition, the database server for the message store is started with the -qi option.

Quiet mode is useful for some Windows Mobile applications because it prevents an application from being closed when Windows Mobile reaches its limit of 32 concurrent processes. Quiet mode allows the QAnywhere UltraLite Agent to run like a service.

When in -qi quiet mode, you can only stop the QAnywhere UltraLite Agent by typing **qastop**.

See also

- "qastop utility" on page 717
- "-q qauagent option" on page 712

-si qauagent option

Initializes the database for use as a client message store.

Syntax

qauagent -c "*connection-string*" -si …

Default

None. You only use this option once, to initialize the client message store.

Remarks

Before using this option, you must create an UltraLite database. When you use -si, the QAnywhere UltraLite Agent initializes the database with database objects such as QAnywhere system tables; it then exits immediately.

When you run -si, you must specify a connection string with the -c option that indicates which database to initialize. The connection string specified in the -c option should also specify a user ID with DBA privileges. If you do not specify a user ID and password, the default user DBA with password SQL is used.

The -si option creates a database user named ml_qa_user and password qanywhere for the client message store. The user called ml_qa_user has permissions suitable for QAnywhere applications only. If you do not change this database user name and password, then you do not need to specify the pwd or uid in the -c option when you start qauagent. If you change either of them, then you must supply the uid and/or pwd in the -c option on the qauagent command line.

Note
You should change the default passwords. To change them, use the GRANT statement. See "Changing a password" [*SQL Anywhere Server - Database Administration*].

The -si option does not provide an ID for the client message store. You can assign an ID using the -id option when you run -si or the next time you run qauagent; or, if you do not do that, qauagent, by default, assigns the device name as the ID.

When a message store is created but is not set up with an ID, QAnywhere applications local to the message store can send and receive messages, but cannot exchange messages with remote QAnywhere applications. Once an ID is assigned, remote messaging may also occur.

See also

- "Setting up the client message store" on page 23
- "Creating a secure client message store" on page 117

Examples

The following command connects to a database called *qaclient.db* and initializes it as a QAnywhere client message store. The QAnywhere UltraLite Agent immediately exits when the initialization is complete.

```
qauagent -si -c "DBF=qaclient.db"
```

-su qauagent option

Upgrades a client message store to the current version. If you are upgrading from a pre-10.0.0 message store, you must first manually unload and reload the message store.

Syntax

qauagent -su -c "*connection-string*" ...

Remarks

This option is useful if you want to perform custom actions after the unload/reload and before the qauagent upgrade. Use the -sur option if you are upgrading from a pre-10.0.0 message store and you want the Agent to automatically perform the unload/reload step for you.

This operation exits when the upgrade is complete.

This operation cannot be undone.

Example

To upgrade from a version 9 database, first, unload and reload the database:

```
dbunload  -q  -c "UID=dba;PWD=sql;DBF=qanywhere.db" -ar
```

Next, run qauagent with the -su option:

```
qauagent -q -su -c "UID=dba;PWD=sql;DBF=qanywhere.db"
```

-v qauagent option

Allows you to specify what information is logged to the message log file and displayed in the QAnywhere UltraLite Agent console.

Syntax

qauagent -v *levels* ...

Default

Minimal verbosity

Remarks

The -v option affects the log files and console. You only have a message log if you specify -o or -ot on the qauagent command line.

A high level of verbosity may affect performance and should normally be used in the development phase only.

If you specify -v alone, a minimal amount of information is logged.

The values of *levels* are as follows. You can use one or more of these options at once; for example, -vlm.

- **+** Turn on all logging options.
- **l** Show all MobiLink Listener logging. This causes the MobiLink Listener (dblsn) to start with verbosity level -v3. See the -v option in the "MobiLink Listener utility for Windows devices (dblsn)" [*MobiLink - Server-Initiated Synchronization*].
- **m** Show all synchronization logging.
- **n** Show all network status change notifications. the QAnywhere UltraLite Agent receives these notifications from the Listener utility.
- **p** Show all message push notifications. The QAnywhere UltraLite Agent receives these notifications from the Listener utility via the MobiLink server, which includes a MobiLink Notifier.
- **q** Show the SQL that is used to represent the transmission rules.
- **s** Show all the message synchronizations that are initialized by QAnywhere UltraLite Agent.

See also

- "-o qauagent option" on page 706
- "-ot qauagent option" on page 708
- "-on qauagent option" on page 707
- "-os qauagent option" on page 708

-x qauagent option

Specify the network protocol and the protocol options for communication with the MobiLink server.

Syntax

qaagent -x *protocol* [**(** *protocol-options*;**...** **)** **...**]

protocol: **http**, **tcpip**, **https**, **tls**

protocol-options: *keyword***=***value*

Remarks

For a complete list of *protocol-options*, see "MobiLink client network protocol options" [*MobiLink - Client Administration*].

The -x option is required when the MobiLink server is not on the same device as the QAnywhere UltraLite Agent.

You can specify -x multiple times. This allows you to set up failover to multiple MobiLink servers. When you set up failover, the QAnywhere UltraLite Agent attempts to connect to the MobiLink servers in the order in which you enter them on the command line.

The QAnywhere UltraLite Agent also has a Listener that receives notifications from the MobiLink server that messages are available at the server for transmission to the client. This Listener only uses the first MobiLink server that is specified, and does not fail over to others.

See also

- "MobiLink client network protocol options" [*MobiLink - Client Administration*]
- "Encrypting the communication stream" on page 118
- "Transport-layer security" [*SQL Anywhere Server - Database Administration*]
- "Setting up a failover mechanism" on page 36
- "-fd qauagent option" on page 701
- "-fr qauagent option" on page 701

-xd qauagent option

Specify that the QAnywhere UltraLite Agent should use dynamic addressing of the MobiLink server.

Syntax

qauagent -xd

Remarks

When you specify -xd, the QAnywhere UltraLite Agent can determine the protocol and address of the MobiLink server based on message store properties. This means that it can dynamically determine the address of a single MobiLink server, where the server address is dependent on the current network that is active for the device where the QAnywhere UltraLite Agent is running.

The QAnywhere application must initialize message store properties that describe the communication protocol and address of the MobiLink server, and establish a relationship with the currently active network interface. As the mobile device switches between different networks, the QAnywhere UltraLite

Agent detects which network is active and automatically adjusts the communication protocol and address of the MobiLink server—without having to be restarted.

See also

- "Client message store properties" on page 26

Example

The following example sets properties so that the appropriate MobiLink address is used based on the type of network the device is on. For example, if the device is on a LAN the appropriate LAN address is used.

```
QAManager mgr;
...
mgr.SetStringStoreProperty( "LAN.CommunicationAddress",
"host=1.2.3.4;port=10997" );
mgr.SetStringStoreProperty( "LAN.CommunicationType", "tcpip" );
mgr.SetStringStoreProperty( "WAN.CommunicationAddress",
"host=5.6.7.8;port=7777" );
mgr.SetStringStoreProperty( "WAN.CommunicationType", "tcpip" );
mgr.SetStringStoreProperty( "EL3C589 Ethernet Adapter.type", "LAN" );
mgr.SetStringStoreProperty( "Acme Wireless Adapter.type", "WAN" );
```

qastop utility

Stops the QAnywhere Agent or QAnywhere UltraLite Agent when the agent is running in quiet mode.

Syntax

qastop [*option* ...]

Option	Description
-id *id*	Specifies the ID of the client message store that the QAnywhere Agent or UltraLite Agent is to stop.
-wc *name*	Specifies the window class name that the QAnywhere Agent or UltraLite Agent is to stop.

See also

- "-q qaagent option" on page 690
- "-q qauagent option" on page 712
- "Stopping the QAnywhere Agent" on page 45

QAnywhere properties

Client message store properties

The following sections provide information about client message store properties.

Predefined client message store properties

Several client message store properties have been predefined for your convenience. The predefined message store properties are:

- **ias_Adapters** A list of network adapters that can be used to connect to the MobiLink server. The list is a string and is delimited by a vertical bar.
- **ias_MaxDeliveryAttempts** When defined, the maximum number of times that a message can be received without being acknowledged before its status is set to UNRECEIVABLE. By default, this property is not defined and is equivalent to a value of -1, which means that the client library continues to attempt to deliver an unacknowledged message forever.
- **ias_MaxDownloadSize** The download increment size. By default, QAnywhere uses a maximum download size of -1 which means there is no maximum. If a message originating from a server connector or destination alias exceeds the download increment size specified, the message is broken into smaller message parts and sent in separate downloads. This property is set by the qaagent -idl option. See "-idl qaagent option" on page 680.
- **ias_MaxUploadSize** The upload increment size. By default, QAnywhere uploads messages in increments of 256K. If a message exceeds the upload increment size specified, the message is broken into smaller message parts and sent in separate uploads. This property is set by the qaagent -iu option. See "-iu qaagent option" on page 681.
- **ias_Network** Information about the current network in use. This property can be read but should not be set. ias_Network is a special property. It has several built-in attributes that provide information regarding the current network that is being used by the device. The following attributes are automatically set by QAnywhere:
  - **ias_Network.Adapter** The current name of the network card, if any. (The name of the network card that is assigned to the Adapter attribute is displayed in the Agent window when the network connection is established.)
  - **ias_Network.RAS** The current RAS entry name, if any.
  - **ias_Network.IP** The current IP address assigned to the device, if any.
  - **ias_Network.MAC** The current MAC address of the network card being used, if any.
- **ias_RASNames** String. A list of RAS entry names that can be used to connect to the MobiLink server. The list is delimited by a vertical bar.
- **ias_StoreID** The message store ID.
- **ias_StoreInitialized** True if this message stores has successfully been initialized for QAnywhere messaging; otherwise False.

  See "-si qaagent option" on page 690.

- **ias_StoreVersion** The QAnywhere-defined version number of this message store.

For information about managing predefined message properties, see:

- C++ API: "MessageStoreProperties class" on page 363
- .NET API: "MessageProperties class" on page 179
- Java API: "MessageStoreProperties interface" on page 476
- SQL API: "Message store properties" on page 647

Custom client message store properties

QAnywhere allows you to define your own client message store properties using the QAnywhere C++, Java, SQL or .NET APIs. These properties are shared between applications connected to the same message store. They are also synchronized to the server message store so that they are available to server-side transmission rules for this client.

Client message store property names are case insensitive. You can use a sequence of letters, digits, and underscores, but the first character must be a letter. The following names are reserved and may not be used as message store property names:

- NULL
- TRUE
- FALSE
- NOT
- AND
- OR
- BETWEEN
- LIKE
- IN
- IS
- ESCAPE (SQL Anywhere message stores only)
- Any name beginning with **ias_**

Using custom client message store property attributes

Client message store properties can have attributes that you define. An attribute is defined by appending a dot after the property name followed by the attribute name. The main use of this feature is to be able to use information about your network in your transmission rules.

Limited support is provided for property attributes when using UltraLite as a client message store. UltraLite message stores only support the predefined ias_Network property.

Example (SQL Anywhere only)

The following is a simple example of how to set custom client message store property attributes. In this example, the Object property has two attributes: Shape and Color. The value of the Shape attribute is Round and the value of the Color attribute is Blue.

```
// C++ example.
mgr->setStringStoreProperty( "Object.Shape", "Round" );
mgr->setStringStoreProperty( "Object.Color", "Blue" );

// C# example.
mgr.SetStoreStringProperty( "Object.Shape", "Round" );
mgr.SetStringStoreProperty( "Object.Color", "Blue" );

// Java example
mgr.setStringStoreProperty( "Object.Shape", "Round" );
mgr.setStringStoreProperty( "Object.Color", "Blue" );

-- SQL example
BEGIN
    CALL ml_qa_setstoreproperty( 'Object.Shape', 'Round' );
    CALL ml_qa_setstoreproperty( 'Object.Color', 'Blue' );
    COMMIT;
END
```

All client message store properties have a Type attribute that initially has no value. The value of the Type attribute must be the name of another property. When setting the Type attribute of a property, the property inherits the attributes of the property being assigned to it. In the following example, the Object property inherits the attributes of the Circle property. Therefore, the value of Object.Shape is Round and the value of Object.Color is Blue.

```
// C++ example
QAManager qa_manager;
qa_manager->setStoreStringProperty( "Circle.Shape", "Round" );
qa_manager->setStoreStringProperty( "Circle.Color", "Blue" );
qa_manager->setStoreStringProperty( "Object.Type", "Circle" );

// C# example
QAManager qa_manager;
qa_manager.SetStringStoreProperty( "Circle.Shape", "Round" );
qa_manager.SetStringStoreProperty( "Circle.Color", "Blue" );
qa_manager.SetStringStoreProperty( "Object.Type", "Circle" );

// Java example
QAManager qa_manager;
qa_manager.setStringStoreProperty( "Circle.Shape", "Round" );
qa_manager.setStringStoreProperty( "Circle.Color", "Blue" );
qa_manager.setStringStoreProperty( "Object.Type", "Circle" );

-- SQL example
BEGIN
    CALL ml_qa_setstoreproperty( 'Circle.Shape', 'Round' );
    CALL ml_qa_setstoreproperty( 'Circle.Color', 'Blue' );
    CALL ml_qa_setstoreproperty( 'Object.Type', 'Circle');
    COMMIT;
END
```

Example

The following C# example shows how you can use message store properties to provide information about your network to your transmission rules.

Assume you have a Windows laptop that has the following network connectivity options: LAN, Wireless LAN, and Wireless WAN. Access to the network via LAN is provided by a network card named My LAN Card. Access to the network via Wireless LAN is provided by a network card named My Wireless LAN

Card. Access to the network via Wireless WAN is provided by a network card named My Wireless WAN Card.

Assume you want to develop a messaging application that sends all messages to the server when connected using LAN or Wireless LAN and only high priority messages when connected using Wireless WAN. You define high priority messages as those whose priority is greater than or equal to 7.

First, find the names of your network adapters. The names of network adapters are fixed when the card is plugged in and the driver is installed. To find the name of a particular network card, connect to the network through that adapter, and then run qaagent with the -vn option. The QAnywhere Agent displays the network adapter name, as follows:

```
"Listener thread received message '[netstat] network-adapter-name !...'
```

Next, define three client message store properties for each of the network types: LAN, WLAN, and WWAN. Each of these properties are assigned a Cost attribute. The Cost attribute is a value between 1 and 3 and represents the cost incurred when using the network. A value of 1 represents the lowest cost.

```
QAManager qa_manager;
qa_manager.SetStoreProperty( "LAN.Cost", "1" );
qa_manager.SetStoreProperty( "WLAN.Cost", "2" );
qa_manager.SetStoreProperty( "WWAN.Cost", "3" );
```

Next, define three client message store properties, one for each network card that is used. The property name must match the network card name. Assign the appropriate network classification to each property by assigning the network type to the Type attribute. Each property therefore inherits the attributes of the network types assigned to them.

```
QAManager qa_manager;
qa_manager.SetStoreProperty( "My LAN Card.Type", "LAN" );
qa_manager.SetStoreProperty( "My Wireless LAN Card.Type", "WLAN" );
qa_manager.SetStoreProperty( "My Wireless WAN Card.Type", "WWAN" );
```

When network connectivity is established, QAnywhere automatically defines the Adapter attribute of the ias_Network property to one of My LAN Card, My Wireless LAN Card or My Wireless WAN Card, depending on the network in use. Similarly, it automatically sets the Type attribute of the ias_Network property to one of My LAN Card, My Wireless LAN Card, or My Wireless WAN Card so that the ias_Network property inherits the attributes of the network being used.

Finally, create the following transmission rule.

```
automatic=ias_Network.Cost < 3 or ias_Priority >= 7
```

For more information about transmission rules, see “QAnywhere transmission and delete rules” on page 733.

Enumerating client message store properties

The QAnywhere .NET, C++, and Java APIs can provide an enumeration of predefined and custom client message store properties.

.NET example

See "GetStorePropertyNames method" on page 248.

```
// qaManager is a QAManager instance.
IEnumerator propertyNames = qaManager.GetStorePropertyNames();
```

C++ example

See "beginEnumStorePropertyNames method" on page 398.

```
// qaManager is a QAManager instance.
qa_store_property_enum_handle handle = qaManager-
>beginEnumStorePropertyNames();
qa_char propertyName[256];

if( handle != qa_null ) {
    while(qaManager->nextStorePropertyName(handle, propertyName, 255) != -1)
{
        // Do something with the message store property name.
    }
    // Message store properties cannot be set after
    // the beginEnumStorePropertyNames call
    // and before the endEnumStorePropertyNames call.
    qaManager->endEnumStorePropertyNames(handle);
}
```

Java example

See "getStorePropertyNames method" on page 532.

```
// qaManager is a QAManager instance.
Enumeration propertyNames = qaManager.getStorePropertyNames();
```

Managing client message store properties in your application

The following QAManagerBase methods can be used to get and set client message store properties.

C++ methods to manage client message store properties

- qa_bool getBooleanStoreProperty(qa_const_string name, qa_bool * value)
- qa_bool setBooleanStoreProperty(qa_const_string name, qa_bool value)
- qa_bool getByteStoreProperty(qa_const_string name, qa_byte * value)
- qa_bool setByteStoreProperty(qa_const_string name, qa_byte value)
- qa_bool getShortStoreProperty(qa_const_string name, qa_short * value)
- qa_bool setShortStoreProperty(qa_const_string name, qa_short value)
- qa_bool getIntStoreProperty(qa_const_string name, qa_int * value)
- qa_bool setIntStoreProperty(qa_const_string name, qa_int value)
- qa_bool getLongStoreProperty(qa_const_string name, qa_long * value)
- qa_bool setLongStoreProperty(qa_const_string name, qa_long value)
- qa_bool getFloatStoreProperty(qa_const_string name, qa_float * value)
- qa_bool setFloatStoreProperty(qa_const_string name, qa_float value)
- qa_bool getDoubleStoreProperty(qa_const_string name, qa_double * value)
- qa_bool setDoubleStoreProperty(qa_const_string name, qa_double value)
- qa_int getStringStoreProperty(qa_const_string name, qa_string value, qa_int len)
- qa_bool setStringStoreProperty(qa_const_string name, qa_const_string value)
- qa_store_property_enum_handle QAManagerBase::beginEnumStorePropertyNames()
- virtual qa_int QAManagerBase::nextStorePropertyName(qa_store_property_enum_handle h, qa_string buffer, qa_int bufferLen)
- virtual void QAManagerBase::endEnumStorePropertyNames(qa_store_property_enum_handle h)

See "QAManagerBase class" on page 394.

C# methods to manage client message store properties

- Object GetStoreProperty(String name)
- void SetStoreProperty(String name, Object value)
- boolean GetBooleanStoreProperty(String name)
- void SetBooleanStoreProperty(String name, boolean value)
- byte GetByteStoreProperty(String name)
- void SetByteStoreProperty(String name, byte value)
- short GetShortStoreProperty(String name)
- void SetShortStoreProperty(String name, short value)
- int GetIntStoreProperty(String name)
- void SetIntStoreProperty(String name, int value)
- long GetLongStoreProperty(String name)
- void SetLongStoreProperty(String name, long value)
- float GetFloatStoreProperty(String name)
- void SetFloatStoreProperty(String name, float value)
- double GetDoubleStoreProperty(String name)
- void SetDoubleStoreProperty(String name, double value)
- String GetStringStoreProperty(String name)
- void SetStringStoreProperty(String name, String value)
- IEnumerator GetStorePropertyNames()

See "QAManagerBase interface" on page 226.

Java methods to manage client message store properties

- boolean getBooleanStoreProperty(String name)
- void setBooleanStoreProperty(String name, boolean value)
- byte getByteStoreProperty(String name)
- void setByteStoreProperty(String name, byte value)
- double getDoubleStoreProperty(String name)
- void setDoubleStoreProperty(String name, double value)
- float getFloatStoreProperty(String name)
- void setFloatStoreProperty(String name, float value)
- int getIntStoreProperty(String name)
- void setIntStoreProperty(String name, int value)
- long getLongStoreProperty(String name)
- void setLongStoreProperty(String name, long value)
- short getShortStoreProperty(String name)
- void setShortStoreProperty(String name, short value)
- void setStringStoreProperty(String name, String value)
- String getStringStoreProperty(String name)
- java.util.Enumeration getStorePropertyNames()

See “QAManagerBase interface” on page 514.

SQL stored procedures to manage client message store properties

- ml_qa_getstoreproperty
- ml_qa_setstoreproperty

See “Message store properties” on page 647.

Server properties

You can set server properties in Sybase Central or with a server management request. Server properties are always stored in the database. See:

- “Setting server properties with a server management request” on page 159
- “Setting server properties with Sybase Central” on page 726

Server properties

- **ianywhere.qa.server.autoRulesEvaluationPeriod** The time in milliseconds between evaluations of rules, including message transmission and persistence rules. Since, typically, rules are evaluated dynamically as messages are transmitted to the server store, the rule evaluation period is only for rules that are timing-sensitive. The default value is **60000** (one minute).

- **ianywhere.qa.server.compressionLevel** The default amount of compression applied to each message received by a QAnywhere connector. The compression is an integer between 0 and 9, with 0 being no compression and 9 being the most compression. The default is **0**.

If you also set the compression level for a connector in the connector properties file, this setting is overridden for that connector. See "Configuring JMS connector properties" on page 131.

- **ianywhere.qa.server.connectorPropertiesFiles**

  Deprecated feature
  Replaced by Sybase Central.

  A list of one or more files that specify the configuration of QAnywhere connectors to an external message system such as JMS. The default is no connectors.

  See "Connectors" on page 129.

- **ianywhere.qa.server.disableNotifications** Set this to true to disable notification from the server about pending messages. This disables the processing on the server that is required to initiate notifications to clients when messages are waiting on the server for those clients. Set to true in any setup where notifications cannot be sent from the server, such as when firewall restrictions make notifications impossible. The default is false.

- **ianywhere.qa.server.logLevel** The logging level of the messaging. The property value may be one of 1, 2, 3, or 4. 1 indicates that only message errors are logged. 2 additionally causes warnings to be logged. 3 additionally causes informational messages to be logged. 4 additionally causes more verbose informational messages to be logged, including details about each QAnywhere message that is transmitted with the MobiLink server. The default is **2**.

  These logging messages are output to the MobiLink server messages window. If the mlsrv12 -o or -ot option was specified, the messages are output to the MobiLink server message log file.

- **ianywhere.qa.server.id** Specifies the agent portion of the address to which to send server management requests. If this property is not set, this value is ianywhere.server.

- **ianywhere.qa.server.password.e** Specifies the password for authenticating server management requests. If this property is not set, the password is QAnywhere.

  See "Server management requests" on page 145.

- **ianywhere.qa.server.scheduleDateFormat** Specifies the date format used for server-side transmission rules. By default, the date format is yyyy-MM-dd.

Letter	Date component	Example
y	year	1996
M	month in year	July
d	day in month	10

- **ianywhere.qa.server.scheduleTimeFormat** Specifies the time format used for server-side transmission rules. By default, the time format is HH:mm:ss.

Letter	Date component	Example
a	AM/PM marker	PM
H	hour in day, a value between 0 and 23	0
k	hour in day, a value between 1 and 24	24
K	hour in AM/PM, a value between 0 and 11	0
h	hour in AM/PM, a value between 1 and 12	12
m	minute in hour	30
s	second in minute	55

- **ianywhere.qa.server.transmissionRulesFile**

  Deprecated feature
  Replaced by Sybase Central.

  A file used to specify rules for governing the transmission and persistence of messages. By default, there are no filters for messages, and messages are deleted when the final status of the message has been transmitted to the message originator.

Setting server properties with Sybase Central

To set server properties with Sybase Central

1. Start Sybase Central:

   Choose **Start** » **Programs** » **SQL Anywhere 12** » **Administration Tools** » **Sybase Central**.

2. Choose **Connections** » **Connect With QAnywhere 12**.

3. Specify an **ODBC Data Source Name** or **ODBC Data Source File**, and the **User ID** and **Password** if required. Click **OK**.

4. Under **Server Message Stores** in the left pane, select the name of the data source.

5. Choose **File** » **Properties**.

JMS connector properties

The following properties are used to configure the JMS connectors:

- **ianywhere.connector.nativeConnection** The Java class that implements the connector. It is for QAnywhere internal use only, and should not be deleted or modified.
- **ianywhere.connector.id (deprecated)** An identifier that uniquely identifies the connector. The default is the value of the connector property ianywhere.connector.address.
- **ianywhere.connector.address** The connector address that a QAnywhere client should use to address the connector. This address is also used to prefix all logged error, warning, and informational messages appearing in the MobiLink server messages window for this connector.

  See “Sending a QAnywhere message to a JMS connector” on page 132.

  In Sybase Central, set this property in the **Connector Wizard** on the **Connector Names** page in the **Connector name** field.
- **ianywhere.connector.incoming.priority** The priority, expressed as an integer, assigned to all incoming messages. If the value is unspecified or negative, the default for that type of connector is used. In JMS, the default is to use the priority of the JMS message. In web services, the default is 4.
- **ianywhere.connector.incoming.retry.max** The maximum number of times the connector retries transferring a JMS message to a QAnywhere message store before giving up. After the maximum number of failed attempts, the JMS message is re-addressed to the ianywhere.connector.jms.deadMessageDestination property value. The default is -1, which means that the connector does not give up.
- **ianywhere.connector.incoming.ttl** The time-to-live, expressed as an integer, assigned to all incoming messages measured in milliseconds. If the value is unspecified or negative, the default for that type of connector is used. If the value is 0, messages do not expire. In JMS, the default is calculated using the expiration time of the JMS message. In web services, the default is 0.
- **ianywhere.connector.outgoing.deadMessageAddress** The address that a message is sent to when it cannot be processed. For example, if a message contains a JMS address that is malformed or unknown, the message is marked as unreceivable and a copy of the message is sent to the dead message address.

  If no dead message address is specified, the message is marked as unreceivable but no copy of the message is sent.

  In Sybase Central, you can set this property in the **Connector Properties** window, **Properties** tab, by clicking **New**.
- **ianywhere.connector.logLevel** The amount of connector information displayed in the MobiLink server messages window and message log file. Values for the log level are as follows:
  - **1** Log error messages.
  - **2** Log error and warning messages.
  - **3** Log error, warning, and information messages.

  - **4** Log error, warning, information, and debug messages.

  In Sybase Central, set this property on the **Connector Properties** window, on the **General** tab, in the **Logging Level** section.

  You can also set this property for all connectors. To do this in Sybase Central, connect to a server message store and choose the task **Change Properties Of This Message Store**. Open the **Server Properties** tab.

- **ianywhere.connector.compressionLevel** The default message compression factor of messages received from JMS: an integer between 0 and 9, with 0 indicating no compression and 9 indicating maximum compression.

  In Sybase Central, set this property on the **Connector Properties** window, on the **General** tab, in the **Compression Level** section.

  You can also set this property for all connectors. To do this in Sybase Central, connect to a server message store, choose the task **Change Properties Of This Message Store**, and open the **Server Properties** tab.

- **ianywhere.connector.jms.deadMessageDestination** The address that a JMS message is sent to when it cannot be converted to a QAnywhere message. This might occur if the JMS message is an instance of an unsupported class, if the JMS message does not specify a QAnywhere address, if an unexpected JMS provider exception occurs, or if an unexpected QAnywhere exception occurs.

  In Sybase Central, set this property on the **Connector Properties** window, on the **JMS** tab, in the **Other** section, in the **Dead message destination** field.

- **ianywhere.connector.outgoing.retry.max** The default number of retries for messages going from QAnywhere to the external messaging system. The default value is 5. Specify 0 to have the connector retry forever.

  In Sybase Central, you can set this property in the **Connector Properties** window, **Properties** tab, by clicking **New**.

- **ianywhere.connector.runtimeError.retry.max** The number of times a connector retries a message that causes a RuntimeException. If a dead message queue is specified, the message is put in that queue. Otherwise, the message is marked as unreceivable and skipped. Specify a value of 0 to have the server never give up.

- **ianywhere.connector.startupType** Startup types can be automatic, manual, or disabled.

- **xjms.jndi.authName** The authentication name to connect to the external JMS JNDI name service.

  In Sybase Central, set this property in the **Connector Wizard**, **JNDI Settings** page, **User name** field; or on the **Connector Properties** window on the **JMS** tab, **JNDI** section, **User name** field.

- **xjms.jndi.factory** The factory name used to access the external JMS JNDI name service. In Sybase Central, set this property in the **Connector Wizard**, **JNDI Settings** page, **JNDI factory** field; or on the **Connector Properties** window on the **JMS** tab, **JNDI** section, **JNDI Factory** field,

- **xjms.jndi.password.e** The authentication password to connect to the external JMS JNDI name service.

  In Sybase Central, set this property in the **Connector Wizard**, **JNDI Settings** page, **Password** field; or on the **Connector Properties** window on the **JMS** tab, **JNDI** section, **Password** field.

- **xjms.jndi.url** The URL to access the JMS JNDI name service.

  In Sybase Central, set this property in the **Connector Wizard**, **JNDI Settings** page, **Name service URL** field; or on the **Connector Properties** window on the **JMS** tab, **JNDI** section, **URL** field.

- **xjms.password.e** The authentication password to connect to the external JMS provider.

- **xjms.queueConnectionAuthName** The user ID to connect to the external JMS queue connection.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Queue Settings** page, **User name** field; or on the **Connector Properties** window on the **JMS** tab, **Queue** section, **User name** field.

- **xjms.queueConnectionPassword.e** The password to connect to the external JMS queue connection.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Queue Settings** page, **Password** field; or on the **Connector Properties** window on the **JMS** tab, **Queue** section, **Password** field.

- **xjms.queueFactory** The external JMS provider queue factory name.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Queue Settings** page, **Queue factory** field; or on the **Connector Properties** window on the **JMS** tab, **Queue** section, **Queue factory** field.

- **xjms.receiveDestination** The queue name used by the connector to listen for messages from JMS targeted for QAnywhere clients.

  In Sybase Central, set this property in the **Connector Wizard**, **Connector Names** page, **Receiver destination** field.

- **xjms.topicFactory** The external JMS provider topic factory name.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Topic Settings** page, **Topic Factory** field; or on the **Connector Properties** window on the **JMS** tab, **Topic** section, **Topic factory** field.

- **xjms.topicConnectionAuthName** The user ID to connect to the external JMS topic connection.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Topic Settings** page, **User name** field; or on the **Connector Properties** window on the **JMS** tab, **Topic** section, **User name** field.

- **xjms.topicConnectionPassword.e** The password to connect to the external JMS topic connection.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Topic Settings** page, **Password** field; or on the **Connector Properties** window on the **JMS** tab, **Topic** section, **Password** field.

- **ianywhere.connector.nativeConnection** The Java class that implements the connector. It is for QAnywhere internal use only, and should not be deleted or modified.

- **ianywhere.connector.id (deprecated)** An identifier that uniquely identifies the connector. The default is the value of the connector property ianywhere.connector.address.

- **ianywhere.connector.address** The connector address that a QAnywhere client should use to address the connector. This address is also used to prefix all logged error, warning, and informational messages appearing in the MobiLink server messages window for this connector.

  See "Sending a QAnywhere message to a JMS connector" on page 132.

  In Sybase Central, set this property in the **Connector Wizard** on the **Connector Names** page in the **Connector name** field.

- **ianywhere.connector.incoming.priority** The priority, expressed as an integer, assigned to all incoming messages. If the value is unspecified or negative, the default for that type of connector is used. In JMS, the default is to use the priority of the JMS message. In web services, the default is 4.

- **ianywhere.connector.incoming.retry.max** The maximum number of times the connector retries transferring a JMS message to a QAnywhere message store before giving up. After the maximum number of failed attempts, the JMS message is re-addressed to the ianywhere.connector.jms.deadMessageDestination property value. The default is -1, which means that the connector does not give up.

- **ianywhere.connector.incoming.ttl** The time-to-live, expressed as an integer, assigned to all incoming messages measured in milliseconds. If the value is unspecified or negative, the default for that type of connector is used. If the value is 0, messages do not expire. In JMS, the default is calculated using the expiration time of the JMS message. In web services, the default is 0.

- **ianywhere.connector.outgoing.deadMessageAddress** The address that a message is sent to when it cannot be processed. For example, if a message contains a JMS address that is malformed or unknown, the message is marked as unreceivable and a copy of the message is sent to the dead message address.

  If no dead message address is specified, the message is marked as unreceivable but no copy of the message is sent.

  In Sybase Central, you can set this property in the **Connector Properties** window, **Properties** tab, by clicking **New**.

- **ianywhere.connector.logLevel** The amount of connector information displayed in the MobiLink server messages window and message log file. Values for the log level are as follows:

  - **1** Log error messages.

  - **2** Log error and warning messages.

  - **3** Log error, warning, and information messages.

  - **4** Log error, warning, information, and debug messages.

  In Sybase Central, set this property on the **Connector Properties** window, on the **General** tab, in the **Logging Level** section.

  You can also set this property for all connectors. To do this in Sybase Central, connect to a server message store and choose the task **Change Properties Of This Message Store**. Open the **Server Properties** tab.

- **ianywhere.connector.compressionLevel** The default message compression factor of messages received from JMS: an integer between 0 and 9, with 0 indicating no compression and 9 indicating maximum compression.

  In Sybase Central, set this property on the **Connector Properties** window, on the **General** tab, in the **Compression Level** section.

  You can also set this property for all connectors. To do this in Sybase Central, connect to a server message store, choose the task **Change Properties Of This Message Store**, and open the **Server Properties** tab.

- **ianywhere.connector.jms.deadMessageDestination** The address that a JMS message is sent to when it cannot be converted to a QAnywhere message. This might occur if the JMS message is an instance of an unsupported class, if the JMS message does not specify a QAnywhere address, if an unexpected JMS provider exception occurs, or if an unexpected QAnywhere exception occurs.

  In Sybase Central, set this property on the **Connector Properties** window, on the **JMS** tab, in the **Other** section, in the **Dead message destination** field.

- **ianywhere.connector.outgoing.retry.max** The default number of retries for messages going from QAnywhere to the external messaging system. The default value is 5. Specify 0 to have the connector retry forever.

  In Sybase Central, you can set this property in the **Connector Properties** window, **Properties** tab, by clicking **New**.

- **ianywhere.connector.runtimeError.retry.max** The number of times a connector retries a message that causes a RuntimeException. If a dead message queue is specified, the message is put in that queue. Otherwise, the message is marked as unreceivable and skipped. Specify a value of 0 to have the server never give up.

- **ianywhere.connector.startupType** Startup types can be automatic, manual, or disabled.

- **xjms.jndi.authName** The authentication name to connect to the external JMS JNDI name service.

  In Sybase Central, set this property in the **Connector Wizard**, **JNDI Settings** page, **User name** field; or on the **Connector Properties** window on the **JMS** tab, **JNDI** section, **User name** field.

- **xjms.jndi.factory** The factory name used to access the external JMS JNDI name service. In Sybase Central, set this property in the **Connector Wizard**, **JNDI Settings** page, **JNDI factory** field; or on the **Connector Properties** window on the **JMS** tab, **JNDI** section, **JNDI Factory** field,

- **xjms.jndi.password.e** The authentication password to connect to the external JMS JNDI name service.

  In Sybase Central, set this property in the **Connector Wizard**, **JNDI Settings** page, **Password** field; or on the **Connector Properties** window on the **JMS** tab, **JNDI** section, **Password** field.

- **xjms.jndi.url** The URL to access the JMS JNDI name service.

  In Sybase Central, set this property in the **Connector Wizard**, **JNDI Settings** page, **Name service URL** field; or on the **Connector Properties** window on the **JMS** tab, **JNDI** section, **URL** field.

- **xjms.password.e** The authentication password to connect to the external JMS provider.

- **xjms.queueConnectionAuthName** The user ID to connect to the external JMS queue connection.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Queue Settings** page, **User name** field; or on the **Connector Properties** window on the **JMS** tab, **Queue** section, **User name** field.

- **xjms.queueConnectionPassword.e** The password to connect to the external JMS queue connection.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Queue Settings** page, **Password** field; or on the **Connector Properties** window on the **JMS** tab, **Queue** section, **Password** field.

- **xjms.queueFactory** The external JMS provider queue factory name.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Queue Settings** page, **Queue factory** field; or on the **Connector Properties** window on the **JMS** tab, **Queue** section, **Queue factory** field.

- **xjms.receiveDestination** The queue name used by the connector to listen for messages from JMS targeted for QAnywhere clients.

  In Sybase Central, set this property in the **Connector Wizard**, **Connector Names** page, **Receiver destination** field.

- **xjms.topicFactory** The external JMS provider topic factory name.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Topic Settings** page, **Topic Factory** field; or on the **Connector Properties** window on the **JMS** tab, **Topic** section, **Topic factory** field.

- **xjms.topicConnectionAuthName** The user ID to connect to the external JMS topic connection.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Topic Settings** page, **User name** field; or on the **Connector Properties** window on the **JMS** tab, **Topic** section, **User name** field.

- **xjms.topicConnectionPassword.e** The password to connect to the external JMS topic connection.

  In Sybase Central, set this property in the **Connector Wizard**, **JMS Topic Settings** page, **Password** field; or on the **Connector Properties** window on the **JMS** tab, **Topic** section, **Password** field.

QAnywhere transmission and delete rules

Rule syntax

Rule syntax

Each rule has the following form:

*schedules***=***condition*

Schedule syntax

Schedule syntax

schedules : { **AUTOMATIC** | *schedule-spec* ,... }

schedule-spec :
  { **START TIME** *start-time* | **BETWEEN** *start-time* **AND** *end-time* }
  [**EVERY** *period* { **HOURS** | **MINUTES** | **SECONDS** }]
  [**ON** { **(** *day-of-week*, **...** **)** | **(** *day-of-month*, **...** **)** }]
  [**START DATE** *start-date*]

Parameters

- **AUTOMATIC** For transmission rules, rules are evaluated when a message changes state or there is a change in network status. For delete rules, messages that satisfy the delete rule condition are deleted when a message transmission is initiated.

- **schedule-spec** Schedule specifications other than AUTOMATIC specify times when conditions are to be evaluated. At those scheduled times, the corresponding condition is evaluated.

- **START TIME** The first scheduled time for each day on which the event is scheduled. If a START DATE is specified, the START TIME refers to that date. If no START DATE is specified, the START TIME is on the current day (unless the time has passed) and each subsequent day (if the schedule includes EVERY or ON).

- **BETWEEN ... AND ...** A range of times during the day outside which no scheduled times occur. If a START DATE is specified, the scheduled times do not occur until that date.

- **EVERY** An interval between successive scheduled events. Scheduled events occur only after the START TIME for the day, or in the range specified by BETWEEN ... AND.

- **ON** A list of days on which the scheduled events occur. The default is every day if EVERY is specified. Days can be specified as days of the week or days of the month.

  Days of the week are Mon, Tues, and so on. You may also use the full forms of the day, such as Monday. You must use the full forms of the day names if the language you are using is not English, is not the language requested by the client in the connection string, and is not the language that appears in the server messages window.

  Days of the month are integers from 0 to 31. A value of 0 represents the last day of any month.

- **START DATE** The date on which scheduled events are to start occurring. The default is the current date.

Usage

You can create more than one schedule for a given condition. This permits complex schedules to be implemented.

A schedule specification is recurring if its definition includes EVERY or ON; if neither of these reserved words is used, the schedule specifies at most a single time. An attempt to create a non-recurring schedule for which the start time has passed generates an error.

Each time a scheduled time occurs, the associated condition is evaluated and then the next scheduled time and date is calculated.

The next scheduled time is computed by inspecting the schedule or schedules, and finding the next schedule time that is in the future. If a schedule specifies every minute, and it takes 65 seconds to evaluate the conditions, it runs every two minutes. If you want execution to overlap, you must create more than one rule.

1. If the EVERY clause is used, find whether the next scheduled time falls on the current day, and is before the end of the BETWEEN ... AND range. If so, that is the next scheduled time.

2. If the next scheduled time does not fall on the current day, find the next date on which the event is to be executed.

3. Find the START TIME for that date, or the beginning of the BETWEEN ... AND range.

The QAnywhere schedule syntax is derived from the SQL Anywhere CREATE EVENT schedule syntax.

Keywords are case insensitive.

See also

- "CREATE EVENT statement" [*SQL Anywhere Server - SQL Reference*]

Example

The following sample server transmission rules file applies to the client identified by the client message store ID sample_store_id. It creates a dual schedule: high priority messages are sent once an hour. The schedule is `every 1 hours` and the condition is `ias_priority=9`. Also, between the hours of 8 A.M. and 9 A.M., high priority messages are sent every minute.

```
[sample_store_id]
; This rule governs when messages are transmitted to the client
; store with id sample_store_id.
;
   START TIME '06:00:00' EVERY 1 hours = ias_Priority = 9
   BETWEEN '08:00:00' AND '09:00:00' EVERY 1 minutes = ias_Priority = 9
```

Condition syntax

QAnywhere conditions use a SQL-like syntax. Conditions are evaluated against messages in the message store. A condition evaluates to true, false, or unknown. If a condition is empty, all messages are judged to satisfy the condition. Conditions can be used in transmission rules, delete rules, and the QAnywhere programming APIs.

Keywords and string comparisons are case insensitive.

Syntax

condition :
expression **IS** [**NOT**] **NULL**
| *expression compare expression*
| *expression* [**NOT**] **BETWEEN** *expression* **AND** *expression*
| *expression* [**NOT**] **LIKE** *pattern* [**ESCAPE** *character*]
| *expression* [**NOT**] **IN (** *string*, **...** **)**
| **NOT** *condition*
| *condition* **AND** *condition*
| *condition* **OR** *condition*
| **(** *condition* **)**

compare: **= |> | < | >= | <= | <>**

expression:
constant
| *rule-variable*
| **-***expression*
| *expression operator expression*
| **(** *expression* **)**
| *rule-function* **(** *expression*, **...** **)**

constant: *integer* | *floating-point number* | *string* | *boolean*

integer: An integer in the range -2**63 to 2**63-1.

floating-point number: A number in scientific notation in the range 2.2250738585072e-308 to 1.79769313486231e+308.

string: A sequence of characters enclosed in single quotes. A single quote in a string is represented by two consecutive single quotes.

boolean: A statement that is **TRUE** or **FALSE**, **T** or **F**, **Y** or **N**, **1** or **0**.

operator: **+ | - | * | /**

rule-variable:

See "Rule variables" on page 738.

rule-function:

See "Rule functions" on page 737.

Parameters

- **BETWEEN** The BETWEEN condition can evaluate as true, false, or unknown. Without the NOT keyword, the condition evaluates as true if *expression* is greater than or equal to the start expression and less than or equal to the end expression.

  The NOT keyword reverses the meaning of the condition but leaves UNKNOWN unchanged.

  The BETWEEN condition is equivalent to a combination of two inequalities:

  [**NOT**] **(** *expression* **>=** *start-expression* **AND** *arithmetic-expression* **<=** *end-expr* **)**

  For example:

  - `age BETWEEN 15 AND 19` is equivalent to `age >=15 AND age <= 19`
  - `age NOT BETWEEN 15 AND 19` is equivalent to `age < 15 OR age > 19`.

- **IN** The IN condition evaluates according to the following rules:

  - True if *expression* is not null and equals at least one of the values in the list.
  - Unknown if *expression* is null and the values list is not empty, or if at least one of the values is null and expression does not equal any of the other values.
  - False if none of the values are null, and *expression* does not equal any of the values in the list.

  The NOT keyword interchanges true and false.

  For example:

  - `Country IN ( 'UK', 'US', 'France' )` is true for `'UK'` and false for `'Peru'`. It is equivalent to the following:

    ```
    ( Country = 'UK' )         \
    OR ( Country = 'US' )      \
    OR ( Country = 'France' )
    ```

  - `Country NOT IN ( 'UK', 'US', 'France' )` is false for `'UK'` and true for `'Peru'`. It is equivalent to the following:

    ```
    NOT ( ( Country = 'UK' )          \
          OR ( Country = 'US' )       \
          OR ( Country = 'France' ) )
    ```

- **LIKE** The LIKE condition can evaluate as true, false, or unknown.

  Without the NOT keyword, the condition evaluates as true if *expression* matches the *like expression*. If either *expression* or *like expression* is null, this condition is unknown.

  The NOT keyword reverses the meaning of the condition, but leaves unknown unchanged.

  The *like expression* may contain any number of wildcards. The wildcards are:

Wildcard	Matches
_ (underscore)	Any one character
% (percent)	Any string of zero or more characters

For example:

- `phone LIKE 12%3` is true for `'123'` or `'12993'` and false for `'1234'`
- `word LIKE 's_d'` is true for `'sad'` and false for `'said'`
- `phone NOT LIKE '12%3'` is false for `'123'` or `'12993'` and true for `'1234'`

- **ESCAPE CHARACTER** The ESCAPE CHARACTER is a single character string literal whose character is used to escape the special meaning of the wildcard characters (_, **%**) in *pattern*. For example:
  - `underscored LIKE '\_%' ESCAPE '\'` is true for `'_myvar'` and false for `'myvar'`.
- **IS NULL** The IS NULL condition evaluates to true if the rule-variable is unknown; otherwise it evaluates to false. The NOT keyword reverses the meaning of the condition. This condition cannot evaluate to unknown.

Rule functions

You can use the following functions in transmission rules:

Syntax	Description
DATEADD(*date-part, count, date-time* **)**	Returns a datetime produced by adding several date parts to a datetime. The *datepart* can be one of year, quarter, month, week, day, hour, minute, or second. For example, the following example adds two months, resulting in the value 2006-07-02 00:00:00.0: `DATEADD( month, 2, '2006/05/02' )`
DATEPART(*date-part, date* **)**	Returns the value of part of a datetime value. The datepart can be one of year, quarter, month, week, day, dayofyear, weekday, hour, minute, or second. For example, the following example gets the month May as a number, resulting in the value 5: `DATEPART( month, '2006/05/02' )`
DATE-TIME(*string* **)**	Converts a string value to a datetime. The string must have the format 'yyyy-mm-dd hh:nn:ss'.
LENGTH(*string* **)**	Returns the number of characters in a string.

Syntax	Description
SUB-STRING(*string, start, length* **)**	Returns a substring of a string. The *start* is the start position of the substring to return, in characters. The *length* is the length of the substring to return, in characters.

Example

The following delete rule deletes all messages that entered a final state more than 10 days ago:

```
START TIME '06:00:00' every 1 hours = ias_Status >= ias_FinalState \
  AND ias_StatusTime < DATEADD( day, -10, ias_CurrentTimestamp) \
  AND ias_TransmissionStatus = ias_Transmitted
```

Rule variables

QAnywhere rule variables can be used in the condition part of rules. You can use the following as rule variables:

- "Message properties" on page 659
- "Client message store properties" on page 26
- "Variables defined by the rule engine" on page 738

Using properties as rule variables

Message properties and message store properties can be used as transmission rule variables. In both cases you can use predefined properties or you can create custom properties. If you have a message property and a message store property with the same name, the message property is used. To override this precedence, you can explicitly reference the property as follows:

- Preface a message store property name with ias_Store.

- Preface a message property name with ias_Message.

For example, the following automatic transmission rule selects all messages with the custom message property **urgent** set to **yes**:

```
automatic = ias_Message.urgent = 'yes'
```

The following automatic transmission rule selects messages when the custom message store property **transmitNow** is set to **yes**:

```
automatic = ias_Store.transmitNow = 'yes'
```

Variables defined by the rule engine

The following variables are defined by the rule engine:

- **ias_Address** The address of the message. For example, myclient\myqueue.
- **ias_ContentSize** The size of the message content. If the message is a text message, this is the number of characters. If the message is binary, this is the number of bytes.
- **ias_ContentType** The type of message:

IAS_TEXT_CONTENT	The message content consists of unicode characters.
IAS_BINARY_CONTENT	The message content is treated as an uninterpreted sequence of bytes.

- **ias_CurrentDate** The current date.

  A string can be compared against ias_currentDate if it is supplied in one of two ways:

  - as a string of format, which is interpreted unambiguously.
  - as a string according to the date_format database option set for the client message store database.

    See "Setting database options" [*SQL Anywhere Server - Database Administration*] and "date_format option" [*SQL Anywhere Server - Database Administration*].

- **ias_CurrentTime** The current time.

  A string can be compared against ias_CurrentTime if the hours, minutes, and seconds are separated by colons in the format hh:mm:ss:sss. A 24-hour clock is assumed unless **am** or **pm** is specified. See "time_format option" [*SQL Anywhere Server - Database Administration*].

- **ias_CurrentTimestamp** The current timestamp (current date and time). See "time_format option" [*SQL Anywhere Server - Database Administration*].
- **ias_Expires** The date and time when the message expires if it is not delivered.
- **ias_Network** Information about the current network in use. ias_Network is a special transmission variable. It has many built-in attributes that provide information regarding the current network that is being used by the device.
- **ias_Priority** The priority of message: an integer between 0 and 9, where 0 indicates less priority and 9 indicates more priority.
- **ias_Status** The current status of the message. The values can be:

IAS_CANCELLED_STATE	The message has been canceled.
IAS_EXPIRED_STATE	The message expired before it could be received by the intended recipient.

IAS_FINAL_STATE	The message is received or expired. Therefore, `>=IAS_FINAL_STATE` means that the message is received or expired, and `<IAS_FINAL_STATE` means that the message is neither received nor expired.
IAS_PENDING_STATE	The message has not yet been received by the intended recipient.
IAS_RECEIVED_STATE	The message was received by the intended recipient.
IAS_UNRECEIVABLE_STATE	The message has been marked as unreceivable because it is either malformed or there were too many failed attempts to deliver it.

- **ias_TransmissionStatus**   The synchronization status of the message. It can be one of:

IAS_UNTRANSMITTED	The message has not been transmitted to its intended recipient message store.
IAS_TRANSMITTED	The message has been transmitted to its intended recipient message store.
IAS_DO_NOT_TRANSMIT	The recipient and originating message stores are the same so no transmission is necessary.
IAS_TRANSMITTING	The message has been transmitted to its intended recipient, but that transmission has yet to be confirmed. There is a possibility that the message transmission was interrupted, and that QAnywhere may transmit the message again.

Example

For an example of how to create client store properties and use them in transmission rules, see "Using custom client message store property attributes" on page 719.

Message transmission rules

You can specify transmission rules on the server and on the client. See:

- "Client transmission rules" on page 740
- "Server transmission rules" on page 741

Client transmission rules

Client transmission rules govern the behavior of messages going from the client to the server. Client transmission rules are handled by the QAnywhere Agent.

By default, the QAnywhere Agent uses the automatic policy. You can change and customize this behavior by specifying a transmission rules file as the transmission policy for the QAnywhere Agent.

The following partial qaagent command line shows how to specify a rules file for the QAnywhere Agent:

```
qaagent -policy myrules.txt ...
```

For a complete description of how to write transmission rules, see “Rule syntax” on page 733.

For more information about policies, see:

- “Determining when message transmission should occur on the client” on page 46
- “-policy qaagent option” on page 686

For information about client delete rules, see “Client delete rules” on page 744.

The transmission rules file holds the following kinds of entry:

- **Rules** No more than one rule can be entered per line.

  Each rule must be entered on a single line, but you can use \ as a line continuation character.

- **Comments** Comments are indicated by a line beginning with either a **#** or **;** character. Any characters on that line are ignored.

See “Rule syntax” on page 733 and “Condition syntax” on page 734.

You can also use transmission rules files to determine when messages are to be deleted from the message stores.

See “Message delete rules” on page 743.

You can also use the Sybase Central QAnywhere 12 plug-in to create a QAnywhere Agent rules file.

Example

For example, the following client transmission rules file specifies that during business hours only small, high priority messages should be transmitted, and any message can be transmitted outside business hours. This rule is automatic, which indicates that if the condition is satisfied, the message is transmitted immediately. This example demonstrates that conditions can use information derived from the message and other information such as the current time.

```
automatic=(ias_ContentSize < 100000 AND ias_Priority > 7 ) \
 OR datepart(Weekday,ias_CurrentDate) in ( 1, 7 ) \
 OR ias_CurrentTime < datetime('8:00:00') \
 OR ias_CurrentTime > datetime('18:00:00')
```

Server transmission rules

Setting default rules

You can specify server transmission rules for a particular message store or destination alias, or you can set default rules for all clients. Every user that does not have an explicit transmission rule uses the default rule.

To set default rules, you use the special client name ianywhere.server.defaultClient.

Scheduled server transmission rules

Keep the following points in mind when specifying scheduled server transmission rules:

- Automatic rules for a given client are evaluated whenever that client synchronizes and at the automatic rule evaluation period.
- Scheduled rules for a given client are evaluated on the specified schedule.
- The evaluation of a rule causes push notifications to be sent to clients that currently have messages satisfying the rule conditions.
- Every time a client synchronizes, messages that satisfy conditions of automatic rules for that client are transmitted to the client.
- If and only if a scheduled rule has caused a push notification to be sent to a client since the last time that client synchronized, all messages satisfying the condition of the scheduled rule at the time of the next synchronization are transmitted to the client.

Specifying server transmission rules with a transmission rules file (deprecated)

You can create a server transmission rules file and specify it with the ianywhere.qa.server.transmissionRulesFile property in your QAnywhere messaging properties file.

For more information about the messaging properties file, see "-m mlsrv12 option" [*MobiLink - Server Administration*].

To specify transmission rules for a particular client, precede a section of rules with the client message store ID in square brackets.

Default server transmission rules can be created that apply to all users.

To specify default transmission rules, start a section with the following line:

```
[ianywhere.server.defaultClient]
```

For new transmission rules to take effect, you must restart the MobiLink server. This only applies to transmission rules specified in a transmission rules file. Server transmission rules specified using Sybase Central or a server management request take effect immediately.

For information about server delete rules, see "Server delete rules" on page 744.

Example

The following section of a server transmission rules file creates the default rule that only high priority messages should be sent:

```
[ianywhere.server.defaultClient]
auto = ias_Priority > 6
```

In the following sample server transmission rules file, the rules apply only to the client identified by the client message store ID sample_store_id.

```
[sample_store_id]
; This rule governs when messages are transmitted to the client
; store with id sample_store_id.
;
;    ias_Priority >= 7
;
; Messages with priority 7 or greater should always be
; transmitted.
;
;    ias_ContentSize < 100
;
; Small messages (messages less than 100 characters or
; bytes in size) should always be transmitted.
;
;    ias_CurrentTime < '8:00am' OR ias_CurrentTime > '6:00pm'
;
; Messages outside business hours should always be
; transmitted

auto = ias_Priority >= 7 OR ias_ContentSize < 100 \
    OR ias_CurrentTime < datetime('8:00:00') \
    OR ias_CurrentTime > datetime('18:00:00')
```

In the following example, the rules apply only to the client identified by the client message store ID qanywhere.

```
[qanywhere]
; This rule governs when messages are transmitted to the client
; store with id qanywhere.
;
;    tm_Subject not like '%non-business%'
;
; Messages with the property tm_Subject set to a value that
; includes the phrase 'non-business' should not be transmitted
;
;    ias_CurrentTime < '8:00:00' OR ias_CurrentTime > '18:00:00'
;
; Messages outside business hours should always be
; transmitted

auto = tm_Subject NOT LIKE '%non-business%' \
    OR ias_CurrentTime < datetime('8:00am') OR ias_CurrentTime >
datetime('6:00pm')
```

Message delete rules

Delete rules determine the persistence of messages in the client message store and the server message store.

Default behavior

A QAnywhere message expires when the expiry time has passed and the message has not been received or transmitted anywhere. After a message expires, it is deleted by the default delete rules. If a message has been received at least once, but not acknowledged, it is possible to receive it again, even if the expiry time passes.

Client delete rules

By default, messages are deleted from the client message store when the status of the message is determined to be received, expired, canceled, or undeliverable and the final state has been transmitted to the server message store. You may want messages to be deleted faster than that, or to hold on to messages longer. You do that by creating a delete section in your client transmission rules file. The delete section must be prefaced by **[system:delete]**.

For more information about acknowledgement, see:

- .NET: "AcknowledgementMode enumeration" on page 301
- C++: "AcknowledgementMode class" on page 354
- Java: "AcknowledgementMode interface" on page 467

For more information about client transmission rules, see "Client transmission rules" on page 740.

The following is an example of the delete rules section in a client transmission rules file:

```
[system:delete]

; This rule governs when messages are deleted from the client
; store.
;
;    start time '1:00:00' on ( 'Sunday' )
;
; Messages are deleted every Sunday at 1:00 A.M.
;
;    ias_Status >= ias_FinalState
;
; Typically, messages are deleted when they reach a final
; state: received, unreceivable, expired, or canceled.

START TIME '1:00:00' ON ( 'Sunday' ) = ias_Status >= ias_FinalState
```

For an explanation of ias_Status, see "Rule variables" on page 738.

Server delete rules

By default, messages are deleted from the server message store when the status of the message is determined to be received, expired, canceled, or undeliverable and the final state has been transmitted back to the message originator. You may want to keep messages longer for purposes such as auditing.

Server-side delete rules apply to all messages in the server message store.

For more information about server transmission rules, see "Server transmission rules" on page 741.

For an explanation of ias_Status, see "Rule variables" on page 738.

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