QAnywhere™

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Contents

About This Manual

Subject

This manual describes QAnywhere, which is a messaging platform for mobile and wireless clients as well as traditional desktop and laptop clients.

Audience

This manual is for users of SQL Anywhere and other relational database systems who want to add messaging to their mobile applications, or who want to build new mobile application-to-application messaging solutions.

SQL Anywhere documentation

This book is part of the SQL Anywhere documentation set. This section describes the books in the documentation set and how you can use them.

The SQL Anywhere documentation

The complete SQL Anywhere documentation is available in two forms: an online form that combines all books, and as separate PDF files for each book. Both forms of the documentation contain identical information and consist of the following books:

- **SQL Anywhere 10 - Introduction** This book introduces SQL Anywhere 10—a product that provides data management and data exchange technologies, enabling the rapid development of database-powered applications for server, desktop, mobile, and remote office environments.
- **SQL Anywhere 10 - Changes and Upgrading** This book describes new features in SQL Anywhere 10 and in previous versions of the software, as well as upgrade instructions.
- **SQL Anywhere Server - Database Administration** This book covers material related to running, managing, and configuring SQL Anywhere databases. It describes database connections, the database server, database files, backup procedures, security, high availability, and replication with Replication Server, as well as administration utilities and options.
- **SQL Anywhere Server - SQL Usage** This book describes how to design and create databases; how to import, export, and modify data; how to retrieve data; and how to build stored procedures and triggers.
- **SQL Anywhere Server - SQL Reference** This book provides a complete reference for the SQL language used by SQL Anywhere. It also describes the SQL Anywhere system views and procedures.
- **SQL Anywhere Server - Programming** This book describes how to build and deploy database applications using the C, C++, and Java programming languages, as well as Visual Studio .NET. Users of tools such as Visual Basic and PowerBuilder can use the programming interfaces provided by these tools.
- **SQL Anywhere 10 - Error Messages** This book provides a complete listing of SQL Anywhere error messages together with diagnostic information.
- **MobiLink - Getting Started** This manual introduces MobiLink, a session-based relational-database synchronization system. MobiLink technology allows two-way replication and is well suited to mobile computing environments.
- **MobiLink - Server Administration** This manual describes how to set up and administer MobiLink server-side utilities and functionality.
- **MobiLink - Client Administration** This manual describes how to set up, configure, and synchronize MobiLink clients. MobiLink clients can be SQL Anywhere or UltraLite databases.
- **MobiLink - Server-Initiated Synchronization** This manual describes MobiLink server-initiated synchronization, a feature of MobiLink that allows you to initiate synchronization or other remote actions from the consolidated database.

- **QAnywhere** This manual describes QAnywhere, which is a messaging platform for mobile and wireless clients as well as traditional desktop and laptop clients.
- **SQL Remote** This book describes the SQL Remote data replication system for mobile computing, which enables sharing of data between a SQL Anywhere consolidated database and many SQL Anywhere remote databases using an indirect link such as email or file transfer.
- **SQL Anywhere 10 - Context-Sensitive Help** This manual contains the context-sensitive help for the Connect dialog, the Query Editor, the MobiLink Monitor, MobiLink Model mode, the SQL Anywhere Console utility, the Index Consultant, and Interactive SQL.
- **UltraLite - Database Management and Reference** This manual introduces the UltraLite database system for small devices.
- **UltraLite - AppForge Programming** This manual describes UltraLite for AppForge. With UltraLite for AppForge you can develop and deploy database applications to handheld, mobile, or embedded devices, running Palm OS, Symbian OS, or Windows CE.
- **UltraLite - .NET Programming** This manual describes UltraLite.NET. With UltraLite.NET you can develop and deploy database applications to computers, or handheld, mobile, or embedded devices.
- **UltraLite - M-Business Anywhere Programming** This manual describes UltraLite for M-Business Anywhere. With UltraLite for M-Business Anywhere you can develop and deploy web-based database applications to handheld, mobile, or embedded devices, running Palm OS, Windows CE, or Windows XP.
- **UltraLite - C and C++ Programming** This manual describes UltraLite C and C++ programming interfaces. With UltraLite, you can develop and deploy database applications to handheld, mobile, or embedded devices.

Documentation formats

SQL Anywhere provides documentation in the following formats:

- **Online documentation** The online documentation contains the complete SQL Anywhere documentation, including the books and the context-sensitive help for SQL Anywhere tools. The online documentation is updated with each maintenance release of the product, and is the most complete and up-to-date source of documentation.

  To access the online documentation on Windows operating systems, choose Start ► Programs ► SQL Anywhere 10 ► Online Books. You can navigate the online documentation using the HTML Help table of contents, index, and search facility in the left pane, as well as using the links and menus in the right pane.

  To access the online documentation on Unix operating systems, see the HTML documentation under your SQL Anywhere installation or on your installation CD.

- **PDF files** The complete set of SQL Anywhere books is provided as a set of Adobe Portable Document Format (pdf) files, viewable with Adobe Reader.

On Windows, the PDF books are accessible from the online documentation via the PDF link at the top of each page, or from the Windows Start menu (Start ► Programs ► SQL Anywhere 10 ► Online Books - PDF Format).

On Unix, the PDF books are available on your installation CD.

Documentation conventions

This section lists the typographic and graphical conventions used in this documentation.

Syntax conventions

The following conventions are used in the SQL syntax descriptions:

- **Keywords** All SQL keywords appear in uppercase, like the words ALTER TABLE in the following example:

  ALTER TABLE [*owner*.]*table-name*

- **Placeholders** Items that must be replaced with appropriate identifiers or expressions are shown like the words *owner* and *table-name* in the following example:

  ALTER TABLE [*owner*.]*table-name*

- **Repeating items** Lists of repeating items are shown with an element of the list followed by an ellipsis (three dots), like *column-constraint* in the following example:

  ADD *column-definition* [*column-constraint*, …]

  One or more list elements are allowed. In this example, if more than one is specified, they must be separated by commas.

- **Optional portions** Optional portions of a statement are enclosed by square brackets.

  RELEASE SAVEPOINT [*savepoint-name*]

  These square brackets indicate that the *savepoint-name* is optional. The square brackets should not be typed.

- **Options** When none or only one of a list of items can be chosen, vertical bars separate the items and the list is enclosed in square brackets.

  [**ASC** | **DESC**]

  For example, you can choose one of ASC, DESC, or neither. The square brackets should not be typed.

- **Alternatives** When precisely one of the options must be chosen, the alternatives are enclosed in curly braces and a bar is used to separate the options.

  [**QUOTES** { **ON** | **OFF** }]

  If the QUOTES option is used, one of ON or OFF must be provided. The brackets and braces should not be typed.

Operating system conventions

- **Windows** The Microsoft Windows family of operating systems for desktop and laptop computers. The Windows family includes Windows Vista and Windows XP.

- **Windows CE** Platforms built from the Microsoft Windows CE modular operating system, including the Windows Mobile and Windows Embedded CE platforms.

  Windows Mobile is built on Windows CE. It provides a Windows user interface and additional functionality, such as small versions of applications like Word and Excel. Windows Mobile is most commonly seen on mobile devices.

  Limitations or variations in SQL Anywhere are commonly based on the underlying operating system (Windows CE), and seldom on the particular variant used (Windows Mobile).

- **Unix** Unless specified, Unix refers to both Linux and Unix platforms.

File name conventions

The documentation generally adopts Windows conventions when describing operating system dependent tasks and features such as paths and file names. In most cases, there is a simple transformation to the syntax used on other operating systems.

- **Directories and path names** The documentation typically lists directory paths using Windows conventions, including colons for drives and backslashes as a directory separator. For example,

  ```
  MobiLink\redirector
  ```

  On Unix, Linux, and Mac OS X, you should use forward slashes instead. For example,

  ```
  MobiLink/redirector
  ```

  If SQL Anywhere is used in a multi-platform environment you must be aware of path name differences between platforms.

- **Executable files** The documentation shows executable file names using Windows conventions, with the suffix *.exe*. On Unix, Linux, and Mac OS X, executable file names have no suffix. On NetWare, executable file names use the suffix *.nlm*.

  For example, on Windows, the network database server is *dbsrv10.exe*. On Unix, Linux, and Mac OS X, it is *dbsrv10*. On NetWare, it is *dbsrv10.nlm*.

- **install-dir** The installation process allows you to choose where to install SQL Anywhere, and the documentation refers to this location using the convention *install-dir*.

  After installation is complete, the environment variable SQLANY10 specifies the location of the installation directory containing the SQL Anywhere components (*install-dir*). SQLANYSH10 specifies the location of the directory containing components shared by SQL Anywhere with other Sybase applications.

  For more information on the default location of *install-dir*, by operating system, see "SQLANY10 environment variable" [*SQL Anywhere Server - Database Administration*].

- **samples-dir** The installation process allows you to choose where to install the samples that are included with SQL Anywhere, and the documentation refers to this location using the convention *samples-dir*.

After installation is complete, the environment variable SQLANYSAMP10 specifies the location of the directory containing the samples (*samples-dir*). From the Windows Start menu, choosing Programs ► SQL Anywhere 10 ► Sample Applications and Projects opens a Windows Explorer window in this directory.

For more information on the default location of *samples-dir*, by operating system, see "Samples directory" [*SQL Anywhere Server - Database Administration*].

- **Environment variables** The documentation refers to setting environment variables. On Windows, environment variables are referred to using the syntax *%envvar%*. On Unix, Linux, and Mac OS X, environment variables are referred to using the syntax *$envvar* or *${envvar}*.

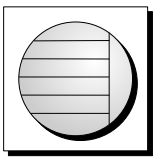
  Unix, Linux, and Mac OS X environment variables are stored in shell and login startup files, such as *.cshrc* or *.tcshrc*.

Graphic icons

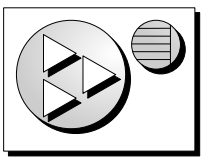
The following icons are used in this documentation.

- A client application.

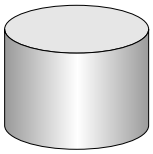
- A database server, such as SQL Anywhere.



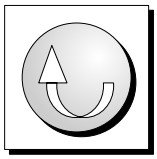
- An UltraLite application.



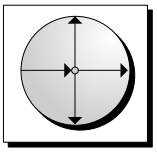
- A database. In some high-level diagrams, the icon may be used to represent both the database and the database server that manages it.



- Replication or synchronization middleware. These assist in sharing data among databases. Examples are the MobiLink server and the SQL Remote Message Agent.



- A Sybase Replication Server



- A programming interface.

Finding out more and providing feedback

Finding out more

Additional information and resources, including a code exchange, are available at the iAnywhere Developer Network at http://www.ianywhere.com/developer/.

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 detailed information about your problem, including the build number of your version of SQL Anywhere. You can find this information by entering **dbeng10 -v** at a command prompt.

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

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

Feedback

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

You can email comments and suggestions to the SQL Anywhere documentation team at iasdoc@ianywhere.com. Although we do not reply to emails sent to that address, we read all suggestions with interest.

In addition, you can provide feedback on the documentation and the software through the newsgroups listed above.

Part I. Creating QAnywhere Applications

This part shows you how to set up QAnywhere and write client applications.

CHAPTER 1

Introducing QAnywhere

Contents

QAnywhere application-to-application messaging

QAnywhere is a comprehensive application-to-application messaging system for mobile users. It provides the infrastructure for you to write applications that exchange messages with remote applications located on a variety of devices running on Windows or Windows CE operating systems.

Application-to-application messaging permits communication between custom programs running on mobile or wireless devices and a centrally located server application. QAnywhere messaging is a useful in a variety of situations:

- It provides messaging between mobile devices and between mobile devices and the enterprise.
- It provides communication in occasionally-connected environments.

  The store-and-forward nature of 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.
- It provides network-independent communication.

  QAnywhere messages can be transported over TCP/IP, HTTP, or HTTPS protocols. They can also be delivered from a Windows CE handheld device by ActiveSync. The message itself is independent of the network protocol, and can be received by an application that communicates over a different network.

QAnywhere handles the challenges of wireless networks, such as slow speed, spotty geographic coverage, and dropped network connections. It 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, messages are transmitted during off-peak hours.

QAnywhere compresses and, optionally, encrypts data sent between mobile applications and enterprise servers. Furthermore, it implements a store-and-forward messaging paradigm that guarantees message delivery.

QAnywhere is designed for messaging solutions on a variety of handheld devices. This system provides a QAnywhere 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 J2EE applications.

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 CE 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, messages 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 in case 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 facilitate 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:

- **Simple 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 7.

- **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 9.

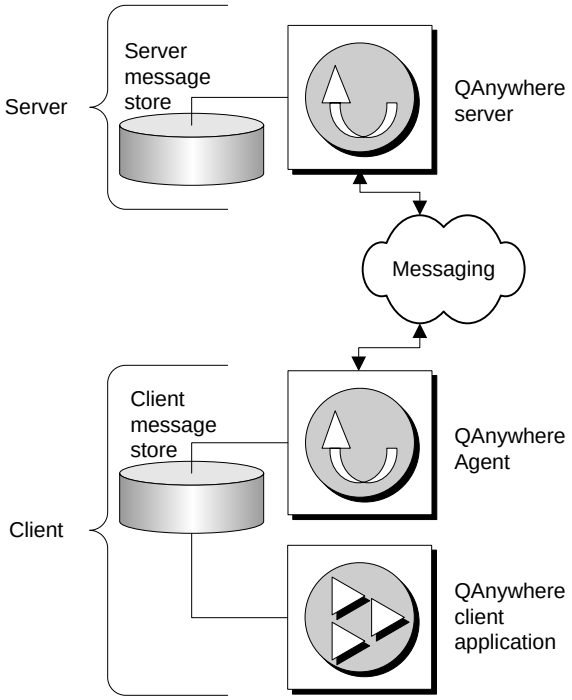
- **Messaging with external messaging systems** For exchanging messages among QAnywhere clients over an external system that supplies a JMS provider, such as BEA WebLogic or Sybase EAServer.

  See "Scenario for messaging with external messaging systems" on page 11.

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

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 (SQL Anywhere, Adaptive Server Enterprise, Microsoft SQL Server, DB2, or Oracle).
- **Client message store** The messages at each client are also stored in a relational database. This SQL Anywhere database is used exclusively for QAnywhere messaging.
- **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 the QAnywhere server" 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 "Running the QAnywhere Agent" on page 34.
- **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 47.

Messages are sent and received by QAnywhere clients. Messages at the server will not be picked up until the client initiates a message transmission. QAnywhere clients use **policies** to determine when to carry out 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.

See "Determining when message transmission should occur on the client" on page 36.

Scenario for messaging with push notifications

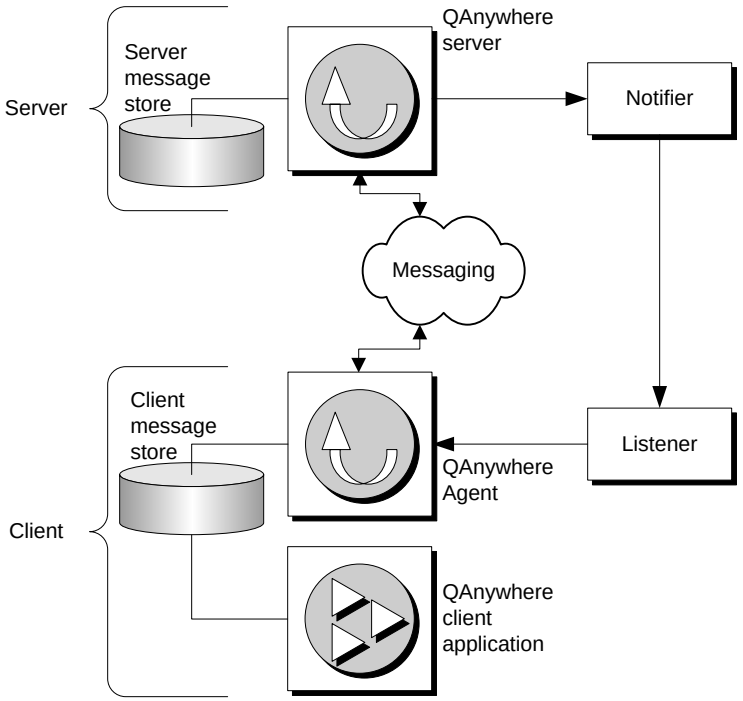
A push notification is a special message delivered from the server to a QAnywhere client. The push notification occurs when a message arrives at the server message store. The messaging server automatically notifies the recipient client Listener of the push request. The client initiates message transmission 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 36.

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 7. The following diagram shows this architecture:



The following components are added to the "Simple messaging scenario" on page 7 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 36.

See also

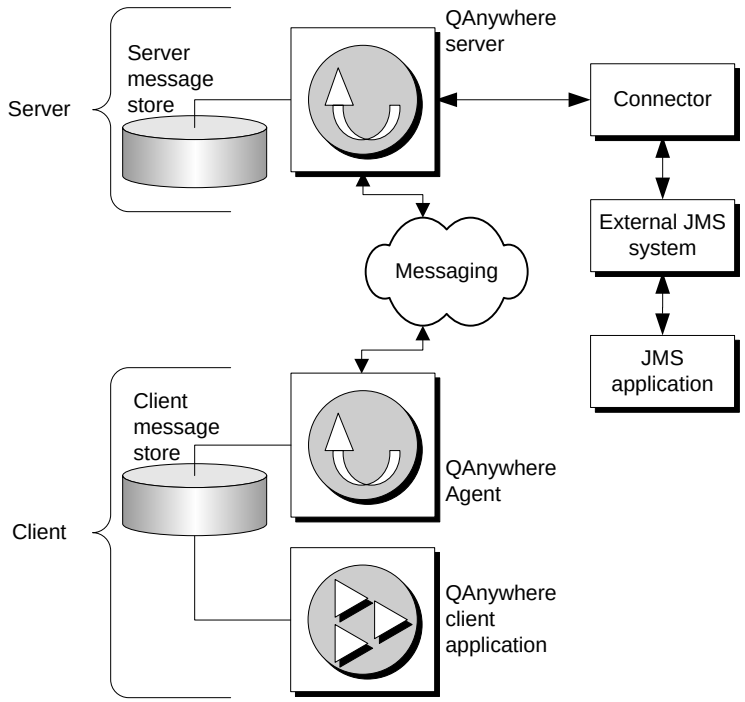
- "Using push notifications" on page 40
- "Receiving messages asynchronously" on page 77
- "Introducing Server-Initiated Synchronization" [*MobiLink - Server-Initiated Synchronization*]

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 7. The following diagram shows this architecture:



The component that is added to "Simple messaging scenario" on page 7 in order 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

- "JMS Connectors" on page 127
- "Tutorial: Using JMS connectors" on page 142

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 will be delivered unless one of the following occurs:

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

A message will not be delivered more than once. If an application successfully acknowledges or commits the receipt of a message, then the same message will not be 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 will be delivered twice.

QAnywhere plug-in

The Sybase Central QAnywhere 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 plug-in

1. Start Sybase Central:

   Choose Start ► Programs ► SQL Anywhere 10 ► Sybase Central.
2. From Connections, choose Connect with QAnywhere 10.
3. Specify an ODBC data source name or file, and a 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 server message store or use an existing MobiLink consolidated database.

   See "Setting up the server message store" on page 28.

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

   See "Starting the QAnywhere server" on page 29.

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

   See "Setting up the client message store" on page 32.

4. For each client, write a messaging application.

   See "Writing QAnywhere Client Applications" on page 47.

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

   See "JMS Connectors" on page 127.

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

   See "Running the QAnywhere Agent" on page 34.

For information about setting up mobile web services, see "Mobile Web Services" on page 183.

Other resources for getting started

- "Tutorial: Exploring TestMessage" on page 15
- "Tutorial: Using JMS connectors" on page 142
- Sample applications are installed to *samples-dir\QAnywhere*. (For information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database Administration*].)

CHAPTER 2

Tutorial: Exploring TestMessage

Contents

About the tutorial

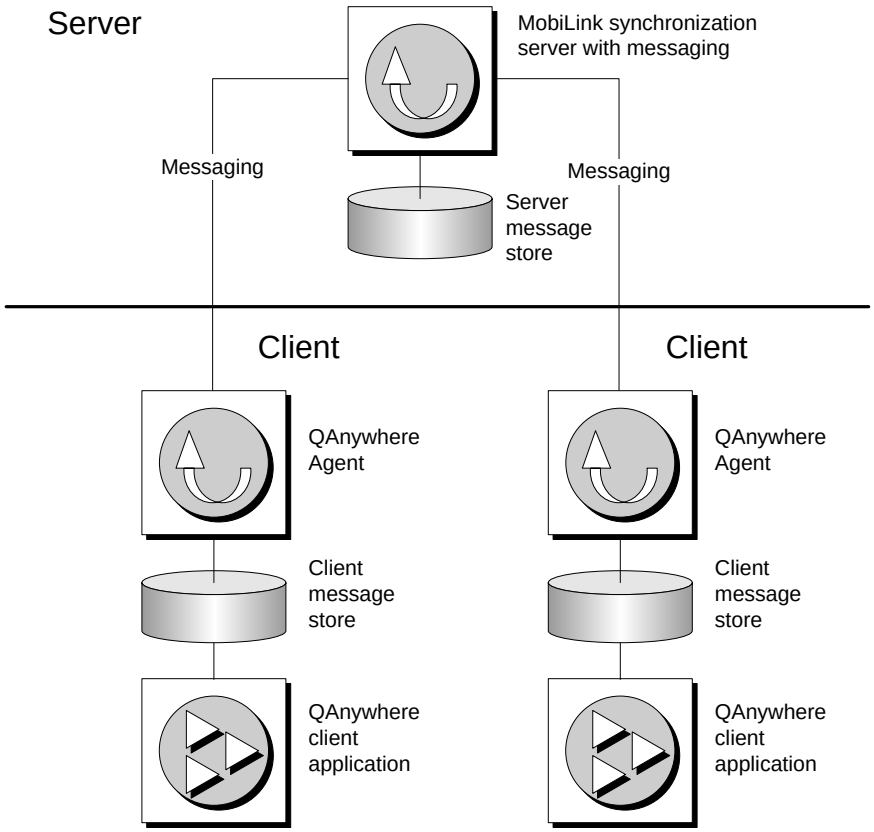
TestMessage is a sample QAnywhere client application. This application demonstrates how you can use QAnywhere to create your own messaging client applications. TestMessage provides a single client-to-client interface to send, receive, and display messages. Being human-readable, text messages provide 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 CE devices. Source code is provided for Windows CE for C++, Visual Basic .NET, 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 carried out 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 carry out actions at the server.

Activity

The MobiLink server can be started with messaging by supplying the -m option, as well as 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 plug-in to Sybase Central.

♦ Start the messaging server

1. From the Windows Start menu, choose Programs ► SQL Anywhere 10 ► MobiLink ► MobiLink with Messaging Sample.

   Alternatively, at a command prompt, navigate to *samples-dir\QAnywhere\server* and type the following command:

   ```
   mlsrv10 -m -c "dsn=QAnywhere 10 Demo" -vcrs -zu+
   ```

   This command line uses the following mlsrv10 options:

Option	Description
-m	The -m option enables messaging. See "-m option" [*MobiLink - Server Administration*].
-c	The -c option specifies the connection string to the server message store, in this case using the QAnywhere 10.0 Demo ODBC data source. See "-c option" [*MobiLink - Server Administration*].
-vcrs	The -vcrs option provides verbose logging of server activities, which is useful during development. See "-v 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 option" [*MobiLink - Server Administration*].

2. Move the MobiLink server window to the center of your screen, which represents the server in this tutorial.

Once the MobiLink server is started, you can move on to the next lesson.

Further reading

- "Starting the QAnywhere server" on page 29
- "-m option" [*MobiLink - Server Administration*]
- "Quick start to QAnywhere" on page 14
- "Simple messaging scenario" on page 7

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 carrying out 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 will 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 10 ► QAnywhere ► Agent for Client1 Sample.

   This starts an instance of the QAnywhere Agent. This 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, which represents the first client in this tutorial.

3. From the Start menu, choose Programs ► SQL Anywhere 10 ► QAnywhere ► Agent for Client2 Sample.

   This starts another instance of the QAnywhere Agent. This Agent 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, which represents the second client in this tutorial.

5. Each of the QAnywhere Agent windows displays a client message store ID, called client1 and client2.

♦ To start TestMessage

1. From the Windows Start menu, choose Programs ► SQL Anywhere 10 ► QAnywhere ► TestMessage for Client1 Sample.

   The TestMessage window is displayed. The application is connected to the first TestMessage client message store that you started in the above procedure.

2. Move the TestMessage window to the right side of your screen, together with the first QAnywhere Agent. Both these components belong on the first client.

3. Check the message queue.

From the TestMessage - client 1 Tools menu, choose Options. You will see that the queue name **testmessage** is specified. This is the queue that the TestMessage application is listening on for incoming messages. Do not change this name.

4. From the Windows Start menu, choose Programs ▶ SQL Anywhere 10 ▶ QAnywhere ▶ TestMessage for Client2 Sample.

   The TestMessage window is displayed. The application is connected to the second TestMessage client message store that you started in the above procedure.

5. Move the TestMessage window to the left side of your screen, together with the second QAnywhere Agent. Both these components belong on the second client.

6. Check the message queue.

   From the TestMessage - client 2 Tools menu, choose Options. You will see that the queue name **testmessage** is specified. This is the queue that the TestMessage application is listening on for incoming messages. Do not change this name.

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.
- **ondemand** 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.

Further reading

- "Running the QAnywhere Agent" on page 34
- "Determining when message transmission should occur on the client" on page 36
- "qaagent syntax" on page 146
- "QAnywhere Transmission and Delete Rules" on page 227
- "Writing QAnywhere Client Applications" on page 47
- 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

The TestMessage sample includes two client message stores, which you started in Lesson 1. In this lesson you will send a message from the TestMessage client1 application to the TestMessage client2 application.

Activity

- **To send a message from TestMessage**

1. From the TestMessage - client1 Message menu, choose New. The New Message window appears.
2. In the Destination ID field, enter client2. (Leave testmessage in the Destination Queue field.)
3. Fill out the Subject and Message fields with sample text, and click Send.

   When testing messaging, it is often useful to use the current time as a subject line to make it easy to track individual messages.

   An Alert appears.
4. Read the message.

   Switch to the TestMessage client2 window. Select the message to display its contents in the bottom pane of the window.

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.

Further reading

- “QAnywhere message addresses” on page 52
- “Sending QAnywhere messages” on page 67
- “Message delete rules” on page 240

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 good deal 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 the *samples-dir\QAnywhere*.

Several versions of the TestMessage source code are provided. The following versions are provided for Windows 2000 and Windows XP:

- A C++ version built using the Microsoft Foundation Classes is provided as *Samples\QAnywhere\Desktop\MFC\TestMessage\TestMessage.sln*.
- A Visual Basic .NET version built on the .NET Framework is provided as *Samples\QAnywhere\Desktop\.NET\VB\TestMessage\TestMessage.sln*.
- A C# version built on the .NET Framework is provided as *Samples\QAnywhere\Desktop\.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\PocketPC\.NET\CS\TestMessage\TestMessage.sln*.

Required software

Visual Studio .NET 2003 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 .NET. For example, *Samples\QAnywhere\Desktop\.NET\CS\TestMessage\TestMessage.sln* is a solution file. There are several solution files for different environments.

2. Ensure the 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 the 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 locations for this file are (relative to your SQL Anywhere installation directory):

   - .NET Framework 1.1: *\Assembly\v1*
   - .NET Framework 2.0: *\Assembly\v2*
   - .NET Compact Framework 1.0: *ce\Assembly\v1*
   - .NET Compact Framework 2.0: *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( null );
     ```

     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.

```
_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 9. 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 dialog.

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 carried out in the *MessageList* file.

8. From the Solution Explorer, open the *NewMessage* file.

9. Inspect the sendMessage() method.

   This method takes the information entered in the New Message dialog 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 );
   ```

Further reading

- "QAnywhere C++ API Reference" on page 399
- "iAnywhere.QAnywhere.Client namespace (.NET 1.0)" on page 246
- "Writing QAnywhere Client Applications" on page 47
- 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.

CHAPTER 3

Setting Up QAnywhere Messaging

Contents

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 28.

2. Start mlsrv10 with the -m option and a connection to the server message store.

   See "Starting the QAnywhere server" 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 plug-in task pane, choose Work With a Server Message Store.

Setting up the server message store

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 so can be any RDBMS that MobiLink supports (SQL Anywhere, Adaptive Server Enterprise, Microsoft SQL Server, Oracle, or DB2). You can create a new database for this purpose, or use an existing database.

To set up a database to use as a MobiLink consolidated database (and hence a server message store), you run a setup script. 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 on upgrading your database, see "Upgrading to SQL Anywhere 10" [*SQL Anywhere 10 - Changes and Upgrading*].

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

Example

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

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

Run the MobiLink setup script on the database:

```
%SQLANY10%\MobiLink\setup\syncsa.sql
```

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

Starting the QAnywhere server

QAnywhere uses MobiLink synchronization to transport messages. The QAnywhere server is a MobiLink server with messaging enabled.

To run the QAnywhere server, start the MobiLink server (mlsrv10) with the following options:

- **-c *connection-string*** Specifies the connection string to connect to the server message store. This is a required mlsrv10 option.

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

- **-m** Enables QAnywhere messaging.

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

You can also use other MobiLink server options to customize your operations. For more information, see "mlsrv10 syntax" [*MobiLink - Server Administration*].

Notes

- 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 (called *qanyserv.db*), navigate to *samples-dir\QAnywhere\server* and type the following at a command prompt:

```
mlsrv10 -m -c "dsn=QAnywhere 10 Demo"
```

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 MobiLink Admin mode in Sybase Central.
- Specify the -zu+ option with mlsrv10. 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 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 option" on page 153.

Setting properties for clients on the QAnywhere server

As a convenience, you can use the QAnywhere 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 will be downloaded.

♦ To add a client user name using Sybase Central

1. Start Sybase Central:
   - Choose Start ► Programs ► SQL Anywhere 10 ► Sybase Central.
   - From Connections, choose Connect with QAnywhere 10.
   - Specify an ODBC data source name or file, and a 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 10 ► 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.

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 32.

2. Write client applications.

   See "Writing QAnywhere Client Applications" on page 47.

3. Start the QAnywhere Agent.

   See "Running the QAnywhere Agent" on page 34.

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

Setting up the client message store

The client message store is a SQL Anywhere database on the remote device. The application connects to this message store using the QAnywhere API.

The client message store must be used exclusively for QAnywhere applications. 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 178.

♦ **To create a client message store**

1. Create a SQL Anywhere database.

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

2. Initialize each client message store by running the QAnywhere Agent (qaagent) with the following options:

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

   See "-c option" on page 149.

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

See "-si option" on page 171.

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

  See "Creating client message store IDs" on page 33 and "-id option" on page 153.

- **-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 will be 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 mlsrv10 -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 178.

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

See "-su option" on page 172 and "-sur option" on page 173.

Note
The easiest way to create and maintain your client message store is in Sybase Central. From the QAnywhere plug-in task pane, choose Work With a 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" on page 145.

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

dbsrv10 -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" on page 145.

Running 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.

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 dialog, this is the information on the Message Store tab.

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

  See "-c option" on page 149.

- **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 dialog, this is specified on the General tab.

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

  See "-id option" on page 153.

- **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 dialog, this is the server information on the Server tab.

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

  See "-x option" on page 175.

For a complete list of all QAnywhere Agent options, see "qaagent syntax" on page 146.

Starting qaagent on Windows CE

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

See "-qi option" on page 170.

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 option" on page 153.

Stopping QAnywhere Agent

To stop the QAnywhere Agent, click Shutdown on the console.

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

See "-qi option" on page 170.

Processes started by 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 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 option" on page 167.

- **database server** The client message store is a SQL Anywhere database. QAnywhere Agent requires the SQL Anywhere database server to run the database. For Windows CE, the database server is *dbsrv10.exe*. For Windows, the database server is the personal database server *dbeng10.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 option" on page 149.

Deploying QAnywhere Agent

For deployment information, see "Deploying QAnywhere applications" on page 90.

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 are three pre-defined policies: scheduled, automatic, and ondemand, as well as a custom policy.

You can specify policies in two ways:

- Using the QAnywhere plug-in in Sybase Central, choose the task Create an Agent Configuration File. Policies are specified on the General tab of the command file Properties dialog.

  To specify custom properties, you must also choose the task Create an Agent Rule File. This task creates a file with a *.qar* extension; this extension is a Sybase Central convention.

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

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 dialog 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 246
- C++: "AcknowledgementMode class" on page 400
- Java: "Interface AcknowledgementMode" on page 506

- 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 319
- C++: "triggerSendReceive function" on page 463
- Java: "triggerSendReceive method" on page 572
- SQL: "ml_qa_triggersendreceive" on page 682

Automatic policy

The automatic policy attempts to keep the client and server message stores as up-to-date as possible.

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 304
  - C++: "putMessage function" on page 456
  - Java: "putMessage method" on page 562
  - SQL: "ml_qa_putmessage" on page 681
- A message status changes has occurred. This typically occurs when a received message is acknowledged by the application. See:
  - .NET: "AcknowledgementMode enumeration" on page 246
  - C++: "AcknowledgementMode class" on page 400
  - Java: "Interface AcknowledgementMode" on page 506
  - SQL: all messaging using the SQL API is transactional
- A Push Notification is received.

  See "Using push notifications" on page 40.
- A Network Status Change Notification is received.

  See "Notifications of push notification" on page 55.
- TriggerSendReceive() is called. See:

- .NET: "TriggerSendReceive method" on page 319
- C++: "triggerSendReceive function" on page 463
- Java: "triggerSendReceive method" on page 572
- SQL: "ml_qa_triggersendreceive" on page 682

Ondemand policy

The ondemand 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 319
- C++: "triggerSendReceive function" on page 463
- Java: "triggerSendReceive method" on page 572
- SQL: "ml_qa_triggersendreceive" on page 682

For more information about handling push notifications and network status changes, see "System queue" on page 53.

Custom policy

A custom policy allows you to define when message transmission occurs and which messages to send in the message transmission. 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 228.

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 304
  - C++: "putMessage function" on page 456
  - Java: "putMessage method" on page 562
  - SQL: "ml_qa_putmessage" on page 681
- A message status change has occurred. This typically occurs when a message is acknowledged by the application. See:
  - .NET: "AcknowledgementMode enumeration" on page 246
  - C++: "AcknowledgementMode class" on page 400
  - Java: "Interface AcknowledgementMode" on page 506
  - SQL: all messaging using the SQL API is transactional

- A Push Notification is received.

  See “Using push notifications” on page 40.

- A Network Status Change Notification is received.
- TriggerSendReceive ( ) is called. See:

  - .NET: “TriggerSendReceive method” on page 319
  - C++: “triggerSendReceive function” on page 463
  - Java: “triggerSendReceive method” on page 572
  - SQL: “ml_qa_triggersendreceive” on page 682

See also

- “Message transmission rules” on page 236
- “-policy option” on page 165

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 ondemand 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 55.

For more information about QAnywhere Agent policies, see "Determining when message transmission should occur on the client" on page 36.

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 will not work with ActiveSync.

See also

- "Scenario for messaging with push notifications" on page 9
- "Notifications of push notification" on page 55
- "-push option" on page 167

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 preconfigured 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 41

- "Configuring the Listener" on page 42
- "Configuring QAnywhere gateways" on page 43

You can disable push notifications and so not use Notifiers or Listeners. See "-push option" on page 167.

For information about the client's response to a push notification, see "Determining when message transmission should occur on the client" on page 36.

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 Notification Properties" [*MobiLink - Server-Initiated Synchronization*], with the following exceptions:

- The gui property is set to off, meaning that the Notifier dialog is not displayed on the computer where the Notifier is running.
- The enable property is set to no, meaning that you have to run mlsrv10 with the -m option to start the Notifier.
- The poll_every property is set to 5, which means that the Notifier will poll 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 "poll_every property" [*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 will be resent for 3 hours by default. In most cases, these defaults are 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 "Creating the push request table" [*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 property" [*MobiLink - Server-Initiated Synchronization*].

See also

- "Configuring Notifiers" [*MobiLink - Server-Initiated Synchronization*]
- "MobiLink Notification Properties" [*MobiLink - Server-Initiated Synchronization*]
- "Notifiers" [*MobiLink - Server-Initiated Synchronization*]
- "ml_add_property" [*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 preconfigured to work with QAnywhere. In some rare circumstances, you may want to change the default behavior.

For example, if you change the gateway used by QAnywhere to be an SMS gateway, you need to manually start the Listener with different options. Assume that your QAnywhere message store ID is mystore, your MobiLink host is *acme.com*, and you want to start the Listener with the SMS library *maac555.dll* for listening for SMS messages on an AirCard 555. You would then need to start the Listener with the following command:

```
dblsn.exe -u ias_mystore_lsn -e mystore -t+ mystore
  -x "tcpip(host=acme.com)" -pc- -d lsn_udp.dll -a "port=5001" -d
maac555.dll
  -i 60
```

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;eng=mystore;dbn=mystore" -id mystore
  -lp 5001-x tcpip(host=acme.com)
```

See also

- "Listeners" [*MobiLink - Server-Initiated Synchronization*]
- "Listener syntax" [*MobiLink - Server-Initiated Synchronization*]
- "Configuring QAnywhere gateways" on page 43

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. In most cases, the default device tracker gateway is the best way to send push notifications. However, you can also choose to use an SMS or UDP gateway.

To configure a gateway, see "Gateway properties" [*MobiLink - Server-Initiated Synchronization*] and "Setting 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 42.

To use a UDP gateway, you need to set the -push disconnected option of qaagent. See "-push option" on page 167.

See also

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

Setting up a failover mechanism

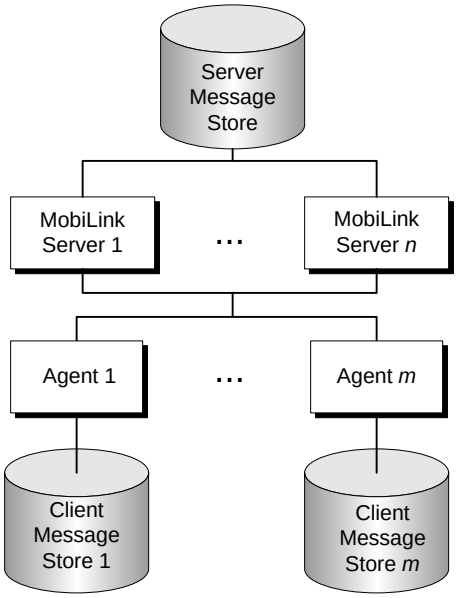
QAnywhere applications can be set up with a failover mechanism so that alternate MobiLink servers can be used if one fails. In order to support failover, each QAnywhere Agent must be started with a list of MobiLink servers. The first MobiLink server specified in the list is the primary server. The remaining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

For example, running the following command on the remote device will start 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 machine 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 option" on page 175
- "-fd option" on page 151
- "-fr option" on page 152
- "Running the QAnywhere Agent" on page 34

CHAPTER 4

Writing QAnywhere Client Applications

Contents

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 .NET 2003 and 2005.

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 22.

See "iAnywhere.QAnywhere.Client namespace (.NET 1.0)" on page 246.

QAnywhere C++ API

The QAnywhere C++ API supports Microsoft Visual C++ 6.0, Microsoft Visual Studio .NET 2003, Microsoft eMbedded Visual C++ 3.0, Microsoft eMbedded Visual C++ 4.0, and Visual Studio 2005.

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

- A set of header files (the main one being *qa.hpp*) located in the *QAnywhere\h* subdirectory of your SQL Anywhere installation.

- An import library (*qany10.lib*) located in the *ce\arm.30\lib*, *ce\arm.50\lib*, *QAnywhere\lib*, and *ce\x86.30\lib* subdirectories of your SQL Anywhere installation.
- A run-time DLL (*qany10.dll*) located in the *win32*, *ce\arm.30*, *ce\arm.50\lib*, and *ce\x86.30* subdirectories of your SQL Anywhere installation.

Your source code file must include the header file in order to access the API. 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*. (For information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database Administration*].)

See "QAnywhere C++ API Reference" on page 399.

QAnywhere Java API

The QAnywhere Java API supports JRE 1.4.2 and 1.5.0.

The QAnywhere Java API consists of the following files:

- API reference material, available in this book or in Javadoc format in the *docs\en\javadocs\QAnywhere* subdirectory of your SQL Anywhere 10 installation.
- Runtime DLLs (*qany10jni.dll and qany10.dll*), located in the *win32* subdirectory of your SQL Anywhere 10 installation.
- An archive of the class files (*qaclient.jar*), located in the *java* subdirectory of your SQL Anywhere 10 installation.

The class file archive must be included in your path when you compile your application. The run-time DLLs 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" on page 505.

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 645.

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 11

- "Introduction to JMS connectors" on page 128
- "Tutorial: Using JMS connectors" on page 142

Mobile web services connector

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

See "Mobile Web Services" on page 183.

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 56
   - "Setting up C++ applications" on page 58
   - "Setting up Java applications" on page 60
   - "Setting up SQL applications" on page 61

2. Set QAnywhere manager configuration properties. See "QAnywhere manager configuration properties" on page 64.

3. Write application code and compile. See:

   - "Message headers and message properties" on page 208
   - "Client message store properties" on page 217
   - "Sending QAnywhere messages" on page 67
   - "Receiving QAnywhere messages" on page 76
   - "Reading very large messages" on page 81
   - "Implementing transactional messaging" on page 69
   - "Shutting down QAnywhere" on page 89

4. Deploy the application to the target device.

   See "Deploying QAnywhere applications" on page 90.

Other resources for getting started

- "Tutorial: Exploring TestMessage" on page 15
- Sample applications are installed to *samples-dir**QAnywhere*. (For information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database Administration*].)

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 32.

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 53.

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 "JMS connector properties" on page 132.

- 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:

- "Addressing QAnywhere messages meant for JMS" on page 137
- "Addressing JMS messages meant for QAnywhere" on page 139
- "JMS Connectors" on page 127

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 using server management requests" on page 116.

- Sybase Central

  See "Creating destination aliases using Sybase Central" on page 53.

Creating destination aliases 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 10 ► Sybase Central.
   - Choose Connections ► Connect to QAnywhere 10.
   - Specify an ODBC data source name or 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.

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 54
- "Notifications of push notification" on page 55

Example

The following C# code processes system and normal messages and can be useful if you are using an ondemand 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 250
  - C++: "ADAPTER variable" on page 403
  - Java: "ADAPTERS variable" on page 509

- **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 254
  - C++: "RASNAMES variable" on page 407
  - Java: "RASNAMES variable" on page 512
- **ias_NetworkStatus** Int. The state of the network connection. The value is 1 if connected, 0 otherwise. See:
  - .NET: "NETWORK_STATUS field" on page 253
  - C++: "NETWORK_STATUS variable" on page 405
  - Java: "NETWORK_STATUS variable" on page 511

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 ondemand 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 "Pre-defined message properties" on page 211
- "System queue" on page 52

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 ondemand 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 9
- "Using push notifications" on page 40
- "System queue" on page 52
- "Receiving messages asynchronously" on page 77
- ias_MessageType in "Pre-defined message properties" on page 211
- .NET: "MessageProperties class" on page 248
- C++: "MessageProperties class" on page 402
- Java: "Interface MessageProperties" on page 507

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 .NET 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. In order 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 .NET project

1. Start Visual Studio .NET and open your project.
2. In the Solution Explorer window, right-click the References folder and choose Add Reference from the popup menu.

   The Add Reference dialog appears.
3. On the .NET tab, click Browse to locate iAnywhere.QAnywhere.Client.dll. The default locations are (relative to your SQL Anywhere installation directory):

   - .NET Framework 1.1: *Assembly\v1*
   - .NET Framework 2.0: *Assembly\v2*
   - .NET Compact Framework 1.0: *ce\Assembly\v1*
   - .NET Compact Framework 2.0: *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 dialog and then click the .NET tab. iAnywhere.QAnywhere.Client.dll appears in the Selected Components list. Click OK to close the dialog.

Referencing the data provider classes in your source code

♦ To reference the QAnywhere .NET API classes in your code

1. Start Visual Studio .NET 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 .NET, 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-threaded QAManager" on page 63.

For more information about QAManagerFactory, see "QAManagerFactory class" on page 319.

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 as soon as 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 246.

You are now ready to send messages.

Instead of creating a QAManager, you can create a QATransactionalManager. See "Implementing transactional messaging for .NET clients" on page 69.

See also

- "iAnywhere.QAnywhere.Client namespace (.NET 1.0)" on page 246

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 465.

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 432.

> **Tip**
> For maximum concurrency benefits, multi-threaded applications should create a QAManager for each thread. See "Multi-threaded QAManager" on page 63.

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 66.

- 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 64.

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 as soon as 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 400.

Instead of creating a QAManager, you can create a QATransactionalManager. See "Implementing transactional messaging for C++ clients" on page 70.

You are now ready to send messages.

See also

- "QAnywhere C++ API Reference" on page 399

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, it is located in the *java* subdirectory of your SQL Anywhere installation.
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-threaded QAManager" on page 63.

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 as soon as 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 "Interface AcknowledgementMode" on page 506.

Instead of creating a QAManager, you can create a QATransactionalManager. See "Implementing transactional messaging for Java clients" on page 72.

You are now ready to send messages.

See also

♦ "QAnywhere Java API Reference" on page 505

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 47.

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 680.

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 645

Multi-threaded QAManager

Access to a QAManager is serialized. When you have multiple threads accessing a single QAManager, threads will block while one thread performs a method call on the QAManager. Use a different QAManager for each thread in order to maximize concurrency. Only one thread is allowed to access an instance of QAManager at one time. Other threads will 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 will be used by one Manager instance.

  See "Setting QAnywhere manager configuration properties in a file" on page 64.

- Set QAnywhere manager configuration properties programmatically.

  See "Setting QAnywhere manager configuration properties programmatically" on page 66.

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 semi-colons.

  The default is `"eng=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 177.

- **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 CE.

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 plug-in task pane, choose Create An Agent Configuration File. When you have chosen a file name and location, the Properties dialog 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 on specifying the name of the property file, see:

- .NET API: "CreateQAManager method" on page 322
- C++ API: "createQAManager function" on page 465
- Java API: "createQAManager method" on page 573
- SQL API: You cannot set properties in a file using the QAnywhere SQL API. See "Setting QAnywhere manager configuration properties programmatically" on page 66.

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 64. 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=eng=qanywhere;uid=ml_qa_user;pwd=qanywhere
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.

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 275 and "QAManagerFactory class" on page 319.

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 432 and "QAManagerFactory class" on page 465.

Following is an example using Java:


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

For the Java API, see "Class QAManagerFactory" on page 573 and "Interface QAManager" on page 539.

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 64.

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.Open( AcknowledgeMode.EXPLICIT_ACKNOWLEDGEMENT );
```

For the .NET API, see "QAManager interface" on page 275 and "QAManagerFactory class" on page 319.

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->open( AcknowledgementMode::EXPLICIT_ACKNOWLEDGEMENT );
```

For the C++ API, see "QAManager class" on page 432 and "QAManagerFactory class" on page 465.

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.open(AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT);
```

For the Java API, see "Class QAManagerFactory" on page 573 and "Interface QAManager" on page 539.

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 carries out 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 36.

♦ 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 "Message headers and message properties" on page 208.

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 304 and "Determining when message transmission should occur on the client" on page 36.

♦ 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 "Message headers and message properties" on page 208.

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 function" on page 456 and "Determining when message transmission should occur on the client" on page 36.

♦ 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 "Message headers and message properties" on page 208.

3. Put the message on the queue.

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

See "putMessage method" on page 562 and "Determining when message transmission should occur on the client" on page 36.

♦ 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 655.

4. Put the message on the queue.

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


See "ml_qa_putmessage" on page 681 and "Determining when message transmission should occur on the client" on page 36.

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 347
- C++ clients: "QATransactionalManager class" on page 495
- Java clients: "Interface QATransactionalManager" on page 602
- 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 319.

   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 347

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 495

- Java: “Interface QATransactionalManager” on page 602

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 319.

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.

Cancelling QAnywhere messages

Cancelling a QAnywhere message puts the message into a cancelled state before it is transmitted. With the default delete rules of the QAnywhere Agent, cancelled messages are eventually deleted from the message store. Cancelling 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 288.

♦ 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 function" on page 443.

♦ 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 548.

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:

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

See "GetMessageNoWait method" on page 298.

♦ 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:

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

See "getMessageNoWait function" on page 452.

♦ **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 557.

♦ **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 677
- "ml_qa_getmessagetimeout" on page 679
- "ml_qa_getmessage" on page 676

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 will be 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 248 and “SetMessageListener method” on page 310.

♦ 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 490.

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 function" on page 460.

♦ 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 "Interface QAMessageListener" on page 595 and "setMessageListener method" on page 567.

♦ 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 680.

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 230.

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 295 and "GetMessageBySelectorNoWait method" on page 296
- C++: "getMessageBySelector function" on page 450 and "getMessageBySelectorNoWait function" on page 451
- Java: "getMessageBySelector method" on page 554 and "getMessageBySelectorNoWait method" on page 554
- 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 CE. 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 261 and "ReadText method" on page 346
- C++: "readBinary function" on page 415 and "readText function" on page 493
- Java: "readBinary method" on page 520 and "readText method" on page 600
- 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 61.

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 "Pre-defined message properties" on page 211.

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 284
- C++: "browseMessages function" on page 439
- Java: "browseMessages method" on page 545
- 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 287
- C++: “browseMessagesByQueue function” on page 441
- Java: “browseMessagesByQueue method” on page 546
- 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 286
- C++: "browseMessagesByID function" on page 440
- Java: "browseMessagesByID method" on page 546
- 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 230.

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 287
- C++: "browseMessagesBySelector function" on page 441
- Java: "browseMessagesBySelector method" on page 547
- 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 will be 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 248
- "MessageListener2 delegate" on page 248
- "ExceptionListener delegate" on page 247
- "ExceptionListener2 delegate" on page 247

For more information about the log file, see "QAnywhere manager configuration properties" on page 64.

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 will 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 will attempt 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 will attempt to receive messages an unlimited number of times.

For more information, see:

- "QAException class" on page 273
- "ErrorCode property" on page 275
- "Pre-defined client message store properties" on page 217

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 426.

For more information about getLastError and getLastErrorMessage, see:

- QAManagerBase "getLastError function" on page 448 and "getLastErrorMsg function" on page 449.
- QAManagerFactory "getLastError function" on page 467 and "getLastErrorMsg function" on page 468.

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 will be 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:

- "Interface QAMessageListener" on page 595
- "Interface QAMessageListener2" on page 596
- "Class QAException" on page 532

For more information about the log file, see "QAnywhere manager configuration properties" on page 64.

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 will 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 will attempt 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 will attempt to receive messages an unlimited number of times.

For more information, see:

- "ErrorCode property" on page 275
- "Pre-defined client message store properties" on page 217

Error codes

The following table lists QAnywhere error code values:

LastError value	Description
0	No error.
1000	Initialization error.
1001	Termination error.
1002	Unable to access the client properties file.

LastError value	Description
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 cancelling message.
1019	Error cancelling 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.
1023	The given selector has a syntax error.
1024	The timestamp is outside of the acceptable range.

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 318
- C++: “stop function” on page 463
- Java: “stop method” on page 572
- SQL: the SQL API does not support shutting down QAnywhere

Deploying QAnywhere applications

See “Deploying QAnywhere applications” [*MobiLink - Server Administration*].

CHAPTER 5

Server management requests

Contents

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:

- Starting and stopping connectors and web services.

  See "Opening connectors" on page 106 and "Closing connectors" on page 106.

- Monitoring connector status.

  See "Monitoring connectors" on page 107.

- Setting and refreshing client transmission rules.

  See "Specifying transmission rules with a server management request" on page 115.

- Monitoring message status.

  See "Monitoring QAnywhere" on page 119.

- Setting, updating, deleting, and querying client message store properties on the server.

  See "Setting server properties with a server management request" on page 113.

- Cancelling messages.

  See "Cancelling messages" on page 101.

- 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 224.

For more information about addressing QAnywhere messages, see "Sending QAnywhere messages" on page 67.

For more information about the system queue, see "System queue" on page 53.

Authenticating server management requests

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 224.

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 );
```

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 **>** and **<**.

Each server management request starts with an <actions> tag.

Each type of server management request includes it own XML tags. For example, to close a connector you use the <CloseConnector> tag.

request tag

In addition, most server management requests can include a <request> tag that describes the request. Within a <request> tag, you can use the following subtags:

<request> subtags	Description
<condition>	Groups conditions for including a message in the report. Only used in the <request> tag, which is a subtag of <MessageDetailsRequest> and <CancelMessageRequest>.
<onEvent>	Specifies the events upon which the server should generate reports. Only used with <ClientStatusRequest>. 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 registers event listeners for the specified events.
<persistent>	Specifies 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). Only used with schedules.
<report>	Specifies that a report should be sent each time the request is activated. Only used in the <request> tag, which is a subtag of <CancelMessageRequest>.
<requestId>	Specifies a unique identifier for the request that is included in each report generated as a result of this request. Only used when a server management request generates a response or report. 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>	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. Only used when a server management request generates a response or report.
<schedule>	Specifies that the report should be generated on a schedule. Only used when a server management request generates a response or report. See “Scheduling server management requests” on page 98.

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 "OR"ed together, whereas if you use two different tags, the values are logically "AND"ed together.

<condition> subtags	Description
<address>	Selects the messages that are addressed to the specified address.
<customRule>	Selects messages based on rules. See "Custom message requests" on page 95.
<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 the 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.

Custom message requests

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 230.

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>
```

Server management request DTD

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 chapter.

```
<!-- Set of requests -->

<!ELEMENT actions ((CloseConnector|OpenConnector|RestartRules|SetProperty
```



```
    |ClientStatusRequest|MessageDetailsRequest|CancelMessageRequest
    |GetClientList)+)>

<!-- Request for list of all clients -->

<!ELEMENT GetClientList EMPTY>

<!-- Request to close a connector -->

<!ELEMENT CloseConnector (client)>

<!-- Request to open a connector -->

<!ELEMENT OpenConnector (client)>

<!-- Request to restart transmission rules for a client -->

<!ELEMENT RestartRules (client)>

<!-- Request for setting a property -->

<!ELEMENT SetProperty (client,prop)>

<!-- Request for client properties -->

<!ELEMENT GetProperties (client,replyAddr?)>

<!-- Request for the status on a connector -->

<!ELEMENT ClientStatusRequest (request)>

<!-- Request for clients -->

<!ELEMENT MessageDetailsRequest (request)>
<!ELEMENT CancelMessageRequest (request)>

<!ELEMENT request (requestId?,replyAddr?,schedule*,onEvent*,condition?,

persistent?,report?,messageId?,status?,priority?,address?,originator?,kind?,
    statusTime?,contentSize?,customRule?,property*)>

<!ELEMENT client (#PCDATA)>

<!ELEMENT prop (name?,value?)>

<!ELEMENT name (#PCDATA)>

<!ELEMENT value (#PCDATA)>

<!ELEMENT replyAddr (#PCDATA)>

<!ELEMENT requestId (#PCDATA)>

<!ELEMENT persistent EMPTY>

<!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 onEvent (#PCDATA)>

<!ELEMENT condition ((messageId|status|priority|address|originator|kind|
    customRule|property)+)>

<!ELEMENT messageId (#PCDATA)>
<!ELEMENT status (#PCDATA)>
<!ELEMENT transmissionStatus (#PCDATA)>
<!ELEMENT priority (#PCDATA)>
<!ELEMENT address (#PCDATA)>
<!ELEMENT originator (#PCDATA)>
<!ELEMENT kind (#PCDATA)>
<!ELEMENT statusTime (#PCDATA)>
<!ELEMENT expires (#PCDATA)>
<!ELEMENT contentSize (#PCDATA)>
<!ELEMENT customRule (#PCDATA)>
<!ELEMENT property (#PCDATA)>

<!-- Reports and response sent back by the server -->

<!-- Report returned as a response to a CancelMessageRequest -->

<!ELEMENT CancelMessageReport (requestId,UTCDatetime,statusDescription,
    messageCount,message*)>

<!-- Report returned as a response to a ClientStatusRequest -->

<!ELEMENT ClientStatusReport (requestId,componentReport)>

<!-- Report returned as a response to a MessageDetailsRequest -->

<!ELEMENT MessageDetailsReport (requestId,UTCDatetime,statusDescription,
    messageCount,message*)>

<!-- Response to a GetPropertiesRequest -->

<!ELEMENT GetPropertiesResponse (client,prop*)>

<!-- Response to a GetClientList -->

<!ELEMENT GetClientListResponse (client*)>

<!ELEMENT UTCDatetime (#PCDATA)>

<!ELEMENT statusDescription (#PCDATA)>

<!ELEMENT messageCount (#PCDATA)>

<!ELEMENT message ((messageId|status|transmissionStatus|priority|address|
originator|kind|
    statusTime|expires|contentSize|property)*)>

<!-- Report on a specific server component (such as a connector) -->

<!ELEMENT componentReport (client,UTCDatetime,statusCode,statusSubcode?,
    statusDescription?,vendorStatusCode?,vendorStatusDescription?)>
```



```
<!ELEMENT statusCode (#PCDATA)>
<!ELEMENT statusSubcode (#PCDATA)>
<!ELEMENT vendorStatusCode (#PCDATA)>
<!ELEMENT vendorStatusDescription (#PCDATA)>
```

Scheduling server management requests

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> subtags	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 starttime. 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 request generates a report every two hours starting on January 16 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 example, the following schedule runs on Mondays and Tuesdays:
	`<schedule>`
	`  <ondayofweek>Monday</ondayofweek>`
	`  <ondayofweek>Tuesday</ondayofweek>`
	`</schedule>`

<schedule> subtags	Description

<ondayofmonth>	Each tag contains one day of the month on which the schedule is active. For example, the following schedule runs on the fifteenth of the month:
	
	`<schedule>`
	`  <ondayofmonth>15</ondayofmonth>`
	`</schedule>`

<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 will report on all the messages on the server, including the ID and status of each message. It will also overwrite 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>
```

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>
```


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 "Introduction to server management requests" on page 92.

Refreshing client transmission rules

When a server-side client transmission rule is changed, the rules for the corresponding client must be refreshed. You can do this 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>
```

Cancelling 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 cancelled.

Messages can only be cancelled if they are on the server and in a non-final state when the request is activated.

<CancelMessageRequest> subtags	
<request>	Groups information about a particular request. Specifying more than one <request> tag is equivalent to sending multiple separate server managment requests.

<Request> subtags	Description
<condition>	Groups conditions for including a message to be cancelled. See "Condition tag" on page 94.
<persistent>	Specifies that the request should be made persistent in the server database (so that messages can be cancelled 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 "Scheduling server management requests" on page 98.

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</client>
            <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 cancelled 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

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 "Introduction to server management requests" on page 92.

See also

- "JMS Connectors" on page 127
- "Setting up web service connectors" on page 197

Creating and configuring connectors

To create connectors, use <OpenConnector>.

Example

In the following example, the server management request first sets a number of 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 will not be 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> with a client name but no other values.

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>
    <CloseConnector>
        <client>ianywhere.connector.jboss</client>
```



```
    </CloseConnector>
    <SetProperty>
        <prop>
          <client>ianywhere.connector.jboss</client>
      </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

- "JMS Connectors" on page 127
- "Setting up web service connectors" on page 197

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

- "JMS Connectors" on page 127
- "Setting up web service connectors" on page 197

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	
<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. In the case of a one-time request, all of the connectors are included in the report. In the case of 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. In the case of a one-time request, all of the connectors listed are included in the report. In the case of an event listener request, the server will begin 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 will produce a one-time request. Otherwise, the Client Status Request will be 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 "Scheduling server management requests" on page 98.

condition tag

To filter the request, use <condition> subtags. You can use as many of the following subtags as you want in a <condition> tag. If you use more than one of the same tag, the values are logically "OR"ed together, whereas if you use two different tags, the values are logically "AND"ed together.

<condition> subtags	Description
<messageId>	Selects the message with a particular message ID.
<status>	Selects messages that currently have the status specified.
<priority>	Selects the messages that currently have the priority specified.
<address>	Selects the messages that are addressed to the specified address.
<originator>	Selects messages that originated from the specified client.

<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.
<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>**.
<customRule>	Selects messages based on rules. See "Custom message requests" on page 95.

One-time client status requests

You create a one-time request by omitting <onEvent> 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> tag 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 will not immediately respond to the request, but instead will begin 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.

Event	When it occurs
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 will 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 will replace 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 will no longer respond 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 will be sent every half hour, as well as any time 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 will persist in the server until the server is shut down. If the connector is reopened, the stored event listeners will 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. When the connector state is changed to "running" the connector will be initialized from scratch. This state is reflected in the connector property ianywhere.connector.state=2.

For information about how to change the connector state, see “Modifying connectors” on page 105.

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 will be deleted.

For an overview of how to use server management requests, including how to authenticate and schedule them, see "Introduction to server management requests" on page 92.

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 "Introduction to server management requests" on page 92.

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 defaultClient 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>ianywhere.server.defaultClient</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>ianywhere.server.defaultClient</client>
  </RestartRules>
</actions>
```


Creating destination aliases using server management requests

You can use server management requests to create and modify destination aliases.

For more information about destination aliases, see “Destination aliases” on page 52.

For an overview of how to use server management requests, including how to authenticate and schedule them, see “Introduction to server management requests” on page 92.

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

ianywhere.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.connector.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.connector.nativeConnection	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

ianywhere.qa.member.*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 230. 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 "Introduction to server management requests" on page 92.

See also

- "QAnywhere Transmission and Delete Rules" on page 227

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 "Introduction to server management requests" on page 92.

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 94.

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 "Scheduling server management requests" on page 98.

<MessageDetailsRequest> sub-tags	**Description**
<request>	Groups information about a particular request. Specifying more than one <request> tag is equivalent to sending multiple separate server managment requests for message information. See below.

Request tag

<Request> subtags	Description
<address>	Displays the address of each message.
<condition>	Groups conditions for including a message in the report. See "Condition tag" on page 94.
<contentSize>	Requests the content size of each message.
<customRule>	See "Custom message requests" on page 95.
<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 "Scheduling server management requests" on page 98.
<status>	Requests the status of each message.
<transmissionStatus>	Requests the transmission status of each message.

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 will be included in the report. Otherwise, each message will have 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 will expire 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 208.
<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 less priority and 9 indicates more priority.
<property>	Properties of the message. See “Message properties” on page 211.
<status>	The current status of the message. The status codes are defined in “Pre-defined message properties” on page 211.
<statusTime>	The time at which the message became its current status. This is the local time.

<message> subtags	Description
<transmissionStatus>	The synchronization status of the message. It 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

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 as soon as 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>
```


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 "Introduction to server management requests" on page 92.

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 "Introduction to server management requests" on page 92.

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>
```


CHAPTER 6

JMS Connectors

Contents

Introduction to 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 application, 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 11.

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.

   The Connector wizard appears.

4. Ensure that JMS is selected and then select the type of web server you are using. Click Next.
5. In the Connector Names page, enter the following values:

   - **Connector name** The connector address that a QAnywhere client should use to address the connector.

     See "Addressing QAnywhere messages meant for JMS" on page 137.

   - **Receiver destination** The queue name used by the connector to listen for messages from JMS targeted for QAnywhere clients.

6. In the JNDI Settings page, enter the following values:

   - **JNDI factory** The factory name used to access the external JMS JNDI name service.
   - **Name service URL** The URL to access the JMS JNDI name service.
   - **User name** The authentication name to connect to the external JMS JNDI name service.
   - **Password** The authentication password to connect to the external JMS JNDI name service.

7. In the JMS Queue Settings page, enter the following values:

   - **Queue factory** The external JMS provider queue factory name.
   - **User name** The user ID to connect to the external JMS queue connection.
   - **Password** The password to connect to the external JMS queue connection.

8. In the JMS Topic Settings page, enter the following values:

   - **Topic factory** The external JMS provider topic factory name.
   - **User name** The user ID to connect to the external JMS topic connection.
   - **Password** The password to connect to the external JMS topic connection.

9. Click Finish.

   You are prompted to add the client JAR files in the mlsrv10 command line.

10. Start the MobiLink server with a connection to the server message store and the -sl java option.

    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 "JMS connector properties" on page 132.

    For information about how to set connector properties with server management requests, see "Administering connectors" on page 104.

♦ 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 "Addressing QAnywhere messages meant for JMS" on page 137.

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 139.

Other resources for getting started

- QAnywhere JMS samples are installed to *samples-dir\QAnywhere\connectors*. (For information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database 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 (mlsrv10) with the following options:

- **-c *connection-string*** To connect to the server message store.

  See "-c 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 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.

```
mlsrv10 -sl java(-cp "jmsclient.jar")
            -m -c "QAnywhere 10.0 Demo" ...
```


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 dialog.
- Server management requests.

  See "Creating and configuring connectors" on page 104.
- The ml_qa_global_props MobiLink system table.

  See "ml_qa_global_props" [*MobiLink - Server Administration*].

The following properties are used to configure the JMS connector:

- **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 server console for this connector.

  See "Addressing QAnywhere messages meant for JMS" on page 137.

  In Sybase Central, set this property in the Connector wizard, Connector Names page, Connector Name field.
- **ianywhere.connector.incoming.retry.max** The maximum number of times the connector will retry 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 will never give up.
- **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 dialog Properties tab, by clicking New.

- **ianywhere.connector.logLevel** The amount of connector information displayed in the MobiLink server console and 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 dialog, 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 dialog, 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 dialog, 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 dialog, 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 dialog 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, Password field; or on the connector properties dialog on the JMS tab, JNDI section, Password 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, Name Service URL field; or on the connector properties dialog on the JMS tab, JNDI section, URL 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 dialog 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 dialog 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 dialog 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 dialog 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 dialog 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 dialog 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 dialog on the JMS tab, Topic section, Password field.

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

- "Addressing QAnywhere messages meant for JMS" on page 137
- "JMS connector properties" on page 132
- "Creating and configuring connectors" on page 104

Addressing QAnywhere messages meant for JMS

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 52
- "JMS connector properties" on page 132

Mapping QAnywhere messages on to JMS messages

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, in the case of a message looping back into QAnywhere, there may be an additional QAnywhere address suffix. 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.

QAnywhere	JMS	Remarks
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 52.

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
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 '\'.

Tutorial: Using JMS connectors

A JMS connector provides connectivity between a JMS message system and QAnywhere. This tutorial sends messages between a JMS system and QAnywhere.

About the tutorial

This tutorial starts a JMS connector and sends a message from a JMS client to a QAnywhere client.

Required software

For this tutorial, you need access to a JMS provider and basic knowledge of how to configure it. In addition, you need JDK version 1.3.1 or later and any JAR files required by a JMS client of the JMS provider.

Lesson 1: Start a JMS connector

♦ To prepare your JMS provider

1. Start your JMS server.

   See the documentation for your JMS server.

2. Create two queues within your JMS server: qa_testmessage and qa_receive. You may need to restart your JMS server after creating the queues.

   See the documentation for your JMS server.

♦ To start QAnywhere client and server components

1. Create a directory to hold the files you create for this tutorial. For example, *c:\JMSTestMessage*. Navigate to that directory.
2. Create a QAnywhere connector:

   - In Sybase Central, choose File ► New Connector and following the prompts in the Connector wizard.

     See "Setting up JMS connectors" on page 129.

3. Start the MobiLink server for messaging:

   From the Windows Start menu, choose Programs ► SQL Anywhere 10 ► MobiLink ► MobiLink with Messaging Sample.

   Alternatively, at a command prompt, navigate to *samples-dir\QAnywhere\server* and type the following command:

   ```
   mlsrv10 -m -c "dsn=QAnywhere 10.0 Demo" -sl java(-cp "jarfiles") -vcrs -zu
   +
   ```

4. Start the QAnywhere Agent:

From the Start menu, choose Programs ▶ SQL Anywhere 10 ▶ QAnywhere ▶ Agent for Client1 Sample.

5. Start the TestMessage sample:

   From the Windows Start menu, choose Programs ▶ SQL Anywhere 10 ▶ QAnywhere ▶ TestMessage for Client1 Sample.

♦ To start the Java version of the TestMessage client

1. At a command prompt, navigate to *Samples\QAnywhere\connectors\JMS\TestMessage* and type the following:

   ```
   java -cp .;JMS-client-jar-files ianywhere.message.samples.TestMessage
   ```

   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.

   For Sybase EAServer, this command would be:

   ```
   java -cp .;path\easclient.jar;path\easj2ee.jar
   ianywhere.message.samples.TestMessage
   ```

   where *path* is the location of the jar files.

   Note
   On Unix, use colons instead of semicolons.

2. Move the JMS TestMessage window to the right side of your screen under the existing TestMessage for Client1 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 the JMS TestMessage Message menu, choose New.

   The New Message window appears.

2. In the To field, enter the client message store ID of client1.
3. Fill out the Subject and Message fields with sample text, and click Send.
4. Within a short time a message box appears, indicating that a message has been received by TestMessage for Client2.

Tutorial cleanup

Shut down TestMessage clients, the QAnywhere Agent, and the MobiLink server.

CHAPTER 7

QAnywhere Agent

Contents

qaagent syntax

Use the QAnywhere Agent to send and receive messages for all QAnywhere applications on a single client device.

Syntax

qaagent [*option* ...]

Option	Description
@data	Reads options from the specified environment variable or configuration file. See "@data option" on page 148.
-c *connection-string*	Specifies a connection string to the client message store. See "-c option" on page 149.
-id *id*	Specifies the ID of the client message store that the QAnywhere Agent is to connect to. See "-id option" on page 153.
-idl *download-size*	Specifies the maximum size of a download to use during a message transmission. See "-idl option" on page 154.
-iu *upload-size*	Specifies the maximum size of an upload to use during a message transmission. See "-iu option" on page 155.
-lp *number*	Specifies the port on which the Listener listens for notifications from the MobiLink server. The default is 5001. See "-lp option" on page 156.
-mn *password*	Specify a new password for the MobiLink user. See "-mn option" on page 157.
-mp *password*	Specifies the password for the MobiLink user. See "-mp option" on page 158.
-mu *username*	Specifies the MobiLink user. See "-mu option" on page 159.
-o *logfile*	Specifies a file to which to log output messages. See "-o option" on page 160.
-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 option" on page 161.
-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 option" on page 162.
-ot *logfile*	Specifies a file to which to log output messages. See "-ot option" on page 163.
-pc{**+**|**-**}	Enables persistent connections for message transmission. See "-pc option" on page 164.

Option	Description
-policy *policy-type*	Specifies the transmission policy used by the QAnywhere Agent. See "-policy option" on page 165.
-push *mode*	Enables or disables push notifications. The default is enabled. See "-push option" on page 167.
-q	Starts the QAnywhere Agent in quiet mode with the window minimized in the system tray. See "-q option" on page 169.
-qi	Starts the QAnywhere Agent in quiet mode with the window completely hidden. See "-qi option" on page 170.
-si	Initializes the database for use as a client message store. See "-si option" on page 171.
-su	Upgrades a client message store to the current version without running dbunload/reload. See "-su option" on page 172.
-sur	Upgrades a client message store to the current version and performs dbunload/reload of the message store. See "-sur option" on page 173
-v [*levels*]	Specifies a level of verbosity. See "-v option" on page 174.
-x { **http**|**tcpip**|**tls**|**https** } [**(***keyword***=***value*;...**)**]	Specifies protocol options for communication with the MobiLink server. See "-x option" on page 175.
-xd	Specifies that the QAnywhere Agent should use dynamic addressing of the MobiLink server. See "-xd option" on page 176.

See also

- "Running the QAnywhere Agent" on page 34

@data 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.

This option is useful for Windows CE because command lines in shortcuts are limited to 256 characters.

See "File Hiding utility (dbfhide)" [*SQL Anywhere Server - Database Administration*].

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 dialog 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 option

Specify a connection string 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.

For a complete list of connection parameters, see "Connection parameters" [*SQL Anywhere Server - Database Administration*].

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 connection parameter [DBF]" [*SQL Anywhere Server - Database Administration*].

- **dbn=*database-name*** If the client message store is already running when the QAnywhere Agent starts, you can connect to it by specifying a database name rather than a database file.

  See "DatabaseName connection parameter [DBN]" [*SQL Anywhere Server - Database Administration*].

- **eng=*server-name*** If you want to use a database server that is already running, use this option to specify the server name. The default value is the name of the database.

  See "EngineName connection parameter [ENG]" [*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 defaults.

  See "Userid connection parameter [UID]" [*SQL Anywhere Server - Database Administration*].

- **pwd=*password*** Specify the password for the database user ID. This is required if you change the defaults.

  See "Password connection parameter [PWD]" [*SQL Anywhere Server - Database Administration*].

- **dbkey=*key*** If the client message store is encrypted using strong encryption, specify the encryption key required to access the database.

See "DatabaseKey connection parameter [DBKEY]" [*SQL Anywhere Server - Database Administration*].

- **start=*startline*** Specify the database server start line. If you do not specify the startline, the default for Windows CE is `start=dbsrv10 -m -gn 5`, and the default for other Windows platforms is `start=dbsrv10 -m`. The -m option causes the contents of the transaction log to be deleted at checkpoints and is recommended. See:

  - "StartLine connection parameter [START]" [*SQL Anywhere Server - Database Administration*]
  - "-m server option" [*SQL Anywhere Server - Database Administration*]
  - "-gn server option" [*SQL Anywhere Server - Database Administration*]

See also

- "Connection parameters" [*SQL Anywhere Server - Database Administration*]
- "Connecting to a Database" [*SQL Anywhere Server - Database Administration*]

Example

```
qaagent -id Device1 -c "DBF=qanyclient.db" -x tcpip(host=hostname) -policy
automatic
```

-fd option

This option, when specified in conjunction with the -fr 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 option" on page 152
- "-x option" on page 175
- "Setting up a failover mechanism" on page 44

-fr option

This 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 will 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 option" on page 151
- "-x option" on page 175
- "Setting up a failover mechanism" on page 44

-id option

Specify 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. In some cases, device names may not be unique, in which case you must use the -id option.

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 (not the default), 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 32

-idl 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 are not split, so if there are messages queued for delivery, a download always contains at least one message. Therefore, the incremental download size is an approximation, and it will be a poor approximation if there is a message to be downloaded that is many times larger than the incremental download size.

See also

- ias_MaxDownloadSize in "Pre-defined client message store properties" on page 217

-iu 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 will jump to the front of the queue.

Messages are not split, so if there are messages queued for delivery, the upload always contains at least one message. The incremental upload size is an approximation, and it will be a poor approximation if there is a message to be uploaded that is many times larger than the incremental upload size.

See also

- ias_MaxUploadSize in "Pre-defined client message store properties" on page 217

-lp 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.

A UDP listener port is only established if the Agent is started with the -push disconnected option.

See also

- "Scenario for messaging with push notifications" on page 9
- "-push option" on page 167

-mn option

Specify 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 option" on page 158
- "-mu option" on page 159

-mp option

Specify 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 option" on page 159

-mu option

Specify the MobiLink user.

Syntax

qaagent -mu *username* ...

Default

The client message store ID

Remarks

The MobiLink user 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 option" on page 153
- "-mp option" on page 158
- "Remote IDs" [*MobiLink - Client Administration*]

-o option

Sends output to a 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 option" on page 163
- "-on option" on page 161
- "-os option" on page 162
- "-v option" on page 174

-on 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 output log, in bytes. Use the suffix k or m to specify units of kilobytes or megabytes, respectively. The minimum size limit is 10KB.

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 option" on page 160
- "-ot option" on page 163
- "-os option" on page 162
- "-v option" on page 174

-os 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 will make 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 option” on page 160
- “-ot option” on page 163
- “-on option” on page 161
- “-v option” on page 174

-ot 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 option" on page 160
- "-on option" on page 161
- "-os option" on page 162
- "-v option" on page 174

-pc option

Maintain 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 option" on page 167
- "-pc option" [*MobiLink - Client Administration*]

-policy 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 ondemand 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 53.

- **scheduled** Transmit messages at a specified interval. The default value is 900 seconds (15 minutes).

  Transmission of messages between the client and the server takes place at a specified time interval.

  The QAManager PutMessage() method causes messages to be queued locally. These messages are not transmitted until the time interval has elapsed. Messages queued on the server for delivery to the client are also transmitted when the time interval has elapsed.

  If push notifications are enabled, messages queued on the server for delivery to the client are transmitted when the next time interval elapses.

  TriggerSendReceive() can override the time interval. It forces a message transmission to occur before the time interval elapses.

  The optional *interval* argument is the number of seconds between send/receive operations. For example, the following command schedules the QAnywhere Agent to send/receive messages every 20 minutes:

  ```
  qaagent.exe -policy scheduled[1200]
  ```

- **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 9.
- 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 236.

See also

- "Determining when message transmission should occur on the client" on page 36
- "Scenario for messaging with push notifications" on page 9

-push option

Specifies whether push notifications are enabled.

Syntax

qaagent -push *mode* ...

mode : **none** | **connected** | **disconnected**

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 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. See "-lp option" on page 156.

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 7.

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 40
- "-pc option" on page 164

- “Running the QAnywhere Agent” on page 34
- “Notifications of push notification” on page 55

-q 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 option" on page 170

-qi 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 CE 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 CE applications because it prevents an application from being closed when Windows CE 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

- "-q option" on page 169

-si 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 will by default assign 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 32
- "Creating a secure client message store" on page 178

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"
```


-su 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

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.

This operation exits when the upgrade is complete.

This operation cannot be undone.

See also

- "-sur option" on page 173

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 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.

The unload/reload is necessary to upgrade from a version 9 message store to a version 10 message store. 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 option" on page 172

Example

The following example unloads and reloads a version 9.0.2 SQL Anywhere database called qanywhere.db, making it useful with QAnywhere version 10.

```
qaagent -q -sur -c "UID=dba;PWD=sql;DBF=qanywhere.db"
```


-v option

Allows you to specify what information is logged to the message log file and displayed in the QAnywhere Agent console. A high level of verbosity may affect performance and should normally be used in the development phase only.

Syntax

qaagent -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 qaagent command line.

If you specify –v alone, a small 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.

  For more information, see the -v option in the "Listener syntax" [*MobiLink - Server-Initiated Synchronization*].
- **m** Show all dbmlsync logging. This causes the SQL Anywhere synchronization client (dbmlsync) to start with verbosity level -v+.

  For more information, see the dbmlsync "-v 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 option" on page 160
- "-ot option" on page 163
- "-on option" on page 161
- "-os option" on page 162

-x 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 180
- "Transport-Layer Security" [*SQL Anywhere Server - Database Administration*]
- "Setting up a failover mechanism" on page 44
- "-fd option" on page 151
- "-fr option" on page 152

-xd 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, as well as a relationship to 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 217

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( "Sierra Wireless AirCard 555 Adapter.type",
"WAN" );
```


CHAPTER 8

Writing Secure Messaging Applications

Contents

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 178.

- Encrypt the contents of the message store.

  See "Encrypting the client message store" on page 179.

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:

```
GRANT CONNECT TO 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
GRANT CONNECT TO 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. In order 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 a database" [*SQL Anywhere Server - Database Administration*]
- "Initialization utility (dbinit)" [*SQL Anywhere Server - Database Administration*]
- QAnywhere Agent "-c option" on page 149

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 option" on page 175.

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 10 - Introduction*].

Examples

The following examples show how to establish a secure communication stream between the QAnywhere Agent and the MobiLink server. They use sample certificates that are installed when the SQL Anywhere security option is installed.

Secure TCP/IP using RSA:

```
mlsrv10 -x tls
(tls_type=rsa;certificate=rsaserver.crt;certificate_password=test)
qaagent –x tls(tls_type=rsa;trusted_certificates=rsaroot.crt)
```

Secure TCP/IP using ECC:

```
mlsrv10 -x tls
(tls_type=ecc;certificate=sample.crt;certificate_password=tJ1#m6+W)
qaagent –x tls(tls_type=ecc;trusted_certificates=eccroot.crt)
```

Secure HTTP using HTTPS (only RSA certificates are supported for HTTPS):

```
mlsrv10 -x https(certificate=rsaserver.crt;certificate_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 option" on page 159
- "-mp option" on page 158
- "MobiLink Users" [*MobiLink - Client Administration*]

CHAPTER 9

Mobile Web Services

Contents

Introducing 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 all of 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 10 - 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 28.

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

   See "Starting the QAnywhere server" 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 32.

4. Run the QAnywhere WSDL compiler to create classes you can use in your application.

   See "Running the QAnywhere WSDL compiler" on page 186.

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 187.

6. Create a web services connector.

   See "Setting up web service connectors" on page 197.

7. For each client, start the QAnywhere Agent (qaagent) with a connection to the local client message store.

   See "Running the QAnywhere Agent" on page 34.

Other resources for getting started

- A simple example using a hypothetical web service is described in "Mobile web service example" on page 200.
- A full-featured mobile web service sample application is installed to *samples-dir**QAnywhere**MobileWebServices*. (For information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database Administration*].) This sample, which is provided in both Java and C#, demonstrates how to use mobile web services to make asynchronous web service requests.

Running the QAnywhere WSDL compiler

Given a WSDL file that describes a web service, the QAnywhere WSDL compiler generates a set of Java or C# proxy classes that you include in your application. These classes expose web service operations as method calls. The classes that are generated are:

- The main service binding class (this class inherits from 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: "iAnywhere.QAnywhere.WS namespace (.NET 1.0)" on page 351
- Java: "ianywhere.qanywhere.ws package" on page 611

The WSDL compiler supports WSDL 1.1 and SOAP 1.1 over HTTP and HTTPS.

Syntax

wsdlc -l *programming-language wsdl-file* [*options*]

Parameters

programming-language: **cs** | **java**

wsdl-file: the name of the WSDL file that describes a web service

Options	Description
-h	Print a help screen.
-v	Print verbose information.
-o *output-directory*	Specify an output directory for generated files.
-d	Print debug information.
-n	For C# output only, specify a namespace.
-p	For Java output only, specify a package name.

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 .NET project:

- Add references to the QAnywhere .NET DLL and the mobile web services .NET DLL. This tells Visual Studio.NET 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. In order 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.

Complete instructions follow.

♦ To add references to the QAnywhere .NET API and mobile web services API in a Visual Studio .NET project

1. Start Visual Studio .NET and open your project.
2. In the Solution Explorer window, right-click the References folder and choose Add Reference from the popup menu.

   The Add Reference dialog appears.
3. On the .NET tab, click Browse to locate *iAnywhere.QAnywhere.Client.dll* and *iAnywhere.QAnywhere.WS.dll*. The location of these files is (relative to your SQL Anywhere installation directory):

   - .NET Framework 1.1: *\Assembly\v1*
   - .NET Framework 2.0: *\Assembly\v2*
   - .NET Compact Framework 1.0: *ce\Assembly\v1*
   - .NET Compact Framework 2.0: *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, open the Add Reference dialog and open the .NET tab. *iAnywhere.QAnywhere.Client.dll* and *iAnywhere.QAnywhere.WS.dll* appear in the Selected Components list. Click OK.

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 .NET 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 .NET, 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-threaded QAManager" on page 63.

   For more information about QAManagerFactory, see "QAManagerFactory class" on page 319.

   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 355
- WSResult "Acknowledge method" on page 367

> Instead of creating a QAManager, you can create a QATransactionalManager. See "Implementing transactional messaging for .NET clients" on page 69.

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

- "iAnywhere.QAnywhere.WS namespace (.NET 1.0)" on page 351

- "iAnywhere.QAnywhere.Client namespace (.NET 1.0)" on page 246

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( null );
        mgr.SetProperty( "CONNECT_PARAMS",
"eng=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\\" );
```

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-threaded QAManager" on page 63.

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:

- WSBase "setQAManager method" on page 614
- WSResult "acknowledge method" on page 620

> Instead of creating a QAManager, you can create a QATransactionalManager. See "Implementing transactional messaging for Java clients" on page 72.

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

- "ianywhere.qanywhere.ws package" on page 611
- "ianywhere.qanywhere.client package" on page 506

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",
"eng=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 the *java* subdirectory of your SQL Anywhere installation.

The runtime library for C# is *iAnywhere.QAnywhere.WS.dll*, located in the following directories (relative to your SQL Anywhere installation directory):

- .NET Framework 1.1: *\Assembly\v1*
- .NET Framework 2.0: *\Assembly\v2*
- .NET Compact Framework 1.0: *ce\Assembly\v1*
- .NET Compact Framework 2.0: *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, located in the *java* subdirectory of your SQL Anywhere 10 installation, in your classpath:

- *jaxrpc.jar*
- *qaclient.jar*
- *iawsrt.jar*

Required runtime libraries (.NET)

The SQL Anywhere 10 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 194.
- **Asynchronous** See "Asynchronous web service requests" on page 194.

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();
   }
}
```


Setting up 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.

♦ To create a web service connector

1. Open Sybase Central and connect to your server message store.
2. Choose File ► New Connector.

   The Connector wizard appears.
3. In the Connector Type page, choose Web Services and click Next.
4. In the Connector Name page, enter the Connector Name.

   This is the connector address that a QAnywhere client should use to address the connector. It sets the property ianywhere.connector.address.
5. In the Communication Parameters page, enter the URL.

   This is the URL where the web service is located. (For example, *http://localhost:8080/qanyserv/F2C*.) It sets the property webservice.url.

   You can optionally specify a timeout period in milliseconds, which cancels requests if the web service does not respond in the amount of time your specify. This sets the property webservice.socket.timeout.
6. In the HTTP Parameters page, optionally enter the following values:

   - **HTTP User Name** If the web service requires HTTP authentication, use this property to specify the user name.

     This sets the property webservice.http.authName.
   - **HTTP Password** If the web service requires HTTP authentication, use this property to specify the password.

     This sets the property webservice.http.password.e.
   - **Proxy Host Name** 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.

     This sets the property webservice.http.proxy.host.
   - **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.

     This sets the property webservice.http.proxy.port.

- **Proxy User Name** 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.

  This sets the property webservice.http.proxy.authName.

- **Proxy Password** The proxy password to use if the proxy requires authentication. If you specify this property, you must also specify the webservice.http.proxy.authName property.

  This sets the property webservice.http.proxy.password.e.

7. Click Finish.
8. 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 198.

   For information about using server management requests, see "Administering connectors" on page 104.

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 "Setting up web service connectors" on page 197.

You can view web service connector properties in the Sybase Central Connector Properties dialog, or in the ml_qa_global_props MobiLink system table.

To open the Connector Properties dialog, right-click the connector in Sybase Central and choose Properties.

For more information about the ml_qa_global_props MobiLink system table, see "ml_qa_global_props" [*MobiLink - Server Administration*].

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 server console 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 dialog, on the General tab, in the Compression Level section.

- **ianywhere.connector.logLevel** The amount of connector information displayed in the MobiLink server console and 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 dialog, 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 dialog 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.

Mobile web service example

This example shows you how to create a mobile web service application. The example uses a non-existent web service and so is designed to be read, not run.

For a more full-featured example, see the sample that is installed to *samples-dir**QAnywhere**MobileWebServices*. (For information about *samples-dir*, see "Samples directory" [*SQL Anywhere Server - Database Administration*].)

Global Weather web service

Suppose there is a web service called Global Weather. The following WSDL file, called *globalweather.wsdl*, describes this web service:

```
<?xml version="1.0" encoding="utf-8"?>
<wsdl:definitions 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.myweather.com"
                  targetNamespace="http://www.myweather.com"
                  xmlns:wsdl="http://schemas.xmlsoap.org/wsdl/">

  <wsdl:types>
    <s:schema targetNamespace="http://www.myweather.com">
      <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: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:portType name="GlobalWeatherSoap">
    <wsdl:operation name="GetWeather">
      <wsdl:input message="tns:GetWeatherSoapIn" />
      <wsdl:output message="tns:GetWeatherSoapOut" />
    </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.myweather.com/GetWeather"
style="document" />
      <wsdl:input>
        <soap:body use="literal" />
      </wsdl:input>
      <wsdl:output>
        <soap:body use="literal" />
      </wsdl:output>
    </wsdl:operation>
  </wsdl:binding>

  <wsdl:service name="GlobalWeather">
    <wsdl:port name="GlobalWeatherSoap" binding="tns:GlobalWeatherSoap">
      <soap:address location="http://www.myweather.com/" />
    </wsdl:port>
  </wsdl:service>

</wsdl:definitions>
```

Generate proxy class

To create a mobile application to access the Global Weather web service, you 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 *com\myweather* directory (relative to 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
 */

package com.myweather;

import ianywhere.qanywhere.ws.*;
import ianywhere.qanywhere.client.QABinaryMessage;
import ianywhere.qanywhere.client.QAException;

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
    {
        StringBuffer    soapRequest = new StringBuffer();
        QABinaryMessage    qaRequestMsg = null;
        String        responsePartName = "GetWeatherResult";
        java.lang.String    returnValue;

        writeSOAPHeader( soapRequest, "GetWeather", "http://
www.myweather.com" );
        soapRequest.append( WSBaseTypeSerializer.serialize
("CityName",cityName,"string","http://www.w3.org/2001/
XMLSchema",true,true) );
        soapRequest.append( WSBaseTypeSerializer.serialize
("CountryName",countryName,"string","http://www.w3.org/2001/
XMLSchema",true,true) );
        writeSOAPFooter( soapRequest, "GetWeather" );

        qaRequestMsg = createQAMessage( soapRequest.toString(), "http://
www.myweather.com/GetWeather", "GetWeatherResponse" );

        WSResult wsResult = invokeWait( qaRequestMsg );

        returnValue = wsResult.getStringValue(responsePartName);

        return returnValue;
    }


    public WSResult asyncGetWeather(java.lang.String cityName,
                        java.lang.String countryName)  throws
QAException,WSException
    {
        StringBuffer    soapRequest = new StringBuffer();
        QABinaryMessage    qaRequestMsg = null;

        writeSOAPHeader( soapRequest, "GetWeather", "http://
www.myweather.com" );
        soapRequest.append( WSBaseTypeSerializer.serialize
("CityName",cityName,"string","http://www.w3.org/2001/
XMLSchema",true,true) );
        soapRequest.append( WSBaseTypeSerializer.serialize
("CountryName",countryName,"string","http://www.w3.org/2001/
XMLSchema",true,true) );
        writeSOAPFooter( soapRequest, "GetWeather" );

        qaRequestMsg = createQAMessage( soapRequest.toString(), "http://
www.myweather.com/GetWeather", "GetWeatherResponse" );

        WSResult wsResult = invoke( qaRequestMsg );

        return wsResult;
    }

}
```


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 at a later time.

The first application, called RequestWeather, makes a request of the global weather service and displays the ID of the request:

```
import ianywhere.qanywhere.client.*;
import ianywhere.qanywhere.ws.*;
import com.myweather.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:

```
import ianywhere.qanywhere.client.*;
import ianywhere.qanywhere.ws.*;
import com.myweather.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 ".;%sqlany10%\java\iawsrt.jar;%sqlany10%\java\qaclient.jar"
com\myweather\GlobalWeatherSoap.java   RequestWeather.java
javac -classpath ".;%sqlany10%\java\iawsrt.jar;%sqlany10%\java\qaclient.jar"
com\myweather\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. The following must all be on one command line:

```
qaagent
  -c "dbf=qanywhere.db;eng=qanywhere;uid=ml_qa_user;pwd=qanywhere"
  -policy automatic
```

Start the MobiLink server. This example uses the QAnywhere sample database as the server message store. The following must all be on one command line:

```
mlsrv10
  -m
  -zu+
  -c "dsn=QAnywhere 10 Demo;uid=ml_server;pwd=sql;start=dbsrv10
       -xs http(port=8080)"
  -v+
  -ot qanyserv.mls
```

For more information about these components, see:

- "Setting up the client message store" on page 32
- "Setting up the server message store" on page 28
- "Running the QAnywhere Agent" on page 34
- "Starting the QAnywhere server" on page 29

Create a web service connector

You must 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.

Open Sybase Central and connect to your server message store. To create your web service connector, choose File ► New Connector. When the Connector wizard appears, choose Web Services. In the wizard pages, you must set the following properties to match the mobile applications you created earlier in the example:

- In the Connector Name page, enter the Connector Name **ianywhere.connector.globalweather**
- In the Communication Parameters page, enter the URL **http://www.myweather.com/GetWeather**

CHAPTER 10

QAnywhere Properties

Contents

Message headers and message properties

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.

The following message headers are pre-defined. 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 327
  - C++ API: “getMessageID function” on page 477 and “setMessageID function” on page 487
  - Java API: “getMessageID method” on page 583
  - SQL API: “ml_qa_createmessage” on page 676 and “ml_qa_getmessage” on page 676
- **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 329
  - C++ API: “getTimestamp function” on page 481 and “setTimestamp function” on page 489
  - Java API: “getTimestamp method” on page 587
  - SQL API: “ml_qa_gettimestamp” on page 651

- **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 328
  - C++ API: "getReplyToAddress function" on page 479 and "setReplyToAddress function" on page 488
  - Java API: "getReplyToAddress method" on page 586 and "setReplyToAddress method" on page 593
  - SQL API:"ml_qa_getreplytoaddress" on page 650 and "ml_qa_setreplytoaddress" on page 654

- **Message address** Read-write. 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 326
  - C++ API: "getAddress function" on page 472 and "setAddress function" on page 483
  - Java API: "getAddress method" on page 579 and "setAddress method" on page 588
  - SQL API:"ml_qa_getaddress" on page 646 and "ml_qa_getaddress" on page 646

- **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 328
- C++ API: "getRedelivered function" on page 478 and "setRedelivered function" on page 487
- Java API:"getRedelivered method" on page 586
- SQL API: "ml_qa_getredelivered" on page 649

- **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 326
  - C++ API: "getExpiration function" on page 474
  - Java API: "getExpiration method" on page 581
  - SQL API: "ml_qa_getexpiration" on page 647 and "ml_qa_setexpiration" on page 652

- **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 327
  - C++ API: "getPriority function" on page 477
  - Java API: "getPriority method" on page 584
  - SQL API: "ml_qa_getpriority" on page 648

- **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 326
  - C++ API:"getInReplyToID function" on page 475
  - Java API: "getInReplyToID method" on page 582
  - SQL API: "ml_qa_getinreplytoid" on page 647

Some message headers can be used in transmission rules. See "Variables defined by the rule engine" on page 233.

See also

- .NET API: "QAMessage members" on page 324
- C++ API: "QAMessage class" on page 469
- Java API: "Interface QAMessage" on page 577
- SQL API: "Message headers" on page 646

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 pre-defined 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:

- **Pre-defined 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 pre-defined or custom property as the first parameter.

See "Managing message properties" on page 213.

Pre-defined message properties

Some message properties have been pre-defined for your convenience. Pre-defined 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 55.
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 54.

- **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 cancelled.
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 350
- C++ API: "StatusCodes class" on page 501
- Java API: "Interface StatusCodes" on page 606

- **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 members" on page 249
- C++ API: "MessageProperties class" on page 402
- Java API: "Interface MessageProperties" on page 507

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.

You can get and set custom properties, but should only get pre-defined 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 324.

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 469.

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 "Interface QAMessage" on page 577.

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 655.

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
```

Client message store properties

There are two types of client message store property:

- **Pre-defined 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 defined. You cannot prefix them with ias_ or IAS_.

In either case, you access client message store properties using get and set methods defined in the appropriate class and pass the name of the pre-defined or custom property as the first parameter.

See "Managing client message store properties" on page 221.

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

- "QAnywhere Transmission and Delete Rules" on page 227

Pre-defined client message store properties

A number of client message store properties have been pre-defined 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 will continue 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, but no matter what the download size is set to, QAnywhere does not split messages. This property is set by the qaagent -idl option. See "-idl option" on page 154.
- **ias_MaxUploadSize** The upload increment size. By default, QAnywhere uploads messages in increments of 256K, but no matter what the upload size is set to, QAnywhere will send at least one message per increment and will not split messages. This property is set by the qaagent -iu option. See "-iu option" on page 155.
- **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 a number of 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 option" on page 171.
- **ias_StoreVersion** The QAnywhere-defined version number of this message store.

For information about managing pre-defined message properties, see:

- C++ API: "MessageStoreProperties class" on page 410
- .NET API: "MessageStoreProperties class" on page 257
- Java API: "Interface MessageStoreProperties" on page 513
- SQL API: "Message store properties" on page 674

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
- 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.

Example

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 will be 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 will be 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 will therefore inherit 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 227.

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 303.

```
// qaManager is a QAManager instance.
IEnumerator propertyNames = qaManager.GetStorePropertyNames();
```

C++ example

See "beginEnumStorePropertyNames function" on page 439.

```
// 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 561.

```
// qaManager is a QAManager instance.
Enumeration propertyNames = qaManager.getStorePropertyNames();
```

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 222.

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 227.

Client message store properties can also be specified in server management messages, and stored on the server message store.

See "Introduction to server management requests" on page 92.

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 437.

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 280.

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 "Interface QAManagerBase" on page 543.

SQL stored procedures to manage client message store properties

- ml_qa_getstoreproperty
- ml_qa_setstoreproperty

See "Message store properties" on page 674.

Server properties

You can set server properties in Sybase Central or with a server management request. In all cases, the server properties are stored in the database. See:

- "Setting server properties with a server management request" on page 113
- "Setting server properties with Sybase Central" on page 225

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.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 "JMS connector properties" on page 132.
- **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 "JMS Connectors" on page 127.
- **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 console. If the mlsrv10 -o or -ot option was specified, the messages are output to the MobiLink server 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 "Introduction to server management requests" on page 92.

- **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 10 ► Sybase Central.
- From Connections, choose Connect with QAnywhere 10.
- Specify an ODBC data source name or file, and a user ID and password if required. Click OK.

2. Under Server Store tasks in the left pane, choose Change Properties of this message store.

   The message store Properties dialog appears.

CHAPTER 11

QAnywhere Transmission and Delete Rules

Contents

Rule syntax

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 will occur and the condition defines which messages will be included in the transmission. If the event is message deletion, then the schedule indicates when deleting will occur and the condition indicates which messages will be deleted.

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 of 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 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.
;
   every 1 hours = ias_priority=9
   between 8:00 and 9:00 every 1 minutes = iasPriority=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** *string* [**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*, ... **)**

integer: An integer in the range -2**63 to 2**63-1

number: A n umber 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.

constant: *integer* | *number* | *string* | **TRUE** | **FALSE**

operator: **+** | **-** | ***** | **/**

rule-variable:

See "Rule variables" on page 233.

rule-function:

See "Rule functions" on page 232.

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(*datepart*, *count*, *datetime* **)**	Returns a datetime produced by adding a number of 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(*datepart*, *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' )`
DATETIME(*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.
SUBSTRING(*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:

```
every 1 hours = ias_Status >= ias_FinalState
   AND ias_StatusTime < DATEADD( day, -10, ias_CurrentTimestamp )
   AND ias_TransmissionStatus = 1
```

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 211
- "Client message store properties" on page 217
- "Variables defined by the rule engine" on page 233

Using properties as rule variables

Message properties and message store properties can be used as transmission rule variables. In both cases you can use pre-defined 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 called 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 options" [*SQL Anywhere Server - Database Administration*] and "date_format option [compatibility]" [*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 [compatibility]" [*SQL Anywhere Server - Database Administration*].

- **ias_CurrentTimestamp** The current timestamp (current date and time). See "time_format option [compatibility]" [*SQL Anywhere Server - Database Administration*].
- **ias_Expires** The date and time when the message will expire if it is not delivered.
- **ias_Network** Information about the current network in use. ias_Network is a special transmission variable. It has a number of 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 cancelled.
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 219.

Message 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.

Transmission rules allow you to specify when message transmission is to occur and which messages to transmit. 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 transmission rules on the server and on the client. See:

- "Client transmission rules" on page 236
- "Server transmission rules" on page 237

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 228.

For more information about policies, see:

- "Determining when message transmission should occur on the client" on page 36
- "-policy option" on page 165

For information about client delete rules, see "Client delete rules" on page 240.

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 228 and "Condition syntax" on page 230.

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 240.

You can also use the Sybase Central QAnywhere 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, while outside of business hours, any message can be transmitted. 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 as well as 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 < '8:00:00' or ias_CurrentTime > '18:00:00'
```

Server transmission rules

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 115.

- Use Sybase Central to set the rules.

  See "Specifying server transmission rules using Sybase Central" on page 238.

- 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 238.

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 will use the default rule.

To set default rules, you use the special client name ianywhere.server.defaultClient.

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 10 ► Sybase Central.
   - ♦ From Connections, choose Connect with QAnywhere 10.
   - ♦ Specify an ODBC data source name or file, and a user ID and password if required. Click OK.
2. From Server Store Tasks, click Change Properties of this Message Store.

   The Properties dialog appears.
3. Open the Transmission Rules tab and select Customize the Default Transmission Rules.
4. Click New to add a rule.

   The Rule Editor appears.
5. Add conditions either by typing them into the text field or by choosing Message Variables or Status Constants from the dropdown lists.
6. Click OK to exit.

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 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 240.

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'
;
; Outside of business hours messages should always be
; transmitted

auto = ias_Priority >= 7 or ias_ContentSize < 100 \
    or ias_CurrentTime < '8:00:00' or ias_CurrentTime > '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'
;
; Outside of business hours, messages should always be
; transmitted

auto = tm_Subject not like '%non-business%' \
    or ias_CurrentTime < '8:00am' or ias_CurrentTime > '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, cancelled, 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 246
- C++: "AcknowledgementMode class" on page 400
- Java: "Interface AcknowledgementMode" on page 506

For more information about client transmission rules, see "Client transmission rules" on page 236.

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 cancelled.

start time '1:00:00' on ( 'Sunday' ) = ias_Status >= ias_FinalState
```

For an explanation of ias_Status, see "Rule variables" on page 233.

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, cancelled, 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 237.

For an explanation of ias_Status, see “Rule variables” on page 233.

Part II. QAnywhere API Reference

This part provides reference documentation of the QAnywhere APIs.

CHAPTER 12

QAnywhere .NET API Reference

Contents

iAnywhere.QAnywhere.Client namespace (.NET 1.0)

AcknowledgementMode enumeration

Indicates how messages should be acknowledged by QAnywhere client applications.

Syntax

Visual Basic
Public Enum **AcknowledgementMode**

C#
public enum **AcknowledgementMode**

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 56.

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 76 and "Receiving messages asynchronously" on page 77.

Member name

Member name	Description
EXPLICIT_ACKNOWLEDGE-MENT	Indicates that received messages are acknowledged using one of the QAManager acknowledge methods.
IMPLICIT_ACKNOWLEDGE-MENT	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 QA-TransactionalManager instances.

See also

- "QAManager interface" on page 275
- "QATransactionalManager interface" on page 347
- "QAManagerBase interface" on page 280

ExceptionListener delegate

ExceptionListener delegate definition. You pass an ExceptionListener to the SetExceptionListener method.

Syntax

Visual Basic

```
Public Delegate Sub ExceptionListener( _
  ByVal ex As QAException, _
  ByVal msg As QAMessage _
)
```

C#

```
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.

ExceptionListener2 delegate

ExceptionListener2 delegate definition. You pass an ExceptionListener2 to the SetExceptionListener2 method.

Syntax

Visual Basic

```
Public Delegate Sub ExceptionListener2( _
  ByVal mgr As QAManagerBase, _
  ByVal ex As QAException, _
  ByVal msg As QAMessage _
)
```

C#

```
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.

MessageListener delegate

MessageListener delegate definition. You pass a MessageListener to the QAManagerBase.SetMessageListener method.

Syntax

Visual Basic

```
Public Delegate Sub MessageListener( _
  ByVal msg As QAMessage _
)
```

C#

```
public delegate void MessageListener(
  QAMessage msg
);
```

Parameters

- **msg** The message that was received.

See also

- "MessageListener delegate" on page 248
- "SetMessageListener method" on page 310

MessageListener2 delegate

MessageListener2 delegate definition. You pass a MessageListener2 to the SetMessageListener2 method.

Syntax

Visual Basic

```
Public Delegate Sub MessageListener2( _
  ByVal mgr As QAManagerBase, _
  ByVal msg As QAMessage _
)
```

C#

```
public delegate void MessageListener2(
  QAManagerBase mgr,
  QAMessage msg
);
```

Parameters

- **mgr** The QAManagerBase that received the message.
- **msg** The message that was received.

MessageProperties class

Provides fields storing standard message property names.

Syntax

Visual Basic
Public Class **MessageProperties**

C#
public class **MessageProperties**

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 "Message headers and message properties" on page 208.

See also

- "MessageProperties members" on page 249
- "QAMessage interface" on page 324
- "GetIntProperty method" on page 332
- "GetStringProperty method" on page 336

MessageProperties members

Public static fields (shared)

Member 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.
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.

Member name	Description
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.

ADAPTER field

For "system" queue messages, the network adapter that is being used to connect to the QAnywhere server.

Syntax

Visual Basic
Public Shared **ADAPTER** As String

C#
public const string **ADAPTER**;

Remarks

The value of this field is "ias_Network.Adapter".

For more information, see “Pre-defined client message store properties” on page 217.

You can pass MessageProperties.ADAPTER in the QAMessage.GetStringProperty method to access the associated property.

See also

- “MessageProperties class” on page 248
- “MessageProperties members” on page 249
- “MessageProperties class” on page 248
- “GetStringProperty method” on page 336

ADAPTERS field

This property name refers to a delimited list of network adapters that can be used to connect to the QAnywhere server.

Syntax

Visual Basic
Public Shared **ADAPTERS** As String

C#
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 "Pre-defined client message store properties" on page 217.

See also

- "MessageProperties class" on page 248
- "MessageProperties members" on page 249
- "MessageProperties class" on page 248
- "GetStringProperty method" on page 336

DELIVERY_COUNT field

This property name refers to the number of attempts that have been made so far to deliver the message.

Syntax

Visual Basic
Public Shared **DELIVERY_COUNT** As String

C#
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 248
- "MessageProperties members" on page 249
- "MessageProperties class" on page 248
- "GetIntProperty method" on page 332

IP field

For "system" queue messages, the IP address of the network adapter that is being used to connect to the QAnywhere server.

Syntax

Visual Basic
Public Shared **IP** As String

C#
public const string **IP**;

Remarks

The value of this field is "ias_Network.IP".

For more information, see "Pre-defined client message store properties" on page 217.

You can pass MessageProperties.IP in the QAMessage.GetStringProperty method to access the associated property.

See also

- "MessageProperties class" on page 248
- "MessageProperties members" on page 249
- "MessageProperties class" on page 248
- "GetStringProperty method" on page 336

MAC field

For "system" queue messages, the MAC address of the network adapter that is being used to connect to the QAnywhere server.

Syntax

Visual Basic
Public Shared **MAC** As String

C#
public const string **MAC**;

Remarks

The value of this field is "ias_Network.MAC".

For more information, see "Pre-defined client message store properties" on page 217.

You can pass MessageProperties.MAC in the QAMessage.GetStringProperty method to access the associated property.

See also

- "MessageProperties class" on page 248
- "MessageProperties members" on page 249
- "MessageProperties class" on page 248
- "GetStringProperty method" on page 336

MSG_TYPE field

This property name refers to MessageType values associated with a QAnywhere message.

Syntax

Visual Basic
Public Shared **MSG_TYPE** As String

C#
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 248
- "MessageProperties members" on page 249
- "MessageProperties class" on page 248
- "MessageType enumeration" on page 258
- "GetIntProperty method" on page 332
- "GetStringProperty method" on page 336

NETWORK_STATUS field

This property name refers to the state of the network connection.

Syntax

Visual Basic
Public Shared **NETWORK_STATUS** As String

C#
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 "Pre-defined client message store properties" on page 217.

You can pass MessageProperties.NETWORK_STATUS in the QAMessage.GetIntProperty method to access the associated property.

See also

- "MessageProperties class" on page 248
- "MessageProperties members" on page 249
- "MessageProperties class" on page 248
- "GetIntProperty method" on page 332

ORIGINATOR field

This property name refers to the message store ID of the originator of the message.

Syntax

Visual Basic
Public Shared **ORIGINATOR** As String

C#
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 248
- "MessageProperties members" on page 249
- "MessageProperties class" on page 248
- "GetStringProperty method" on page 336

RAS field

For "system" queue messages, the RAS entry name that is being used to connect to the QAnywhere server.

Syntax

Visual Basic
Public Shared **RAS** As String

C#
public const string **RAS**;

Remarks

The value of this field is "ias_Network.RAS".

For more information, see "Pre-defined client message store properties" on page 217.

You can pass MessageProperties.RAS in the QAMessage.GetStringProperty method to access the associated property.

See also

- "MessageProperties class" on page 248
- "MessageProperties members" on page 249
- "MessageProperties class" on page 248
- "GetStringProperty method" on page 336

RASNAMES field

For "system" queue messages, a delimited list of RAS entry names that can be used to connect to the QAnywhere server.

Syntax

Visual Basic
Public Shared **RASNAMES** As String

C#
public const string **RASNAMES**;

Remarks

The value of this field is "ias_RASNames".

For more information, see "Pre-defined client message store properties" on page 217.

You can pass MessageProperties.RASNAMES in the QAMessage.GetStringProperty method to access the associated property.

See also

- "MessageProperties class" on page 248
- "MessageProperties members" on page 249
- "MessageProperties class" on page 248
- "GetStringProperty method" on page 336

STATUS field

This property name refers to the current status of the message.

Syntax

Visual Basic
Public Shared **STATUS** As String

C#
public const string **STATUS**;

Remarks

For a list of property values, see the StatusCodes enumeration.

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

- "MessageProperties class" on page 248
- "MessageProperties members" on page 249
- "StatusCodes enumeration" on page 350
- "MessageProperties class" on page 248
- "GetIntProperty method" on page 332

STATUS_TIME field

This property name refers to the time at which the message became its current status.

Syntax

Visual Basic
Public Shared **STATUS_TIME** As String

C#
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

- “MessageProperties class” on page 248
- “MessageProperties members” on page 249
- “GetProperty method” on page 334
- “MessageProperties class” on page 248
- “GetProperty method” on page 334

TRANSMISSION_STATUS field

This property name refers to the current transmission status of the message.

Syntax

Visual Basic
Public Shared **TRANSMISSION_STATUS** As String

C#
public const string **TRANSMISSION_STATUS**;

Remarks

For a list of property values, see the StatusCodes enumeration.

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

- “MessageProperties class” on page 248
- “MessageProperties members” on page 249
- “StatusCodes enumeration” on page 350
- “MessageProperties class” on page 248
- “GetIntProperty method” on page 332

MessageStoreProperties class

This class defines constant values for useful message store property names.

Syntax

Visual Basic
Public Class **MessageStoreProperties**

C#
public class **MessageStoreProperties**

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 217.

MessageStoreProperties members

Public static fields (shared)

Member 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. The value of this field is "ias_MaxDeliveryAttempts".

Public constructors

Member name	Description
MessageStoreProperties constructor	Initializes a new instance of the MessageStoreProperties class.

MessageStoreProperties constructor

Initializes a new instance of the MessageStoreProperties class.

Syntax

Visual Basic
Public Sub **New()**

C#
public **MessageStoreProperties();**

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. The value of this field is "ias_MaxDeliveryAttempts".

Syntax

Visual Basic
Public Shared **MAX_DELIVERY_ATTEMPTS** As String

C#
public const string **MAX_DELIVERY_ATTEMPTS**;

MessageType enumeration

Defines constant values for the MessageProperties.MSG_TYPE message property.

Syntax

Visual Basic
Public Enum **MessageType**

C#
public enum **MessageType**

Member name

Member name	Description
NETWORK_STATUS_NOTIFICATION	Identifies a QAnywhere system message used to notify QAnywhere client applications of network status changes.
PUSH_NOTIFICATION	Identifies a QAnywhere system message used to notify QAnywhere client applications of push notifications.
REGULAR	If no message type property exists then the message type is assumed to be REGULAR.

PropertyType enumeration

QAMessage property type enumeration, corresponding naturally to the C# types.

Syntax

Visual Basic
Public Enum **PropertyType**

C#
public enum **PropertyType**

Member name

Member name	Description
BOOLEAN	Indicates a boolean property.
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.

QABinaryMessage interface

An QABinaryMessage object is used to send a message containing a stream of uninterpreted bytes. 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.

Syntax

Visual Basic
Public Interface **QABinaryMessage**

C#
public interface **QABinaryMessage**

QABinaryMessage members

Public properties

Member name	Description
BodyLength property	Returns the size of the message body in bytes.

Public methods

Member name	Description
ReadBinary method	Reads a specified number of bytes starting from the unread portion of a QABinaryMessage instance body.
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.
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.
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.

Member name	Description
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.

BodyLength property

Returns the size of the message body in bytes.

Syntax

Visual Basic
Public Readonly Property **BodyLength** As Long

C#
public long **BodyLength** {get;}

See also

- "QABinaryMessage interface" on page 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259

ReadBinary method

Reads a specified number of bytes starting from the unread portion of a QABinaryMessage instance body.

Syntax

Visual Basic
```
Public Function ReadBinary( _
   ByVal bytes As Byte(), _
   ByVal len As Integer _
) As Integer
```

C#
```
public int ReadBinary(
   byte[] bytes,
   int len
);
```

Parameters

- **bytes** The byte array that will contain the read bytes.

- **len** The maximum number of bytes to read.

Return value

The number of bytes 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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "WriteBinary method" on page 267

ReadBoolean method

Reads a boolean value starting from the unread portion of the QABinaryMessage instance's message body.

Syntax

Visual Basic
Public Function **ReadBoolean()** As Boolean

C#
public bool **ReadBoolean();**

Return value

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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "WriteBoolean method" on page 268

ReadChar method

Reads a char value starting from the unread portion of a QABinaryMessage message body.

Syntax

Visual Basic
Public Function **ReadChar()** As Char

C#
public char **ReadChar();**

Return value

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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "WriteChar method" on page 268

ReadDouble method

Reads a double value starting from the unread portion of a QABinaryMessage message body.

Syntax

Visual Basic
Public Function **ReadDouble()** As Double

C#
public double **ReadDouble();**

Return value

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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "WriteDouble method" on page 269

ReadFloat method

Reads a float value starting from the unread portion of a QABinaryMessage message body.

Syntax

Visual Basic
Public Function **ReadFloat()** As Single

C#
public float **ReadFloat();**

Return value

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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "WriteFloat method" on page 269

ReadInt method

Reads an integer value starting from the unread portion of a QABinaryMessage message body.

Syntax

Visual Basic
Public Function **ReadInt()** As Integer

C#
public int **ReadInt();**

Return value

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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "WriteInt method" on page 270

ReadLong method

Reads a long value starting from the unread portion of a QABinaryMessage message body.

Syntax

Visual Basic
Public Function **ReadLong()** As Long

C#
public long **ReadLong();**

Return value

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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "WriteLong method" on page 270

ReadSbyte method

Reads a signed byte value starting from the unread portion of a QABinaryMessage message body.

Syntax

Visual Basic
Public Function **ReadSbyte()** As System.SByte

C#
public System.Sbyte **ReadSbyte();**

Return value

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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "WriteSbyte method" on page 271

ReadShort method

Reads a short value starting from the unread portion of a QABinaryMessage message body.

Syntax

Visual Basic
Public Function **ReadShort()** As Short

C#
public short **ReadShort();**

Return value

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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "WriteShort method" on page 272

ReadString method

Reads a string value starting from the unread portion of a QABinaryMessage message body.

Syntax

Visual Basic
Public Function **ReadString()** As String

C#
public string **ReadString();**

Return value

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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "WriteString method" on page 272

Reset method

Resets a message so that the reading of values starts from the beginning of the message body.

Syntax

Visual Basic
Public Sub **Reset()**

C#
public void **Reset();**

Remarks

The Reset method also puts the QABinaryMessage message body in read-only mode.

See also

- "QABinaryMessage interface" on page 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259

WriteBinary method

Appends a byte array value to the QABinaryMessage instance's message body.

Syntax

Visual Basic
```
Public Sub WriteBinary( _
  ByVal val As Byte(), _
  ByVal offset As Integer, _
  ByVal len As Integer _
)
```

C#
```
public void WriteBinary(
  byte[] val,
  int offset,
  int len
);
```

Parameters

- **val** The byte array value to write to the message body.
- **len** The number of bytes to write.
- **offset** The offset within the byte array to begin writing.

See also

- "QABinaryMessage interface" on page 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "ReadBinary method" on page 261

WriteBoolean method

Appends a boolean value to the QABinaryMessage instance's message body.

Syntax

Visual Basic
```
Public Sub WriteBoolean( _
  ByVal val As Boolean _
)
```

C#
```
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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "ReadBoolean method" on page 262

WriteChar method

Appends a char value to the QABinaryMessage instance's message body.

Syntax

Visual Basic
```
Public Sub WriteChar( _
  ByVal val As Char _
)
```

C#
```
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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "ReadChar method" on page 262

WriteDouble method

Appends a double value to the QABinaryMessage instance's message body.

Syntax

Visual Basic

```
Public Sub WriteDouble( _
  ByVal val As Double _
)
```

C#

```
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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "ReadDouble method" on page 263

WriteFloat method

Appends a float value to the QABinaryMessage instance's message body.

Syntax

Visual Basic

```
Public Sub WriteFloat( _
  ByVal val As Single _
)
```

C#

```
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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "ReadFloat method" on page 263

WriteInt method

Appends an integer value to the QABinaryMessage instance's message body.

Syntax

Visual Basic

```
Public Sub WriteInt( _
   ByVal val As Integer _
)
```

C#

```
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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "ReadInt method" on page 264

WriteLong method

Appends a long value to the QABinaryMessage instance's message body.

Syntax

Visual Basic
```
Public Sub WriteLong( _
  ByVal val As Long _
)
```

C#
```
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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "ReadLong method" on page 264

WriteSbyte method

Appends a signed byte value to the QABinaryMessage instance's message body.

Syntax

Visual Basic
```
Public Sub WriteSbyte( _
  ByVal val As System.SByte _
)
```

C#
```
public void WriteSbyte(
  System.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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259

- "ReadSbyte method" on page 265

WriteShort method

Appends a short value to the QABinaryMessage instance's message body.

Syntax

Visual Basic

```
Public Sub WriteShort( _
  ByVal val As Short _
)
```

C#

```
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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "ReadShort method" on page 266

WriteString method

Appends a string value to the QABinaryMessage instance's message body.

Syntax

Visual Basic

```
Public Sub WriteString( _
  ByVal val As String _
)
```

C#

```
public void WriteString(
  string  val
);
```

Parameters

- **val** The string value to write to the message body.

Remarks

Note: The receving application needs to invoke ReadString method 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 259
- "QABinaryMessage members" on page 259
- "QABinaryMessage interface" on page 259
- "ReadString method" on page 266

QAException class

Encapsulates QAnywhere client application exceptions. You can use the QAException class to catch QAnywhere exceptions.

Syntax

Visual Basic
Public Class **QAException**
  Inherits ApplicationException

C#
public class **QAException** :
  ApplicationException

QAException members

Public constructors

Member name	Description
QAException constructor	Create a QAException instance providing the error message text.
QAException constructor	Create a QAException instance providing the error code and the error message text.

Public properties

Member name	Description
ErrorCode property	The error code of the exception.
HelpLink (inherited from Exception)	Gets or sets a link to the help file associated with this exception.
InnerException (inherited from Exception)	Gets the System.Exception instance that caused the current exception.

Member name	Description
Message (inherited from Exception)	Gets a message that describes the current exception.
Source (inherited from Exception)	Gets or sets the name of the application or the object that causes the error.
StackTrace (inherited from Exception)	Gets a string representation of the frames on the call stack at the time the current exception was thrown.
TargetSite (inherited from Exception)	Gets the method that throws the current exception.

Public methods

Member name	Description
GetBaseException (inherited from Exception)	When overridden in a derived class, returns the System.Exception that is the root cause of one or more subsequent exceptions.
GetObjectData (inherited from Exception)	When overridden in a derived class, sets the System.Runtime.Serialization.SerializationInfo with information about the exception.
ToString (inherited from Exception)	Creates and returns a string representation of the current exception.

QAException constructor

Create a QAException instance providing the error message text.

Syntax

Visual Basic

```
Overloads Public Sub New( _
  ByVal msg As String _
)
```

C#

```
public QAException(
  string  msg
);
```

Parameters

- **msg** The text description of the exception.

QAException constructor

Create a QAException instance providing the error code and the error message text.

Syntax

Visual Basic

```
Overloads Public Sub New( _
  ByVal msg As String, _
  ByVal errCode As Integer _
)
```

C#

```
public QAException(
  string  msg,
  int errCode
);
```

Parameters

- **msg** The text description of the exception.
- **errCode** The error code.

ErrorCode property

The error code of the exception.

Syntax

Visual Basic

```
Public Readonly Property ErrorCode As Integer
```

C#

```
public int ErrorCode {get;}
```

QAManager interface

The QAManager class derives from QAManagerBase and manages non-transactional QAnywhere messaging operations.

Syntax

Visual Basic

```
Public Interface QAManager
```

C#

```
public interface QAManager
```

Remarks

For a detailed description of derived behavior, see QAManagerBase interface.

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

- "QAManager members" on page 276
- "AcknowledgementMode enumeration" on page 246
- "QATransactionalManager interface" on page 347

QAManager members

Public methods

Member 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. All unacknowledged messages are acknowledged.
AcknowledgeUntil method	Acknowledges the given QAMessage instance and all unacknowledged messages received before the given message.
Open method	Open the QAManager with the given AcknowledgementMode value.
Recover method	Forces all unacknowledged messages into a state of unreceived.

Acknowledge method

Acknowledges that the client application successfully received a QAnywhere message.

Syntax

Visual Basic

```
Public Sub Acknowledge( _
  ByVal msg As QAMessage _
)
```

C#

```
public void Acknowledge(
  QAMessage msg
);
```

Parameters

- **msg** the message to acknowledge.

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 240.

Exceptions

- QAException class - Thrown if there is a problem acknowledging the message.

See also

- "QAManager interface" on page 275
- "QAManager members" on page 276
- "QAManager interface" on page 275
- "AcknowledgeUntil method" on page 278
- "StatusCodes enumeration" on page 350
- "MessageProperties class" on page 248
- "AcknowledgeAll method" on page 277

AcknowledgeAll method

Acknowledges that the client application successfully received QAnywhere messages. All unacknowledged messages are acknowledged.

Syntax

Visual Basic
Public Sub **AcknowledgeAll()**

C#
public void **AcknowledgeAll();**

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 240.

Exceptions

- QAException class - Thrown if there is a problem acknowledging the messages.

See also

- "QAManager interface" on page 275
- "QAManager members" on page 276
- "QAManager interface" on page 275
- "Acknowledge method" on page 276
- "AcknowledgeUntil method" on page 278
- "StatusCodes enumeration" on page 350
- "MessageProperties class" on page 248

AcknowledgeUntil method

Acknowledges the given QAMessage instance and all unacknowledged messages received before the given message.

Syntax

Visual Basic

```
Public Sub AcknowledgeUntil( _
  ByVal msg As QAMessage _
)
```

C#

```
public void AcknowledgeUntil(
  QAMessage msg
);
```

Parameters

- **msg** The last message to acknowledge. All earlier unacknowledged messages are also acknowledged.

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 240.

Exceptions

- QAException class - Thrown if there is a problem acknowledging the messages.

See also

- "QAManager interface" on page 275
- "QAManager members" on page 276
- "QAManager interface" on page 275
- "Acknowledge method" on page 276
- "AcknowledgeAll method" on page 277
- "StatusCodes enumeration" on page 350
- "MessageProperties class" on page 248

Open method

Open the QAManager with the given AcknowledgementMode value.

Syntax

Visual Basic

```
Public Sub Open( _
  ByVal mode As AcknowledgementMode _
)
```


C#
public void **Open(**
  AcknowledgementMode *mode*
);

Parameters

- **mode** The acknowledgement mode, one of AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT or AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT.

Remarks

The Open method must be the first method called after creating a QAManager.

Exceptions

- QAException class - Thrown if there is a problem opening the QAManager instance.

See also

- "QAManager interface" on page 275
- "QAManager members" on page 276
- "QAManager interface" on page 275

Recover method

Forces all unacknowledged messages into a state of unreceived.

Syntax

Visual Basic
Public Sub **Recover()**

C#
public void **Recover();**

Remarks

That is, these messages must be received again using QAManagerBase.GetMessage.

Exceptions

- QAException class - Thrown if there is a problem recovering.

See also

- "QAManager interface" on page 275
- "QAManager members" on page 276
- "QAManager interface" on page 275
- "GetMessage method" on page 294

QAManagerBase interface

This class acts as a base class for QATransactionalManager and QAManager, which manage transactional and non-transactional messaging, respectively.

Syntax

Visual Basic
Public Interface **QAManagerBase**

C#
public interface **QAManagerBase**

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 36.

Messages are released from memory when you close a QAManagerBase instance using the QAManagerBase.Close method.

You can use QAManagerBase.LastError and QAManagerBase.LastErrorMessage to return error information when a QAException occurs. You may also obtain the error information from the QAException object.

QAManagerBase also provides methods to set and get message store properties.

For more information, see "Client message store properties" on page 217 and the MessageStoreProperties class.

See also

- "QAManagerBase members" on page 281
- "CreateBinaryMessage method" on page 289
- "TriggerSendReceive method" on page 319
- "Close method" on page 289
- "LastError property" on page 283
- "LastErrorMessage property" on page 284
- "QAException class" on page 273

QAManagerBase members

Public properties

Member name	Description
LastError property	The error code associated with the last excecuted QAManagerBase method.
LastErrorMessage property	The error text associated with the last executed QAManagerBase method.
Mode property	Returns the QAManager acknowledgement mode for received messages.

Public methods

Member name	Description
BrowseMessages method	Browses all available messages in the message store.
BrowseMessages method	This method is deprecated. Use the BrowseMessagesByQueue (string) method instead.
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.

Member 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 depth of a queue, based on a given filter.
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.
PutMessage method	Prepares a message to send to another QAnywhere client.
PutMessageTimeToLive method	Prepares a message to send to another QAnywhere client.
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 delegate to receive QAExceptions when processing QAnywhere messages asynchronously.
SetExceptionListener2 method	Sets an ExceptionListener2 delegate 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 delegate to receive QAnywhere messages asynchronously.

Member name	Description
SetMessageListener2 method	Sets a MessageListener2 delegate delegate to receive QAnywhere messages asynchronously.
SetMessageListenerBySelector method	Sets a MessageListener delegate delegate to receive QAnywhere messages asynchronously, with a message selector.
SetMessageListenerBySelector2 method	Sets a MessageListener2 delegate 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.
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.

LastError property

The error code associated with the last excecuted QAManagerBase method.

Syntax

Visual Basic
Public Readonly Property **LastError** As Integer

C#
public int **LastError** {get;}

Return value

The error code.

Remarks

A value of 0 indicates no error. You can retrieve this property after catching a QAException class.

See also

- "QAManagerBase interface" on page 280

- "QAManagerBase members" on page 281
- "QAException class" on page 273

LastErrorMessage property

The error text associated with the last executed QAManagerBase method.

Syntax

Visual Basic
Public Readonly Property **LastErrorMessage** As String

C#
public string **LastErrorMessage** {get;}

Remarks

This value is null if the LastError property is 0. You can retrieve this property after catching a QAException class.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "QAException class" on page 273

Mode property

Returns the QAManager acknowledgement mode for received messages.

Syntax

Visual Basic
Public Readonly Property **Mode** As AcknowledgementMode

C#
public AcknowledgementMode **Mode** {get;}

Remarks

For a list of possible values, see AcknowledgementMode enumeration.
AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT and AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT apply to QAManager instances; AcknowledgementMode.TRANSACTIONAL is the mode for QATransactionalManager instances.

BrowseMessages method

Browses all available messages in the message store.

Syntax

Visual Basic
Overloads Public Function **BrowseMessages()** As System.Collections.IEnumerator

C#
public System.Collections.IEnumerator **BrowseMessages();**

Return value

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

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "BrowseMessagesByQueue method" on page 287
- "BrowseMessagesByID method" on page 286
- "BrowseMessages method" on page 285

BrowseMessages method

This method is deprecated. Use the BrowseMessagesByQueue(string) method instead.

Syntax

Visual Basic
```
Overloads Public Function BrowseMessages( _
  ByVal address As String _
) As System.Collections.IEnumerator
```

C#
```
public System.Collections.IEnumerator BrowseMessages(
  string  address
);
```

Parameters

- **address** The address of the messages.

Return value

An enumerator over the available messages.

Remarks

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

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "BrowseMessagesByQueue method" on page 287
- "BrowseMessagesByID method" on page 286
- "BrowseMessagesBySelector method" on page 287
- "BrowseMessages method" on page 285

BrowseMessagesByID method

Browses the message with the given message ID.

Syntax

Visual Basic

```
Public Function BrowseMessagesByID( _
  ByVal msgid As String _
) As System.Collections.IEnumerator
```

C#

```
public System.Collections.IEnumerator BrowseMessagesByID(
  string  msgid
);
```

Parameters

- **msgid** The message id of the message.

Return value

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

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "BrowseMessagesByQueue method" on page 287
- "BrowseMessages method" on page 284
- "BrowseMessages method" on page 285

BrowseMessagesByQueue method

Browses the next available messages waiting that have been sent to the given address.

Syntax

Visual Basic

```
Public Function BrowseMessagesByQueue( _
  ByVal address As String _
) As System.Collections.IEnumerator
```

C#

```
public System.Collections.IEnumerator BrowseMessagesByQueue(
  string  address
);
```

Parameters

- **address** The address of the messages.

Return value

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

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "BrowseMessagesByID method" on page 286
- "BrowseMessages method" on page 284
- "BrowseMessages method" on page 285

BrowseMessagesBySelector method

Browses messages queued in the message store that satisfy the given selector.

Syntax

Visual Basic
```
Public Function BrowseMessagesBySelector( _
  ByVal selector As String _
) As System.Collections.IEnumerator
```

C#
```
public System.Collections.IEnumerator BrowseMessagesBySelector(
  string  selector
);
```

Parameters

- **selector** The selector.

Return value

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

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "BrowseMessagesByQueue method" on page 287
- "BrowseMessages method" on page 284
- "BrowseMessages method" on page 285
- "BrowseMessagesByID method" on page 286

CancelMessage method

Cancels the message with the given message ID.

Syntax

Visual Basic
```
Public Sub CancelMessage( _
  ByVal msgid As String _
)
```

C#
```
public void CancelMessage(
  string  msgid
);
```

Parameters

- **msgid** The message ID of the message to cancel.

Remarks

CancelMessage puts a message into a cancelled state before it is transmitted. With the default delete rules of the QAnywhere Agent, cancelled 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 240.

Exceptions

- QAException class - Thrown if there is a problem cancelling the message.

Close method

Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.

Syntax

Visual Basic
Public Sub **Close()**

C#
public void **Close();**

Remarks

Additional calls to Close() following the first are ignored. Any subsequent calls to a QAManagerBase method, other than Close(), will result in a QAException. You must create and open a new QAManagerBase instance in this case.

Exceptions

- QAException class - Thrown if there is a problem closing the QAManagerBase instance.

CreateBinaryMessage method

Creates a QABinaryMessage object.

Syntax

Visual Basic
Public Function **CreateBinaryMessage()** As QABinaryMessage

C#
public QABinaryMessage **CreateBinaryMessage();**

Return value

A new QABinaryMessage instance.

Remarks

A QABinaryMessage object is used to send a message containing a message body of uninterpreted bytes.

Exceptions

- QAException class - Thrown if there is a problem creating the message.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "QABinaryMessage interface" on page 259

CreateTextMessage method

Creates a QATextMessage object.

Syntax

Visual Basic
Public Function **CreateTextMessage()** As QATextMessage

C#
public QATextMessage **CreateTextMessage();**

Return value

A new QATextMessage instance.

Remarks

A QATextMessage object is used to send a message containing a string message body.

Exceptions

- QAException class - Thrown if there is a problem creating the message.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "QATextMessage interface" on page 344

GetBooleanStoreProperty method

Gets a boolean value for a pre-defined or custom message store property.

Syntax

Visual Basic
Public Function **GetBooleanStoreProperty(** _
  ByVal *propName* As String _
) As Boolean

C#
public bool **GetBooleanStoreProperty(**
  string *propName*
);

Parameters

- **propName** The pre-defined or custom property name.

Return value

The boolean property 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 class.

For more information, see "Client message store properties" on page 217.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

GetDoubleStoreProperty method

Gets a double value for a pre-defined or custom message store property.

Syntax

Visual Basic
Public Function **GetDoubleStoreProperty(** _
  ByVal *propName* As String _
) As Double

C#
public double **GetDoubleStoreProperty(**
  string *propName*
);

Parameters

- **propName** The pre-defined or custom property name.

Return value

The double property 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 class.

For more information, see "Client message store properties" on page 217.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

GetFloatStoreProperty method

Gets a float value for a pre-defined or custom message store property.

Syntax

Visual Basic

```
Public Function GetFloatStoreProperty( _
  ByVal propName As String _
) As Single
```

C#

```
public float  GetFloatStoreProperty(
  string  propName
);
```

Parameters

- **propName** The pre-defined or custom property name.

Return value

The float property 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 class.

For more information, see "Client message store properties" on page 217.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

GetIntStoreProperty method

Gets a int value for a pre-defined or custom message store property.

Syntax

Visual Basic

```
Public Function GetIntStoreProperty( _
   ByVal propName As String _
) As Integer
```

C#

```
public int GetIntStoreProperty(
   string  propName
);
```

Parameters

- **propName** The pre-defined or custom property name.

Return value

The integer property 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 class.

For more information, see "Client message store properties" on page 217.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

GetLongStoreProperty method

Gets a long value for a pre-defined or custom message store property.

Syntax

Visual Basic
```
Public Function GetLongStoreProperty( _
  ByVal propName As String _
) As Long
```

C#
```
public long GetLongStoreProperty(
  string  propName
);
```

Parameters

- **propName** The pre-defined or custom property name.

Return value

The long property 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 class.

For more information, see "Client message store properties" on page 217

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

GetMessage method

Returns the next available QAMessage sent to the specified address.

Syntax

Visual Basic
```
Public Function GetMessage( _
  ByVal address As String _
) As QAMessage
```

C#
```
public QAMessage GetMessage(
  string  address
);
```


Parameters

- **address** Specifies the queue name used by the QAnywhere client to receive messages.

Return value

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 77.

Exceptions

- QAException class - Thrown if there is a problem getting the message.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "QAMessage interface" on page 324

GetMessageBySelector method

Returns the next available QAMessage sent to the specified address that satisfies the given selector.

Syntax

Visual Basic

```
Public Function GetMessageBySelector( _
  ByVal address As String, _
  ByVal selector As String _
) As QAMessage
```

C#

```
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.

Return value

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 77.

Exceptions

- QAException class - Thrown if there is a problem getting the message.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "QAMessage interface" on page 324

GetMessageBySelectorNoWait method

Returns the next available QAMessage sent to the given address that satisfies the given selector.

Syntax

Visual Basic

```
Public Function GetMessageBySelectorNoWait( _
  ByVal address As String, _
  ByVal selector As String _
) As QAMessage
```

C#

```
public QAMessage GetMessageBySelectorNoWait(
  string  address,
  string  selector
);
```

Parameters

- **address** Specifies the queue name used by the QAnywhere client to receive messages.
- **selector** The selector.

Return value

The next available message or null there are no available 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 77.

Exceptions

- QAException class - Thrown if there is a problem getting the message.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "QAMessage interface" on page 324

GetMessageBySelectorTimeout method

Returns the next available QAMessage sent to the given address that satisfies the given selector.

Syntax

Visual Basic

```
Public Function GetMessageBySelectorTimeout( _
   ByVal address As String, _
   ByVal selector As String, _
   ByVal timeout As Long _
) As QAMessage
```

C#

```
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.

Return value

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 77.

Exceptions

- QAException class - Thrown if there is a problem getting the message.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "QAMessage interface" on page 324

GetMessageNoWait method

Returns the next available QAMessage sent to the given address.

Syntax

Visual Basic

```
Public Function GetMessageNoWait( _
  ByVal address As String _
) As QAMessage
```

C#

```
public QAMessage GetMessageNoWait(
  string  address
);
```

Parameters

- **address** this address specifies the queue name used by the QAnywhere client to receive messages.

Return value

The next available message or null there is no available 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 77.

Exceptions

- QAException class - Thrown if there is a problem getting the message.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "QAMessage interface" on page 324

GetMessageTimeout method

Returns the next available QAMessage sent to the given address.

Syntax

Visual Basic

```
Public Function GetMessageTimeout( _
  ByVal address As String, _
  ByVal timeout As Long _
) As QAMessage
```

C#

```
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.

Return value

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 77.

Exceptions

- QAException class - Thrown if there is a problem getting the message.

GetQueueDepth method

Returns the depth of a queue, based on a given filter.

Syntax

Visual Basic

```
Overloads Public Function GetQueueDepth( _
  ByVal address As String, _
  ByVal filter As QueueDepthFilter _
) As Integer
```

C#

```
public int GetQueueDepth(
  string  address,
  QueueDepthFilter filter
);
```


Parameters

- **filter** A filter indicating incoming messages, outgoing messages, or all messages.
- **address** The queue name.

Return value

The number of messages.

Remarks

The depth of the queue is the number of messages which have not been received (for example, using QAManagerBase.GetMessage).

Exceptions

- QAException class - Thrown if there was an error.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "QueueDepthFilter enumeration" on page 349

GetQueueDepth method

Returns the total depth of all queues, based on a given filter.

Syntax

Visual Basic

```
Overloads Public Function GetQueueDepth( _
  ByVal filter As QueueDepthFilter _
) As Integer
```

C#

```
public int GetQueueDepth(
  QueueDepthFilter filter
);
```

Parameters

- **filter** A filter indicating incoming messages, outgoing messages, or all messages.

Return value

The number of messages.

Remarks

The depth of the queue is the number of messages which have not been received (for example, using QAManagerBase.GetMessage).

Exceptions

- QAException class - Thrown if there was an error.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "QueueDepthFilter enumeration" on page 349

GetSbyteStoreProperty method

Gets a signed byte value for a pre-defined or custom message store property.

Syntax

Visual Basic

```
Public Function GetSbyteStoreProperty( _
   ByVal propName As String _
) As System.SByte
```

C#

```
public System.Sbyte GetSbyteStoreProperty(
   string  propName
);
```

Parameters

- **propName** The pre-defined or custom property name.

Return value

The signed byte property 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 class.

For more information, see "Client message store properties" on page 217.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

GetShortStoreProperty method

Gets a short value for a pre-defined or custom message store property.

Syntax

Visual Basic
```
Public Function GetShortStoreProperty( _
  ByVal propName As String _
) As Short
```

C#
```
public short GetShortStoreProperty(
  string  propName
);
```

Parameters

- **propName** the pre-defined or custom property name.

Return value

The short property 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 class.

For more information, see "Client message store properties" on page 217.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

GetStoreProperty method

Gets a System.Object representing a message store property.

Syntax

Visual Basic
```
Public Function GetStoreProperty( _
  ByVal propName As String _
) As Object
```

C#
```
public object GetStoreProperty(
  string  propName
);
```


Parameters

- **propName** The pre-defined or custom property name.

Return value

The property 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 class.

For more information, see "Client message store properties" on page 217.

Exceptions

- QAException class - Thrown if the property does not exist

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

GetStorePropertyNames method

Gets an enumerator over the message store property names.

Syntax

Visual Basic
```
Public Function GetStorePropertyNames() As System.Collections.IEnumerator
```

C#
```
public System.Collections.IEnumerator GetStorePropertyNames();
```

Return value

An enumerator over the message store property names.

Remarks

For more information about client store properties, see "Client message store properties" on page 217.

GetStringStoreProperty method

Gets a string value for a pre-defined or custom message store property.

Syntax

Visual Basic
```
Public Function GetStringStoreProperty( _
  ByVal propName As String _
) As String
```


C#
public string **GetStringStoreProperty(**
  string *propName*
);

Parameters

- **propName** The pre-defined or custom property name.

Return value

The string property value or null 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 class.

For more information, see "Client message store properties" on page 217.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

PutMessage method

Prepares a message to send to another QAnywhere client.

Syntax

Visual Basic
Public Sub **PutMessage(** _
  ByVal *address* As String, _
  ByVal *msg* As QAMessage _
)

C#
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.

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 36.

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 52.

Exceptions

- QAException class - Thrown if there is a problem putting the message.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "PutMessageTimeToLive method" on page 305

PutMessageTimeToLive method

Prepares a message to send to another QAnywhere client.

Syntax

Visual Basic

```
Public Sub PutMessageTimeToLive( _
  ByVal address As String, _
  ByVal msg As QAMessage, _
  ByVal ttl As Long _
)
```

C#

```
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.

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 36.

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 52.

Exceptions

- QAException class - Thrown if there is a problem putting the message.

SetBooleanStoreProperty method

Sets a pre-defined or custom message store property to a boolean value.

Syntax

Visual Basic

```
Public Sub SetBooleanStoreProperty( _
  ByVal propName As String, _
  ByVal val As Boolean _
)
```

C#

```
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 class.

For more information, see "Client message store properties" on page 217.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

SetDoubleStoreProperty method

Sets a pre-defined or custom message store property to a double value.

Syntax

Visual Basic

```
Public Sub SetDoubleStoreProperty( _
```



```
  ByVal propName As String, _
  ByVal val As Double _
)

C#
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 class.

For more information, see "Client message store properties" on page 217.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

SetExceptionListener method

Sets an ExceptionListener delegate delegate to receive QAExceptions when processing QAnywhere messages asynchronously.

Syntax

```
Visual Basic
Public Sub SetExceptionListener( _
  ByVal address As String, _
  ByVal listener As ExceptionListener _
)

C#
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 77.

SetExceptionListener2 method

Sets an ExceptionListener2 delegate delegate to receive QAExceptions when processing QAnywhere messages asynchronously.

Syntax

Visual Basic

```
Public Sub SetExceptionListener2( _
   ByVal address As String, _
   ByVal listener As ExceptionListener2 _
)
```

C#

```
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 77.

SetFloatStoreProperty method

Sets a pre-defined or custom message store property to a float value.

Syntax

Visual Basic

```
Public Sub SetFloatStoreProperty( _
   ByVal propName As String, _
   ByVal val As Single _
)
```


C#
```
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 class.

For more information, see "Client message store properties" on page 217.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

SetIntStoreProperty method

Sets a pre-defined or custom message store property to a int value.

Syntax

Visual Basic
```
Public Sub SetIntStoreProperty( _
  ByVal propName As String, _
  ByVal val As Integer _
)
```

C#
```
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 class.

For more information, see "Client message store properties" on page 217.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

SetLongStoreProperty method

Sets a pre-defined or custom message store property to a long value.

Syntax

Visual Basic

```
Public Sub SetLongStoreProperty( _
  ByVal propName As String, _
  ByVal val As Long _
)
```

C#

```
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 class.

For more information, see "Client message store properties" on page 217.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

SetMessageListener method

Sets a MessageListener delegate delegate to receive QAnywhere messages asynchronously.

Syntax

Visual Basic

```
Public Sub SetMessageListener( _
  ByVal address As String, _
  ByVal listener As MessageListener _
)
```


C#
```
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 77.

See also

- “QAManagerBase interface” on page 280
- “QAManagerBase members” on page 281
- “MessageListener delegate” on page 248

SetMessageListener2 method

Sets a MessageListener2 delegate delegate to receive QAnywhere messages asynchronously.

Syntax

Visual Basic
```
Public Sub SetMessageListener2( _
  ByVal address As String, _
  ByVal listener As MessageListener2 _
)
```

C#
```
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 77.

SetMessageListenerBySelector method

Sets a MessageListener delegate delegate to receive QAnywhere messages asynchronously, with a message selector.

Syntax

Visual Basic

```
Public Sub SetMessageListenerBySelector( _
  ByVal address As String, _
  ByVal selector As String, _
  ByVal listener As MessageListener _
)
```

C#

```
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 77 and "System queue" on page 52.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageListener delegate" on page 248

SetMessageListenerBySelector2 method

Sets a MessageListener2 delegate delegate to receive QAnywhere messages asynchronously, with a message selector.

Syntax

Visual Basic

```
Public Sub SetMessageListenerBySelector2( _
  ByVal address As String, _
  ByVal selector As String, _
  ByVal listener As MessageListener2 _
)
```

C#

```
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 77 and "System queue" on page 52.

SetProperty method

Allows you to set QAnywhere Manager configuration properties programmatically.

Syntax

Visual Basic

```
Public Sub SetProperty( _
  ByVal name As String, _
  ByVal val As String _
)
```

C#

```
public void SetProperty(
  string  name,
  string  val
);
```

Parameters

- **name** The QAnywhere Manager configuration property name.
- **val** The QAnywhere Manager configuration property 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 "QAnywhere manager configuration properties" on page 64.

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 64. *Note:* you must set required properties before calling QAManager.Open or QATransactionalManager.Open ().

Exceptions

- QAException class - Thrown if there is a problem setting the property.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "Open method" on page 278
- "Open method" on page 348

SetSbyteStoreProperty method

Sets a pre-defined or custom message store property to a sbyte value.

Syntax

Visual Basic

```
Public Sub SetSbyteStoreProperty( _
  ByVal propName As String, _
  ByVal val As System.SByte _
)
```

C#

```
public void SetSbyteStoreProperty(
  string  propName,
  System.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 class.

For more information, see "Client message store properties" on page 217.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

SetShortStoreProperty method

Sets a pre-defined or custom message store property to a short value.

Syntax

Visual Basic

```
Public Sub SetShortStoreProperty( _
  ByVal propName As String, _
```

```
  ByVal val As Short _
)

C#
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 class.

For more information, see "Client message store properties" on page 217.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

SetStoreProperty method

Sets a pre-defined or custom message store property to a System.Object value.

Syntax

```
Visual Basic
Public Sub SetStoreProperty( _
  ByVal propName As String, _
  ByVal val As Object _
)

C#
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 class.

For more information, see "Client message store properties" on page 217.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

SetStringStoreProperty method

Sets a pre-defined or custom message store property to a string value.

Syntax

Visual Basic

```
Public Sub SetStringStoreProperty( _
  ByVal propName As String, _
  ByVal val As String _
)
```

C#

```
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 class.

For more information, see "Client message store properties" on page 217.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "MessageStoreProperties class" on page 257

Start method

Starts the QAManagerBase for receiving incoming messages in message listeners.

Syntax

Visual Basic
Public Sub **Start()**

C#
public void **Start();**

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, one should 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.

Exceptions

- QAException class - Thrown if there is a problem starting the QAManagerBase instance.

See also

- “QAManagerBase interface” on page 280
- “QAManagerBase members” on page 281
- “Stop method” on page 318

Stop method

Stops the QAManagerBase's reception of incoming messages.

Syntax

Visual Basic
Public Sub **Stop()**

C#
public void **Stop();**

Remarks

The messages are not lost. They just won't be received until the manager is started again. Any calls to Stop () beyond the first without an intervening QAManagerBase.Start() call are ignored.

Exceptions

- QAException class - Thrown if there is a problem stopping the QAManagerBase instance.

See also

- “QAManagerBase interface” on page 280
- “QAManagerBase members” on page 281
- “Start method” on page 317

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

Visual Basic
Public Sub **TriggerSendReceive()**

C#
public void **TriggerSendReceive();**

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 36.

Exceptions

- QAException class - Thrown if there is a problem triggering the send/receive.

See also

- "QAManagerBase interface" on page 280
- "QAManagerBase members" on page 281
- "PutMessage method" on page 304

QAManagerFactory class

This class acts as a factory class for creating QATransactionalManager and QAManager objects.

Syntax

Visual Basic
MustInherit Public Class **QAManagerFactory**
  Inherits Component

C#
public abstract class **QAManagerFactory** :
  Component

Remarks

You can only have one instance of QAManagerFactory.

QAManagerFactory members

Public static properties (shared)

Member name	Description
Instance property	A singleton QAManagerFactory instance.
InstanceCount property	Indicates the number of factory instances.

Public fields

Member name	Description
InstanceID field	Factory ID.

Public properties

Member name	Description
LastError property	The error code associated with the last excecuted QAManagerFactory method.
LastErrorMessage property	The error text associated with the last executed QAManagerFactory method.

Public methods

Member name	Description
CreateQAManager method	Returns a new QAManager instance with the specified properties.
CreateQATransactionalManager method	Returns a new QATransactionalManager instance with the specified properties.

InstanceID field

Factory ID.

Syntax

Visual Basic
Public**InstanceID** As Integer

C#
public int **InstanceID**;

Instance property

A singleton QAManagerFactory instance.

Syntax

Visual Basic
Public Shared Readonly Property **Instance** As QAManagerFactory

C#
public const QAManagerFactory **Instance** {get;}

Exceptions

- QAException class - Thrown if there is a problem creating the manager factory.

InstanceCount property

Indicates the number of factory instances.

Syntax

Visual Basic
Public Shared Readonly Property **InstanceCount** As Long

C#
public const long **InstanceCount** {get;}

LastError property

The error code associated with the last excecuted QAManagerFactory method.

Syntax

Visual Basic
Public Readonly Property **LastError** As Integer

C#
public int **LastError** {get;}

Return value

The error code.

Remarks

A value of 0 indicates no error. You can retrieve this property after catching a QAException class.

See also

- “QAManagerFactory class” on page 319
- “QAManagerFactory members” on page 320
- “QAException class” on page 273

LastErrorMessage property

The error text associated with the last executed QAManagerFactory method.

Syntax

Visual Basic
Public Readonly Property **LastErrorMessage** As String

C#
public string **LastErrorMessage** {get;}

Return value

The error message.

Remarks

This value is null if the LastError property is 0. You can retrieve this property after catching a QAException class.

See also

- "QAManagerFactory class" on page 319
- "QAManagerFactory members" on page 320
- "QAException class" on page 273

CreateQAManager method

Returns a new QAManager instance with the specified properties.

Syntax

Visual Basic
```
Public Function CreateQAManager( _
  ByVal iniFile As String _
) As QAManager
```

C#
```
public QAManager CreateQAManager(
  string iniFile
);
```

Parameters

- **iniFile** A properties file for configuring the QAManager instance.

Return value

A new QAManager instance.

Remarks

If the properties file parameter is null, the QAManager is created using default properties. You can use the SetProperty method 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 64.

For more information, see "Setting QAnywhere manager configuration properties in a file" on page 64.

Exceptions

- QAException class - Thrown if there is a problem creating the manager.

See also

- "QAManagerFactory class" on page 319
- "QAManagerFactory members" on page 320
- "QAManager interface" on page 275

CreateQATransactionalManager method

Returns a new QATransactionalManager instance with the specified properties.

Syntax

Visual Basic

```
Public Function CreateQATransactionalManager( _
  ByVal iniFile As String _
) As QATransactionalManager
```

C#

```
public QATransactionalManager CreateQATransactionalManager(
  string  iniFile
);
```

Parameters

- **iniFile** A properties file for configuring the QATransactionalManager instance, or null to create the QATransactionalManager instance with default properties.

Return value

The configured QATransactionalManager.

Remarks

If the properties file parameter is null, the QATransactionalManager is created using default properties. You can use the SetProperty method 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 64.

For more information, see "Setting QAnywhere manager configuration properties in a file" on page 64.

Exceptions

- QAException class - Thrown if there is a problem creating the manager.

See also

- "QAManagerFactory class" on page 319
- "QAManagerFactory members" on page 320
- "QATransactionalManager interface" on page 347

QAMessage interface

Provides an interface to set message properties and header fields.

Syntax

Visual Basic
Public Interface **QAMessage**

C#
public interface **QAMessage**

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 class.

For more information about setting message properties and header fields, see "Message headers and message properties" on page 208.

See also

- "QAMessage members" on page 324
- "QABinaryMessage interface" on page 259
- "QATextMessage interface" on page 344

QAMessage members

Public properties

Member name	Description
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.

Public methods

Member 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.
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.

Syntax

Visual Basic
Public Property **Address** As String

C#
public string **Address** {get;set;}

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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "PutMessage method" on page 304

Expiration property

Gets the message's expiration value.

Syntax

Visual Basic
Public Readonly Property **Expiration** As Date

C#
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 "Message headers and message properties" on page 208.

InReplyToID property

The message id of the message for which this message is a reply.

Syntax

Visual Basic
Public Property **InReplyToID** As String

C#
public string **InReplyToID** {get;set;}

Remarks

May be null.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

MessageID property

The globally unique message id of the message.

Syntax

Visual Basic
Public Readonly Property **MessageID** As String

C#
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "PutMessage method" on page 304

Priority property

The priority of the message (ranging from 0 to 9).

Syntax

Visual Basic
Public Property **Priority** As Integer

C#
public int **Priority** {get;set;}

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Redelivered property

Indicates whether the message has been previously received but not acknowledged.

Syntax

Visual Basic
Public Readonly Property **Redelivered** As Boolean

C#
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "QAManager interface" on page 275
- "AcknowledgementMode enumeration" on page 246

ReplyToAddress property

The reply to address of this message.

Syntax

Visual Basic
Public Property **ReplyToAddress** As String

C#
public string **ReplyToAddress** {get;set;}

Remarks

May be null.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Timestamp property

The message timestamp.

Syntax

Visual Basic
Public Readonly Property **Timestamp** As Date

C#
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 "Message headers and message properties" on page 208.

ClearBody method

Clears the body of the message.

Syntax

Visual Basic
Public Sub **ClearBody()**

C#
public void **ClearBody();**

ClearProperties method

Clears all the properties of the message.

Syntax

Visual Basic
Public Sub **ClearProperties()**

C#
public void **ClearProperties();**

GetBooleanProperty method

Gets a boolean message property.

Syntax

Visual Basic
```
Public Function GetBooleanProperty( _
  ByVal propName As String _
) As Boolean
```

C#
```
public bool GetBooleanProperty(
  string  propName
);
```

Parameters

- **propName** The property name.

Return value

The property value.

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

GetByteProperty method

Gets a byte message property.

Syntax

Visual Basic
```
Public Function GetByteProperty( _
  ByVal propName As String _
) As Byte
```

C#
```
public byte GetByteProperty(
  string  propName
);
```

Parameters

- **propName** The property name.

Return value

The property value.

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

GetDoubleProperty method

Gets a double message property.

Syntax

Visual Basic

```
Public Function GetDoubleProperty( _
  ByVal propName As String _
) As Double
```

C#

```
public double GetDoubleProperty(
  string  propName
);
```

Parameters

- **propName** The property name.

Return value

The property value.

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAMessage interface" on page 324

- "QAMessage members" on page 324
- "MessageProperties class" on page 248

GetFloatProperty method

Gets a float message property.

Syntax

Visual Basic

```
Public Function GetFloatProperty( _
  ByVal propName As String _
) As Single
```

C#

```
public float  GetFloatProperty(
  string  propName
);
```

Parameters

- **propName** The property name.

Return value

The property value.

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

GetIntProperty method

Gets an int message property.

Syntax

Visual Basic

```
Public Function GetIntProperty( _
  ByVal propName As String _
) As Integer
```


C#
```
public int GetIntProperty(
  string  propName
);
```

Parameters

- **propName** The property name.

Return value

The property value.

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

GetLongProperty method

Gets a long message property.

Syntax

Visual Basic
```
Public Function GetLongProperty( _
  ByVal propName As String _
) As Long
```

C#
```
public long GetLongProperty(
  string  propName
);
```

Parameters

- **propName** The property name.

Return value

The property value.

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

GetProperty method

Gets a message property.

Syntax

Visual Basic

```
Public Function GetProperty( _
  ByVal propName As String _
) As Object
```

C#

```
public object GetProperty(
  string  propName
);
```

Parameters

- **propName** The property name.

Return value

The property value.

Remarks

The property must be one of the acceptable primitive types, string, or DateTime.

Exceptions

- QAException class - Thrown if the property does not exist.

GetPropertyNames method

Gets an enumerator over the property names of the message.

Syntax

Visual Basic

```
Public Function GetPropertyNames() As System.Collections.IEnumerator
```

C#

```
public System.Collections.IEnumerator GetPropertyNames();
```


Return value

An enumerator over the message property names.

GetPropertyType method

Returns the property type of the given property.

Syntax

Visual Basic

```
Public Function GetPropertyType( _
  ByVal propName As String _
) As PropertyType
```

C#

```
public PropertyType GetPropertyType(
  string  propName
);
```

Parameters

- **propName** The name of the property.

Return value

The property type.

GetSbyteProperty method

Gets a signed byte message property.

Syntax

Visual Basic

```
Public Function GetSbyteProperty( _
  ByVal propName As String _
) As System.SByte
```

C#

```
public System.Sbyte GetSbyteProperty(
  string  propName
);
```

Parameters

- **propName** the property name.

Return value

The property value.

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

GetShortProperty method

Gets a short message property.

Syntax

Visual Basic

```
Public Function GetShortProperty( _
  ByVal propName As String _
) As Short
```

C#

```
public short GetShortProperty(
  string  propName
);
```

Parameters

- **propName** The property name.

Return value

The property value.

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Exceptions

- QAException class - Thrown if there is a conversion error getting the property value or if the property does not exist.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

GetStringProperty method

Gets a string message property.

Syntax

Visual Basic

```
Public Function GetStringProperty( _
  ByVal propName As String _
) As String
```

C#

```
public string  GetStringProperty(
  string  propName
);
```

Parameters

- **propName** The property name.

Return value

The property value or null if the property does not exist.

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

PropertyExists method

Indicates whether the given property has been set for this message.

Syntax

Visual Basic

```
Public Function PropertyExists( _
  ByVal propName As String _
) As Boolean
```

C#

```
public bool PropertyExists(
  string  propName
);
```

Parameters

- **propName** The property name.

Return value

True if the property exists.

SetBooleanProperty method

Sets a boolean property.

Syntax

Visual Basic

```
Public Sub SetBooleanProperty( _
  ByVal propName As String, _
  ByVal val As Boolean _
)
```

C#

```
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

SetByteProperty method

Sets a byte property.

Syntax

Visual Basic

```
Public Sub SetByteProperty( _
  ByVal propName As String, _
  ByVal val As Byte _
)
```

C#

```
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

SetDoubleProperty method

Sets a double property.

Syntax

Visual Basic

```
Public Sub SetDoubleProperty( _
  ByVal propName As String, _
  ByVal val As Double _
)
```

C#

```
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

SetFloatProperty method

Sets a float property.

Syntax

Visual Basic

```
Public Sub SetFloatProperty( _
  ByVal propName As String, _
  ByVal val As Single _
)
```

C#

```
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

SetIntProperty method

Sets an int property.

Syntax

Visual Basic

```
Public Sub SetIntProperty( _
  ByVal propName As String, _
  ByVal val As Integer _
)
```

C#

```
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

SetLongProperty method

Sets a long property.

Syntax

Visual Basic

```
Public Sub SetLongProperty( _
  ByVal propName As String, _
  ByVal val As Long _
)
```

C#

```
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

SetProperty method

Sets a property.

Syntax

Visual Basic

```
Public Sub SetProperty( _
  ByVal propName As String, _
```



```
    ByVal val As Object _
)

C#
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

SetSbyteProperty method

Sets a signed byte property.

Syntax

```
Visual Basic
Public Sub SetSbyteProperty( _
    ByVal propName As String, _
    ByVal val As System.SByte _
)

C#
public void SetSbyteProperty(
    string  propName,
    System.Sbyte val
);
```

Parameters

- **propName** The property name.
- **val** The property value.

Remarks

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

SetShortProperty method

Sets a short property.

Syntax

Visual Basic

```
Public Sub SetShortProperty( _
  ByVal propName As String, _
  ByVal val As Short _
)
```

C#

```
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

SetStringProperty method

Sets a string property.

Syntax

Visual Basic

```
Public Sub SetStringProperty( _
  ByVal propName As String, _
  ByVal val As String _
)
```


C#
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 "Message headers and message properties" on page 208.

See also

- "QAMessage interface" on page 324
- "QAMessage members" on page 324
- "MessageProperties class" on page 248

QATextMessage interface

QATextMessage inherits from the QAMessage class and adds a text message body. QATextMessage provides methods to read from and write to the text message body.

Syntax

Visual Basic
Public Interface **QATextMessage**

C#
public interface **QATextMessage**

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 of values starts from the beginning of the message body.

See also

- "QATextMessage members" on page 345
- "QABinaryMessage interface" on page 259
- "QAMessage interface" on page 324

QATextMessage members

Public properties

Member name	Description
Text property	The message text.
TextLength property	The length, in characters, of the message.

Public methods

Member name	Description
ReadText method	Read unread text into the given buffer.
Reset method	Resets the text position of the message to the beginning.
WriteText method	Append text to the text of the message.

Text property

The message text.

Syntax

Visual Basic
Public Property **Text** As String

C#
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 64.

See also

- "QATextMessage interface" on page 344
- "QATextMessage members" on page 345
- "ReadText method" on page 346

TextLength property

The length, in characters, of the message.

Syntax

Visual Basic
Public Readonly Property **TextLength** As Long

C#
public long **TextLength** {get;}

ReadText method

Read unread text into the given buffer.

Syntax

Visual Basic
Public Function **ReadText(** _
  ByVal *buf* As System.Text.StringBuilder _
) As Integer

C#
public int **ReadText(**
  System.Text.string Builder *buf*
);

Parameters

- **buf** Target buffer for any read text.

Return value

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.

Syntax

Visual Basic
Public Sub **Reset()**

C#
public void **Reset();**

WriteText method

Append text to the text of the message.

Syntax

Visual Basic
```
Public Sub WriteText( _
  ByVal val As String _
)
```

C#
```
public void WriteText(
  string  val
);
```

Parameters

- **val** The text to append.

QATransactionalManager interface

The QATransactionalManager class derives from QAManagerBase and manages transactional QAnywhere messaging operations.

Syntax

Visual Basic
```
Public Interface QATransactionalManager
```

C#
```
public interface QATransactionalManager
```

Remarks

For a detailed description of derived behavior, see QAManagerBase interface.

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 69.

See also

- "QATransactionalManager members" on page 347
- "QATransactionalManager interface" on page 347

QATransactionalManager members

Public methods

Member name	Description
Commit method	Commits the current transaction and begins a new transaction.
Open method	Opens a QATransactionalManager instance.

Member name	Description
Rollback method	Rolls back the current transaction and begins a new transaction.

Commit method

Commits the current transaction and begins a new transaction.

Syntax

Visual Basic
Public Sub **Commit()**

C#
public void **Commit();**

Remarks

This method commits all QAManagerBase.PutMessage and QAManagerBase.GetMessage invocations.
Note: The first transaction begins with the call to QATransactionalManager.Open().

Exceptions

- QAException class - Thrown if there is a problem committing.

See also

- "QATransactionalManager interface" on page 347
- "QATransactionalManager members" on page 347
- "QATransactionalManager interface" on page 347

Open method

Opens a QATransactionalManager instance.

Syntax

Visual Basic
Public Sub **Open()**

C#
public void **Open();**

Remarks

The Open method must be the first method called after creating a manager.

Exceptions

- QAException class - Thrown if there is a problem opening the manager

See also

- "QATransactionalManager interface" on page 347

- "QATransactionalManager members" on page 347
- "QATransactionalManager interface" on page 347

Rollback method

Rolls back the current transaction and begins a new transaction.

Syntax

Visual Basic
Public Sub **Rollback()**

C#
public void **Rollback();**

Remarks

This method rolls back all uncommitted QAManagerBase.PutMessage and QAManagerBase.GetMessage invocations.

Exceptions

- QAException class - Thrown if there is a problem rolling back

See also

- "QATransactionalManager interface" on page 347
- "QATransactionalManager members" on page 347
- "QATransactionalManager interface" on page 347

QueueDepthFilter enumeration

Provides queue depth filter values for QAManagerBase.GetQueueDepth(QueueDepthFilter) and QAManagerBase.GetQueueDepth(string,QueueDepthFilter).

Syntax

Visual Basic
Public Enum **QueueDepthFilter**

C#
public enum **QueueDepthFilter**

Member name

Member name	Description
ALL	Count both incoming and outgoing messages.
INCOMING	Count only incoming messages.
OUTGOING	Count only outgoing messages.

See also

- "GetQueueDepth method" on page 300
- "GetQueueDepth method" on page 299

StatusCodes enumeration

This enumeration defines a set of codes for the status of a message.

Syntax

Visual Basic
Public Enum **StatusCodes**

C#
public enum **StatusCodes**

Member name

Member name	Description
CANCELLED	The message has been cancelled.
EXPIRED	The message has expired because it was not received before its expiration time had passed.
FINAL	The message has acheived a final state.
LOCAL	The message is addressed to the local message store and will not be transmitted to the server.
PENDING	The message has been sent but not received.
RECEIVED	The message has been received and acknowledged by the receiver.
RECEIVING	The message is in the process of being received, or it was received but not acknowledged.
TRANSMITTED	The message has been transmitted to the server.
TRANSMITTING	The message is in the process of being transmitted to the server.
UNRECEIVABLE	The message has been marked as unreceivable. The message is either malformed, or there were too many failed attempts to deliver it.
UNTRANSMITTED	The message has not been transmitted to the server.

iAnywhere.QAnywhere.WS namespace (.NET 1.0)

WSBase class

This is the base class for the main web service proxy class generated by the mobile web service compiler.

Syntax

Visual Basic
Public Class **WSBase**

C#
public class **WSBase**

WSBase members

Public constructors

Member name	Description
WSBase constructor	Constructs a WSBase instance with the properties specified by a configuration property file.
WSBase constructor	Constructs a WSBase instance with default properties.

Public methods

Member name	Description
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.
SetListener method	Sets a listener for the results of all web service requests made by this instance of WSBase.
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.

Syntax

Visual Basic
```
Overloads Public Sub New( _
  ByVal iniFile As String _
)
```

C#
```
public WSBase(
  string  iniFile
);
```

Parameters

- **iniFile** A file containing configuration properties.

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\\".

Exceptions

- WSException class - Thrown if there is a problem constructing the WSBase.

WSBase constructor

Constructs a WSBase instance with default properties.

Syntax

Visual Basic
```
Overloads Public Sub New()
```

C#
```
public WSBase();
```

Exceptions

- WSException class - Thrown if there is a problem constructing the WSBase.

ClearRequestProperties method

Clears all request properties that have been set for this WSBase.

Syntax

Visual Basic
Public Sub **ClearRequestProperties()**

C#
public void **ClearRequestProperties();**

GetResult method

Gets a WSResult object that represents the results of a web service request.

Syntax

Visual Basic
```
Public Function GetResult( _
  ByVal requestID As String _
) As iAnywhere.QAnywhere.WS.WSResult
```

C#
```
public iAnywhere.QAnywhere.WS.WSResult GetResult(
  string  requestID
);
```

Parameters

- **requestID** The ID of the web service request.

Return value

A WSResult instance representing the results of the web service request.

See also

- "WSBase class" on page 351
- "WSBase members" on page 351
- "WSStatus enumeration" on page 398

GetServiceID method

Gets the service ID for this instance of WSBase.

Syntax

Visual Basic
Public Function **GetServiceID()** As String

C#
public string **GetServiceID();**

Return value

The service ID.

SetListener method

Sets a listener for the results of a given web service request.

Syntax

Visual Basic

```
Overloads Public Sub SetListener( _
  ByVal requestID As String, _
  ByVal listener As iAnywhere.QAnywhere.WS.WSListener _
)
```

C#

```
public void SetListener(
  string  requestID,
  iAnywhere.QAnywhere.WS.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 method

Sets a listener for the results of all web service requests made by this instance of WSBase.

Syntax

Visual Basic

```
Overloads Public Sub SetListener( _
  ByVal listener As iAnywhere.QAnywhere.WS.WSListener _
)
```

C#

```
public void SetListener(
  iAnywhere.QAnywhere.WS.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.

Syntax

Visual Basic

```
Public Sub SetProperty( _
  ByVal property As String, _
  ByVal val As String _
)
```

C#

```
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.

Syntax

Visual Basic

```
Public Sub SetQAManager( _
```



```
  ByVal mgr As QAManagerBase _
)

C#
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.

Syntax

```
Visual Basic
Public Sub SetRequestProperty( _
  ByVal name As String, _
  ByVal value As Object _
)

C#
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.

Syntax

Visual Basic
```
Public Sub SetServiceID( _
  ByVal serviceID As String _
)
```

C#
```
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.

Syntax

Visual Basic
```
Public Class WSException
  Inherits Exception
```

C#
```
public class WSException :
  Exception
```

WSException members

Public static fields (shared)

Member name	Description
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.

Member name	Description
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.

Public constructors

Member name	Description
WSException constructor	Constructs a new exception with the specified error message.
WSException constructor	Constructs a new exception with the specified error message and error code.
WSException constructor	Constructs a new exception.

Public properties

Member name	Description
ErrorCode property	The error code associated with this exception.
HelpLink (inherited from Exception)	Gets or sets a link to the help file associated with this exception.
InnerException (inherited from Exception)	Gets the System.Exception instance that caused the current exception.
Message (inherited from Exception)	Gets a message that describes the current exception.
Source (inherited from Exception)	Gets or sets the name of the application or the object that causes the error.
StackTrace (inherited from Exception)	Gets a string representation of the frames on the call stack at the time the current exception was thrown.
TargetSite (inherited from Exception)	Gets the method that throws the current exception.

Public methods

Member name	Description
GetBaseException (inherited from Exception)	When overridden in a derived class, returns the System.Exception that is the root cause of one or more subsequent exceptions.
GetObjectData (inherited from Exception)	When overridden in a derived class, sets the System.Runtime.Serialization.SerializationInfo with information about the exception.

Member name	Description
ToString (inherited from Exception)	Creates and returns a string representation of the current exception.

WSException constructor

Constructs a new exception with the specified error message.

Syntax

Visual Basic
```
Overloads Public Sub New( _
  ByVal msg As String _
)
```

C#
```
public WSException(
  string  msg
);
```

Parameters

- **msg** The error message.

WSException constructor

Constructs a new exception with the specified error message and error code.

Syntax

Visual Basic
```
Overloads Public Sub New( _
  ByVal msg As String, _
  ByVal errorCode As Integer _
)
```

C#
```
public WSException(
  string  msg,
  int errorCode
);
```

Parameters

- **msg** The error message.
- **errorCode** The error code.

WSException constructor

Constructs a new exception.

Syntax

Visual Basic
```
Overloads Public Sub New( _
  ByVal ex As System.Exception _
)
```

C#
```
public WSException(
  System.Exception ex
);
```

Parameters

- **ex** The 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.

Syntax

Visual Basic
```
Public Shared WS_STATUS_HTTP_ERROR As Integer
```

C#
```
public const 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.

Syntax

Visual Basic
```
Public Shared WS_STATUS_HTTP_OK As Integer
```

C#
```
public const 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.

Syntax

Visual Basic
```
Public Shared WS_STATUS_HTTP_RETRIES_EXCEEDED As Integer
```

C#
```
public const 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.

Syntax

Visual Basic
Public Shared **WS_STATUS_SOAP_PARSE_ERROR** As Integer

C#
public const int **WS_STATUS_SOAP_PARSE_ERROR**;

ErrorCode property

The error code associated with this exception.

Syntax

Visual Basic
Public Property **ErrorCode** As Integer

C#
public int **ErrorCode** {get;set;}

WSFaultException class

This class represents a SOAP Fault exception from the web service connector.

Syntax

Visual Basic
Public Class **WSFaultException**
  Inherits WSException

C#
public class **WSFaultException** :
  WSException

WSFaultException members

Public constructors

Member name	Description
WSFaultException constructor	Constructs a new exception with the specified error message.

Public properties

Member name	Description
ErrorCode property (inherited from WSException)	The error code associated with this exception.
HelpLink (inherited from Exception)	Gets or sets a link to the help file associated with this exception.
InnerException (inherited from Exception)	Gets the System.Exception instance that caused the current exception.
Message (inherited from Exception)	Gets a message that describes the current exception.
Source (inherited from Exception)	Gets or sets the name of the application or the object that causes the error.
StackTrace (inherited from Exception)	Gets a string representation of the frames on the call stack at the time the current exception was thrown.
TargetSite (inherited from Exception)	Gets the method that throws the current exception.

Public methods

Member name	Description
GetBaseException (inherited from Exception)	When overridden in a derived class, returns the System.Exception that is the root cause of one or more subsequent exceptions.
GetObjectData (inherited from Exception)	When overridden in a derived class, sets the System.Runtime.Serialization.SerializationInfo with information about the exception.
ToString (inherited from Exception)	Creates and returns a string representation of the current exception.

WSFaultException constructor

Constructs a new exception with the specified error message.

Syntax

Visual Basic

```
Public Sub New( _
  ByVal msg As String _
)
```

C#

```
public WSFaultException(
  string  msg
);
```

Parameters

- **msg** The error message.

WSListener interface

This class represents a listener for results of web service requests.

Syntax

Visual Basic
Public Interface **WSListener**

C#
public interface **WSListener**

WSListener members

Public methods

Member 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

Visual Basic
```
Public Sub OnException( _
  ByVal e As iAnywhere.QAnywhere.WS.WSException, _
  ByVal wsResult As iAnywhere.QAnywhere.WS.WSResult _
)
```

C#
```
public void OnException(
  iAnywhere.QAnywhere.WS.WSException e,
  iAnywhere.QAnywhere.WS.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.

Syntax

Visual Basic
```
Public Sub OnResult( _
  ByVal wsResult As iAnywhere.QAnywhere.WS.WSResult _
)
```

C#
```
public void OnResult(
  iAnywhere.QAnywhere.WS.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.

Syntax

Visual Basic
```
Public Class WSResult
```

C#
```
public class 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.

WSResult members

Public methods

Member 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.

Member name	Description
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.
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.

Member name	Description
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.
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.

Member name	Description
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.
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.

Acknowledge method

Acknowledges that this WSResult has been processed.

Syntax

Visual Basic
Public Sub **Acknowledge()**

C#
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.

Syntax

Visual Basic
Public Function **GetArrayValue(** _
  ByVal *parentName* As String _
) As iAnywhere.QAnywhere.WS.WSSerializable()

C#
public iAnywhere.QAnywhere.WS.WSSerializable[] **GetArrayValue(**
  string *parentName*
);

Parameters

- **parentName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetBoolArrayValue method

Gets an array of bool values from this WSResult.

Syntax

Visual Basic
Public Function **GetBoolArrayValue(** _
  ByVal *elementName* As String _
) As Boolean()

C#
public bool[] **GetBoolArrayValue(**
  string *elementName*
);

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetBooleanArrayValue method

Gets an array of Boolean values from this WSResult.

Syntax

Visual Basic
Public Function **GetBooleanArrayValue(** _
  ByVal *elementName* As String _
) As Boolean()

C#
public bool[] **GetBooleanArrayValue(**
  string *elementName*
);

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetBooleanValue method

Gets a Boolean value from this WSResult.

Syntax

Visual Basic
Public Function **GetBooleanValue(** _
  ByVal *childName* As String _
) As Boolean

C#
public bool **GetBooleanValue(**
  string *childName*
);

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetBoolValue method

Gets a bool value from this WSResult.

Syntax

Visual Basic
Public Function **GetBoolValue(** _
  ByVal *childName* As String _
) As Boolean

C#
public bool **GetBoolValue(**
  string *childName*
);

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetByteArrayValue method

Gets an array of byte values from this WSResult.

Syntax

Visual Basic
Public Function **GetByteArrayValue(** _
  ByVal *elementName* As String _
) As Byte()

C#
public byte[] **GetByteArrayValue(**
  string *elementName*
);

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetByteValue method

Gets a byte value from this WSResult.

Syntax

Visual Basic
Public Function **GetByteValue(** _
  ByVal *childName* As String _
) As Byte

C#
public byte **GetByteValue(**
  string *childName*
);

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetCharArrayValue method

Gets an array of char values from this WSResult.

Syntax

Visual Basic
Public Function **GetCharArrayValue(** _
  ByVal *elementName* As String _
) As Char()

C#
public char[] **GetCharArrayValue(**
  string *elementName*
);

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetCharValue method

Gets a char value from this WSResult.

Syntax

Visual Basic
Public Function **GetCharValue(** _
  ByVal *childName* As String _
) As Char

C#
public char **GetCharValue(**
  string *childName*
);

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetDecimalArrayValue method

Gets an array of decimal values from this WSResult.

Syntax

Visual Basic
Public Function **GetDecimalArrayValue(** _
  ByVal *elementName* As String _
) As Decimal()

C#
public decimal[] **GetDecimalArrayValue(**
  string *elementName*
);

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetDecimalValue method

Gets a decimal value from this WSResult.

Syntax

Visual Basic
Public Function **GetDecimalValue(** _
  ByVal *childName* As String _
) As Decimal

C#
public decimal **GetDecimalValue(**
  string *childName*
);

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetDoubleArrayValue method

Gets an array of double values from this WSResult.

Syntax

Visual Basic
Public Function **GetDoubleArrayValue(** _
  ByVal *elementName* As String _
) As Double()

C#
public double[] **GetDoubleArrayValue(**
  string *elementName*
);

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetDoubleValue method

Gets a double value from this WSResult.

Syntax

Visual Basic
Public Function **GetDoubleValue(** _
  ByVal *childName* As String _
) As Double

C#
public double **GetDoubleValue(**
  string *childName*
);

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetErrorMessage method

Gets the error message.

Syntax

Visual Basic
Public Function **GetErrorMessage()** As String

C#
public string **GetErrorMessage();**

Return value

The error message.

GetFloatArrayValue method

Gets an array of float values from this WSResult.

Syntax

Visual Basic
Public Function **GetFloatArrayValue(** _
  ByVal *elementName* As String _
) As Single()

C#
public float [] **GetFloatArrayValue(**
  string *elementName*
);

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetFloatValue method

Gets a float value from this WSResult.

Syntax

Visual Basic

```
Public Function GetFloatValue( _
  ByVal childName As String _
) As Single
```

C#

```
public float  GetFloatValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetInt16ArrayValue method

Gets an array of Int16 values from this WSResult.

Syntax

Visual Basic

```
Public Function GetInt16ArrayValue( _
  ByVal elementName As String _
) As Short()
```

C#

```
public short[] GetInt16ArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetInt16Value method

Gets an Int16 value from this WSResult.

Syntax

Visual Basic
```
Public Function GetInt16Value( _
  ByVal childName As String _
) As Short
```

C#
```
public short GetInt16Value(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetInt32ArrayValue method

Gets an array of Int32 values from this WSResult.

Syntax

Visual Basic
```
Public Function GetInt32ArrayValue( _
  ByVal elementName As String _
) As Integer()
```

C#
```
public int[] GetInt32ArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetInt32Value method

Gets an Int32 value from this WSResult.

Syntax

Visual Basic

```
Public Function GetInt32Value( _
   ByVal childName As String _
) As Integer
```

C#

```
public int GetInt32Value(
   string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetInt64ArrayValue method

Gets an array of Int64 values from this WSResult.

Syntax

Visual Basic

```
Public Function GetInt64ArrayValue( _
   ByVal elementName As String _
) As Long()
```

C#

```
public long[] GetInt64ArrayValue(
   string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetInt64Value method

Gets an Int64 value from this WSResult.

Syntax

Visual Basic
```
Public Function GetInt64Value( _
  ByVal childName As String _
) As Long
```

C#
```
public long GetInt64Value(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetIntArrayValue method

Gets an array of int values from this WSResult.

Syntax

Visual Basic
```
Public Function GetIntArrayValue( _
  ByVal elementName As String _
) As Integer()
```

C#
```
public int[] GetIntArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetIntValue method

Gets an int value from this WSResult.

Syntax

Visual Basic

```
Public Function GetIntValue( _
  ByVal childName As String _
) As Integer
```

C#

```
public int GetIntValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetLongArrayValue method

Gets an array of long values from this WSResult.

Syntax

Visual Basic

```
Public Function GetLongArrayValue( _
  ByVal elementName As String _
) As Long()
```

C#

```
public long[] GetLongArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetLongValue method

Gets a long value from this WSResult.

Syntax

Visual Basic

```
Public Function GetLongValue( _
  ByVal childName As String _
) As Long
```

C#

```
public long GetLongValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableBoolArrayValue method

Gets an array of bool values from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableBoolArrayValue( _
  ByVal elementName As String _
) As iAnywhere.QAnywhere.WS.NullableBool()
```

C#

```
public iAnywhere.QAnywhere.WS.NullableBool[] GetNullableBoolArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableBoolValue method

Gets a bool value from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableBoolValue( _
   ByVal childName As String _
) As iAnywhere.QAnywhere.WS.NullableBool
```

C#

```
public iAnywhere.QAnywhere.WS.NullableBool GetNullableBoolValue(
   string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableDecimalArrayValue method

Gets an array of NullableDecimal values from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableDecimalArrayValue( _
   ByVal elementName As String _
) As iAnywhere.QAnywhere.WS.NullableDecimal()
```

C#

```
public iAnywhere.QAnywhere.WS.Nullabledecimal[] GetNullableDecimalArrayValue(
   string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableDecimalValue method

Gets a NullableDecimal value from this WSResult.

Syntax

Visual Basic
```
Public Function GetNullableDecimalValue( _
  ByVal childName As String _
) As iAnywhere.QAnywhere.WS.NullableDecimal
```

C#
```
public iAnywhere.QAnywhere.WS.Nullabledecimal GetNullableDecimalValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableDoubleArrayValue method

Gets an array of double values from this WSResult.

Syntax

Visual Basic
```
Public Function GetNullableDoubleArrayValue( _
  ByVal elementName As String _
) As iAnywhere.QAnywhere.WS.NullableDouble()
```

C#
```
public iAnywhere.QAnywhere.WS.Nullabledouble[] GetNullableDoubleArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableDoubleValue method

Gets a double value from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableDoubleValue( _
   ByVal childName As String _
) As iAnywhere.QAnywhere.WS.NullableDouble
```

C#

```
public iAnywhere.QAnywhere.WS.Nullabledouble GetNullableDoubleValue(
   string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableFloatArrayValue method

Gets an array of float values from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableFloatArrayValue( _
   ByVal elementName As String _
) As iAnywhere.QAnywhere.WS.NullableFloat()
```

C#

```
public iAnywhere.QAnywhere.WS.NullableFloat[] GetNullableFloatArrayValue(
   string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableFloatValue method

Gets a float value from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableFloatValue( _
  ByVal childName As String _
) As iAnywhere.QAnywhere.WS.NullableFloat
```

C#

```
public iAnywhere.QAnywhere.WS.NullableFloat GetNullableFloatValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableIntArrayValue method

Gets an array of int values from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableIntArrayValue( _
  ByVal elementName As String _
) As iAnywhere.QAnywhere.WS.NullableInt()
```

C#

```
public iAnywhere.QAnywhere.WS.NullableInt[] GetNullableIntArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableIntValue method

Gets an int value from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableIntValue( _
   ByVal childName As String _
) As iAnywhere.QAnywhere.WS.NullableInt
```

C#

```
public iAnywhere.QAnywhere.WS.NullableInt GetNullableIntValue(
   string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableLongArrayValue method

Gets an array of long values from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableLongArrayValue( _
   ByVal elementName As String _
) As iAnywhere.QAnywhere.WS.NullableLong()
```

C#

```
public iAnywhere.QAnywhere.WS.NullableLong[] GetNullableLongArrayValue(
   string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableLongValue method

Gets an Int64 value from this WSResult.

Syntax

Visual Basic
```
Public Function GetNullableLongValue( _
  ByVal childName As String _
) As iAnywhere.QAnywhere.WS.NullableLong
```

C#
```
public iAnywhere.QAnywhere.WS.NullableLong GetNullableLongValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableSByteArrayValue method

Gets an array of byte values from this WSResult.

Syntax

Visual Basic
```
Public Function GetNullableSByteArrayValue( _
  ByVal elementName As String _
) As iAnywhere.QAnywhere.WS.NullableSByte()
```

C#
```
public iAnywhere.QAnywhere.WS.NullableSbyte[] GetNullableSByteArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableSByteValue method

Gets a byte value from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableSByteValue( _
   ByVal childName As String _
) As iAnywhere.QAnywhere.WS.NullableSByte
```

C#

```
public iAnywhere.QAnywhere.WS.NullableSbyte GetNullableSByteValue(
   string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableShortArrayValue method

Gets an array of short values from this WSResult.

Syntax

Visual Basic

```
Public Function GetNullableShortArrayValue( _
   ByVal elementName As String _
) As iAnywhere.QAnywhere.WS.NullableShort()
```

C#

```
public iAnywhere.QAnywhere.WS.NullableShort[] GetNullableShortArrayValue(
   string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetNullableShortValue method

Gets a short value from this WSResult.

Syntax

Visual Basic
```
Public Function GetNullableShortValue( _
  ByVal childName As String _
) As iAnywhere.QAnywhere.WS.NullableShort
```

C#
```
public iAnywhere.QAnywhere.WS.NullableShort GetNullableShortValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetObjectArrayValue method

Gets an array of Object values from this WSResult.

Syntax

Visual Basic
```
Public Function GetObjectArrayValue( _
  ByVal elementName As String _
) As Object()
```

C#
```
public object[] GetObjectArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetObjectValue method

Gets an object value from this WSResult.

Syntax

Visual Basic

```
Public Function GetObjectValue( _
   ByVal childName As String _
) As Object
```

C#

```
public object GetObjectValue(
   string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

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

Visual Basic

```
Public Function GetRequestID() As String
```

C#

```
public string  GetRequestID();
```

Return value

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.

Syntax

Visual Basic

```
Public Function GetSByteArrayValue( _
  ByVal elementName As String _
) As System.SByte()
```

C#

```
public System.Sbyte[] GetSByteArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetSByteValue method

Gets an sbyte value from this WSResult.

Syntax

Visual Basic

```
Public Function GetSByteValue( _
  ByVal childName As String _
) As System.SByte
```

C#

```
public System.Sbyte GetSByteValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetShortArrayValue method

Gets an array of short values from this WSResult.

Syntax

Visual Basic

```
Public Function GetShortArrayValue( _
  ByVal elementName As String _
) As Short()
```

C#

```
public short[] GetShortArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetShortValue method

Gets a short value from this WSResult.

Syntax

Visual Basic

```
Public Function GetShortValue( _
  ByVal childName As String _
) As Short
```

C#

```
public short GetShortValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetSingleArrayValue method

Gets an array of Single values from this WSResult.

Syntax

Visual Basic

```
Public Function GetSingleArrayValue( _
  ByVal elementName As String _
) As Single()
```

C#

```
public float [] GetSingleArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetSingleValue method

Gets a Single value from this WSResult.

Syntax

Visual Basic

```
Public Function GetSingleValue( _
  ByVal childName As String _
) As Single
```

C#

```
public float  GetSingleValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetStatus method

Gets the status of this WSResult.

Syntax

Visual Basic
Public Function **GetStatus()** As iAnywhere.QAnywhere.WS.WSStatus

C#
public iAnywhere.QAnywhere.WS.WSStatus **GetStatus();**

Return value

The status code.

See also

- "WSResult class" on page 364
- "WSResult members" on page 364
- "WSStatus enumeration" on page 398

GetStringArrayValue method

Gets an array of string values from this WSResult.

Syntax

Visual Basic
```
Public Function GetStringArrayValue( _
  ByVal elementName As String _
) As String()
```

C#
```
public string [] GetStringArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetStringValue method

Gets a string value from this WSResult.

Syntax

Visual Basic
```
Public Function GetStringValue( _
  ByVal childName As String _
) As String
```

C#
```
public string  GetStringValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetUIntArrayValue method

Gets an array of unsigned int values from this WSResult.

Syntax

Visual Basic
```
Public Function GetUIntArrayValue( _
  ByVal elementName As String _
) As UInt32()
```

C#
```
public uint[] GetUIntArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetUIntValue method

Gets a unsigned int value from this WSResult.

Syntax

Visual Basic
```
Public Function GetUIntValue( _
  ByVal childName As String _
) As UInt32
```

C#
```
public uint GetUIntValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetULongArrayValue method

Gets an array of unsigned long values from this WSResult.

Syntax

Visual Basic
```
Public Function GetULongArrayValue( _
  ByVal elementName As String _
) As UInt64()
```

C#
```
public ulong[] GetULongArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetULongValue method

Gets a unsigned long value from this WSResult.

Syntax

Visual Basic
```
Public Function GetULongValue( _
  ByVal childName As String _
) As UInt64
```

C#
```
public ulong GetULongValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetUShortArrayValue method

Gets an array of unsigned short values from this WSResult.

Syntax

Visual Basic
```
Public Function GetUShortArrayValue( _
  ByVal elementName As String _
) As UInt16()
```

C#
```
public ushort[] GetUShortArrayValue(
  string  elementName
);
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

GetUShortValue method

Gets a unsigned short value from this WSResult.

Syntax

Visual Basic
```
Public Function GetUShortValue( _
  ByVal childName As String _
) As UInt16
```

C#
```
public ushort GetUShortValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

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

Visual Basic
```
Public Function GetValue( _
  ByVal childName As String _
) As Object
```

C#
```
public object GetValue(
  string  childName
);
```

Parameters

- **childName** The element name in the WSDL document of this value.

Return value

The value.

Exceptions

- WSException class - Thrown if there is a problem getting the value.

SetLogger method

Turns debug on or off.

Syntax

Visual Basic
```
Public Sub SetLogger( _
  ByVal wsLogger As iAnywhere.QAnywhere.WS.WSLogger _
)
```

C#
```
public void SetLogger(
  iAnywhere.QAnywhere.WS.WSLogger wsLogger
);
```

WSStatus enumeration

This class defines codes for the status of a web service. request.

Syntax

Visual Basic
```
Public Enum WSStatus
```

C#
```
public enum WSStatus
```

Member name

Member name	Description
STATUS_ERROR	There was an error processing the request.
STATUS_QUEUED	The request has been queued for delivery to the server.
STATUS_RESULT_AVAIL-ABLE	The result of the request is available.
STATUS_SUCCESS	The request was successful.

CHAPTER 13

QAnywhere C++ API Reference

Contents

AcknowledgementMode class

Syntax

public **AcknowledgementMode**

Remarks

Indicates how messages should be acknowledged by QAnywhere client applications.

The IMPLICIT_ACKNOWLEDGEMENT and EXPLICIT_ACKNOWLEDGEMENT modes are assigned to a QAManager instance using the QAManageropen() method. The TRANSACTIONAL mode is implicitly assigned to QATransactionalManager instances.

For more information, see"Initializing a QAnywhere API" on page 56.

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 QATransactionalManagercommit() 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 76 and"Receiving messages asynchronously" on page 77.

For transactional messaging, use the QATransactionalManager. In this case, you use the QATransactionalManagercommit method to acknowledge messages belonging to a transaction.

You can determine the mode of a QAManagerBase instance using the QAManagerBaseMode property.

See Also

QAManager class

QATransactionalManager class

QAManagerBase class

Members

All members of AcknowledgementMode, including all inherited members.

- "EXPLICIT_ACKNOWLEDGEMENT variable" on page 400
- "IMPLICIT_ACKNOWLEDGEMENT variable" on page 401
- "TRANSACTIONAL variable" on page 401

EXPLICIT_ACKNOWLEDGEMENT variable

Synopsis

const qa_short **AcknowledgementMode::EXPLICIT_ACKNOWLEDGEMENT**

Remarks

Indicates that received messages are acknowledged using one of the QAManager acknowledge methods.

IMPLICIT_ACKNOWLEDGEMENT variable

Synopsis

const qa_short **AcknowledgementMode::IMPLICIT_ACKNOWLEDGEMENT**

Remarks

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 QAManagerBasegetMessage method returns. If you receive messages asynchronously, the message is acknowledged as soon as the event handling function returns.

TRANSACTIONAL variable

Synopsis

const qa_short **AcknowledgementMode::TRANSACTIONAL**

Remarks

Indicates that messages are only acknowledged as part of the ongoing transaction.

This mode is automatically assigned to QATransactionalManager instances.

MessageProperties class

Syntax

public **MessageProperties**

Remarks

Provides fields storing standard message property names.

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"Message headers and message properties" on page 208

```
QATextMessage * t_msg;
```

The following example gets the value corresponding to MessagePropertiesMSG_TYPE using the QAMessagegetIntProperty 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 MessagePropertiesMSG_TYPE and MessagePropertiesRASNAMES 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));

    }

  //...
  }
 }
```

See Also

QAMessage class

Members

All members of MessageProperties, including all inherited members.

ADAPTER variable

Synopsis

const qa_string **MessageProperties::ADAPTER**

Remarks

This property name refers to the currently active network adapter that is being used to connect to the QAnywhere server.

It is used for system queue messages.

The value of this field is "ias_Network.Adapter".

Pass MessagePropertiesADAPTER as the first parameter to the QAMessagegetStringProperty method to access the associated message property.

For more information, see"Message properties" on page 211.

See Also

getStringProperty function

ADAPTERS variable

Synopsis

const qa_string **MessageProperties::ADAPTERS**

Remarks

This property name refers to a delimited list of network adapters that can be used to connect to the QAnywhere server.

It is used for system queue messages.

The value of this field is "ias_Adapters".

Pass MessagePropertiesADAPTERS as the first parameter to the QAMessagegetStringProperty method to access the associated message property.

For more information, see"Message properties" on page 211. getStringProperty function

DELIVERY_COUNT variable

Synopsis

const qa_string **MessageProperties::DELIVERY_COUNT**

Remarks

This property name refers to the number of attempts that have been made so far to deliver the message.

The value of this field is "ias_DeliveryCount".

Pass MessagePropertiesDELIVERY_COUNT as the first parameter in the QAMessagesetStringProperty method or the QAMessagegetStringProperty method to access the associated message property.

See Also

setStringProperty function

getStringProperty function

IP variable

Synopsis

const qa_string **MessageProperties::IP**

Remarks

This property name refers to the IP address of the currently active network adapter that is being used to connect to the QAnywhere server.

It is used for system queue messages.

The value of this field is "ias_Network.IP".

Pass MessagePropertiesIP as the first parameter to the QAMessagegetStringProperty method to access the associated message property.

For more information, see"Message properties" on page 211.

See Also

getStringProperty function

MAC variable

Synopsis

const qa_string **MessageProperties::MAC**

Remarks

This property name refers to the MAC address of the currently active network adapter that is being used to connect to the QAnywhere server.

It is used for system queue messages.

The value of this field is "ias_Network.MAC".

Pass MessagePropertiesMAC as the first parameter to the QAMessagegetStringProperty method to access the associated message property.

For more information, see"Message properties" on page 211.

See Also

getStringProperty function

MSG_TYPE variable

Synopsis

const qa_string **MessageProperties::MSG_TYPE**

Remarks

This property name refers to MessageType enumeration values associated with a QAnywhere message.

The value of this field is "ias_MessageType". Pass MessagePropertiesMSG_TYPE as the first parameter in the QAMessagesetIntProperty method or the QAMessagegetIntProperty method to determine the associated property.

See Also

MessageType class

setIntProperty function

getIntProperty function

NETWORK_STATUS variable

Synopsis

const qa_string **MessageProperties::NETWORK_STATUS**

Remarks

This property name refers to the state of the network connection.

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 211.

Pass MessagePropertiesNETWORK_STATUS as the first parameter in the QAMessagesetStringProperty method or the QAMessagegetStringProperty method to access the associated message property.

See Also

setStringProperty function

getStringProperty function

ORIGINATOR variable

Synopsis

const qa_string **MessageProperties::ORIGINATOR**

Remarks

This property name refers to the message store ID of the originator of the message.

The value of this field is "ias_Originator".

Pass MessagePropertiesORIGINATOR as the first parameter in the QAMessagesetStringProperty method or the QAMessagegetStringProperty method to access the associated message property.

See Also

setStringProperty function

getStringProperty function

RAS variable

Synopsis

const qa_string **MessageProperties::RAS**

Remarks

This property name refers to the currently active RAS name that is being used to connect to the QAnywhere server.

It is used for system queue messages.

The value of this field is "ias_Network.RAS".

Pass MessagePropertiesRAS as the first parameter to the QAMessagegetStringProperty method to access the associated message property.

For more information, see"Message properties" on page 211.

See Also

getStringProperty function

RASNAMES variable

Synopsis

const qa_string **MessageProperties::RASNAMES**

Remarks

This property name refers to a delimited list of RAS entry names that can be used to connect to the QAnywhere server.

It is used for system queue messages.

The value of this field is "ias_RASNames".

For more information, see"Message properties" on page 211.

Pass MessagePropertiesRASNAMES as the first parameter in the QAMessagesetStringProperty method or the QAMessagegetStringProperty method to access the associated message property.

See Also

setStringProperty function

getStringProperty function

setIntProperty function

getIntProperty function

STATUS variable

Synopsis

const qa_string **MessageProperties::STATUS**

Remarks

This property name refers to the current status of the message.

For a list of values, see the StatusCodes class. The value of this field is "ias_Status".

Pass MessagePropertiesSTATUS as the first parameter in the QAMessagesetIntProperty method or the QAMessagegetIntProperty method to access the associated message property.

See Also

StatusCodes class

setIntProperty function

getIntProperty function

STATUS_TIME variable

Synopsis

const qa_string **MessageProperties::STATUS_TIME**

Remarks

This property name refers to the time at which the message received its current status.

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 MessagePropertiesSTATUS_TIME as the first parameter in the QAMessagegetLongProperty method to access the associated read-only message property.

See Also

getLongProperty function

TRANSMISSION_STATUS variable

Synopsis

const qa_string **MessageProperties::TRANSMISSION_STATUS**

Remarks

This property name refers to the current transmission status of the message.

For a list of values, see the StatusCodes class.

The value of this field is "ias_TransmissionStatus".

Pass MessagePropertiesTRANSMISSION_STATUS as the first parameter in the QAMessagesetIntProperty method or the QAMessagegetIntProperty method to access the associated message property.

See Also

StatusCodes class

setIntProperty function

MessageStoreProperties class

Syntax

public **MessageStoreProperties**

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.

For more information, see "Client message store properties" on page 217.

Members

All members of MessageStoreProperties, including all inherited members.

- "MAX_DELIVERY_ATTEMPTS variable" on page 410

MAX_DELIVERY_ATTEMPTS variable

Synopsis

const qa_string **MessageStoreProperties::MAX_DELIVERY_ATTEMPTS**

Remarks

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 StatusCodesUNRECEIVABLE.

The value of this field is "ias_MaxDeliveryAttempts".

See Also

StatusCodes class

MessageType class

Syntax

public **MessageType**

Remarks

Defines constant values for the MessagePropertiesMSG_TYPE message property.

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));

    }

    //...
    }
   }
```

Members

All members of MessageType, including all inherited members.

- “NETWORK_STATUS_NOTIFICATION variable” on page 411
- “PUSH_NOTIFICATION variable” on page 412
- “REGULAR variable” on page 412

NETWORK_STATUS_NOTIFICATION variable

Synopsis

const qa_int **MessageType::NETWORK_STATUS_NOTIFICATION**

Remarks

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 the MessagePropertiesADAPTER, MessagePropertiesNETWORK, and MessagePropertiesNETWORK_STATUS fields to identify new network status information.

For more information, see"Pre-defined message properties" on page 211.

PUSH_NOTIFICATION variable

Synopsis

const qa_int **MessageType::PUSH_NOTIFICATION**

Remarks

Identifies a QAnywhere system message used to notify QAnywhere client applications of push notifications.

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"Pre-defined message properties" on page 211.

REGULAR variable

Synopsis

const qa_int **MessageType::REGULAR**

Remarks

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.

QABinaryMessage class

Syntax

public **QABinaryMessage**

Base classes

- "QAMessage class" on page 469

Remarks

A QABinaryMessage object is used to send a message containing a stream of uninterpreted bytes.

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 QABinaryMessagereset 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.

The following example uses the QABinaryMessagewriteString 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();
    }
```

Note: On the receiving end, the first QABinaryMessagereadString() invocation returns "Q" and the next QABinaryMessagereadString() 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 36 and"Writing QAnywhere Client Applications" on page 47.

Members

All members of QABinaryMessage, including all inherited members.

getBodyLength function

Synopsis

qa_long **QABinaryMessage::getBodyLength()**

Remarks

Returns the size of the message body in bytes.

Returns

The size of the message body in bytes.

readBinary function

Synopsis

qa_int **QABinaryMessage::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.

Remarks

Reads a specified number of bytes starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeBinary function

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.

readBoolean function

Synopsis

qa_bool **QABinaryMessage::readBoolean(**
  qa_bool * *value*
)

Parameters

- **value** The destination of the `qa_bool` value read from the bytes message stream.

Remarks

Reads a boolean value starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeBoolean function

Returns

True if and only if the operation succeeded.

readByte function

Synopsis

qa_bool **QABinaryMessage::readByte(**
  qa_byte * *value*
)

Parameters

- **value** The destination of the `qa_byte` value read from the bytes message stream.

Remarks

Reads a signed 8-bit value starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeByte function

Returns

True if and only if the operation succeeded.

readChar function

Synopsis

qa_bool **QABinaryMessage::readChar(**
  qa_char * *value*
)

Parameters

- **value** The destination of the `qa_char` value read from the bytes message stream.

Remarks

Reads a character value starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeChar function

Returns

The character value read.

readDouble function

Synopsis

qa_bool **QABinaryMessage::readDouble(**
  qa_double * *value*
)

Parameters

- **value** The destination of the double value read from the bytes message stream.

Remarks

Reads a double value starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeDouble function

Returns

True if and only if the operation succeeded.

readFloat function

Synopsis

```
qa_bool QABinaryMessage::readFloat(
  qa_float * value
)
```

Parameters

- **value** The destination of the float value read from the bytes message stream.

Remarks

Reads a float value starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeFloat function

Returns

True if and only if the operation succeeded.

readInt function

Synopsis

```
qa_bool QABinaryMessage::readInt(
  qa_int * value
)
```

Parameters

- **value** The destination of the `qa_int` value read from the bytes message stream.

Remarks

Reads a signed 32-bit integer value starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeInt function

Returns

True if and only if the operation succeeded.

readLong function

Synopsis

qa_bool **QABinaryMessage::readLong(**
  qa_long * *value*
)

Parameters

- **value** The destination of the long value read from the bytes message stream.

Remarks

Reads a signed 64-bit integer value starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeLong function

Returns

True if and only if the operation succeeded.

readShort function

Synopsis

qa_bool **QABinaryMessage::readShort(**
  qa_short * *value*
)

Parameters

- **value** The destination of the `qa_short` value read from the bytes message stream.

Remarks

Reads a signed 16-bit value starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeShort function

Returns

True if and only if the operation succeeded.

readString function

Synopsis

qa_int **QABinaryMessage::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.

Remarks

Reads a string value starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeString function

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.

reset function

Synopsis

void **QABinaryMessage::reset()**

Remarks

Resets a message so that the reading of values starts from the beginning of the message body.

The reset method also puts the QABinaryMessage message body in read-only mode.

writeBinary function

Synopsis

void **QABinaryMessage::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.

Remarks

Appends a byte array value to the QABinaryMessage instance's message body.

See Also

readBinary function

writeBoolean function

Synopsis

void **QABinaryMessage::writeBoolean(**
qa_bool *value*
)

Parameters

- **value** The boolean value to write to the message body.

Remarks

Appends a boolean value to the QABinaryMessage instance's message body.

The boolean is represented as a one-byte value. True is represented as 1; false is represented as 0.

See Also

readBoolean function

writeByte function

Synopsis

void **QABinaryMessage::writeByte(**
qa_byte *value*
)

Parameters

- **value** The byte array value to write to the message body.

Remarks

Appends a byte value to the QABinaryMessage instance's message body.

The byte is represented as a one-byte value.

See Also

readByte function

writeChar function

Synopsis

void **QABinaryMessage::writeChar(**
  qa_char *value*
)

Parameters

♦ **value** the char value to write to the message body.

Remarks

Appends a char value to the QABinaryMessage instance's message body.

The char parameter is represented as a two-byte value and the high order byte is appended first.

See Also

readChar function

writeDouble function

Synopsis

void **QABinaryMessage::writeDouble(**
  qa_double *value*
)

Parameters

♦ **value** The double value to write to the message body.

Remarks

Appends a double value to the QABinaryMessage instance's message body.

The double parameter is converted to a representive eight-byte long value. Higher order bytes are appended first.

See Also

readDouble function

writeFloat function

Synopsis

void **QABinaryMessage::writeFloat(**
qa_float *value*
)

Parameters

- **value** The float value to write to the message body.

Remarks

Appends a float value to the QABinaryMessage instance's message body.

The float parameter is converted to a representative 4-byte integer and the higher order bytes are appended first.

See Also

readFloat function

writeInt function

Synopsis

void **QABinaryMessage::writeInt(**
qa_int *value*
)

Parameters

- **value** the int value to write to the message body.

Remarks

Appends an integer value to the QABinaryMessage instance's message body.

The integer parameter is represented as a four-byte value and higher order bytes are appended first.

See Also

readInt function

writeLong function

Synopsis

void **QABinaryMessage::writeLong(**
qa_long *value*
)

Parameters

- **value** The long value to write to the message body.

Remarks

Appends a long value to the QABinaryMessage instance's message body.

The long parameter is represented as an eight-byte value and higher order bytes are appended first.

See Also

readLong function

writeShort function

Synopsis

```
void QABinaryMessage::writeShort(
  qa_short value
)
```

Parameters

- **value** The short value to write to the message body.

Remarks

Appends a short value to the QABinaryMessage instance's message body.

The short parameter is represented as a two-byte value and the higher order byte is appended first.

See Also

readShort function

writeString function

Synopsis

```
void QABinaryMessage::writeString(
  qa_const_string value
)
```

Parameters

- **value** The string value to write to the message body.

Remarks

Appends a string value to the QABinaryMessage instance's message body.

Note: The receving application needs to invoke QABinaryMessagereadString for each writeString invocation.

Note: The UTF-8 representation of the string can be at most 32767 bytes.

See Also

readString function

~QABinaryMessage function

Synopsis

virtual **QABinaryMessage::~QABinaryMessage()**

Remarks

Virtual destructor.

QAError class

Syntax

public **QAError**

Remarks

This class defines error constants associated with a QAnywhere client application.

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 QAManagergetLastError

```
if (qa_mgr->getLastError() != QAError::QA_NO_ERROR)
{
  // Process error.
}
```

See Also

getLastErrorMsg function

Members

All members of QAError, including all inherited members.

- "COMMON_ALREADY_OPEN_ERROR variable" on page 427
- "COMMON_GET_INIT_FILE_ERROR variable" on page 427
- "COMMON_GETQUEUEDEPTH_ERROR variable" on page 427
- "COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG variable" on page 427
- "COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID variable" on page 427
- "COMMON_INIT_ERROR variable" on page 428
- "COMMON_INIT_THREAD_ERROR variable" on page 428
- "COMMON_INVALID_PROPERTY variable" on page 428
- "COMMON_MSG_ACKNOWLEDGE_ERROR variable" on page 428
- "COMMON_MSG_CANCEL_ERROR variable" on page 428
- "COMMON_MSG_CANCEL_ERROR_SENT variable" on page 428
- "COMMON_MSG_NOT_WRITEABLE_ERROR variable" on page 429
- "COMMON_MSG_RETRIEVE_ERROR variable" on page 429
- "COMMON_MSG_STORE_ERROR variable" on page 429
- "COMMON_MSG_STORE_NOT_INITIALIZED variable" on page 429
- "COMMON_MSG_STORE_TOO_LARGE variable" on page 429
- "COMMON_NO_DEST_ERROR variable" on page 430
- "COMMON_NO_IMPLEMENTATION variable" on page 430
- "COMMON_NOT_OPEN_ERROR variable" on page 430
- "COMMON_OPEN_ERROR variable" on page 430
- "COMMON_OPEN_LOG_FILE_ERROR variable" on page 430
- "COMMON_OPEN_MAXTHREADS_ERROR variable" on page 430
- "COMMON_SELECTOR_SYNTAX_ERROR variable" on page 431

- "COMMON_TERMINATE_ERROR variable" on page 431
- "COMMON_UNEXPECTED_EOM_ERROR variable" on page 431
- "COMMON_UNREPRESENTABLE_TIMESTAMP variable" on page 431
- "QA_NO_ERROR variable" on page 431

COMMON_ALREADY_OPEN_ERROR variable

Synopsis

const qa_int **QAError::COMMON_ALREADY_OPEN_ERROR**

Remarks

The QAManager is already open.

COMMON_GETQUEUEDEPTH_ERROR variable

Synopsis

const qa_int **QAError::COMMON_GETQUEUEDEPTH_ERROR**

Remarks

Error getting queue depth.

COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG variable

Synopsis

const qa_int **QAError::COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG**

Remarks

Cannot use QAManagerBase.getQueueDepth on a given destination when filter is ALL.

COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID variable

Synopsis

const qa_int **QAError::COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID**

Remarks

Cannot use QAManagerBase.getQueueDepth when the message store ID has not been set.

COMMON_GET_INIT_FILE_ERROR variable

Synopsis

const qa_int **QAError::COMMON_GET_INIT_FILE_ERROR**

Remarks

Unable to access the client properties file.

COMMON_INIT_ERROR variable

Synopsis

const qa_int **QAError::COMMON_INIT_ERROR**

Remarks

Initialization error.

COMMON_INIT_THREAD_ERROR variable

Synopsis

const qa_int **QAError::COMMON_INIT_THREAD_ERROR**

Remarks

Error initializing the background thread.

COMMON_INVALID_PROPERTY variable

Synopsis

const qa_int **QAError::COMMON_INVALID_PROPERTY**

Remarks

There is an invalid property in the client properties file.

COMMON_MSG_ACKNOWLEDGE_ERROR variable

Synopsis

const qa_int **QAError::COMMON_MSG_ACKNOWLEDGE_ERROR**

Remarks

Error acknowledging the message.

COMMON_MSG_CANCEL_ERROR variable

Synopsis

const qa_int **QAError::COMMON_MSG_CANCEL_ERROR**

Remarks

Error cancelling message.

COMMON_MSG_CANCEL_ERROR_SENT variable

Synopsis

const qa_int **QAError::COMMON_MSG_CANCEL_ERROR_SENT**

Remarks

Error cancelling message.

Cannot cancel a message that has already been sent.

COMMON_MSG_NOT_WRITEABLE_ERROR variable

Synopsis

const qa_int **QAError::COMMON_MSG_NOT_WRITEABLE_ERROR**

Remarks

You cannot write to a message as it is in read-only mode.

COMMON_MSG_RETRIEVE_ERROR variable

Synopsis

const qa_int **QAError::COMMON_MSG_RETRIEVE_ERROR**

Remarks

Error retrieving a message from the client message store.

COMMON_MSG_STORE_ERROR variable

Synopsis

const qa_int **QAError::COMMON_MSG_STORE_ERROR**

Remarks

Error storing a message in the client message store.

COMMON_MSG_STORE_NOT_INITIALIZED variable

Synopsis

const qa_int **QAError::COMMON_MSG_STORE_NOT_INITIALIZED**

Remarks

The message store has not been initialized for messaging.

COMMON_MSG_STORE_TOO_LARGE variable

Synopsis

const qa_int **QAError::COMMON_MSG_STORE_TOO_LARGE**

Remarks

The message store is too large relative to the free disk space on the device.

COMMON_NOT_OPEN_ERROR variable

Synopsis

const qa_int **QAError::COMMON_NOT_OPEN_ERROR**

Remarks

The QAManager is not open.

COMMON_NO_DEST_ERROR variable

Synopsis

const qa_int **QAError::COMMON_NO_DEST_ERROR**

Remarks

No destination.

COMMON_NO_IMPLEMENTATION variable

Synopsis

const qa_int **QAError::COMMON_NO_IMPLEMENTATION**

Remarks

The function is not implemented.

COMMON_OPEN_ERROR variable

Synopsis

const qa_int **QAError::COMMON_OPEN_ERROR**

Remarks

Error opening a connection to the message store.

COMMON_OPEN_LOG_FILE_ERROR variable

Synopsis

const qa_int **QAError::COMMON_OPEN_LOG_FILE_ERROR**

Remarks

Error opening the log file.

COMMON_OPEN_MAXTHREADS_ERROR variable

Synopsis

const qa_int **QAError::COMMON_OPEN_MAXTHREADS_ERROR**

Remarks

Cannot open the QAManager because the maximum number of concurrent server requests is not high enough.

For more information, see"-gn server option" [*SQL Anywhere Server - Database Administration*].

COMMON_SELECTOR_SYNTAX_ERROR variable

Synopsis

const qa_int **QAError::COMMON_SELECTOR_SYNTAX_ERROR**

Remarks

The given selector has a syntax error.

COMMON_TERMINATE_ERROR variable

Synopsis

const qa_int **QAError::COMMON_TERMINATE_ERROR**

Remarks

Termination error.

COMMON_UNEXPECTED_EOM_ERROR variable

Synopsis

const qa_int **QAError::COMMON_UNEXPECTED_EOM_ERROR**

Remarks

Unexpected end of message reached.

COMMON_UNREPRESENTABLE_TIMESTAMP variable

Synopsis

const qa_int **QAError::COMMON_UNREPRESENTABLE_TIMESTAMP**

Remarks

The timestamp is outside of the acceptable range.

QA_NO_ERROR variable

Synopsis

const qa_int **QAError::QA_NO_ERROR**

Remarks

No error.

QAManager class

Syntax

public **QAManager**

Base classes

- "QAManagerBase class" on page 437

Remarks

The QAManager class derives from QAManagerBase and manages non-transactional QAnywhere messaging operations.

For a detailed description of derived behavior, see QAManagerBase class.

The QAManager class 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

QAManagerBase class

QATransactionalManager class

AcknowledgementMode class

Members

All members of QAManager, including all inherited members.

- "acknowledge function" on page 433
- "acknowledgeAll function" on page 434
- "acknowledgeUntil function" on page 435
- "beginEnumStorePropertyNames function" on page 439
- "browseClose function" on page 439
- "browseMessages function" on page 439
- "browseMessagesByID function" on page 440
- "browseMessagesByQueue function" on page 441
- "browseMessagesBySelector function" on page 441
- "browseNextMessage function" on page 442
- "cancelMessage function" on page 443
- "close function" on page 443
- "createBinaryMessage function" on page 444
- "createTextMessage function" on page 444
- "deleteMessage function" on page 444
- "endEnumStorePropertyNames function" on page 445

acknowledge function

Synopsis

qa_bool **QAManager::acknowledge(**
  QAMessage * *msg*
)

Parameters

- **msg** The message to acknowledge.

Remarks

Acknowledges that the client application successfully received a QAnywhere message.

Note: when a QAMessage is acknowledged, its MessagePropertiesSTATUS 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 240.

See Also

acknowledgeAll function

acknowledgeUntil function

Returns

True if and only if the operation succeeded.

acknowledgeAll function

Synopsis

qa_bool **QAManager::acknowledgeAll()**

Remarks

Acknowledges that the client application successfully received all unacknowledged QAnywhere messages.

Note: when a QAMessage is acknowledged, its MessagePropertiesSTATUS 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 240.

See Also

acknowledge function

acknowledgeUntil function

Returns

True if and only if the operation succeeded.

acknowledgeUntil function

Synopsis

qa_bool **QAManager::acknowledgeUntil(**
  QAMessage * *msg*
)

Parameters

- **msg** The last message to acknowledge. All earlier unacknowledged messages are also acknowledged.

Remarks

Acknowledges the given QAMessage instance and all unacknowledged messages received before the given message.

Note: when a QAMessage is acknowledged, its MessagePropertiesSTATUS 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 240.

See Also

acknowledge function

acknowledgeAll function

Returns

True if and only if the operation succeeded.

open function

Synopsis

qa_bool **QAManager::open(**
  qa_short *mode*
)

Parameters

- **mode** The acknowledgement mode.

Remarks

Opens the QAManager with the given AcknowledgementMode value.

The open method must be the first method called after creating a QAManager.

See Also

AcknowledgementMode class

Returns

True if and only if the operation succeeded.

recover function

Synopsis

qa_bool **QAManager::recover()**

Remarks

Force all unacknowledged messages into a state of unreceived.

That is, these messages must be received again using QAManagergetMessage().

Returns

True if and only if the operation succeeded.

QAManagerBase class

Syntax

public **QAManagerBase**

Derived classes

- "QAManager class" on page 432
- "QATransactionalManager class" on page 495

Remarks

This class acts as a base class for QATransactionalManager and QAManager, which manage transactional and non-transactional messaging, respectively.

Use the QAManagerBasestart() 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 QAManagerBasecreateBinaryMessage() method and the QAManagerBasecreateTextMessage() 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 QAManagerputMessage() 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 36.

Messages are released from memory when you close a QAManagerBase instance using the QAManagerBaseclose().

You can use QAManagerBasegetLastError and QAManagerBasegetLastErrorMessage 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 217 and the MessageStoreProperties class.

See Also

QATransactionalManager class

QAManager class

Members

All members of QAManagerBase, including all inherited members.

- "beginEnumStorePropertyNames function" on page 439
- "browseClose function" on page 439
- "browseMessages function" on page 439
- "browseMessagesByID function" on page 440
- "browseMessagesByQueue function" on page 441

beginEnumStorePropertyNames function

Synopsis

qa_store_property_enum_handle **QAManagerBase::beginEnumStorePropertyNames()**

Remarks

Begins an enumeration of message store property names.

The handle returned by this method is supplied to the QAManagerBasenextStorePropertyName. This method and the QAManagerBasenextStorePropertyName 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 QAManagerBasebeginEnumStorePropertyNames and the QAManagerBaseendEnumStorePropertyNames calls.

See Also

nextStorePropertyName function

beginEnumStorePropertyNames function

endEnumStorePropertyNames function

Returns

A handle that is supplied to QAManagerBasenextStorePropertyName.

browseClose function

Synopsis

void **QAManagerBase::browseClose(**
  qa_browse_handle *handle*
)

Parameters

- **handle** A handle returned by one of the begin browse operations.

Remarks

Frees the resources associated with a browse operation.

browseMessages function

Synopsis

qa_browse_handle **QAManagerBase::browseMessages()**

Remarks

Begins a browse of messages queued in the message store.

The handle returned by this method is supplied to QAManagerBasebrowseNextMessage. This method and the QAManagerBasebrowseNextMessage 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 QAManagerBasegetMessage to receive messages so they can be acknowledged.

See Also

browseNextMessage function

browseMessagesByQueue function

browseMessagesByID function

browseClose function

Returns

A handle that is supplied to QAManagerBasebrowseNextMessage

browseMessagesByID function

Synopsis

qa_browse_handle **QAManagerBase::browseMessagesByID(**
  qa_const_string *msgid*
)

Parameters

- **msgid** The message ID.

Remarks

Begins a browse of the message that is queued in the message store, with the given message ID.

The handle returned by this method is supplied to QAManagerBasebrowseNextMessage. This method and QAManagerBasebrowseNextMessage 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 QAManagerBasegetMessage to receive messages so they can be acknowledged.

See Also

browseNextMessage function

browseMessagesByQueue function

browseMessages function

browseClose function

Returns

A handle that is supplied to browseNextMessage.

browseMessagesByQueue function

Synopsis

qa_browse_handle **QAManagerBase::browseMessagesByQueue(**
  qa_const_string *address*
)

Parameters

- **address** The queue in which to browse.

Remarks

Begins a browse of messages queued in the message store for the given queue.

The handle returned by this method is supplied to QAManagerBasebrowseNextMessage. This method and QAManagerBasebrowseNextMessage 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 QAManagerBasegetMessage to receive messages so they can be acknowledged.

See Also

browseNextMessage function

browseMessagesByID function

browseMessages function

browseClose function

Returns

A handle that is supplied to browseNextMessage.

browseMessagesBySelector function

Synopsis

qa_browse_handle **QAManagerBase::browseMessagesBySelector(**
  qa_const_string *selector*
)

Parameters

- **selector** The selector.

Remarks

Begins a browse of messages queued in the message store that satisfy the given selector.

The handle returned by this method is supplied to QAManagerBasebrowseNextMessage. This method and QAManagerBasebrowseNextMessage 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 QAManagerBasegetMessage to receive messages so they can be acknowledged.

See Also

browseNextMessage function

browseMessagesByID function

browseMessagesByQueue function

browseMessages function

browseClose function

Returns

A handle that is supplied to browseNextMessage.

browseNextMessage function

Synopsis

QAMessage * **QAManagerBase::browseNextMessage(**
  qa_browse_handle *handle*
)

Parameters

- **handle** A handle returned by one of the begin browse operations.

Remarks

Returns the next message for the given browse operation, returning null if there are no more messages.

To obtain the handle to browsed messages, use QAManagerBasebrowseMessages or other QAManagerBase methods which allow you to browse messages by queue or message ID.

See Also

browseMessages function

browseMessagesByQueue function

browseMessagesByID function

browseClose function

Returns

The next message, or qa_null if there are no more messages.

cancelMessage function

Synopsis

qa_bool **QAManagerBase::cancelMessage(**
qa_const_string *msgid*
)

Parameters

- **msgid** The ID of the message to cancel.

Remarks

Cancels the message with the given message ID.

The cancelMessage method puts a message into a cancelled state before it is transmitted. With the default delete rules of the QAnywhere Agent, cancelled 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 240.

Returns

True if and only if the operation succeeded.

close function

Synopsis

qa_bool **QAManagerBase::close()**

Remarks

Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.

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.

See Also

open function

open function

Returns

True if and only if the operation succeeded.

createBinaryMessage function

Synopsis

QABinaryMessage * **QAManagerBase::createBinaryMessage()**

Remarks

Creates a QABinaryMessage instance.

A QABinaryMessage instance is used to send a message containing a message body of uninterpreted bytes.

See Also

QABinaryMessage class

Returns

A new QABinaryMessage class instance.

createTextMessage function

Synopsis

QATextMessage * **QAManagerBase::createTextMessage()**

Remarks

Creates a QATextMessage instance.

A QATextMessage object is used to send a message containing a string message body.

See Also

QATextMessage class

Returns

A new QATextMessage instance.

deleteMessage function

Synopsis

void **QAManagerBase::deleteMessage(**
  QAMessage * *msg*
)

Parameters

- **msg** The message to delete.

Remarks

Deletes a QAMessage object.

By default, messages created by QAManagerBasecreateTextMessage or QAManagerBasecreateBinaryMessage are deleted automatically when the QAManagerBase is closed. This method allows more control over when messages are deleted.

endEnumStorePropertyNames function

Synopsis

void **QAManagerBase::endEnumStorePropertyNames(**
qa_store_property_enum_handle *h*
)

Parameters

- **h** A handle returned by beginEnumStorePropertyNames.

Remarks

Frees the resources associated with a message store property name enumeration.

See Also

beginEnumStorePropertyNames function

getAllQueueDepth function

Synopsis

qa_int **QAManagerBase::getAllQueueDepth(**
qa_short *filter*
)

Parameters

- **filter** A filter indicating incoming messages, outgoing messages, or all messages.

Remarks

Returns the total depth of all queues, based on a given filter.

The depth of a queue is the number of messages which have not been received (for example, using QAManagerBasegetMessage).

See Also

QueueDepthFilter class.

Returns

The number of messages, or -1 if an error occurs.

getBooleanStoreProperty function

Synopsis

```
qa_bool QAManagerBase::getBooleanStoreProperty(
  qa_const_string name,
  qa_bool * value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the boolean value.

Remarks

Gets a boolean value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

getByteStoreProperty function

Synopsis

```
qa_bool QAManagerBase::getByteStoreProperty(
  qa_const_string name,
  qa_byte * value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the byte value.

Remarks

Gets a byte value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

getDoubleStoreProperty function

Synopsis

qa_bool **QAManagerBase::getDoubleStoreProperty(**
  qa_const_string *name*,
  qa_double * *value*
)

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the double value.

Remarks

Gets a double value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

getFloatStoreProperty function

Synopsis

qa_bool **QAManagerBase::getFloatStoreProperty(**
  qa_const_string *name*,
  qa_float * *value*
)

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the float value.

Remarks

Gets a float value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

getIntStoreProperty function

Synopsis

qa_bool **QAManagerBase::getIntStoreProperty(**
  qa_const_string *name*,
  qa_int * *value*
)

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the int value.

Remarks

Gets an int value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

getLastError function

Synopsis

qa_int **QAManagerBase::getLastError()**

Remarks

The error code associated with the last excecuted QAManagerBase method.

0 indicates no error.

For a list of values, see the QAError class.

See Also

getLastErrorMsg function

QAError class

Returns

The error code.

getLastErrorMsg function

Synopsis

qa_string **QAManagerBase::getLastErrorMsg()**

Remarks

The error text associated with the last executed QAManagerBase method.

This method returns null if QAManagerBasegetLastError returns 0. You can retrieve this property after catching a QAError.

See Also

getLastError function

QAError class

Returns

The error message.

getLongStoreProperty function

Synopsis

qa_bool **QAManagerBase::getLongStoreProperty(**
  qa_const_string *name*,
  qa_long * *value*
)

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the long value.

Remarks

Gets a long value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see “Client message store properties” on page 217.

Returns

True if and only if the operation succeeded.

getMessage function

Synopsis

QAMessage * **QAManagerBase::getMessage(**
  qa_const_string *address*
)

Parameters

- **address** The destination.

Remarks

Returns the next available QAMessage class sent to the specified address.

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 77.

Returns

The next QAMessage, or null if no message is available.

getMessageBySelector function

Synopsis

QAMessage * **QAManagerBase::getMessageBySelector(**
  qa_const_string *address*,
  qa_const_string *selector*
)

Parameters

- **address** The destination.
- **selector** The selector.

Remarks

Returns the next available QAMessage sent to the specified address that satisfies the given selector.

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 77.

Returns

The next QAMessage, or null if no message is available.

getMessageBySelectorNoWait function

Synopsis

```
QAMessage * QAManagerBase::getMessageBySelectorNoWait(
  qa_const_string address,
  qa_const_string selector
)
```

Parameters

- **address** The destination.
- **selector** The selector.

Remarks

Returns the next available QAMessage sent to the given address that satisfies the given selector.

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 77.

Returns

The next message, or qa_null if no message is available.

getMessageBySelectorTimeout function

Synopsis

```
QAMessage * QAManagerBase::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

Remarks

Returns the next available QAMessage sent to the given address that satisfies the given selector.

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 77.

Returns

The next QAMessage, or null if no message is available.

getMessageNoWait function

Synopsis

QAMessage * **QAManagerBase::getMessageNoWait(**
  qa_const_string *address*
)

Parameters

- **address** The destination.

Remarks

Returns the next available QAMessage sent to the given address.

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 77.

Returns

The next message, or qa_null if no message is available.

getMessageTimeout function

Synopsis

QAMessage * **QAManagerBase::getMessageTimeout(**
  qa_const_string *address*,
  qa_long *timeout*
)

Parameters

- **address** The destination
- **timeout** The maximum time, in milliseconds, to wait

Remarks

Returns the next available QAMessage sent to the given address.

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 77.

Returns

The next QAMessage, or null if no message is available.

getMode function

Synopsis

qa_short **QAManagerBase::getMode()**

Remarks

Returns the QAManager acknowledgement mode for received messages.

For a list of values, see the AcknowledgementMode class.

AcknowledgementModeEXPLICIT_ACKNOWLEDGEMENT and AcknowledgementModeIMPLICIT_ACKNOWLEDGEMENT apply to QAManager instances; AcknowledgementModeTRANSACTIONAL is the mode for QATransactionalManager instances.

See Also

AcknowledgementMode class

Returns

The acknowledgement mode.

getQueueDepth function

Synopsis

qa_int **QAManagerBase::getQueueDepth(**
  qa_const_string *address*,
  qa_short *filter*
)

Parameters

- **address** The queue name.
- **filter** A filter indicating incoming messages, outgoing messages, or all messages.

Remarks

Returns the depth of a queue, based on a given filter.

The depth of the queue is the number of messages which have not been received (for example, using QAManagerBasegetMessage).

See Also

QueueDepthFilter class

Returns

The number of messages in the queue, or -1 if an error occurs.

getShortStoreProperty function

Synopsis

```
qa_bool QAManagerBase::getShortStoreProperty(
  qa_const_string name,
  qa_short * value
)
```

Parameters

- **name** The pre-defined or custom property name.
- **value** The destination for the short value.

Remarks

Gets a short value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see “Client message store properties” on page 217.

Returns

True if and only if the operation succeeded.

getStringStoreProperty function

Synopsis

```
qa_int QAManagerBase::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.

Remarks

Gets a string value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

The number of non-null qa_chars actually copied, or -1 if the operation failed.

nextStorePropertyName function

Synopsis

```
qa_int QAManagerBase::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.

Remarks

Returns the message store property name for the given enumeration.

If there are no more property names, returns -1.

See Also

beginEnumStorePropertyNames function

Returns

The length of the property name, or -1 if there are no more property names. property names

putMessage function

Synopsis

qa_bool **QAManagerBase::putMessage(**
  qa_const_string *address*,
  QAMessage * *msg*
)

Parameters

- **address** The destination.
- **msg** The message.

Remarks

Puts a message into the queue for the given destination.

Returns

True if and only if the operation succeeded.

putMessageTimeToLive function

Synopsis

qa_bool **QAManagerBase::putMessageTimeToLive(**
  qa_const_string *address*,
  QAMessage * *msg*,
  qa_long *ttl*
)

Parameters

- **address** The destination.
- **msg** The message.
- **ttl** The time-to-live, in milliseconds.

Remarks

Puts a message into the queue for the given destination and a given time-to-live in milliseconds.

Returns

True if and only if the operation succeeded.

setBooleanStoreProperty function

Synopsis

qa_bool **QAManagerBase::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.

Remarks

Sets a pre-defined or custom message store property to a boolean value.

You can use this method to set pre-defined or user-defined client. store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

setByteStoreProperty function

Synopsis

qa_bool **QAManagerBase::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.

Remarks

Sets a pre-defined or custom message store property to a byte value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

setDoubleStoreProperty function

Synopsis

```
qa_bool QAManagerBase::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.

Remarks

Sets a pre-defined or custom message store property to a double value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

setFloatStoreProperty function

Synopsis

```
qa_bool QAManagerBase::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.

Remarks

Sets a pre-defined or custom message store property to a float value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

setIntStoreProperty function

Synopsis

qa_bool **QAManagerBase::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.

Remarks

Sets a pre-defined or custom message store property to a int value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

setLongStoreProperty function

Synopsis

qa_bool **QAManagerBase::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.

Remarks

Sets a pre-defined or custom message store property to a long value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

setMessageListener function

Synopsis

void **QAManagerBase::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

Sets a message listener class to receive QAnywhere messages asynchronously.

The listener is an instance of a class implementing QAMessageListeneronMessage, the only method defined in the QAMessageListener interface. QAMessageListeneronMessage 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 77 and "System queue" on page 52.

setMessageListenerBySelector function

Synopsis

void **QAManagerBase::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

Sets a message listener class to receive QAnywhere messages asynchronously, with a message selector.

The listener is an instance of a class implementing QAMessageListeneronMessage, the only method defined in the QAMessageListener interface. QAMessageListeneronMessage 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 77 and "System queue" on page 52.

setProperty function

Synopsis

```
qa_bool QAManagerBase::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.

Remarks

Allows you to set QAnywhere manager configuration properties programmatically.

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 64.

You can also set QAnywhere manager configuration properties using a properties file and the QAManagerFactorycreateQAManager method.

For more information, see "Setting QAnywhere manager configuration properties in a file" on page 64.

Note: you must set required properties before calling QAManageropen() or QATransactionalManageropen ().

Returns

True if and only if the operation succeeded.

setShortStoreProperty function

Synopsis

qa_bool **QAManagerBase::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.

Remarks

Sets a pre-defined or custom message store property to a short value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

setStringStoreProperty function

Synopsis

qa_bool **QAManagerBase::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.

Remarks

Sets a pre-defined or custom message store property to a string value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see MessageStoreProperties class.

For more information, see "Client message store properties" on page 217.

Returns

True if and only if the operation succeeded.

start function

Synopsis

qa_bool **QAManagerBase::start()**

Remarks

Starts the QAManagerBase for receiving incoming messages in message listeners.

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. One should use one or the other of the asynchronous (message listener) or synchronous (getMessage) models.

Any calls to start beyond the first without an intervening QAManagerBasestop() call are ignored.

See Also

stop function

Returns

True if and only if the operation succeeded.

stop function

Synopsis

qa_bool **QAManagerBase::stop()**

Remarks

Stops the QAManagerBase's reception of incoming messages.

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 QAManagerBasestart() are ignored.

See Also

start function

Returns

True if and only if the operation succeeded.

triggerSendReceive function

Synopsis

qa_bool **QAManagerBase::triggerSendReceive()**

Remarks

Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

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 QAManagerBaseputMessage to send a message.

For more information, see "Determining when message transmission should occur on the client" on page 36.

See Also

putMessage function

Returns

True if and only if the operation succeeded.

QAManagerFactory class

Syntax

public **QAManagerFactory**

Remarks

This class acts as a factory class for creating QATransactionalManager and QAManager objects.

You can only have one instance of QAManagerFactory.

See Also

QAManager class

QATransactionalManager class

Members

All members of QAManagerFactory, including all inherited members.

createQAManager function

Synopsis

```
QAManager * QAManagerFactory::createQAManager(
  qa_const_string iniFile
)
```

Parameters

- **iniFile** The path of the properties file.

Remarks

Returns a new QAManager instance with the specified properties.

If the properties file parameter is null, the QAManager is created using default properties. You can use the QAManagersetProperty() 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 64.

See Also

QAManager class

Returns

The QAManager instance.

createQATransactionalManager function

Synopsis

```
QATransactionalManager * QAManagerFactory::createQATransactionalManager(
  qa_const_string iniFile
)
```

Parameters

- **iniFile** The path of the properties file.

Remarks

Returns a new QATransactionalManager instance with the specified properties.

If the properties file parameter is null, the QATransactionalManager is created using default properties. You can use the QATransactionalManagersetProperty() 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 64.

See Also

QATransactionalManager class

Returns

The QATransactionalManager instance.

deleteQAManager function

Synopsis

```
void QAManagerFactory::deleteQAManager(
  QAManager * mgr
)
```

Parameters

- **mgr** The QAManager instance to destroy.

Remarks

Destroys a QAManager, freeing its resources.

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 89.

deleteQATransactionalManager function

Synopsis

void **QAManagerFactory::deleteQATransactionalManager(**
QATransactionalManager * *mgr*
)

Parameters

- **mgr** The QATransactionalManager instance to destroy.

Remarks

Destroys a QATransactionalManager instance, freeing its resources.

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 89

getLastError function

Synopsis

qa_int **QAManagerFactory::getLastError()**

Remarks

The error code associated with the last excecuted QAManagerFactory method.

0 indicates no error.

For a list of values, see the QAError class.

See Also

getLastErrorMsg function

Returns

The error code.

getLastErrorMsg function

Synopsis

qa_string **QAManagerFactory::getLastErrorMsg()**

Remarks

The error text associated with the last executed QAManagerFactory method.

This method returns null if QAManagerFactorygetLastError returns 0.

You can retrieve this property after catching a QAError.

See Also

getLastError function

QAError class

Returns

The error message.

QAMessage class

Syntax

public **QAMessage**

Derived classes

- "QABinaryMessage class" on page 413
- "QATextMessage class" on page 491

Remarks

QAMessage provides an interface to set message properties and header fields.

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 class.

For more information about setting message properties and header fields, see "Message headers and message properties" on page 208.

Members

All members of QAMessage, including all inherited members.

- "beginEnumPropertyNames function" on page 471
- "castToBinaryMessage function" on page 471
- "castToTextMessage function" on page 471
- "clearProperties function" on page 472
- "DEFAULT_PRIORITY variable" on page 470
- "DEFAULT_TIME_TO_LIVE variable" on page 470
- "endEnumPropertyNames function" on page 472
- "getAddress function" on page 472
- "getBooleanProperty function" on page 473
- "getByteProperty function" on page 473
- "getDoubleProperty function" on page 474
- "getExpiration function" on page 474
- "getFloatProperty function" on page 475
- "getInReplyToID function" on page 475
- "getIntProperty function" on page 476
- "getLongProperty function" on page 476
- "getMessageID function" on page 477
- "getPriority function" on page 477
- "getPropertyType function" on page 478
- "getRedelivered function" on page 478
- "getReplyToAddress function" on page 479
- "getShortProperty function" on page 479
- "getStringProperty function" on page 479
- "getStringProperty function" on page 480

DEFAULT_PRIORITY variable

Synopsis

const qa_int **QAMessage::DEFAULT_PRIORITY**

Remarks

The default message priority.

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

Synopsis

const qa_long **QAMessage::DEFAULT_TIME_TO_LIVE**

Remarks

The default message time-to-live value.

This value is 0, which indicates that the message does not expire.

beginEnumPropertyNames function

Synopsis

qa_property_enum_handle **QAMessage::beginEnumPropertyNames()**

Remarks

Begins an enumeration of message property names.

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.

Returns

A handle that is supplied to nextPropertyName.

castToBinaryMessage function

Synopsis

QABinaryMessage * **QAMessage::castToBinaryMessage()**

Remarks

Casts this QAMessage to a QABinaryMessage.

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);
```

Returns

A pointer to the QABinaryMessage, or NULL if this message is not an instance of QABinaryMessage.

castToTextMessage function

Synopsis

QATextMessage * **QAMessage::castToTextMessage()**

Remarks

Casts this QAMessage to a QATextMessage.

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);
```

Returns

A pointer to the QATextMessage, or NULL if this message is not an instance of QATextMessage.

clearProperties function

Synopsis

void **QAMessage::clearProperties()**

Remarks

Clears a message's properties.

Note: The message's header fields and body are not cleared.

endEnumPropertyNames function

Synopsis

void **QAMessage::endEnumPropertyNames(**
  qa_property_enum_handle *h*
)

Parameters

- **h** A handle returned by beginEnumPropertyNames.

Remarks

Frees the resources associated with a message property name enumeration.

getAddress function

Synopsis

qa_const_string **QAMessage::getAddress()**

Remarks

Gets the destination address for the QAMessage instance.

When a message is sent, this field is ignored. After completion of the send method, the field holds the destination address specified in QAManagerBaseputMessage().

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Returns

The destination address.

getBooleanProperty function

Synopsis

```
qa_bool QAMessage::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.

Remarks

Gets the value of the qa_bool property with the specified name.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

Returns

True if and only if the operation succeeded.

getByteProperty function

Synopsis

```
qa_bool QAMessage::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.

Remarks

Gets the value of the qa_byte property with the specified name.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

Returns

True if and only if the operation succeeded.

getDoubleProperty function

Synopsis

qa_bool **QAMessage::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.

Remarks

Gets the value of the qa_double property with the specified name.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

Returns

True if and only if the operation succeeded.

getExpiration function

Synopsis

qa_long **QAMessage::getExpiration()**

Remarks

Gets the message's expiration time.

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 QAManagerBaseputMessageTimeToLive 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 "Message headers and message properties" on page 208.

Returns

The expiration time.

See Also

getTimestamp function

getFloatProperty function

Synopsis

```
qa_bool QAMessage::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.

Remarks

Gets the value of the qa_float property with the specified name.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

Returns

True if and only if the operation succeeded.

getInReplyToID function

Synopsis

```
qa_const_string QAMessage::getInReplyToID()
```

Remarks

Gets the ID of the message that this message is in reply to.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Returns

The In-Reply-To ID.

getIntProperty function

Synopsis

```
qa_bool QAMessage::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.

Remarks

Gets the value of the qa_int property with the specified name.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

Returns

True if and only if the operation succeeded.

getLongProperty function

Synopsis

```
qa_bool QAMessage::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.

Remarks

Gets the value of the qa_long property with the specified name.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

Returns

True if and only if the operation succeeded.

getMessageID function

Synopsis

qa_const_string **QAMessage::getMessageID()**

Remarks

Gets the message ID.

The MessageID header field contains a value that uniquely identifies each message sent by the QAnywhere client.

When a message is sent using QAManagerBaseputMessage 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 "Message headers and message properties" on page 208.

Returns

The message ID.

getPriority function

Synopsis

qa_int **QAMessage::getPriority()**

Remarks

Gets the message priority level.

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 "Message headers and message properties" on page 208.

Returns

The message priority.

getPropertyType function

Synopsis

qa_short **QAMessage::getPropertyType(**
  qa_const_string *name*
)

Parameters

- **name** The name of the property.

Remarks

Returns the type of a property with the given name.

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.

Returns

The type of the property.

getRedelivered function

Synopsis

qa_bool **QAMessage::getRedelivered()**

Remarks

Indicates whether the message has been previously received but not acknowledged.

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 class opened with AcknowledgementModeEXPLICIT_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 "Message headers and message properties" on page 208.

Returns

True if and only if the message was redelivered.

getReplyToAddress function

Synopsis

qa_const_string **QAMessage::getReplyToAddress()**

Remarks

Gets the address to which a reply to this message should be sent.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Returns

The reply-to address.

getShortProperty function

Synopsis

qa_bool **QAMessage::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.

Remarks

Gets the value of the qa_short property with the specified name.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

Returns

True if and only if the operation succeeded.

getStringProperty function

Synopsis

qa_int **QAMessage::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.

Remarks

Gets the value of the qa_string property with the specified name.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

Returns

The number of non-null qa_chars actually copied, or -1 if the operation failed.

getStringProperty function

Synopsis

```
qa_int QAMessage::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.

Remarks

Gets the value of the qa_string property (starting at offset) with the specified name.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

Returns

The number of non-null qa_chars actually copied, or -1 if the operation failed.

getTimestamp function

Synopsis

qa_long **QAMessage::getTimestamp()**

Remarks

Gets the message timestamp.

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 “Message headers and message properties” on page 208.

Returns

The message timestamp.

getTimestampAsString function

Synopsis

qa_int **QAMessage::getTimestampAsString(**
  qa_string *buffer*,

```
  qa_int bufferLen
)
```

Parameters

- **buffer** The buffer for the formatted timestamp.
- **bufferLen** The size of the buffer.

Remarks

Gets the message timestamp as a formatted string.

The format is: "dow, MMM dd, yyyy hh:mm:ss.nnn GMT".

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

Returns

The number of non-null qa_chars written to the buffer.

nextPropertyName function

Synopsis

```
qa_int QAMessage::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

Remarks

Returns the message property name for the given enumeration, returning -1 if there are no more property names.

Returns

The length of the property name, or -1 if there are no more property names.

propertyExists function

Synopsis

qa_bool **QAMessage::propertyExists(**
  qa_const_string *name*
)

Parameters

- **name** The name of the property.

Remarks

Indicates whether a property value exists.

Returns

True if and only if the property exists.

setAddress function

Synopsis

void **QAMessage::setAddress(**
  qa_const_string *destination*
)

Parameters

- **destination** The destination address.

Remarks

Sets the destination address for this message.

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 "Message headers and message properties" on page 208.

setBooleanProperty function

Synopsis

void **QAMessage::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

Sets the qa_bool property with the specified name to the specified value.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

setByteProperty function

Synopsis

```
void QAMessage::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

Sets a qa_byte property with the specified name to the specified value.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class

setDoubleProperty function

Synopsis

```
void QAMessage::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

Sets the qa_double property with the specified name to the specified value.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class.

setFloatProperty function

Synopsis

void **QAMessage::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

Sets the qa_float property with the specified name to the specified value.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class.

setInReplyToID function

Synopsis

void **QAMessage::setInReplyToID(**
  qa_const_string *id*
)

Parameters

- **id** The In-Reply-To ID.

Remarks

Sets the In-Reply-To ID for the message.

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 "Message headers and message properties" on page 208.

setIntProperty function

Synopsis

void **QAMessage::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

Sets the qa_int property with the specified name to the specified value.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class.

setLongProperty function

Synopsis

void **QAMessage::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

Sets the qa_long property with the specified name to the specified value.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class.

setMessageID function

Synopsis

void **QAMessage::setMessageID(**
qa_const_string *id*
)

Parameters

- **id** The message ID.

Remarks

Sets the message ID.

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 "Message headers and message properties" on page 208.

setPriority function

Synopsis

void **QAMessage::setPriority(**
qa_int *priority*
)

Parameters

- **priority** The message priority.

Remarks

Sets the priority level for this message.

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 "Message headers and message properties" on page 208.

setRedelivered function

Synopsis

void **QAMessage::setRedelivered(**
qa_bool *redelivered*
)

Parameters

- **redelivered** The redelivered indication.

Remarks

Sets an indication of whether this message was redelivered.

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 "Message headers and message properties" on page 208.

setReplyToAddress function

Synopsis

```
void QAMessage::setReplyToAddress(
  qa_const_string replyTo
)
```

Parameters

- **replyTo** The reply-to address.

Remarks

Sets the address to which a reply to this message should be sent.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

setShortProperty function

Synopsis

```
void QAMessage::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

Sets e qa_short property with the specified name to the specified value.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class.

setStringProperty function

Synopsis

void **QAMessage::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

Sets a qa_string property with the specified name to the specified value.

For more information about getting and setting message headers and properties, see "Message headers and message properties" on page 208.

See Also

MessageProperties class.

setTimestamp function

Synopsis

void **QAMessage::setTimestamp(**
  qa_long *timestamp*
)

Parameters

- **timestamp** The message timestamp, a coordinated universal time (UTC).

Remarks

Sets the message timestamp.

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 "Message headers and message properties" on page 208.

See Also

getTimestamp function

QAMessageListener class

Syntax

public **QAMessageListener**

Remarks

A QAMessageListener object is used to receive asynchronously delivered messages.

Members

All members of QAMessageListener, including all inherited members.

onMessage function

Synopsis

void **QAMessageListener::onMessage(**
  QAMessage * *message*
)

Parameters

- **message** The message passed to the listener.

Remarks

Passes a message to the listener.

~QAMessageListener function

Synopsis

virtual **QAMessageListener::~QAMessageListener()**

Remarks

Virtual destructor.

QATextMessage class

Syntax

public **QATextMessage**

Base classes

- "QAMessage class" on page 469

Remarks

QATextMessage inherits from the QAMessage class and adds a text message body.

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 QATextMessagereset 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

Members

All members of QATextMessage, including all inherited members.

getText function

Synopsis

qa_string **QATextMessage::getText()**

Remarks

Gets the string containing this message's data.

The default value is null.

If the message exceeds the maximum size specified by the QAManagerMAX_IN_MEMORY_MESSAGE_SIZE property, this function returns null. In this case, use the QATextMessagereadText method to read the text.

For more information about QAManager properties, see "QAnywhere manager configuration properties" on page 64.

Returns

A string containing the message's data.

getTextLength function

Synopsis

qa_long **QATextMessage::getTextLength()**

Remarks

Returns the text length.

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.

Returns

The text length.

readText function

Synopsis

qa_int **QATextMessage::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.

Remarks

Reads the requested length of text from the current text position into a buffer.

Returns

The actual number of non-null qa_chars read, or -1 if the entire text stream has been read.

reset function

Synopsis

void **QATextMessage::reset()**

Remarks

Repositions the current text position to the beginning.

setText function

Synopsis

void **QATextMessage::setText(**
  qa_const_string *string*
)

Parameters

- **string** A string containing the message data to set.

Remarks

Sets the string containing this message's data.

writeText function

Synopsis

void **QATextMessage::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.

Remarks

Concatenates text to the current text.

~QATextMessage function

Synopsis

virtual **QATextMessage::~QATextMessage()**

Remarks

Virtual destructor.

QATransactionalManager class

Syntax

public **QATransactionalManager**

Base classes

- "QAManagerBase class" on page 437

Remarks

This class is the manager for transactional messaging.

The QATransactionalManager class derives from QAManagerBase and manages transactional QAnywhere messaging operations.

For a detailed description of derived behavior, see QAManagerBase class.

The QATransactionalManager can only be used for transactional acknowledgement. Use the QATransactionalManagercommit() method to commit all QAManagerBaseputMessage() and QAManagerBasegetMessage() invocations.

For more information, see "Implementing transactional messaging" on page 69

See Also

QATransactionalManager class.

Members

All members of QATransactionalManager, including all inherited members.

- "beginEnumStorePropertyNames function" on page 439
- "browseClose function" on page 439
- "browseMessages function" on page 439
- "browseMessagesByID function" on page 440
- "browseMessagesByQueue function" on page 441
- "browseMessagesBySelector function" on page 441
- "browseNextMessage function" on page 442
- "cancelMessage function" on page 443
- "close function" on page 443
- "commit function" on page 496
- "createBinaryMessage function" on page 444
- "createTextMessage function" on page 444
- "deleteMessage function" on page 444
- "endEnumStorePropertyNames function" on page 445
- "getAllQueueDepth function" on page 445
- "getBooleanStoreProperty function" on page 446
- "getByteStoreProperty function" on page 446
- "getDoubleStoreProperty function" on page 447
- "getFloatStoreProperty function" on page 447

commit function

Synopsis

qa_bool **QATransactionalManager::commit()**

Remarks

Commits the current transaction and begins a new transaction.

This method commits all QAManagerBaseputMessage() and QAManagerBasegetMessage() invocations.

Note: The first transaction begins with the call to QATransactionalManageropen().

See Also

QATransactionalManager class

Returns

True if and only if the commit operation was successful.

open function

Synopsis

qa_bool **QATransactionalManager::open()**

Remarks

Opens a QATransactionalManager intance.

The open method must be the first method called after creating a manager.

See Also

QATransactionalManager class

Returns

True if and only if the operation was successful.

rollback function

Synopsis

qa_bool **QATransactionalManager::rollback()**

Remarks

Rolls back the current transaction and begins a new transaction.

This method rolls back all uncommitted QAManagerBaseputMessage() and QAManagerBasegetMessage() invocations.

See Also

QATransactionalManager class

Returns

True if and only if the open operation was successful.

~QATransactionalManager function

Synopsis

virtual **QATransactionalManager::~QATransactionalManager()**

Remarks

Virtual destructor.

QueueDepthFilter class

Syntax

public **QueueDepthFilter**

Remarks

QueueDepthFilter values for queue depth methods of QAManagerBase.

Members

All members of QueueDepthFilter, including all inherited members.

ALL variable

Synopsis

const qa_short **QueueDepthFilter::ALL**

Remarks

Count both incoming and outgoing messages.

System messages and expired messages are not included in any queue depth counts.

INCOMING variable

Synopsis

const qa_short **QueueDepthFilter::INCOMING**

Remarks

Count only incoming messages.

An incoming message is defined as a message whose originator is different than the agent ID of the message store.

OUTGOING variable

Synopsis

const qa_short **QueueDepthFilter::OUTGOING**

Remarks

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.

StatusCodes class

Syntax

public **StatusCodes**

Remarks

This interface defines a set of codes for the status of a message.

Members

All members of StatusCodes, including all inherited members.

CANCELLED variable

Synopsis

const qa_int **StatusCodes::CANCELLED**

Remarks

The message has been cancelled.

This code has value 40. This code applies to MessagePropertiesSTATUS.

EXPIRED variable

Synopsis

const qa_int **StatusCodes::EXPIRED**

Remarks

The message has expired, that is the message was not received before its expiration time passed.

This code has value 30. This code applies to MessagePropertiesSTATUS.

FINAL variable

Synopsis

const qa_int **StatusCodes::FINAL**

Remarks

The message has acheived a final state.

This code has value 20. This code applies to MessagePropertiesSTATUS.

LOCAL variable

Synopsis

const qa_int **StatusCodes::LOCAL**

Remarks

The message is addressed to the local message store and will not be transmitted to the server.

This code has value 2. This code applies to MessagePropertiesTRANSMISSION_STATUS.

PENDING variable

Synopsis

const qa_int **StatusCodes::PENDING**

Remarks

The message has been sent but not received.

This code has value 1. This code applies to MessagePropertiesSTATUS.

RECEIVED variable

Synopsis

const qa_int **StatusCodes::RECEIVED**

Remarks

The message has been received and acknowledged by the receiver.

This code has value 60. This code applies to MessagePropertiesSTATUS.

RECEIVING variable

Synopsis

const qa_int **StatusCodes::RECEIVING**

Remarks

The message is in the process of being received, or it was received but not acknowledged.

This code has value 10. This code applies to MessagePropertiesSTATUS.

TRANSMITTED variable

Synopsis

const qa_int **StatusCodes::TRANSMITTED**

Remarks

The message has been transmitted to the server.

This code has value 1. This code applies to MessagePropertiesTRANSMISSION_STATUS.

TRANSMITTING variable

Synopsis

const qa_int **StatusCodes::TRANSMITTING**

Remarks

The message is in the process of being transmitted to the server.

This code has value 3. This code applies to MessagePropertiesTRANSMISSION_STATUS.

UNRECEIVABLE variable

Synopsis

const qa_int **StatusCodes::UNRECEIVABLE**

Remarks

The message has been marked as unreceivable.

The message is either malformed, or there were too many failed attempts to deliver it.

This code has value 50. This code applies to MessagePropertiesSTATUS.

UNTRANSMITTED variable

Synopsis

const qa_int **StatusCodes::UNTRANSMITTED**

Remarks

The message has not been transmitted to the server.

This code has value 0. This code applies to MessagePropertiesTRANSMISSION_STATUS.

CHAPTER 14

QAnywhere Java API Reference

Contents

ianywhere.qanywhere.client package

Interface AcknowledgementMode

Syntax

public **ianywhere.qanywhere.client.AcknowledgementMode**

Remarks

Indicates how messages should be acknowledged by QAnywhere client applications.

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

Interface QAManager

Interface QATransactionalManager

Interface QAManagerBase

Members

All members of ianywhere.qanywhere.client.AcknowledgementMode, including all inherited members.

- "EXPLICIT_ACKNOWLEDGEMENT variable" on page 506
- "IMPLICIT_ACKNOWLEDGEMENT variable" on page 507
- "TRANSACTIONAL variable" on page 507

EXPLICIT_ACKNOWLEDGEMENT variable

Synopsis

final short **ianywhere.qanywhere.client.AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT**

Remarks

Indicates that received messages are acknowledged using one of the QAManager acknowledge methods.

See Also

Interface QAManager

IMPLICIT_ACKNOWLEDGEMENT variable

Synopsis

final short **ianywhere.qanywhere.client.AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT**

Remarks

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 method returns.

See Also

getMessage method

TRANSACTIONAL variable

Synopsis

final short **ianywhere.qanywhere.client.AcknowledgementMode.TRANSACTIONAL**

Remarks

This mode indicates that messages are only acknowledged as part of the on going transaction.

This mode is automatically assigned to QATransactionalManager instances.

See Also

Interface QATransactionalManager

Interface MessageProperties

Syntax

public **ianywhere.qanywhere.client.MessageProperties**

Remarks

Provides fields storing standard message property names.

The MessageProperties class provides standard message property names. You can pass MessageProperties fields to QAMessage methods used to get and set message properties.

```
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.

```
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 );

           //...
      }
  }
}
```

Members

All members of ianywhere.qanywhere.client.MessageProperties, including all inherited members.

- “ADAPTER variable” on page 509
- “ADAPTERS variable” on page 509
- “DELIVERY_COUNT variable” on page 509
- “IP variable” on page 510
- “MAC variable” on page 510
- “MSG_TYPE variable” on page 510
- “NETWORK_STATUS variable” on page 511
- “ORIGINATOR variable” on page 511
- “RAS variable” on page 512
- “RASNAMES variable” on page 512
- “STATUS variable” on page 512
- “STATUS_TIME variable” on page 513
- “TRANSMISSION_STATUS variable” on page 513

ADAPTER variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.ADAPTER**

Remarks

For "system" queue messages, the network adapter that is being used to connect to the QAnywhere server.

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

Interface MessageProperties

getStringProperty method

ADAPTERS variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.ADAPTERS**

Remarks

This property name refers to a delimited list of network adapters that can be used to connect to the QAnywhere server.

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

Interface MessageProperties

getStringProperty method

DELIVERY_COUNT variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.DELIVERY_COUNT**

Remarks

This property name refers to the number of attempts that have been made so far to deliver the message.

IP variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.IP**

Remarks

For "system" queue messages, the IP address of the network adapter that is being used to connect to the QAnywhere server.

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

Interface MessageProperties

getStringProperty method

MAC variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.MAC**

Remarks

For "system" queue messages, the MAC address of the network adapter that is being used to connect to the QAnywhere server.

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

Interface MessageProperties

getStringProperty method

MSG_TYPE variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.MSG_TYPE**

Remarks

This property name refers to MessageType enumeration values associated with a QAnywhere message.

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

Interface MessageProperties

getIntProperty method

NETWORK_STATUS variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.NETWORK_STATUS**

Remarks

This property name refers to the state of the network connection.

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

Interface MessageProperties

getIntProperty method

ORIGINATOR variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.ORIGINATOR**

Remarks

This property name refers to the message store ID of the originator of the message.

RAS variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.RAS**

Remarks

For "system" queue messages, the RAS entry name that is being used to connect to the QAnywhere server.

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

Interface MessageProperties

getStringProperty method

RASNAMES variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.RASNAMES**

Remarks

For "system" queue messages, a delimited list of RAS entry names that can be used to connect to the QAnywhere server.

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

Interface MessageProperties

getStringProperty method

STATUS variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.STATUS**

Remarks

This property name refers to the current status of the message.

See Also

Interface StatusCodes

STATUS_TIME variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.STATUS_TIME**

Remarks

This property name refers to the time at which the message assumed its current status.

If you pass MessageProperties.STATUS_TIME to the QAMessage.getProperty method, it returns a java.util.Date instance.

See Also

getProperty method

TRANSMISSION_STATUS variable

Synopsis

final String **ianywhere.qanywhere.client.MessageProperties.TRANSMISSION_STATUS**

Remarks

This property name refers to the current transmission status of the message.

See Also

Interface StatusCodes

Interface MessageStoreProperties

Syntax

public **ianywhere.qanywhere.client.MessageStoreProperties**

Remarks

This class defines constant values for useful message store property names.

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

Interface QAManagerBase

Members

All members of ianywhere.qanywhere.client.MessageStoreProperties, including all inherited members.

- "MAX_DELIVERY_ATTEMPTS variable" on page 514

MAX_DELIVERY_ATTEMPTS variable

Synopsis

final String **ianywhere.qanywhere.client.MessageStoreProperties.MAX_DELIVERY_ATTEMPTS**

Remarks

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.

See Also

UNRECEIVABLE variable

Interface MessageType

Syntax

public **ianywhere.qanywhere.client.MessageType**

Remarks

Defines constant values for the MessageProperties.MSG_TYPE message property.

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.
```



```
            }
        }
    }
```

Members

All members of ianywhere.qanywhere.client.MessageType, including all inherited members.

- "NETWORK_STATUS_NOTIFICATION variable" on page 515
- "PUSH_NOTIFICATION variable" on page 515
- "REGULAR variable" on page 515

NETWORK_STATUS_NOTIFICATION variable

Synopsis

final int **ianywhere.qanywhere.client.MessageType.NETWORK_STATUS_NOTIFICATION**

Remarks

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 the MessageProperties.ADAPTER, MessageProperties.NETWORK, and MessageProperties.NETWORK_STATUS fields to identify new network status information.

PUSH_NOTIFICATION variable

Synopsis

final int **ianywhere.qanywhere.client.MessageType.PUSH_NOTIFICATION**

Remarks

Identifies a QAnywhere system message used to notify QAnywhere client applications of push notifications.

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

Synopsis

final int **ianywhere.qanywhere.client.MessageType.REGULAR**

Remarks

If no message type property exists, the message type is assumed to be REGULAR.

This type of message is not treated specially by the message system.

Interface PropertyType

Syntax

public **ianywhere.qanywhere.client.PropertyType**

Remarks

QAMessage property type enumeration, corresponding naturally to the Java types.

See Also

Interface QAMessage

Members

All members of ianywhere.qanywhere.client.PropertyType, including all inherited members.

PROPERTY_TYPE_BOOLEAN variable

Synopsis

final short **ianywhere.qanywhere.client.PropertyType.PROPERTY_TYPE_BOOLEAN**

Remarks

Indicates a boolean property.

PROPERTY_TYPE_BYTE variable

Synopsis

final short **ianywhere.qanywhere.client.PropertyType.PROPERTY_TYPE_BYTE**

Remarks

Indicates a signed byte property.

PROPERTY_TYPE_DOUBLE variable

Synopsis

final short **ianywhere.qanywhere.client.PropertyType.PROPERTY_TYPE_DOUBLE**

Remarks

Indicates a double property.

PROPERTY_TYPE_FLOAT variable

Synopsis

final short **ianywhere.qanywhere.client.PropertyType.PROPERTY_TYPE_FLOAT**

Remarks

Indicates a float property.

PROPERTY_TYPE_INT variable

Synopsis

final short **ianywhere.qanywhere.client.PropertyType.PROPERTY_TYPE_INT**

Remarks

Indicates an int property.

PROPERTY_TYPE_LONG variable

Synopsis

final short **ianywhere.qanywhere.client.PropertyType.PROPERTY_TYPE_LONG**

Remarks

Indicates an long property.

PROPERTY_TYPE_SHORT variable

Synopsis

final short **ianywhere.qanywhere.client.PropertyType.PROPERTY_TYPE_SHORT**

Remarks

Indicates a short property.

PROPERTY_TYPE_STRING variable

Synopsis

final short **ianywhere.qanywhere.client.PropertyType.PROPERTY_TYPE_STRING**

Remarks

Indicates a String property.

PROPERTY_TYPE_UNKNOWN variable

Synopsis

final short **ianywhere.qanywhere.client.PropertyType.PROPERTY_TYPE_UNKNOWN**

Remarks

Indicates an unknown property type, usually because the property is unknown.

Interface QABinaryMessage

Syntax

public **ianywhere.qanywhere.client.QABinaryMessage**

Base classes

- "Interface QAMessage" on page 577

Remarks

A QABinaryMessage object is used to send a message containing a stream of uninterpreted bytes.

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

Interface QAMessage

readString method

Members

All members of ianywhere.qanywhere.client.QABinaryMessage, including all inherited members.

getBodyLength method

Synopsis

long **ianywhere.qanywhere.client.QABinaryMessage.getBodyLength()**
throws **QAException**

Throws

- Thrown if there is a problem retrieving the size of the message body.

Remarks

Returns the size of the message body in bytes.

Returns

The size of the message body in bytes.

readBinary method

Synopsis

int **ianywhere.qanywhere.client.QABinaryMessage.readBinary(**
byte[] *dest*

)
throws **QAException**

Parameters

- **dest** The byte array to hold the read bytes.

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads a specified number of bytes starting from the unread portion of a QABinaryMessage instance body.

See Also

writeBinary method

Returns

The number of bytes read from the message body.

readBinary method

Synopsis

int **ianywhere.qanywhere.client.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.

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads a specified number of bytes starting from the unread portion of a QABinaryMessage instance body.

See Also

writeBinary method

Returns

The number of bytes read from the message body.

readBoolean method

Synopsis

boolean **ianywhere.qanywhere.client.QABinaryMessage.readBoolean()**
throws **QAException**

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads a boolean value starting from the unread portion of the QABinaryMessage instance's message body.

See Also

writeBoolean method

Returns

The boolean value read from the message body.

readByte method

Synopsis

byte **ianywhere.qanywhere.client.QABinaryMessage.readByte()**
throws **QAException**

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads a signed byte value starting from the unread portion of a QABinaryMessage message body.

See Also

writeByte method

Returns

The signed byte value read from the message body.

readChar method

Synopsis

char **ianywhere.qanywhere.client.QABinaryMessage.readChar()**
throws **QAException**

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads a char value starting from the unread portion of a QABinaryMessage message body.

See Also

writeChar method

Returns

The character value read from the message body.

readDouble method

Synopsis

double **ianywhere.qanywhere.client.QABinaryMessage.readDouble()**
throws **QAException**

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads a double value starting from the unread portion of a QABinaryMessage message body.

See Also

writeDouble method

Returns

The double value read from the message body.

readFloat method

Synopsis

float **ianywhere.qanywhere.client.QABinaryMessage.readFloat()**
throws **QAException**

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads a float value starting from the unread portion of a QABinaryMessage message body.

See Also

writeFloat method

Returns

The float value read from the message body.

readInt method

Synopsis

int **ianywhere.qanywhere.client.QABinaryMessage.readInt()**
throws **QAException**

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads an integer value starting from the unread portion of a QABinaryMessage message body.

See Also

writeInt method

Returns

The int value read from the message body.

readLong method

Synopsis

long **ianywhere.qanywhere.client.QABinaryMessage.readLong()**
throws **QAException**

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads a long value starting from the unread portion of a QABinaryMessage message body.

See Also

writeLong method

Returns

The long value read from the message body.

readShort method

Synopsis

short **ianywhere.qanywhere.client.QABinaryMessage.readShort()**
throws **QAException**

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads a short value starting from the unread portion of a QABinaryMessage message body.

See Also

writeShort method

Returns

The short value read from the message body.

readString method

Synopsis

String **ianywhere.qanywhere.client.QABinaryMessage.readString()**
throws **QAException**

Throws

- Thrown if there was a conversion error reading the value or if there is no more input.

Remarks

Reads a string value starting from the unread portion of a QABinaryMessage message body.

See Also

writeString method

Returns

The string value read from the message body.

reset method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.reset()**
throws **QAException**

Throws

- Thrown if there is a problem resetting the message.

Remarks

Resets a message so that the reading of values starts from the beginning of the message body.

The reset method also puts the QABinaryMessage message body in read-only mode.

writeBinary method

Synopsis

```
void ianywhere.qanywhere.client.QABinaryMessage.writeBinary(
  byte[] val
)
throws QAException
```

Parameters

- **val** The byte array value to write to the message body.

Throws

- Thrown if there is a problem appending the byte array to the message body.

Remarks

Appends a byte array value to the QABinaryMessage instance's message body.

See Also

readBinary method

writeBinary method

Synopsis

```
void ianywhere.qanywhere.client.QABinaryMessage.writeBinary(
  byte[] val,
  int len
)
throws QAException
```

Parameters

- **val** The byte array value to write to the message body.
- **len** The number of bytes to write.

Throws

- Thrown if there is a problem appending the byte array to the message body.

Remarks

Appends a byte array value to the QABinaryMessage instance's message body.

See Also

readBinary method

writeBinary method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.writeBinary(**
byte[] *val*,
int *offset*,
int *len*
)
throws **QAException**

Parameters

- **val** The byte array value to write to the message body.
- **offset** The offset within the byte array to begin writing.
- **len** The number of bytes to write.

Throws

- Thrown if there is a problem appending the byte array to the message body.

Remarks

Appends a byte array value to the QABinaryMessage instance's message body.

See Also

readBinary method

writeBoolean method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.writeBoolean(**
boolean *val*
)
throws **QAException**

Parameters

- **val** The boolean value to write to the message body.

Throws

- Thrown if there is a problem appending the boolean value to the message body.

Remarks

Appends a boolean value to the QABinaryMessage instance's message body.

The boolean is represented as a one byte value. True is represented as 1; false is represented as 0.

See Also

readBoolean method

writeByte method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.writeByte(**
byte *val*
)
throws **QAException**

Parameters

- **val** The signed byte value to write to the message body.

Throws

- Thrown if there is a problem appending the signed byte value to the message body.

Remarks

Appends a signed byte value to the QABinaryMessage instance's message body.

The signed byte is represented as a one byte value.

See Also

readByte method

writeChar method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.writeChar(**
char *val*
)
throws **QAException**

Parameters

- **val** The char value to write to the message body.

Throws

- Thrown if there is a problem appending the char value to the message body.

Remarks

Appends a char value to the QABinaryMessage instance's message body.

The char is represented as a two byte value and the high order byte is appended first.

See Also

readChar method

writeDouble method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.writeDouble(**
double *val*
)
throws **QAException**

Parameters

- **val** the double value to write to the message body.

Throws

- Thrown if there is a problem appending the double value to the message body.

Remarks

Appends a double value to the QABinaryMessage instance's message body.

The double is converted to a representative 8-byte long and higher order bytes are appended first.

See Also

readDouble method

writeFloat method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.writeFloat(**
float *val*
)
throws **QAException**

Parameters

- **val** The float value to write to the message body.

Throws

- Thrown if there is a problem appending the float value to the message body.

Remarks

Appends a float value to the QABinaryMessage instance's message body.

The float is converted to a representative 4-byte integer and the higher order bytes are appended first.

See Also

readFloat method

writeInt method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.writeInt(**
  int *val*
)
throws **QAException**

Parameters

- **val** The int value to write to the message body.

Throws

- Thrown if there is a problem appending the integer value to the message body.

Remarks

Appends an integer value to the QABinaryMessage instance's message body.

The integer parameter is represented as a 4 byte value and higher order bytes are appended first.

See Also

readInt method

writeLong method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.writeLong(**
  long *val*
)
throws **QAException**

Parameters

- **val** The long value to write to the message body.

Throws

- Thrown if there is a problem appending the long value to the message body.

Remarks

Appends a long value to the QABinaryMessage instance's message body.

The long parameter is represented using 8-bytes value and higher order bytes are appended first.

See Also

readLong method

writeShort method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.writeShort(**
short *val*
)
throws **QAException**

Parameters

- **val** The short value to write to the message body.

Throws

- Thrown if there is a problem appending the short value to the message body.

Remarks

Appends a short value to the QABinaryMessage instance's message body.

The short parameter is represented as a two byte value and the higher order byte is appended first.

See Also

readShort method

writeString method

Synopsis

void **ianywhere.qanywhere.client.QABinaryMessage.writeString(**
String *val*
)
throws **QAException**

Parameters

- **val** The string value to write to the message body.

Throws

- Thrown if there is a problem appending the string value to the message body.

Remarks

Appends a string value to the QABinaryMessage instance's message body.

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

Class QAException

Syntax

public **ianywhere.qanywhere.client.QAException**

Remarks

Encapsulates QAnywhere client application exceptions.

You can use the QAException class to catch QAnywhere exceptions.

```
    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() );
    }
}
```

Members

All members of ianywhere.qanywhere.client.QAException, including all inherited members.

- "COMMON_ALREADY_OPEN_ERROR variable" on page 533
- "COMMON_GET_INIT_FILE_ERROR variable" on page 534
- "COMMON_GETQUEUEDEPTH_ERROR variable" on page 533
- "COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG variable" on page 534
- "COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID variable" on page 534
- "COMMON_INIT_ERROR variable" on page 534
- "COMMON_INIT_THREAD_ERROR variable" on page 534
- "COMMON_INVALID_PROPERTY variable" on page 535

COMMON_ALREADY_OPEN_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_ALREADY_OPEN_ERROR**

Remarks

The QAManager is already open.

See Also

Interface QAManager

COMMON_GETQUEUEDEPTH_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_GETQUEUEDEPTH_ERROR**

Remarks

Error getting the queue depth.

See Also

getQueueDepth method

COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG variable

Synopsis

final int
ianywhere.qanywhere.client.QAException.COMMON_GETQUEUEDEPTH_ERROR_INVALID_ARG

Remarks

Cannot use QAManagerBase.getQueueDepth on a given destination when filter is ALL.

See Also

getQueueDepth method

COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID variable

Synopsis

final int
ianywhere.qanywhere.client.QAException.COMMON_GETQUEUEDEPTH_ERROR_NO_STORE_ID

Remarks

Cannot use QAManagerBase.getQueueDepth when the message store ID has not been set.

See Also

getQueueDepth method

COMMON_GET_INIT_FILE_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_GET_INIT_FILE_ERROR**

Remarks

Unable to access the client properties file.

COMMON_INIT_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_INIT_ERROR**

Remarks

Initialization error.

COMMON_INIT_THREAD_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_INIT_THREAD_ERROR**

Remarks

Error initializing the background thread.

COMMON_INVALID_PROPERTY variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_INVALID_PROPERTY**

Remarks

There is an invalid property in the client properties file.

COMMON_MSG_ACKNOWLEDGE_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_MSG_ACKNOWLEDGE_ERROR**

Remarks

Error acknowledging the message.

COMMON_MSG_CANCEL_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_MSG_CANCEL_ERROR**

Remarks

Error cancelling message.

COMMON_MSG_CANCEL_ERROR_SENT variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_MSG_CANCEL_ERROR_SENT**

Remarks

Error cancelling message.

You cannot cancel a message that has already been sent.

COMMON_MSG_NOT_WRITEABLE_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_MSG_NOT_WRITEABLE_ERROR**

Remarks

You cannot write to a message that is in read-only mode.

COMMON_MSG_RETRIEVE_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_MSG_RETRIEVE_ERROR**

Remarks

Error retrieving a message from the client message store.

COMMON_MSG_STORE_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_MSG_STORE_ERROR**

Remarks

Error storing a message in the client message store.

COMMON_MSG_STORE_NOT_INITIALIZED variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_MSG_STORE_NOT_INITIALIZED**

Remarks

The message store has not been initialized for messaging.

COMMON_MSG_STORE_TOO_LARGE variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_MSG_STORE_TOO_LARGE**

Remarks

The message store is too large relative to the free disk space on the device.

COMMON_NOT_OPEN_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_NOT_OPEN_ERROR**

Remarks

The QAManager is not open.

See Also

Interface QAManager

COMMON_NO_DEST_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_NO_DEST_ERROR**

Remarks

No destination.

COMMON_NO_IMPLEMENTATION variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_NO_IMPLEMENTATION**

Remarks

The method is not implemented.

COMMON_OPEN_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_OPEN_ERROR**

Remarks

Error opening a connection to the message store.

COMMON_OPEN_LOG_FILE_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_OPEN_LOG_FILE_ERROR**

Remarks

Error opening the log file.

COMMON_SELECTOR_SYNTAX_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_SELECTOR_SYNTAX_ERROR**

Remarks

The given selector has a syntax error.

COMMON_TERMINATE_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_TERMINATE_ERROR**

Remarks

Termination error.

COMMON_UNEXPECTED_EOM_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_UNEXPECTED_EOM_ERROR**

Remarks

Unexpected end of message reached.

COMMON_UNREPRESENTABLE_TIMESTAMP variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.COMMON_UNREPRESENTABLE_TIMESTAMP**

Remarks

The timestamp is outside of the acceptable range.

QAException method

Synopsis

ianywhere.qanywhere.client.QAException.QAException(
String *message*,
int *errorCode*
)

Parameters

- **message** The text description of the exception.
- **errorCode** The error code.

Remarks

Creates a QAException instance with the provided error code and error message text.

QA_NO_ERROR variable

Synopsis

final int **ianywhere.qanywhere.client.QAException.QA_NO_ERROR**

Remarks

No error.

getErrorCode method

Synopsis

int **ianywhere.qanywhere.client.QAException.getErrorCode()**

Remarks

Returns the error code of the last exception.

Returns

The error code of the last exception.

Interface QAManager

Syntax

public **ianywhere.qanywhere.client.QAManager**

Base classes

- "Interface QAManagerBase" on page 543

Remarks

QAManager manages non-transactional QAnywhere messaging operations.

It derives from QAManagerBase.

For a detailed description of derived behavior, see Interface 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

Interface AcknowledgementMode

Class QAManagerFactory

Interface QATransactionalManager

Members

All members of ianywhere.qanywhere.client.QAManager, including all inherited members.

- "acknowledge method" on page 541
- "acknowledgeAll method" on page 541
- "acknowledgeUntil method" on page 542
- "browseMessages method" on page 545
- "browseMessagesByID method" on page 546
- "browseMessagesByQueue method" on page 546
- "browseMessagesBySelector method" on page 547
- "cancelMessage method" on page 548
- "close method" on page 548
- "createBinaryMessage method" on page 549
- "createTextMessage method" on page 549

acknowledge method

Synopsis

void **ianywhere.qanywhere.client.QAManager.acknowledge(**
QAMessage *msg*
)
throws **QAException**

Parameters

- **msg** The message to acknowledge.

Throws

- Thrown if there is a problem acknowledging the message.

Remarks

Acknowledges that the client application successfully received a QAnywhere message.

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

acknowledgeUntil method

acknowledgeAll method

acknowledgeAll method

Synopsis

void **ianywhere.qanywhere.client.QAManager.acknowledgeAll()**
throws **QAException**

Throws

- Thrown if there is a problem acknowledging the messages.

Remarks

Acknowledges that the client application successfully received QAnywhere messages.

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

acknowledge method

acknowledgeUntil method

acknowledgeUntil method

Synopsis

void **ianywhere.qanywhere.client.QAManager.acknowledgeUntil(**
QAMessage *msg*
)
throws **QAException**

Parameters

- **msg** The last message to acknowledge. All earlier unacknowledged messages are also acknowledged.

Throws

- Thrown if there is a problem acknowledging the messages.

Remarks

Acknowledges the given QAMessage instance and all unacknowledged messages received before the given message.

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

Interface QAMessage

RECEIVED variable

acknowledge method

acknowledgeAll method

open method

Synopsis

void **ianywhere.qanywhere.client.QAManager.open(**
short *mode*
)
throws **QAException**

Parameters

- **mode** The acknowledgement mode, one of AcknowledgementMode.EXPLICIT_ACKNOWLEDGEMENT or AcknowledgementMode.IMPLICIT_ACKNOWLEDGEMENT.

Throws

- Thrown if there is a problem opening the QAManager instance.

Remarks

Opens the QAManager with the given AcknowledgementMode value.

The open(short) method must be the first method called after creating a QAManager.

See Also

Interface AcknowledgementMode

EXPLICIT_ACKNOWLEDGEMENT variable

IMPLICIT_ACKNOWLEDGEMENT variable

recover method

Synopsis

void **ianywhere.qanywhere.client.QAManager.recover()**
throws **QAException**

Throws

- Thrown if there is a problem recovering.

Remarks

Forces all unacknowledged messages into a state of unreceived.

These messages must be received again using QAManagerBase.getMessage(String).

See Also

getMessage method

Interface QAManagerBase

Syntax

public **ianywhere.qanywhere.client.QAManagerBase**

Derived classes

- "Interface QAManager" on page 539
- "Interface QATransactionalManager" on page 602

Remarks

This class acts as a base class for QATransactionalManager and QAManager, which manage transactional and non-transactional messaging, respectively.

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

Interface QATransactionalManager

Interface QAManager

Members

All members of ianywhere.qanywhere.client.QAManagerBase, including all inherited members.

browseMessages method

Synopsis

java.util.Enumeration **ianywhere.qanywhere.client.QAManagerBase.browseMessages()**
throws **QAException**

Throws

- Thrown if there is a problem browsing the messages.

Remarks

Browses all available messages in the message store.

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

browseMessagesByID method

getMessage method

Returns

An enumerator over the available messages.

browseMessagesByID method

Synopsis

java.util.Enumeration **ianywhere.qanywhere.client.QAManagerBase.browseMessagesByID(**
String *id*
)
throws **QAException**

Parameters

- **id** The message ID of the message.

Throws

- Thrown if there is a problem browsing the messages.

Remarks

Browse the message with the given message ID.

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

browseMessages method

getMessage method

Returns

An enumerator containing 0 or 1 messages.

browseMessagesByQueue method

Synopsis

java.util.Enumeration **ianywhere.qanywhere.client.QAManagerBase.browseMessagesByQueue(**
String *address*
)
throws **QAException**

Parameters

- **address** The address of the messages.

Throws

- Thrown if there is a problem browsing the messages.

Remarks

Browses the available messages waiting that have been sent to the given address.

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

browseMessages method

getMessage method

Returns

An enumerator over the available messages.

browseMessagesBySelector method

Synopsis

java.util.Enumeration **ianywhere.qanywhere.client.QAManagerBase.browseMessagesBySelector(**
String *selector*
)
throws **QAException**

Parameters

- **selector** The selector.

Throws

- Thrown if there is a problem browsing the messages.

Remarks

Browse messages queued in the message store that satisfy the given selector.

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

browseMessages method

browseMessagesByID method

getMessage method

Returns

An enumerator over the available messages.

cancelMessage method

Synopsis

boolean **ianywhere.qanywhere.client.QAManagerBase.cancelMessage(**
String *id*
)
throws **QAException**

Parameters

- **id** The message ID of the message to cancel.

Throws

- Thrown if there is a problem cancelling the message.

Remarks

Cancels the message with the given message ID.

Puts a message into a cancelled state before it is transmitted.

With the default delete rules of the QAnywhere Agent, cancelled 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

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.close()**
throws **QAException**

Throws

- Thrown if there is a problem closing the QAManagerBase instance.

Remarks

Closes the connection to the QAnywhere message system and releases any resources used by the QAManagerBase.

Additional calls to close() following the first are ignored. Any subsequent calls to a QAManagerBase method, other than close(), result in a QAException. You must create and open a new QAManagerBase instance in this case.

createBinaryMessage method

Synopsis

QABinaryMessage **ianywhere.qanywhere.client.QAManagerBase.createBinaryMessage()**
throws **QAException**

Throws

- Thrown if there is a problem creating the message.

Remarks

Creates a QABinaryMessage object.

A QABinaryMessage object is used to send a message containing a message body of uninterpreted bytes.

See Also

Interface QABinaryMessage

Returns

A new QABinaryMessage instance.

createTextMessage method

Synopsis

QATextMessage **ianywhere.qanywhere.client.QAManagerBase.createTextMessage()**
throws **QAException**

Throws

- Thrown if there is a problem creating the message.

Remarks

Creates a QATextMessage object.

A QATextMessage object is used to send a message containing a string message body.

See Also

Interface QATextMessage

Returns

A new QATextMessage instance.

getBooleanStoreProperty method

Synopsis

boolean **ianywhere.qanywhere.client.QAManagerBase.getBooleanStoreProperty(**
String *name*

)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a boolean value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

Returns

The boolean property value.

getByteStoreProperty method

Synopsis

byte **ianywhere.qanywhere.client.QAManagerBase.getByteStoreProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a signed byte value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

Returns

The signed byte property value.

getDoubleStoreProperty method

Synopsis

double **ianywhere.qanywhere.client.QAManagerBase.getDoubleStoreProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** the pre-defined or custom property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a double value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

Returns

The double property value.

getFloatStoreProperty method

Synopsis

float **ianywhere.qanywhere.client.QAManagerBase.getFloatStoreProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a float value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

Returns

The float property value.

getIntStoreProperty method

Synopsis

int **ianywhere.qanywhere.client.QAManagerBase.getIntStoreProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a int value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

Returns

The integer property value.

getLongStoreProperty method

Synopsis

long **ianywhere.qanywhere.client.QAManagerBase.getLongStoreProperty(**
String *name*

)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a long value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

Returns

The long property value.

getMessage method

Synopsis

QAMessage **ianywhere.qanywhere.client.QAManagerBase.getMessage(**
String *address*
)
throws **QAException**

Parameters

- **address** This address specifies the queue name used by the QAnywhere client to receive messages.

Throws

- Thrown if there is a problem getting the message.

Remarks

Returns the next available QAMessage sent to the specified address.

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

Interface QAMessage

Returns

The next QAMessage, or null if no message is available.

getMessageBySelector method

Synopsis

QAMessage **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem getting the message.

Remarks

Returns the next available QAMessage sent to the specified address that satisfies the given selector.

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

Interface QAMessage

Returns

The next QAMessage, or null if no message is available.

getMessageBySelectorNoWait method

Synopsis

QAMessage **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem getting the message.

Remarks

Returns the next available QAMessage sent to the given address that satisfies the given selector.

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

Interface QAMessage

Returns

The next available QAMessage or null there is no available message.

getMessageBySelectorTimeout method

Synopsis

QAMessage **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem getting the message.

Remarks

Returns the next available QAMessage sent to the given address that satisfies the given selector.

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

Interface QAMessage

Returns

The next available QAMessage, or null if no message is available.

getMessageListener method

Synopsis

QAMessageListener **ianywhere.qanywhere.client.QAManagerBase.getMessageListener(**
String *address*
)
throws **QAException**

Parameters

- **address** A local queue name used to receive messages, or system.

Throws

- Thrown if there is a problem getting the listener.

Remarks

Returns the QAMessageListener associated with the specified queue.

If there is no QAMessageListener associated with the specified queue, returns null.

See Also

Interface QAMessageListener

Returns

The listener.

getMessageListener2 method

Synopsis

QAMessageListener2 **ianywhere.qanywhere.client.QAManagerBase.getMessageListener2(**
String *address*
)
throws **QAException**

Parameters

- **address** A local queue name used to receive messages, or system.

Throws

- Thrown if there is a problem getting the listener.

Remarks

Returns the QAMessageListener2 associated with the specified queue.

If there is no QAMessageListener2 associated with the specified queue, returns null.

See Also

Interface QAMessageListener2

Returns

The listener.

getMessageNoWait method

Synopsis

QAMessage **ianywhere.qanywhere.client.QAManagerBase.getMessageNoWait(**
String *address*
)
throws **QAException**

Parameters

- **address** This address specifies the queue name used by the QAnywhere client to receive messages.

Throws

- Thrown if there is a problem getting the message.

Remarks

Returns the next available QAMessage sent to the given address.

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

Interface QAMessage

Returns

The next available QAMessage or null there is no available message.

getMessageTimeout method

Synopsis

QAMessage **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem getting the message.

Remarks

Returns the next available QAMessage sent to the given address.

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

Interface QAMessage

Returns

The next QAMessage, or null if no message is available.

getMode method

Synopsis

short **ianywhere.qanywhere.client.QAManagerBase.getMode()**
throws **QAException**

Throws

- Thrown if there is a problem retrieving the QAManager acknowledgement mode.

Remarks

Returns the QAManager acknowledgement mode for received messages.

For a list of return values, see Interface 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

IMPLICIT_ACKNOWLEDGEMENT variable

Interface QAManager

Interface QATransactionalManager

Returns

The QAManager acknowledgement mode for received messages.

getQueueDepth method

Synopsis

int **ianywhere.qanywhere.client.QAManagerBase.getQueueDepth(**
  short *filter*
)
throws **QAException**

Parameters

- **filter** A filter indicating incoming messages, outgoing messages, or all messages.

Throws

- Thrown if there was an error.

Remarks

Returns the total depth of all queues, based on a given filter.

The depth of the queue is the number of messages that have not been received (for example, using the QAManagerBase.getMessage(String) method).

For a list of possible filter values, see Interface QueueDepthFilter.

See Also

getMessage method

Returns

The number of messages in all queues for the given filter.

getQueueDepth method

Synopsis

int **ianywhere.qanywhere.client.QAManagerBase.getQueueDepth(**
  String *queue*,
  short *filter*
)
throws **QAException**

Parameters

- **queue** A filter indicating incoming messages, outgoing messages, or all messages.

- **filter** The queue name.

Throws

- Thrown if there was an error.

Remarks

Returns the depth of a queue, based on a given filter.

The depth of the queue is the number of messages that have not been received (for example, using the QAManagerBase.getMessage(String) method).

For a list of possible filter values, see Interface QueueDepthFilter.

Returns

The number of messages.

getShortStoreProperty method

Synopsis

short **ianywhere.qanywhere.client.QAManagerBase.getShortStoreProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a short value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

Returns

The short property value.

getStoreProperty method

Synopsis

Object **ianywhere.qanywhere.client.QAManagerBase.getStoreProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets an Object representing a message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

Returns

The property value.

getStorePropertyNames method

Synopsis

java.util.Enumeration **ianywhere.qanywhere.client.QAManagerBase.getStorePropertyNames()**
throws **QAException**

Throws

- Thrown if there is a problem retrieving the enumerator.

Remarks

Gets an enumerator over the message store property names.

Returns

An enumerator over the message store property names.

getStringStoreProperty method

Synopsis

String **ianywhere.qanywhere.client.QAManagerBase.getStringStoreProperty(**
  String *name*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.

Throws

- Thrown if there is a problem retrieving the string value.

Remarks

Gets a string value for a pre-defined or custom message store property.

You can use this method to access pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

Returns

The string property value or null if the property does not exist.

putMessage method

Synopsis

void **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem putting the message.

Remarks

Prepares a message to send to another QAnywhere client.

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

putMessageTimeToLive method

Synopsis

void **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem putting the message.

Remarks

Prepares a message to send to another QAnywhere client.

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.

setBooleanStoreProperty method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.setBooleanStoreProperty(**
String *name*,
boolean *value*

)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.
- **value** The boolean property value.

Throws

- Thrown if there is a problem setting the message store property.

Remarks

Sets a pre-defined or custom message store property to a boolean value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

setByteStoreProperty method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.setByteStoreProperty(**
String *name*,
byte *value*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.
- **value** The sbyte property value.

Throws

- Thrown if there is a problem setting the message store property.

Remarks

Sets a pre-defined or custom message store property to a sbyte value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

setDoubleStoreProperty method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.setDoubleStoreProperty(**
String *name*,
double *value*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.
- **value** The double property value.

Throws

- Thrown if there is a problem setting the message store property.

Remarks

Sets a pre-defined or custom message store property to a double value.

You can use this method to set pre-defined or user-defined client. store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

setFloatStoreProperty method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.setFloatStoreProperty(**
String *name*,
float *value*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.
- **value** The float property value.

Throws

- Thrown if there is a problem setting the message store property.

Remarks

Sets a pre-defined or custom message store property to a float value.

You can use this method to set pre-defined or user-defined client store properties. For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

setIntStoreProperty method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.setIntStoreProperty(**
  String *name*,
  int *value*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.
- **value** The int property value.

Throws

- Thrown if there is a problem setting the message store property.

Remarks

Sets a pre-defined or custom message store property to a int value.

You can use this method to set pre-defined or user-defined client store properties. For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

setLongStoreProperty method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.setLongStoreProperty(**
  String *name*,
  long *value*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.
- **value** The long property value.

Throws

- Thrown if there is a problem setting the message store property.

Remarks

Sets a pre-defined or custom message store property to a long value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

setMessageListener method

Synopsis

void **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem registering the QAMessageListener object.

Remarks

Registers a QAMessageListener object to receive QAnywhere messages asynchronously.

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

Interface QAMessageListener

setMessageListener2 method

Synopsis

void **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem registering the QAMessageListener2 object.

Remarks

Registers a QAMessageListener2 object to receive QAnywhere messages asynchronously.

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

Interface QAMessageListener2

setMessageListenerBySelector method

Synopsis

void **ianywhere.qanywhere.client.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.

Throws

- 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

Registers a QAMessageListener object to receive QAnywhere messages asynchronously, with a message selector.

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

Synopsis

void **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem registering the QAMessageListener2 object.

Remarks

Registers a QAMessageListener2 object to receive QAnywhere messages asynchronously, with a message selector.

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

Interface QAMessageListener2

setShortStoreProperty method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.setShortStoreProperty(**
String *name*,
short *value*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.
- **value** The short property value.

Throws

- Thrown if there is a problem setting the message store property.

Remarks

Sets a pre-defined or custom message store property to a short value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

setStoreProperty method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.setStoreProperty(**
String *name*,
Object *value*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.
- **value** The property value.

Throws

- Thrown if there is a problem setting the message store property to the value.

Remarks

Sets a pre-defined or custom message store property to a System.Object value.

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 Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

setStringStoreProperty method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.setStringStoreProperty(**
String *name*,
String *value*
)
throws **QAException**

Parameters

- **name** The pre-defined or custom property name.
- **value** The String property value.

Throws

- Thrown if there is a problem setting the message store property to a string value.

Remarks

Sets a pre-defined or custom message store property to a String value.

You can use this method to set pre-defined or user-defined client store properties.

For a list of pre-defined properties, see Interface MessageStoreProperties.

See Also

Interface MessageStoreProperties

start method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.start()**
throws **QAException**

Throws

- Thrown if there is a problem starting the QAManagerBase instance.

Remarks

Starts the QAManagerBase for receiving incoming messages.

Any calls to this method beyond the first without an intervening QAManagerBase.stop() call are ignored.

See Also

stop method

stop method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.stop()**
throws **QAException**

Throws

- Thrown if there is a problem stopping the QAManagerBase instance.

Remarks

Halts the QAManagerBase's reception of incoming messages.

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

triggerSendReceive method

Synopsis

void **ianywhere.qanywhere.client.QAManagerBase.triggerSendReceive()**
throws **QAException**

Throws

- Thrown if there is a problem triggering the send/receive.

Remarks

Causes a synchronization with the QAnywhere message server, uploading any messages addressed to other clients, and downloading any messages addressed to the local client.

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

Class QAManagerFactory

Syntax

public **ianywhere.qanywhere.client.QAManagerFactory**

Remarks

This class acts as a factory class for creating QATransactionalManager and QAManager objects.

You can only have one instance of QAManagerFactory.

See Also

Interface QAManager

Interface QATransactionalManager

Members

All members of ianywhere.qanywhere.client.QAManagerFactory, including all inherited members.

- "createQAManager method" on page 573
- "createQAManager method" on page 574
- "createQAManager method" on page 574
- "createQATransactionalManager method" on page 575
- "createQATransactionalManager method" on page 576
- "createQATransactionalManager method" on page 576
- "getInstance method" on page 577

createQAManager method

Synopsis

abstract QAManager **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem creating the manager.

Remarks

Returns a new QAManager instance with the specified properties.

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

Interface QAManager

Returns

A new QAManager instance.

createQAManager method

Synopsis

abstract QAManager **ianywhere.qanywhere.client.QAManagerFactory.createQAManager(**
java.util.Hashtable *properties*
)
throws **QAException**

Parameters

- **properties** A Hashtable for configuring the QAManager instance.

Throws

- Thrown if there is a problem creating the manager.

Remarks

Returns a new QAManager instance with the specified properties as a Hashtable.

See Also

Interface QAManager

Returns

A new QAManager instance.

createQAManager method

Synopsis

abstract QAManager **ianywhere.qanywhere.client.QAManagerFactory.createQAManager()**
throws **QAException**

Throws

- Thrown if there is a problem creating the manager.

Remarks

Returns a new QAManager instance with default properties.

See Also

Interface QAManager

Returns

A new QAManager instance.

createQATransactionalManager method

Synopsis

```
abstract QATransactionalManager
ianywhere.qanywhere.client.QAManagerFactory.createQATransactionalManager(
  String iniFile
)
throws QAException
```

Parameters

- **iniFile** A properties file for configuring the QATransactionalManager instance.

Throws

- Thrown if there is a problem creating the manager.

Remarks

Returns a new QATransactionalManager instance with the specified properties.

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

Interface QATransactionalManager

Returns

The configured QATransactionalManager.

createQATransactionalManager method

Synopsis

abstract QATransactionalManager
ianywhere.qanywhere.client.QAManagerFactory.createQATransactionalManager(
java.util.Hashtable *properties*
)
throws **QAException**

Parameters

- **properties** A hashtable for configuring the QATransactionalManager instance.

Throws

- Thrown if there is a problem creating the manager.

Remarks

Returns a new QATransactionalManager instance with the specified properties.

See Also

Interface QATransactionalManager

Returns

The configured QATransactionalManager.

createQATransactionalManager method

Synopsis

abstract QATransactionalManager
ianywhere.qanywhere.client.QAManagerFactory.createQATransactionalManager()
throws **QAException**

Throws

- Thrown if there is a problem creating the manager.

Remarks

Returns a new QATransactionalManager instance with default properties.

See Also

Interface QATransactionalManager

Returns

A new QATransactionalManager.

getInstance method

Synopsis

QAManagerFactory **ianywhere.qanywhere.client.QAManagerFactory.getInstance()**
throws **QAException**

Throws

- Thrown if there is a problem creating the manager factory.

Remarks

Returns the singleton QAManagerFactory instance.

Returns

The singleton QAManagerFactory instance.

Interface QAMessage

Syntax

public **ianywhere.qanywhere.client.QAMessage**

Derived classes

- “Interface QABinaryMessage” on page 518
- “Interface QATextMessage” on page 597

Remarks

QAMessage provides an interface to set message properties and header fields.

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 Interface MessageProperties.

See Also

Interface QABinaryMessage

Interface QATextMessage

Members

All members of ianywhere.qanywhere.client.QAMessage, including all inherited members.

- “clearProperties method” on page 579
- “DEFAULT_PRIORITY variable” on page 578
- “DEFAULT_TIME_TO_LIVE variable” on page 578
- “getAddress method” on page 579
- “getBooleanProperty method” on page 579

DEFAULT_PRIORITY variable

Synopsis

final int **ianywhere.qanywhere.client.QAMessage.DEFAULT_PRIORITY**

Remarks

The default message priority.

DEFAULT_TIME_TO_LIVE variable

Synopsis

final long **ianywhere.qanywhere.client.QAMessage.DEFAULT_TIME_TO_LIVE**

Remarks

The default time-to-live value.

clearProperties method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.clearProperties()**
throws **QAException**

Throws

- Thrown if there is a problem clearing the message properties.

Remarks

Clear all the properties of the message.

getAddress method

Synopsis

String **ianywhere.qanywhere.client.QAMessage.getAddress()**
throws **QAException**

Throws

- Thrown if there is a problem retrieving the destination address.

Remarks

Returns the destination address for the QAMessage instance.

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).

Returns

The destination address for the QAMessage instance.

getBooleanProperty method

Synopsis

boolean **ianywhere.qanywhere.client.QAMessage.getBooleanProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a boolean message property.

See Also

Interface MessageProperties

Returns

The property value.

getByteProperty method

Synopsis

byte **ianywhere.qanywhere.client.QAMessage.getByteProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a signed byte message property.

See Also

Interface MessageProperties

Returns

The property value.

getDoubleProperty method

Synopsis

double **ianywhere.qanywhere.client.QAMessage.getDoubleProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a double message property.

See Also

Interface MessageProperties

Returns

The property value.

getExpiration method

Synopsis

java.util.Date **ianywhere.qanywhere.client.QAMessage.getExpiration()**
throws **QAException**

Throws

- Thrown if there is a problem getting the expiration.

Remarks

Returns the message's expiration value, or null if the message does not expire or has not yet been sent.

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

Returns

The message's expiration value, or null if the message does not expire or has not yet been sent.

getFloatProperty method

Synopsis

float **ianywhere.qanywhere.client.QAMessage.getFloatProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a float message property.

See Also

Interface MessageProperties

Returns

The property value.

getInReplyToID method

Synopsis

String **ianywhere.qanywhere.client.QAMessage.getInReplyToID()**
throws **QAException**

Throws

- Thrown if there is a problem getting the message ID of the message to which this message is a reply.

Remarks

Returns the message ID of the message to which this message is a reply.

Returns

The message ID of the message to which this message is a reply, or null if this message is not a reply.

getIntProperty method

Synopsis

int **ianywhere.qanywhere.client.QAMessage.getIntProperty(**
  String *name*
)
throws **QAException**

Parameters

- **name** The property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets an int message property.

See Also

Interface MessageProperties

Returns

The property value.

getLongProperty method

Synopsis

long **ianywhere.qanywhere.client.QAMessage.getLongProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a long message property.

See Also

Interface MessageProperties

Returns

The property value.

getMessageID method

Synopsis

String **ianywhere.qanywhere.client.QAMessage.getMessageID()**
throws **QAException**

Throws

- Thrown if there is a problem getting the message ID.

Remarks

Returns the globally unique message ID of the message.

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

Returns

The message ID of the message, or null if the message has not yet been put.

getPriority method

Synopsis

int **ianywhere.qanywhere.client.QAMessage.getPriority()**
throws **QAException**

Throws

- Thrown if there is a problem getting the message priority.

Remarks

Returns the priority of the message (ranging from 0 to 9).

Returns

The priority of the message.

getProperty method

Synopsis

Object **ianywhere.qanywhere.client.QAMessage.getProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The property name.

Throws

- Thrown if there is a conversion error getting the property value.

Remarks

Gets a message property.

Returns

The property value, or null if the property does not exist.

getPropertyNames method

Synopsis

java.util.Enumeration **ianywhere.qanywhere.client.QAMessage.getPropertyNames()**
throws **QAException**

Throws

- Thrown if there is a problem getting the enumerator over the property names of the message.

Remarks

Gets an enumerator over the property names of the message.

Returns

An enumerator over the message property names.

getPropertyType method

Synopsis

short **ianywhere.qanywhere.client.QAMessage.getPropertyType(**
String *name*
)
throws **QAException**

Parameters

- **name** The property name.

Throws

- Thrown if there is a problem retrieving the property type.

Remarks

Returns the property type of the given property.

See Also

Interface PropertyType

Returns

The property type.

getRedelivered method

Synopsis

boolean **ianywhere.qanywhere.client.QAMessage.getRedelivered()**
throws **QAException**

Throws

- Thrown if there is a problem retrieving the redelivered status.

Remarks

Indicates whether the message has been previously received but not acknowledged.

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.

Returns

True if the message has been previously received but not acknowledged.

getReplyToAddress method

Synopsis

String **ianywhere.qanywhere.client.QAMessage.getReplyToAddress()**
throws **QAException**

Throws

- Thrown if there is a problem retrieving the reply-to address.

Remarks

Returns the reply-to address of this message.

Returns

The reply-to address of this message, or null if it does not exist.

getShortProperty method

Synopsis

short **ianywhere.qanywhere.client.QAMessage.getShortProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** the property name.

Throws

- Thrown if there is a conversion error getting the property value or if the property does not exist.

Remarks

Gets a short message property.

See Also

Interface MessageProperties

Returns

The property value.

getStringProperty method

Synopsis

String **ianywhere.qanywhere.client.QAMessage.getStringProperty(**
String *name*
)
throws **QAException**

Parameters

- **name** The property name.

Throws

- Thrown if there is a problem retrieving the message property.

Remarks

Gets a String message property.

See Also

Interface MessageProperties

Returns

The property value, or null if the property does not exist.

getTimestamp method

Synopsis

java.util.Date **ianywhere.qanywhere.client.QAMessage.getTimestamp()**
throws **QAException**

Throws

- Thrown if there is a problem retrieving the message timestamp.

Remarks

Returns the message timestamp, which is the time the message was created.

Returns

The message timestamp.

propertyExists method

Synopsis

boolean **ianywhere.qanywhere.client.QAMessage.propertyExists(**
String *name*
)
throws **QAException**

Parameters

- **name** The property name

Throws

- Thrown if there is a problem checking if the property has been set.

Remarks

Indicates whether the given property has been set for this message.

Returns

True if the property exists.

setAddress method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setAddress(**
String *dest*
)
throws **QAException**

Parameters

- **dest** The destination address.

Throws

- Thrown if there is a problem setting the message destination address.

Remarks

Sets the message destination address.

setBooleanProperty method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setBooleanProperty(**
String *name*,
boolean *value*
)
throws **QAException**

Parameters

- **name** The property name.
- **value** The property value.

Throws

- Thrown if there is a problem setting the property.

Remarks

Sets a boolean property.

See Also

Interface MessageProperties

setByteProperty method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setByteProperty(**
String *name*,
byte *value*
)
throws **QAException**

Parameters

- **name** The property name.
- **value** The property value.

Throws

- Thrown if there is a problem setting the property.

Remarks

Sets a signed byte property.

See Also

Interface MessageProperties

setDoubleProperty method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setDoubleProperty(**
String *name*,
double *value*
)
throws **QAException**

Parameters

- **name** The property name.
- **value** The property value.

Throws

- Thrown if there is a problem setting the property.

Remarks

Sets a double property.

See Also

Interface MessageProperties

setFloatProperty method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setFloatProperty(**
String *name*,
float *value*
)
throws **QAException**

Parameters

- **name** The property name.
- **value** The property value.

Throws

- Thrown if there is a problem setting the property.

Remarks

Sets a float property.

See Also

Interface MessageProperties

setInReplyToID method

Synopsis

```
void ianywhere.qanywhere.client.QAMessage.setInReplyToID(
  String id
)
throws QAException
```

Parameters

- **id** The ID of the message this message is in reply to.

Throws

- Thrown if there is a problem setting the in reply to ID.

Remarks

Sets the in reply to ID, which identifies the message this message is a reply to.

setIntProperty method

Synopsis

```
void ianywhere.qanywhere.client.QAMessage.setIntProperty(
  String name,
  int value
)
throws QAException
```

Parameters

- **name** The property name.
- **value** The property value.

Throws

- Thrown if there is a problem setting the property.

Remarks

Sets an int property.

See Also

Interface MessageProperties

setLongProperty method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setLongProperty(**
String *name*,
long *value*
)
throws **QAException**

Parameters

- **name** The property name.
- **value** The property value.

Throws

- Thrown if there is a problem setting the property.

Remarks

Sets a long property.

See Also

Interface MessageProperties

setPriority method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setPriority(**
int *priority*
)
throws **QAException**

Parameters

- **priority** The priority of the message.

Throws

- Thrown if there is a problem setting the priority.

Remarks

Sets the priority of the message (ranging from 0 to 9).

setProperty method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setProperty(**
String *name*,
Object *value*
)
throws **QAException**

Parameters

- **name** The property name.
- **value** The property value.

Throws

- Thrown if there is a problem setting the property.

Remarks

Sets a property.

The property type must correspond to one of the acceptable primitive types, or String.

See Also

Interface MessageProperties

setReplyToAddress method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setReplyToAddress(**
String *address*
)
throws **QAException**

Parameters

- **address** The reply-to address.

Throws

- Thrown if there is a problem setting the reply-to address.

Remarks

Sets the reply-to address.

setShortProperty method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setShortProperty(**
String *name*,
short *value*
)
throws **QAException**

Parameters

- **name** The property name.
- **value** The property value.

Throws

- Thrown if there is a problem setting the property.

Remarks

Sets a short property.

See Also

Interface MessageProperties

setStringProperty method

Synopsis

void **ianywhere.qanywhere.client.QAMessage.setStringProperty(**
String *name*,
String *value*
)
throws **QAException**

Parameters

- **name** The property name.
- **value** The property value.

Throws

- Thrown if there is a problem setting the property.

Remarks

Sets a string property.

See Also

Interface MessageProperties

Interface QAMessageListener

Syntax

public **ianywhere.qanywhere.client.QAMessageListener**

Remarks

To listen for messages, implement this interface and register your implementation by calling QAManagerBase.setMessageListener(String,QAMessageListener).

See Also

setMessageListener method

Members

All members of ianywhere.qanywhere.client.QAMessageListener, including all inherited members.

onException method

Synopsis

void **ianywhere.qanywhere.client.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

This method is called whenever an exception occurs while listening for messages.

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

Interface QAManagerBase

close method

onMessage method

Synopsis

void **ianywhere.qanywhere.client.QAMessageListener.onMessage(**
QAMessage *message*
)

Parameters

- **message** The message that was received.

Remarks

This method is called whenever a message is received.

Interface QAMessageListener2

Syntax

public **ianywhere.qanywhere.client.QAMessageListener2**

Remarks

To listen for messages, implement this interface and register your implementation by calling QAManagerBase.setMessageListener2(String,QAMessageListener2).

See Also

setMessageListener2 method

Members

All members of ianywhere.qanywhere.client.QAMessageListener2, including all inherited members.

- "onException method" on page 596
- "onMessage method" on page 597

onException method

Synopsis

void **ianywhere.qanywhere.client.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

This method is called whenever an exception occurs while listening for messages.

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

Interface QAManagerBase

close method

onMessage(QAMessage)

onMessage method

Synopsis

void **ianywhere.qanywhere.client.QAMessageListener2.onMessage(**
QAManagerBase *mgr*,
QAMessage *message*
)

Parameters

- **mgr** The QAManagerBase that received the message.
- **message** The message that was received.

Remarks

This method is called whenever a message is received.

See Also

Interface QAManagerBase

Interface QATextMessage

Syntax

public **ianywhere.qanywhere.client.QATextMessage**

Base classes

- "Interface QAMessage" on page 577

Remarks

QATextMessage inherits from the QAMessage class and adds a text message body, and 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 values starts from the beginning of the message body.

See Also

QAmessage

Members

All members of ianywhere.qanywhere.client.QATextMessage, including all inherited members.

- "setPriority method" on page 592
- "setProperty method" on page 593
- "setReplyToAddress method" on page 593
- "setShortProperty method" on page 594
- "setStringProperty method" on page 594
- "setText method" on page 600
- "writeText method" on page 601
- "writeText method" on page 601
- "writeText method" on page 602

getText method

Synopsis

String **ianywhere.qanywhere.client.QATextMessage.getText()**
throws **QAException**

Throws

- Thrown if there is a problem retrieving the message text.

Remarks

Returns the message text.

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

Returns

The message text, or null .

getTextLength method

Synopsis

long **ianywhere.qanywhere.client.QATextMessage.getTextLength()**
throws **QAException**

Throws

- Thrown if there is a problem retrieving the length of the message.

Remarks

Returns the length, in characters, of the message.

Returns

The length in characters of the message.

readText method

Synopsis

String **ianywhere.qanywhere.client.QATextMessage.readText(**
int *maxLength*
)
throws **QAException**

Parameters

- **maxLength** The maximum number of characters to read.

Throws

- Thrown if there is a problem retrieving the unread text.

Remarks

Returns unread text from the message.

Any additional unread text must be read by subsequent calls to this method. Text is read from the beginning of any unread text.

Returns

The text.

reset method

Synopsis

void **ianywhere.qanywhere.client.QATextMessage.reset()**
throws **QAException**

Throws

- Thrown if there is a problem resetting the text position of the message.

Remarks

Resets the text position of the message to the beginning.

setText method

Synopsis

void **ianywhere.qanywhere.client.QATextMessage.setText(**
String *value*
)
throws **QAException**

Parameters

- **value** The text to write to the message body.

Throws

- Thrown if there is a problem overwriting the message text.

Remarks

Overwrites the message text.

writeText method

Synopsis

```
void ianywhere.qanywhere.client.QATextMessage.writeText(
  String value
)
throws QAException
```

Parameters

- **value** The text to append.

Throws

- Thrown if there is a problem appending the message text.

Remarks

Appends text to the text of the message.

writeText method

Synopsis

```
void ianywhere.qanywhere.client.QATextMessage.writeText(
  String value,
  int length
)
throws QAException
```

Parameters

- **value** The text to append.
- **length** The number of characters of text to append.

Throws

- Thrown if there is a problem appending the message text.

Remarks

Appends text to the text of the message.

writeText method

Synopsis

void **ianywhere.qanywhere.client.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.

Throws

- Thrown if there is a problem appending the message text.

Remarks

Appends text to the text of the message.

Interface QATransactionalManager

Syntax

public **ianywhere.qanywhere.client.QATransactionalManager**

Base classes

- "Interface QAManagerBase" on page 543

Remarks

The QATransactionalManager class derives from QAManagerBase and manages transactional QAnywhere messaging operations.

For a detailed description of derived behavior, see Interface 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

putMessage method

getMessage method

Members

All members of ianywhere.qanywhere.client.QATransactionalManager, including all inherited members.

commit method

Synopsis

void **ianywhere.qanywhere.client.QATransactionalManager.commit()**
throws **QAException**

Throws

- Thrown if there is a problem committing.

Remarks

Commits the current transaction and begins a new transaction.

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

Synopsis

void **ianywhere.qanywhere.client.QATransactionalManager.open()**
throws **QAException**

Throws

- Thrown if there is a problem opening the manager.

Remarks

Opens a QATransactionalManager instance.

This method must be the first method called after creating a manager.

rollback method

Synopsis

void **ianywhere.qanywhere.client.QATransactionalManager.rollback()**
throws **QAException**

Throws

- Thrown if there is a problem rolling back.

Remarks

Rolls back the current transaction and begins a new transaction.

This method rolls back all uncommitted QAManagerBase.putMessage(String, QAMessage) and QAManagerBase.getMessage(String) invocations.

Interface QueueDepthFilter

Syntax

public **ianywhere.qanywhere.client.QueueDepthFilter**

Remarks

Provides queue depth filter values for QAManagerBase.getQueueDepth(short) and QAManagerBase.getQueueDepth(String, short).

See Also

getQueueDepth method

getQueueDepth method

Members

All members of ianywhere.qanywhere.client.QueueDepthFilter, including all inherited members.

- "ALL variable" on page 605
- "INCOMING variable" on page 606
- "OUTGOING variable" on page 606

ALL variable

Synopsis

final short **ianywhere.qanywhere.client.QueueDepthFilter.ALL**

Remarks

This filter specifies both incoming and outgoing messages.

System messages and expired messages are not included in any queue depth counts.

INCOMING variable

Synopsis

final short **ianywhere.qanywhere.client.QueueDepthFilter.INCOMING**

Remarks

This filter specifies only incoming messages.

An incoming message is defined as a message whose originator is different than the agent ID of the message store.

OUTGOING variable

Synopsis

final short **ianywhere.qanywhere.client.QueueDepthFilter.OUTGOING**

Remarks

This filter specifies 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.

Interface StatusCodes

Syntax

public **ianywhere.qanywhere.client.StatusCodes**

Remarks

This interface defines a set of codes for the status of a message.

Members

All members of ianywhere.qanywhere.client.StatusCodes, including all inherited members.

CANCELLED variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.CANCELLED**

Remarks

The message has been cancelled.

This code applies to MessageProperties.STATUS.

See Also

STATUS variable

EXPIRED variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.EXPIRED**

Remarks

The message has expired; the message was not received before its expiration time had passed.

This code applies to MessageProperties.STATUS.

See Also

STATUS variable

FINAL variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.FINAL**

Remarks

The message has achieved a final state.

This code applies to MessageProperties.STATUS.

See Also

STATUS variable

LOCAL variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.LOCAL**

Remarks

The message is addressed to the local message store and will not be transmitted to the server.

This code applies to MessageProperties.TRANSMISSION_STATUS.

See Also

TRANSMISSION_STATUS variable

PENDING variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.PENDING**

Remarks

The message has been sent but not received.

This code applies to MessageProperties.STATUS.

See Also

STATUS variable

RECEIVED variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.RECEIVED**

Remarks

The message has been received and acknowledged by the receiver.

This code applies to MessageProperties.STATUS.

See Also

STATUS variable

RECEIVING variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.RECEIVING**

Remarks

The message is in the process of being received, or it was received but not acknowledged.

This code applies to MessageProperties.STATUS.

See Also

STATUS variable

TRANSMITTED variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.TRANSMITTED**

Remarks

The message has been transmitted to the server.

This code applies to MessageProperties.TRANSMISSION_STATUS.

See Also

TRANSMISSION_STATUS variable

TRANSMITTING variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.TRANSMITTING**

Remarks

The message is in the process of being transmitted to the server.

This code applies to MessageProperties.TRANSMISSION_STATUS.

See Also

TRANSMISSION_STATUS variable

UNRECEIVABLE variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.UNRECEIVABLE**

Remarks

The message has been marked as unreceivable.

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

UNTRANSMITTED variable

Synopsis

final int **ianywhere.qanywhere.client.StatusCodes.UNTRANSMITTED**

Remarks

The message has not been transmitted to the server.

This code applies to MessageProperties.TRANSMISSION_STATUS.

See Also

TRANSMISSION_STATUS variable

ianywhere.qanywhere.ws package

Class WSBase

Syntax

public **ianywhere.qanywhere.ws.WSBase**

Remarks

This is the base class for the main web service proxy class generated by the mobile web service compiler.

Members

All members of ianywhere.qanywhere.ws.WSBase, including all inherited members.

WSBase method

Synopsis

ianywhere.qanywhere.ws.WSBase.WSBase(
String *iniFile*
)
throws **WSException**

Parameters

- **iniFile** A file containing configuration properties.

Throws

- Thrown if there is a problem constructing the WSBase.

Remarks

Constructor with configuration property file.

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\\".

WSBase method

Synopsis

ianywhere.qanywhere.ws.WSBase.WSBase()
throws **WSException**

Throws

- Thrown if there is a problem constructing the WSBase.

Remarks

Constructor.

clearRequestProperties method

Synopsis

void **ianywhere.qanywhere.ws.WSBase.clearRequestProperties()**

Remarks

Clears all request properties that have been set for this WSBase.

getResult method

Synopsis

WSResult **ianywhere.qanywhere.ws.WSBase.getResult(**
String *requestID*
)

Parameters

- **requestID** The ID of the web service request.

Remarks

Gets a WSResult object that represents the results of a web service request.

Returns

A WSResult instance representing the results of the web service request.

See Also

Class WSStatus

getServiceID method

Synopsis

String **ianywhere.qanywhere.ws.WSBase.getServiceID()**

Remarks

Gets the service ID for this instance of WSBase.

Returns

The service ID.

setListener method

Synopsis

void **ianywhere.qanywhere.ws.WSBase.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

Sets a listener for the results of a given web service request.

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 method

Synopsis

void **ianywhere.qanywhere.ws.WSBase.setListener(**
  WSListener *listener*
)

Parameters

- **listener** The listener object that gets called when the result of a web service request is available.

Remarks

Sets a listener for the results of all web service requests made by this instance of WSBase.

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

Synopsis

void **ianywhere.qanywhere.ws.WSBase.setProperty(**
  String *property*,
  String *val*
)

Parameters

- **property** The property name to set.
- **val** The property value.

Remarks

Sets a configuration property for this instance of WSBase.

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

Synopsis

void **ianywhere.qanywhere.ws.WSBase.setQAManager(**
  QAManagerBase *mgr*
)

Parameters

- **mgr** The QAManagerBase to use.

Remarks

Sets the QAManagerBase that is used by this web service client to do web service requests.

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

Synopsis

void **ianywhere.qanywhere.ws.WSBase.setRequestProperty(**
String *name*,
Object *value*
)

Parameters

- **name** The property name to set.
- **value** The property value.

Remarks

Sets a request property for webservice requests made by this Class WSBase.

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

Synopsis

void **ianywhere.qanywhere.ws.WSBase.setServiceID(**
String *serviceID*
)

Parameters

- **serviceID** The service ID.

Remarks

Sets a user-defined ID for this instance of WSBase.

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.

Class WSException

Syntax

public **ianywhere.qanywhere.ws.WSException**

Derived classes

- "Class WSFaultException" on page 617

Remarks

This class represents an exception that occurred during processing of a web service request.

Members

All members of ianywhere.qanywhere.ws.WSException, including all inherited members.

- "getErrorCode method" on page 617
- "WSException method" on page 616
- "WSException method" on page 616
- "WSException method" on page 617

WSException method

Synopsis

```
ianywhere.qanywhere.ws.WSException.WSException(
  String msg
)
```

Parameters

- **msg** The error message.

Remarks

Constructs a new exception with the specified error message.

WSException method

Synopsis

```
ianywhere.qanywhere.ws.WSException.WSException(
  String msg,
  int errorCode
)
```

Parameters

- **msg** The error message.
- **errorCode** The error code.

Remarks

Constructs a new exception with the specified error message and error code.

WSException method

Synopsis

ianywhere.qanywhere.ws.WSException.WSException(
Exception *exception*
)

Parameters

- **exception** The exception.

Remarks

Constructs a new exception.

getErrorCode method

Synopsis

int **ianywhere.qanywhere.ws.WSException.getErrorCode()**

Remarks

Gets the error code associated with this exception.

Returns

The error code associated with this exception.

Class WSFaultException

Syntax

public **ianywhere.qanywhere.ws.WSFaultException**

Base classes

- "Class WSException" on page 616

Remarks

This class represents a SOAP Fault exception from the web service connector.

Members

All members of ianywhere.qanywhere.ws.WSFaultException, including all inherited members.

- "getErrorCode method" on page 617
- "WSException method" on page 616
- "WSException method" on page 616
- "WSException method" on page 617

- "WSFaultException method" on page 618

WSFaultException method

Synopsis

ianywhere.qanywhere.ws.WSFaultException.WSFaultException(
String *msg*
)

Parameters

- **msg** The error message.

Remarks

Constructs a new exception with the specified error message.

Interface WSListener

Syntax

public **ianywhere.qanywhere.ws.WSListener**

Remarks

This class represents a listener for results of web service requests.

Members

All members of ianywhere.qanywhere.ws.WSListener, including all inherited members.

- "onException method" on page 618
- "onResult method" on page 619

onException method

Synopsis

void **ianywhere.qanywhere.ws.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.

Remarks

Called when an exception occurs during processing of the result of an asynchronous web service request.

See Also

Class WSException

Class WSResult

onResult method

Synopsis

void **ianywhere.qanywhere.ws.WSListener.onResult(**
WSResult *wsResult*
)

Parameters

- **wsResult** The WSResult describing the result of a web service request.

Remarks

Called with the result of an asynchronous web service request.

See Also

Class WSResult

Class WSResult

Syntax

public **ianywhere.qanywhere.ws.WSResult**

Remarks

This class represents the results of a web service request.

- 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.

A WSResult object is obtained in one of three ways:

Members

All members of ianywhere.qanywhere.ws.WSResult, including all inherited members.

- "acknowledge method" on page 620
- "getArrayValue method" on page 621
- "getBigDecimalArrayValue method" on page 621
- "getBigDecimalValue method" on page 622
- "getBigIntegerArrayValue method" on page 622

acknowledge method

Synopsis

void **ianywhere.qanywhere.ws.WSResult.acknowledge()**

Remarks

Acknowledges that this WSResult has been processed.

This method is only useful when an EXPLICIT_ACKNOWLEDGEMENT QAManager is being used.

getArrayValue method

Synopsis

WSSerializable[] **ianywhere.qanywhere.ws.WSResult.getArrayValue(**
String *parentName*
)
throws **WSException**

Parameters

- **parentName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets an array of complex types value from this WSResult.

Returns

The value.

getBigDecimalArrayValue method

Synopsis

BigDecimal[] **ianywhere.qanywhere.ws.WSResult.getBigDecimalArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a BigDecimal array value from this WSResult.

Returns

The value.

getBigDecimalValue method

Synopsis

BigDecimal **ianywhere.qanywhere.ws.WSResult.getBigDecimalValue(**
  String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a BigDecimal value from this WSResult.

Returns

The value.

getBigIntegerArrayValue method

Synopsis

BigInteger[] **ianywhere.qanywhere.ws.WSResult.getBigIntegerArrayValue(**
  String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a BigInteger array value from this WSResult.

Returns

The value.

getBigIntegerValue method

Synopsis

BigInteger **ianywhere.qanywhere.ws.WSResult.getBigIntegerValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a BigInteger value from this WSResult.

Returns

The value.

getBooleanArrayValue method

Synopsis

Boolean[] **ianywhere.qanywhere.ws.WSResult.getBooleanArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Boolean array value from this WSResult.

Returns

The value.

getBooleanValue method

Synopsis

Boolean **ianywhere.qanywhere.ws.WSResult.getBooleanValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Boolean value from this WSResult.

Returns

The value.

getByteArrayValue method

Synopsis

Byte[] **ianywhere.qanywhere.ws.WSResult.getByteArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Byte array value from this WSResult.

Returns

The value.

getByteValue method

Synopsis

Byte **ianywhere.qanywhere.ws.WSResult.getByteValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Byte value from this WSResult.

Returns

The value.

getCharacterArrayValue method

Synopsis

Character[] **ianywhere.qanywhere.ws.WSResult.getCharacterArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Character array value from this WSResult.

Returns

The value.

getCharacterValue method

Synopsis

Character **ianywhere.qanywhere.ws.WSResult.getCharacterValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Character value from this WSResult.

Returns

The value.

getDoubleArrayValue method

Synopsis

Double[] **ianywhere.qanywhere.ws.WSResult.getDoubleArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Double array value from this WSResult.

Returns

The value.

getDoubleValue method

Synopsis

Double **ianywhere.qanywhere.ws.WSResult.getDoubleValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Double value from this WSResult.

Returns

The value.

getErrorMessage method

Synopsis

String **ianywhere.qanywhere.ws.WSResult.getErrorMessage()**

Remarks

Gets the error message.

Returns

The error message.

getFloatArrayValue method

Synopsis

Float[] **ianywhere.qanywhere.ws.WSResult.getFloatArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Float array value from this WSResult.

Returns

The value.

getFloatValue method

Synopsis

Float **ianywhere.qanywhere.ws.WSResult.getFloatValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Float value from this WSResult.

Returns

The value.

getIntegerArrayValue method

Synopsis

Integer[] **ianywhere.qanywhere.ws.WSResult.getIntegerArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Integer array value from this WSResult.

Returns

The value.

getIntegerValue method

Synopsis

```
Integer ianywhere.qanywhere.ws.WSResult.getIntegerValue(
  String elementName
)
throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Integer value from this WSResult.

Returns

The value.

getLongArrayValue method

Synopsis

```
Long[] ianywhere.qanywhere.ws.WSResult.getLongArrayValue(
  String elementName
)
throws WSException
```

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Long array value from this WSResult.

Returns

The value.

getLongValue method

Synopsis

Long **ianywhere.qanywhere.ws.WSResult.getLongValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Long value from this WSResult.

Returns

The value.

getObjectArrayValue method

Synopsis

Object[] **ianywhere.qanywhere.ws.WSResult.getObjectArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets an array of complex types value from this WSResult.

Returns

The value.

getObjectValue method

Synopsis

Object **ianywhere.qanywhere.ws.WSResult.getObjectValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets value of a complex type from this WSResult.

Returns

The value.

getPrimitiveBooleanArrayValue method

Synopsis

boolean[] **ianywhere.qanywhere.ws.WSResult.getPrimitiveBooleanArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a boolean array value from this WSResult.

Returns

The value.

getPrimitiveBooleanValue method

Synopsis

boolean **ianywhere.qanywhere.ws.WSResult.getPrimitiveBooleanValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a boolean value from this WSResult.

Returns

The value.

getPrimitiveByteArrayValue method

Synopsis

byte[] **ianywhere.qanywhere.ws.WSResult.getPrimitiveByteArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a byte array value from this WSResult.

Returns

The value.

getPrimitiveByteValue method

Synopsis

byte **ianywhere.qanywhere.ws.WSResult.getPrimitiveByteValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a byte value from this WSResult.

Returns

The value.

getPrimitiveCharArrayValue method

Synopsis

char[] **ianywhere.qanywhere.ws.WSResult.getPrimitiveCharArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a char array value from this WSResult.

Returns

The value.

getPrimitiveCharValue method

Synopsis

char **ianywhere.qanywhere.ws.WSResult.getPrimitiveCharValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a char value from this WSResult.

Returns

The value.

getPrimitiveDoubleArrayValue method

Synopsis

double[] **ianywhere.qanywhere.ws.WSResult.getPrimitiveDoubleArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a double array value from this WSResult.

Returns

The value.

getPrimitiveDoubleValue method

Synopsis

double **ianywhere.qanywhere.ws.WSResult.getPrimitiveDoubleValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a double value from this WSResult.

Returns

The value.

getPrimitiveFloatArrayValue method

Synopsis

float[] **ianywhere.qanywhere.ws.WSResult.getPrimitiveFloatArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a float array value from this WSResult.

Returns

The value.

getPrimitiveFloatValue method

Synopsis

float **ianywhere.qanywhere.ws.WSResult.getPrimitiveFloatValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a float value from this WSResult.

Returns

The value.

getPrimitiveIntArrayValue method

Synopsis

int[] **ianywhere.qanywhere.ws.WSResult.getPrimitiveIntArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets an int array value from this WSResult.

Returns

The value.

getPrimitiveIntValue method

Synopsis

int **ianywhere.qanywhere.ws.WSResult.getPrimitiveIntValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets an int value from this WSResult.

Returns

The value.

getPrimitiveLongArrayValue method

Synopsis

long[] **ianywhere.qanywhere.ws.WSResult.getPrimitiveLongArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a long array value from this WSResult.

Returns

The value.

getPrimitiveLongValue method

Synopsis

long **ianywhere.qanywhere.ws.WSResult.getPrimitiveLongValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a long value from this WSResult.

Returns

The value.

getPrimitiveShortArrayValue method

Synopsis

short[] **ianywhere.qanywhere.ws.WSResult.getPrimitiveShortArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a short array value from this WSResult.

Returns

The value.

getPrimitiveShortValue method

Synopsis

short **ianywhere.qanywhere.ws.WSResult.getPrimitiveShortValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a short value from this WSResult.

Returns

The value.

getRequestID method

Synopsis

String **ianywhere.qanywhere.ws.WSResult.getRequestID()**

Remarks

Gets the request ID that this WSResult represents.

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.

Returns

The request ID.

getShortArrayValue method

Synopsis

Short[] **ianywhere.qanywhere.ws.WSResult.getShortArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Short array value from this WSResult.

Returns

The value.

getShortValue method

Synopsis

Short **ianywhere.qanywhere.ws.WSResult.getShortValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a java.lang.Short value from this WSResult.

Returns

The value.

getStatus method

Synopsis

int **ianywhere.qanywhere.ws.WSResult.getStatus()**

Remarks

Gets the status of this WSResult.

Returns

The status code.

See Also

Class WSStatus

getStringArrayValue method

Synopsis

String[] **ianywhere.qanywhere.ws.WSResult.getStringArrayValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a String array value from this WSResult.

Returns

The value.

getStringValue method

Synopsis

String **ianywhere.qanywhere.ws.WSResult.getStringValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets a String value from this WSResult.

Returns

The value.

getValue method

Synopsis

Object **ianywhere.qanywhere.ws.WSResult.getValue(**
String *elementName*
)
throws **WSException**

Parameters

- **elementName** The element name in the WSDL document of this value.

Throws

- Thrown if there is a problem getting the value.

Remarks

Gets the value of a complex type from this WSResult.

Returns

The value.

Class WSStatus

Syntax

public **ianywhere.qanywhere.ws.WSStatus**

Remarks

This class defines codes for the status of a web service request.

Members

All members of ianywhere.qanywhere.ws.WSStatus, including all inherited members.

- "STATUS_ERROR variable" on page 642
- "STATUS_QUEUED variable" on page 643
- "STATUS_RESULT_AVAILABLE variable" on page 643
- "STATUS_SUCCESS variable" on page 643

STATUS_ERROR variable

Synopsis

final int **ianywhere.qanywhere.ws.WSStatus.STATUS_ERROR**

Remarks

There was an error processing the request.

STATUS_QUEUED variable

Synopsis

final int **ianywhere.qanywhere.ws.WSStatus.STATUS_QUEUED**

Remarks

The request has been queued for delivery to the server.

STATUS_RESULT_AVAILABLE variable

Synopsis

final int **ianywhere.qanywhere.ws.WSStatus.STATUS_RESULT_AVAILABLE**

Remarks

The result of the request is available.

STATUS_SUCCESS variable

Synopsis

final int **ianywhere.qanywhere.ws.WSStatus.STATUS_SUCCESS**

Remarks

The request was successful.

CHAPTER 15

QAnywhere SQL API Reference

Contents

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 208.

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 61
- "QAnywhere message addresses" on page 52
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

Example

In the following example, a message is received and its address is output to the database console:

```
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 61
- "Message delete rules" on page 240
- "Sending QAnywhere messages" on page 67
- "ml_qa_setexpiration" on page 652
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

Example

In the following example, a message is received and the message expiration is output to the database console:

```
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 61
- "ml_qa_setinreplytoid" on page 653
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

Example

In the following example, a message is received and the in-reply-to-id of the message is output to the database console:

```
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 61
- "ml_qa_setpriority" on page 654
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

Example

In the following example, a message is received and the priority of the message is output to the database console:

```
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 61
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

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 console:

```
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 61
- "ml_qa_setreplytoaddress" on page 654
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

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 61
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

Example

In the following example, a message is received and the creation time of the message is output to the database console:

```
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 61
- "ml_qa_getexpiration" on page 647
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

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 61
- "ml_qa_getinreplytoid" on page 647
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

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 61
- "ml_qa_getpriority" on page 648
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

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.
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 61
- "ml_qa_getreplytoaddress" on page 650
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

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 pre-defined message properties.

See "Message properties" on page 211.

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 61
- "ml_qa_setbooleanproperty" on page 663
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

Example

In the following example, a message is received and the value of the boolean property mybooleanproperty is output to the database console:

```
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 61
- "ml_qa_setbyteproperty" on page 663
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

Example

In the following example, a message is received and the value of byte property mybyteproperty is output to the database console:

```
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 61
- "ml_qa_setdoubleproperty" on page 664
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

Example

In the following example, a message is received and the value of double property mydoubleproperty is output to the database console:

```
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 61
- “ml_qa_setfloatproperty” on page 665
- “ml_qa_createmessage” on page 676
- “ml_qa_getmessage” on page 676
- “Custom message properties” on page 213

Example

In the following example, a message is received and the value of float property myfloatproperty is output to the database console:

```
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 61
- "ml_qa_setintproperty" on page 666
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

Example

In the following example, a message is received and the value of integer property myintproperty is output to the database console:

```
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 61
- "ml_qa_setlongproperty" on page 666
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

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 61
- "ml_qa_createmessage" on page 676

- “ml_qa_getmessage” on page 676
- “Custom message properties” on page 213

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 61
- “ml_qa_setshortproperty” on page 667
- “ml_qa_createmessage” on page 676
- “ml_qa_getmessage” on page 676
- “Custom message properties” on page 213

Example

In the following example, a message is received and the value of the short property myshortproperty is output to the database console:

```
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 61
- “ml_qa_setstringproperty” on page 668
- “ml_qa_createmessage” on page 676
- “ml_qa_getmessage” on page 676
- “Custom message properties” on page 213

Example

In the following example, a message is received and the value of the string property mystringproperty is output to the database console:

```
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 61
- "ml_qa_getbooleanproperty" on page 655
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

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 61
- "ml_qa_getbyteproperty" on page 656
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

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 61
- "ml_qa_getdoubleproperty" on page 657
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

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.
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 61
- "ml_qa_getfloatproperty" on page 658
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

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 61
- "ml_qa_getintproperty" on page 659
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

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 61
- "ml_qa_getlongproperty" on page 659
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

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 61
- "ml_qa_getshortproperty" on page 661
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

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 61
- "ml_qa_getstringproperty" on page 662
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "Custom message properties" on page 213

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 61
- “ml_qa_setbinarycontent” on page 671
- “ml_qa_createmessage” on page 676
- “ml_qa_getmessage” on page 676
- “ml_qa_getcontentclass” on page 670

Example

In the following example, a message's encrypted content is decrypted and output to the database console:

```
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 61
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "ml_qa_getbinarycontent" on page 669
- "ml_qa_gettextcontent" on page 671

Example

In the following example, a message is received and the content is output to the database console:

```
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 61
- "ml_qa_settextcontent" on page 672
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676
- "ml_qa_getcontentclass" on page 670

Example

In the following example, the content of a message is output to the database console:

```
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 61
- "ml_qa_getbinarycontent" on page 669
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

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 61
- "ml_qa_gettextcontent" on page 671
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

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 217.

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 61
- “ml_qa_setstoreproperty” on page 674

Example

The following example gets the current synchronization policy of this message store and outputs it to the database console:

```
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 61
- "ml_qa_getstoreproperty" on page 674

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 61
- "Message headers" on page 646
- "Message properties" on page 655
- "Message content" on page 669

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. If you want a SQL procedure to be called asynchronously as soon as a message is available for a specified QAnywhere address, use the Listener.

This stored procedure blocks until a message is queued.

For information about avoiding blocking, see "ml_qa_getmessagenowait" on page 677 or "ml_qa_getmessagetimeout" on page 679.

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 61
- "ml_qa_getmessagenowait" on page 677
- "ml_qa_getmessagetimeout" on page 679
- "Message headers" on page 646
- "Message properties" on page 655
- "Message content" on page 669

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. If you want a SQL procedure to be called asynchronously as soon as a message is available for a specified QAnywhere address, use the Listener.

For information on blocking until a message is available, see "ml_qa_getmessage" on page 676 and "ml_qa_getmessagetimeout" on page 679.

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 61
- "QAnywhere message addresses" on page 52
- "Listeners" [*MobiLink - Server-Initiated Synchronization*]
- "ml_qa_getmessagetimeout" on page 679
- "Message headers" on page 646
- "Message properties" on page 655
- "Message content" on page 669

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. If you want a SQL procedure to be called asynchronously as soon as a message is available for a specified QAnywhere address, use the Listener.

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 61
- “ml_qa_getmessage” on page 676
- “ml_qa_getmessagenowait” on page 677

Example

The following example outputs the content of all messages sent to the address myaddress to the database console, and updates the database console 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 61

Example

For example, to grant messaging permissions to a user with the database ID user1, execute the following SQL 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.

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 52.

See also

- "Setting up SQL applications" on page 61
- "Receiving messages asynchronously" on page 77
- "Receiving messages synchronously" on page 76
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

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 61
- "ml_qa_createmessage" on page 676
- "ml_qa_getmessage" on page 676

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 ondemand, 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 61

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
```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