Relay Server

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Contents

About this book

This book describes how to set up and use the Relay Server, which enables secure communication between mobile devices and Afaria, Mobile Office, MobiLink, SQL Anywhere, Unwired Server, and Sybase Unwired Platform servers through a web server.

Introduction to the Relay Server

The Relay Server enables secure, load-balanced communication between mobile devices and back-end servers through a web server. Supported back-end servers include Afaria, Mobile Office, MobiLink, SQL Anywhere, Unwired Server, and Sybase Unwired Platform. The Relay Server provides the following:

- A common communication architecture for mobile devices communicating with back-end servers.
- A mechanism to enable a load-balanced and fault-tolerant environment for back-end servers.
- A way to help communication between mobile devices and back-end servers in a way that integrates easily with existing corporate firewall configurations and policies.

Relay Server architecture

A Relay Server deployment consists of the following:

- Mobile devices running client applications and services that need to communicate with back-end servers running in a corporate LAN.

- Optional load balancer to direct requests from the mobile devices to a group of Relay Servers.

- One or more Relay Servers running in the corporate DMZ.

- At least one back-end server running in a corporate LAN that is responsible for servicing client requests. The following back-end servers are supported for use with the Relay Server:

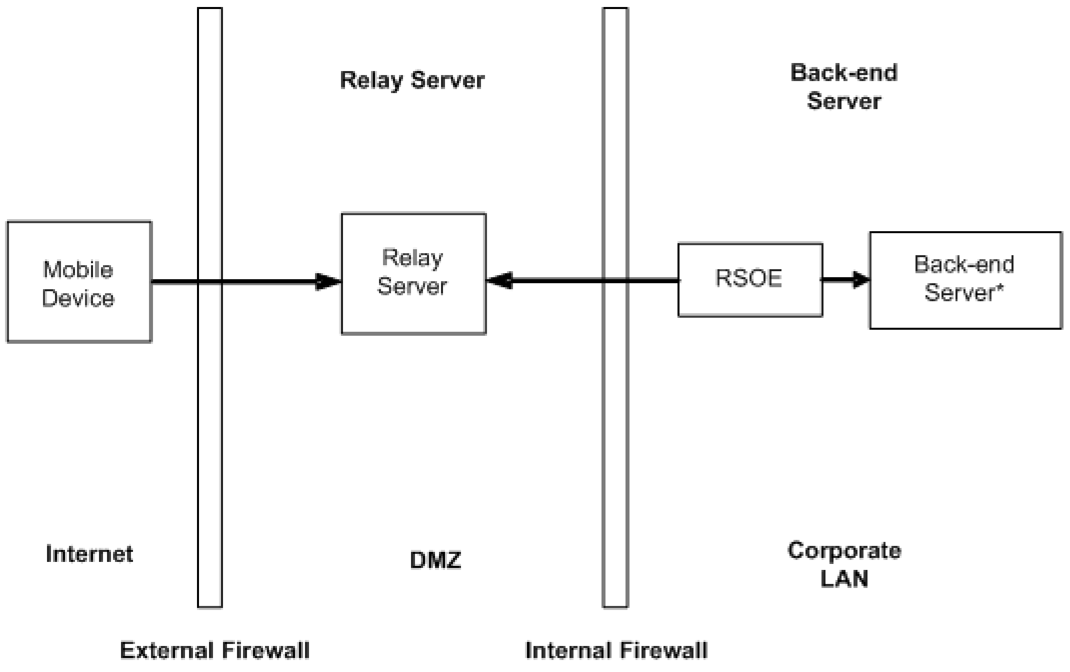
  - Afaria
  - Mobile Office
  - MobiLink
  - SQL Anywhere
  - Unwired Server,
  - Sybase Unwired Platform

  Note
  Relay Server is tested with specific back-end servers and clients that communicate using well-defined HTTP requests and responses. Deployments that use custom HTTP traffic, including using SQL Anywhere as a Web server, must thoroughly test the traffic to ensure that it works with the Relay Server.

  Refer to your license agreement or the SQL Anywhere Components by Platforms page for information about which back-end servers are supported. See http://www.sybase.com/detail?id=1061806 .

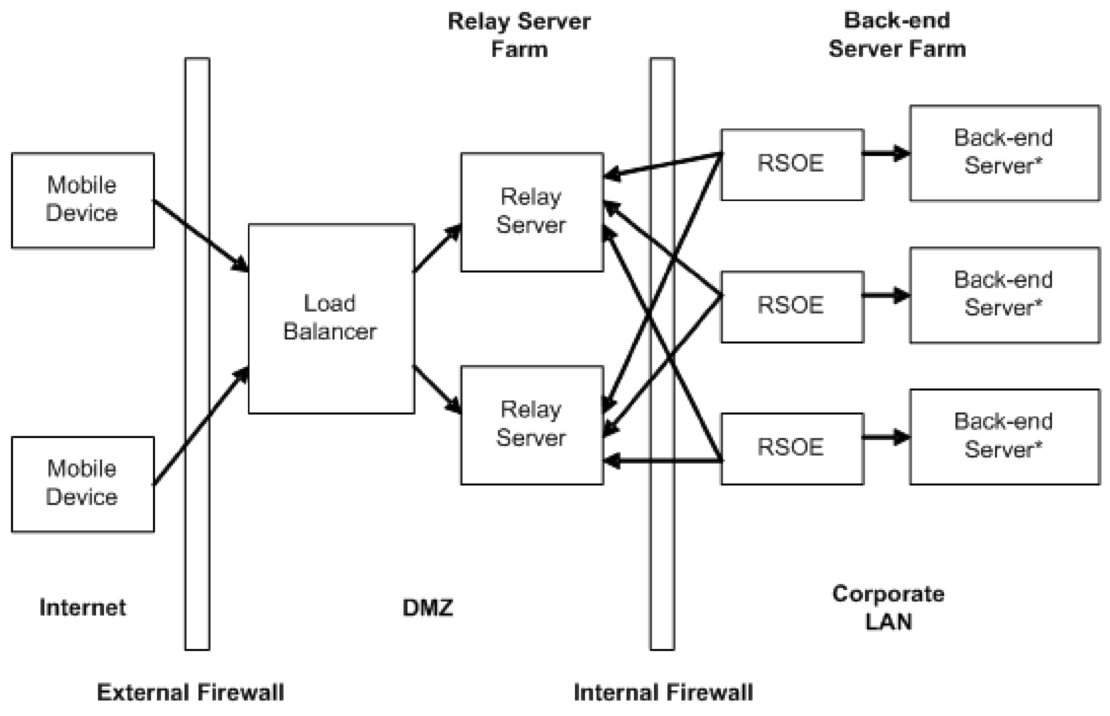
- There is usually only one, but there may be several, Relay Server Outbound Enablers (RSOE) per back-end server. The Outbound Enabler manages all communication between a back-end server and the Relay Server farm.

The following diagram shows the Relay Server architecture with a single Relay Server.



Note
Refer to your license agreement or the SQL Anywhere Components by Platforms page for information about which back-end servers are supported. See http://www.sybase.com/detail?id=1061806 .

The following diagram shows the Relay Server architecture for a more complex system with a Relay Server farm and a back-end server farm.



Note
Refer to your license agreement or the SQL Anywhere Components by Platforms page for information about which back-end servers are supported. See http://www.sybase.com/detail?id=1061806 .

The Relay Server consists of a set of web extensions, a background process for maintaining state information, and a web server.

Because the Relay Server is a web extension running in a web server, all communication is performed using HTTP or HTTPS. Using HTTP easily integrates with existing corporate firewall configurations and policies. The Relay Server requires that the connection from the corporate LAN to the Relay Server be initiated from inside the corporate LAN. This provides a more secure deployment environment because it does not require inbound connections from the DMZ into the corporate LAN.

The Relay Server contains two web extensions: a client extension and a server extension. The client extension handles client requests made from applications running on mobile devices. The server extension handles requests made by the Outbound Enabler on behalf of a back-end server.

Shared Memory and Security

The Relay Server uses shared memory to transfer HTTP requests and responses between the client and server plug-ins. Secure deployments use HTTPS between the client and the Relay Server, and between the Outbound Enabler and the Relay Server. In this scenario, the Web Server decrypts the HTTPS into HTTP, then the Relay Server re-encrypts the HTTP on its way to the Outbound Enabler. The brief interval during which the data is unencrypted in the Relay Server is sometimes called the Wireless Application Protocol gap or WAP Gap.

There are two ways to secure this data from rogue processes on the same computer. The primary approach is to use clients and back-end servers supporting end-to-end encryption. Most MobiLink clients support end-to-end-encryption. The second approach, which is minimally recommended for all Relay Servers, is to harden the Web server and operating system (OS) for deployment to the DMZ using the standard techniques documented for each supported Web server and OS. This hardening should include steps to reduce the number of OS accounts on the Web server computer. Ideally, the hardening also restricts the computer/VM to only run the Relay Server and the Web server -- nothing else. The goal is to minimize the number of processes on the computer to a bare minimum, while hardening to prevent rogue agents from adding rogue programs.

The Relay Server farm

A Relay Server farm is any number of Relay Servers with a front-end load balancer. It is possible to set up a Relay Server farm with a single Relay Server, in which case a load balancer is not required. In this case, mobile devices can connect directly to the Relay Server.

Back-end server farm

A back-end server farm is a group of homogeneous back-end servers. A client making a request through the Relay Server farm must specify the back-end server farm it is targeting.

Load balancer

The load balancer directs requests from the mobile devices to a Relay Server running in the Relay Server farm. The load balancer is not required if there is only one Relay Server.

Relay Server Outbound Enabler

The Relay Server Outbound Enabler runs on the same computer as the back-end server. Its primary function is to initiate an outbound connection to all Relay Servers in the Relay Server farm on behalf of the back-end server. There is usually only one, but there may be several, Relay Server Outbound Enablers (RSOEs) per back-end server.

See also

- See “Outbound Enabler” on page 33.

Relay Server security

The Relay Server has built-in security features, but also relies on the security features provided by the web server. In combination with the web server, the Relay Server provides the following features for secure communications:

- Server-side certificates

- Client-side certificates
- Back-end server and farm configuration
- RSOE MAC address filtering and token authentication
- Client encryption technologies (Protocol-level encryption)

Server-side certificates

Using a server-side certificate, a client communicating with the Relay Server can verify the web server that is running the Relay Server is a trusted server. The client verifies the web server's public certificate with the root certificate stored on the client. If the certificates are verified, a key exchange occurs to establish the encrypted connection.

Client-side certificates

Using a client-side certificate, the web server can verify that a client communicating with the Relay Server is a trusted client. The web server verifies the client's public certificate with its root certificate stored in the certificate manager on the web server computer. If the certificates are verified, a key exchange occurs to establish the encrypted connection.

Back-end server and farm configuration

The *rs.config* file is used by the Relay Server to define the peer list of Relay Servers, if running in a farm environment, including the back-end farm and back-end server configurations. Each Relay Server in the environments needs to maintain a copy of the *rs.config* file.

The configuration of the back-end farm and back-end servers ensures the Relay Server only communicates with computers with which it has been configured. Any attempted communication with computers for which the Relay Server has not been configured will be refused.

The back-end farm can be configured to specify the level of communication security when accepting requests from the clients and the RSOE. There is a client_security and backend_security option that allows the back-end farm to specify the type of communication that can be established. This option is specified as follows:

client_security=on|off **On** indicates the client must connect using HTTPS. **Off** indicates the client must connect using HTTP. This setting is optional. If no value is specified, the client can connect using HTTP or HTTPS.

backend_security=on|off **On** indicates the RSOE must connect using HTTPS. **Off** indicates the RSOE must connect using HTTP. This setting is optional. If no value is specified, the RSOE can connect using HTTP or HTTPS.

RSOE MAC address filtering and token authentication

The RSOE establishes the connection between the back-end server and the Relay Server using three phases: 1) startup phase, 2) ready phase 3) working phase.

In the backend server section of the *rs.config* file, each server that exists in the back-end farm is configured with an ID and associated farm name. The ID corresponds to the server name. The Relay

Server has the ability to verify the MAC address of the computer running the RSOE to ensure the server communicating from within the internal firewall is trusted and allowed to establish a connection with the Relay Server. The MAC property is the MAC address of the network adapter used by the RSOE. The address is specified in IEEE 802 MAC-48 format.

The backend server section also allows for the configuration of a security token that is used by the Relay Server to authenticate the back-end server connection. The token must be provided upon startup of the RSOE when establishing the connection with the Relay Server.

MobiLink security

The MobiLink client uses HTTP or HTTPS to communicate with the Relay Server. With HTTPS communication, data is temporarily decrypted and re-encrypted as it is exchanged between the client and back-end server. This is known as the WAP Gap. To ensure completely secure communication through the WAP Gap, it is recommended that you use the MobiLink end-to-end encryption feature to further protect data as it passes through the Relay Server. The MobiLink end-to-end encryption feature provides protocol-level encryption between the MobiLink, UltraLite, and QAnywhere clients and the MobiLink server. Both RSA and ECC encryption types are supported. TLS security can be used in combination with end-to-end encryption.

HTTP listening port of the outbound enabler

For security purposes, when using the standalone outbound enabler, the HTTP listening port of the back-end server should be explicitly bound only to the loopback IP address (127.0.0.1).

See also

- "Relay Server configuration file" on page 25
- Windows IIS http://www.sybase.com/detail?id=1059277
- Apache http://www.sybase.com/detail?id=1065869
- "End-to-end encryption" [*SQL Anywhere Server - Database Administration*]

Relay Server deployment

Deploying the Relay Server components to Microsoft IIS 6.0 on Windows Server 2003

Before running the Relay Server with IIS 6.0, you need to deploy Relay Server files to each computer in the Relay Server farm.

Prerequisites

The Relay Server components are installed as part of the SQL Anywhere 12 installation. The install process automatically deploys all the necessary files on the computer that is going to run the Relay Server.

By default, all files are installed to *%SQLANY12%* and are based on the bitness of the computer:

- *%SQLANY12%\Bin32* and *%SQLANY12%\Bin64* are used for DLLs and executables for administration.
- *%SQLANY12%\RelayServer\IIS\Bin32* and *%SQLANY12%\RelayServer\IIS\Bin64* are used for Relay Server specific files under the appropriate folder (for example, *Admin*, *Client*, *Monitor*, or *Server*). The *Server* folder contains the *rshost.exe* and *rs.config* files.

Context and remarks

Interactive quick setup feature
An interactive quick setup feature, *rs-setup.bat*, is provided as an alternative to this procedure (refer to the readme file for a more detailed description of the quick setup feature). *rs-setup.bat* is located in the *%SQLANY12%/RelayServer/IIS/quicksetup_iis6* directory and performs the following tasks:

1. Creates a demo application
2. Generates a quick reference guide

The Relay Server for Windows consists of the following executables:

- *rs_client.dll*
- *rs_server.dll*
- *rs_monitor.dll*
- *rshost.exe*
- *dblgen12.dll*
- *dbsvc.exe*
- *dbfhide.exe*
- *dbtool12.dll*
- *dblib12.dll*
- *dbicu12.dll*
- *dbicudt12.dll*
- *dbsupport.exe*
- *dbghelp.dll*

For information about which versions of IIS are supported, see http://www.sybase.com/detail?id=1061806.

Setup scripts for the Relay Server on IIS can be found in the *%SQLANY12%\RelayServer\IIS* directory.

Deploy the Relay Server components to Microsoft IIS 6.0 on Windows Server 2003

1. Create a virtual directory called *rs* under the Default Web Site in the Microsoft IIS Manager for use by the Relay Server. The physical location of the virtual directory is *%SQLANY12%\RelayServer\IIS\BinXX* where XX is either 32 or 64 depending on the bitness of your IIS server.

2. Create the Relay Server configuration file *rs.config* using the following guidelines:

   - The file should have four sections:
     - Options section
     - Relay server section
     - Backend farm section
     - Backend server section
   - Each section starts with a section tag, made by enclosing a keyword that identifies the section name in square brackets.
   - Add the appropriate properties to each section. A property is defined by specifying the property name on the left side of an equal sign and its value on the right side of the equal sign. For example, *propertyname* = *value*.
   - The configuration file should contain only 7-bit ASCII characters.

3. Create an application pool:

   a. Start Microsoft IIS Manager Console.

   b. Right-click **Application Pools** and create a new application pool, for example RS_POOL.

   c. Edit the properties for the application pool you created.

      i. Click the **Recycling** tab and turn off all the recycling options.

ii. Click the **Performance** tab and do the following:

A. Turn off **Shutdown Worker Processes After Being Idle**.

B. Set the number of worker processes to the total number of processing cores. You can further adjust this number depending on your usage and performance preferences. For more information, see the Microsoft IIS performance notes about Web garden size.

4. Set the Connection timeout property of the Default Web Site to a minimum of 60 seconds. By default this value should be 120 seconds, which is sufficient.

5. Edit the properties of rs and enable the Relay Server web extensions using the IIS Manager Console:

   a. Click the **Directory** tab and do the following:

      i. Set execute permissions to **Scripts And Executables**.

      ii. Click **Create** under **Application Settings**. Select the application pool you created in step 4 as the associated application pool.

   b. Click the **Directory Security** tab and do the following:

      i. Click **Edit** in **Authentication and Access Control**.

      ii. Enable anonymous access and fill in the user name and password for an account belonging to the Administrators group.

      Alternatively, you may leave the setting as the built-in user **IUSR_%computername%** and execute the following command to grant permission to access the Microsoft IIS metabase.

```
C:\Windows\Microsoft.Net\Framework\<Version>\aspnet_regiis.exe -ga
IUSR_%computername%
```

   c. Under **Web Server Extensions** in the Microsoft IIS manager, add *rs_server.dll*, *rs_client.dll*, and *rs_monitor.dll* as a new Web service extension. The extension name should be ISAPI and the DLLs need to have the extension status set to Allowed.

6. Deploy the Relay Server configuration file by creating a Relay Server configuration file and copying it to the *%SQLANY12%\RelayServer\IIS\BinXX\server* directory.

7. Ensure optimum performance by reviewing the performance tips.

8. Start the Relay Server State Manager as a service using a command line similar to the following:

```
dbsvc -as -s auto -t rshost -w RelayServer "%SQLANY12%\RelayServer\IIS
\BinXX\Server\rshost.exe" -q -qc -f "%SQLANY12%\RelayServer\IIS\BinXX
\Server\rs.config" -o "c:\temp\ias_relay_server.log"
```

Note
It is recommended that you start the State Manager as a service. However, it can also be started automatically by the Relay Server.

9. Update the Relay Server configuration for Microsoft IIS 6.0 on Windows:

   a. For each computer that belongs to the Relay Server farm you are updating, copy the updated configuration file to the *%SQLANY12%\RelayServer\IIS\BinXX\Server* directory under the Relay

Server web site home directory. The configuration file must be called *rs.config* if auto start is used.

b. From the *%SQLANY12%\RelayServer\IIS\BinXX\Server* directory, run the following command line to apply the configuration update:

```
rshost -u -f rs.config
```

c. Repeat the previous steps for each computer in the Relay Server farm that is being updated.

Note
After configuring the Relay Server with IIS, it is recommended that you restart the IIS server or the computer.

Results

The Relay Server configuration file is deployed to all computers in the Relay Server farm.

Next

None.

See also

- "Relay Server configuration file" on page 25
- "Performance tips" on page 10
- "Relay Server State Manager" on page 21
- "Relay Server State Manager as a service" on page 21
- "Relay Server State Manager command line syntax" on page 23
- "File Hiding utility (dbfhide)" on page 39

Performance tips

Keep the following in mind when deploying the Relay Server to Microsoft IIS on Windows:

- The Relay Server web extension does not rely on ASP.NET. Removing the ASP.NET ISAPI filter yields better performance. The filter gets turned on by default in a standard Microsoft IIS install. To turn off the filter, do the following:

  1. Start Microsoft IIS Manager Console.

  2. Edit the properties of **Default Web Site**.

  3. Under the **ISAPI Filters** tab, remove the ASP.NET filter.

- For better performance, you can turn off the Microsoft IIS access log. To turn off the access log, do the following:

  1. Start Microsoft IIS Manager Console.

2. Edit the properties of the *ias_relay_server* directory under **Default Web Site**.

3. Under the **Directory** tab, clear the **Log Visits** selection.

- In a production environment, Relay Server verbosity can be set to 0 via the Relay Server configuration file. This yields better performance under high loads.

- The Relay Server does not impose restrictions on the Web garden size. One worker process may serve requests from all Outbound Enablers as well as from all the clients. However, the number of threads that can be created in the process is limited by the process heap space left available for thread creation. The thread created by Microsoft IIS has a 256k stack size. If your computer has adequate resources, experiment with a higher number of processes if you suspect you are hitting a concurrency limit when the server is loaded with thousands of concurrent requests.

Deploying the Relay Server components to Microsoft IIS 7.0 or 7.5 on Windows Server 2008/ Windows Server 2008 R2

Before running the Relay Server with IIS 7.0 or 7.5, you need to deploy Relay Server files to each computer in the Relay Server farm.

Prerequisites

The Microsoft IIS ISAPI Extensions feature is installed.

The Relay Server components are installed using the SQL Anywhere install. By default, all files are installed to *%SQLANY12%* and are based on the bitness of the computer:

- *%SQLANY12%\Bin32* and *%SQLANY12%\Bin64* are used for DLLs and executables for administration.

- *%SQLANY12%\RelayServer\IIS\Bin32* and *%SQLANY12%\RelayServer\IIS\Bin64* are used for Relay Server specific files under the appropriate folder (for example, *Admin*, *Client*, *Monitor*, or *Server*). The *Server* folder contains the *rshost.exe* and *rs.config* files.

Context and remarks

Interactive quick setup feature
An interactive quick setup feature, *rs-setup.bat*, is provided as an alternative to this procedure (refer to the readme file for a more detailed description of the quick setup feature). *rs-setup.bat* is located in the *%SQLANY12%/RelayServer/IIS/quicksetup_iis7* directory and performs the following tasks:

1. Installs IIS7 and turns on the required IIS7 features
2. Configures IIS7 for the Relay Server
3. Creates a demo application
4. Generates a quick reference guide

The Relay Server for Windows consists of the following executables:

- *rs_client.dll*
- *rs_server.dll*
- *rs_monitor.dll*
- *rshost.exe*
- *dblgen12.dll*
- *dbsvc.exe*
- *dbfhide.exe*
- *dbtool12.dll*
- *dblib12.dll*
- *dbicu12.dll*
- *dbicudt12.dll*
- *dbsupport.exe*
- *dbghelp.dll*

For information about which versions of IIS are supported, see http://www.sybase.com/detail?id=1061806.

IIS 7 setup scripts for Relay Server can be found in the *%SQLANY12%\RelayServer\IIS\iis7_setup.txt* directory.

Deploy the Relay Server components to Microsoft IIS 7.0 or 7.5 on Windows Server 2008/ Windows Server 2008 R2

1. Backup the IIS configuration file *applicationHost.config* located in the *c:\Windows\System32\inetsrv\config* folder.

2. To add an application pool for the Relay Server, edit the *applicationHost.config* file to add the following code to the **<system.applicationHost>** » **<applicationPools>** section.

```
<add name="RelayServer" queueLength="65535" autoStart="true"
managedRuntimeVersion="" managedPipelineMode="Integrated">
   <processModel identityType="LocalSystem" idleTimeout="00:00:00"
```

```
maxProcesses="20" pingingEnabled="false"
         pingInterval="00:00:30" pingResponseTime="00:01:30" />
   <recycling disallowOverlappingRotation="true">
     <periodicRestart time="00:00:00">
       <schedule>
         <clear />
       </schedule>
     </periodicRestart>
   </recycling>
   <failure rapidFailProtection="false" />
   <cpu resetInterval="00:00:00" />
</add>
```

> **Note**
> The rest of the steps refer the *%SQLANY12%\RelayServer\IIS\BinXX* directory as %rs_dir% in the *applicationHost.config* file. However, environment variable expansion is not fully supported in every section in the IIS configuration file, so the %rs_dir% variable needs to be fully expanded when you add it into the applicationHost.config file.

3. To add the Relay Server application to the default site, edit the *applicationHost.config* file to add the following code to the **<system.applicationHost>** » **<applicationPools>** » **<sites>** » **<site name="Default Web Site">** section.

```
<application path="/rs" applicationPool="RelayServer">
  <virtualDirectory path="/" physicalPath="%rs_dir%"/>
</application>
```

4. To add the Relay Server ISAPI extensions, edit the *applicationHost.config* file to add the following code to the **<system.webServer>** » **<security>** » **<isapiCgiRestriction>** section.

```
<add path="%rs_dir%\Admin\rs_admin.dll" allowed="true" />
<add path="%rs_dir%\Client\rs_client.dll" allowed="true" />
<add path="%rs_dir%\Monitor\rs_monitor.dll" allowed="true" />
<add path="%rs_dir%\Server\rs_server.dll" allowed="true" />
```

5. To enable access to the Relay Server extensions, edit the *applicationHost.config* file to add the following code to the **<configuration>** section.

```
<location path="Default Web Site/rs">
  <system.webServer>
    <security>
      <authentication>
        <anonymousAuthentication userName="" />
      </authentication>
      <requestFiltering>
        <requestLimits maxAllowedContentLength="2147483647" />
      </requestFiltering>
    </security>
    <handlers accessPolicy="Execute, Script" />
  </system.webServer>
</location>
```

> **Note**
> The Relay Server is set up for anonymous access based on these instructions. Proper security needs to be configured for IIS and the Relay Server based on the business requirements.

6. To enforce HTTPS access to the Relay Server administration extension for security reasons, edit the *applicationHost.config* file to add the following code to the <configuration> section.

   ```
   <location path="Default Web Site/rs/Admin">
     <system.webServer>
       <security>
         <access sslFlags="Ssl" />
       </security>
     </system.webServer>
   </location>
   ```

7. Save these changes to the *applicationHost.config* file.

8. Set the Connection timeout property of the Default Web Site to a minimum of 60 seconds. By default this value should be 120 seconds, which is sufficient.

9. Create the Relay Server configuration file *rs.config* using the following guidelines:

   - The file should have four sections:
     - Options section
     - Relay server section
     - Backend farm section
     - Backend server section
   - Each section starts with a section tag, made by enclosing a keyword that identifies the section name in square brackets.
   - Add the appropriate properties to each section. A property is defined by specifying the property name on the left side of an equal sign and its value on the right side of the equal sign. For example, *propertyname* = *value*.
   - The configuration file should contain only 7-bit ASCII characters.

10. Copy the *rs.config* file to the *%SQLANY12%\RelayServer\IIS\BinXX\Server* directory.

11. Ensure optimum performance by reviewing the performance tips.

12. Start the Relay Server State Manager as a service using a command line similar to the following:

    ```
    dbsvc -a <administrator> -p <password> -s auto -t rshost -w RelayServer
    "%rs_dir%\Server\rshost.exe" -q -qc -f "%rs_dir%\Server\rs.config" -o "c:
    \temp\ias_relay_server.log"
    ```

    Note
    It is recommended that you start the State Manager as a service. However, it can also be started automatically by the Relay Server.

13. Update the Relay Server configuration for Microsoft IIS on Windows:

    a. For each computer that belongs to the Relay Server farm you are updating, copy the updated configuration file to the *%SQLANY12%\RelayServer\IIS\BinXX\Server* directory under the Relay Server web site home directory. The configuration file must be called rs.config if auto start is used.

b. From the *%SQLANY12%\RelayServer\IIS\BinXX\Server* directory, run the following command line to apply the configuration update:

```
rshost -u -f rs.config
```

c. Repeat the previous steps for each computer in the Relay Server farm that is being updated.

Results

The Relay Server configuration file is deployed to all computers in the Relay Server farm.

Next

None.

See also

- “Relay Server configuration file” on page 25
- “Performance tips” on page 10
- “Relay Server State Manager” on page 21
- “Relay Server State Manager as a service” on page 21
- “Relay Server State Manager command line syntax” on page 23
- “File Hiding utility (dbfhide)” on page 39

Deploying the Relay Server components to Apache on Linux

Before running the Relay Server with Apache, you need to deploy Relay Server files to each computer in the Relay Server farm.

Prerequisites

The Relay Server components are installed using the SQL Anywhere install. On Linux, the Relay Server files are installed to the */opt/sqlanywhere12* directory as part of the SQL Anywhere installation.

Context and remarks

Interactive quick setup feature
An interactive quick setup feature is provided as an alternative to this procedure. The quick setup feature:

- Configures the web server for Relay Server
- Creates a demo application
- Generates a quick reference guide

Refer to the readme file for a more detailed description of the quick setup feature. The quick setup is comprised of two main steps:

1. Configure the Apache web server for Relay Server. This step can be accomplished by running *ap-setup.sh* script in the *install-dir/RelayServer/Apache/quicksetup_apache* directory.

2. Create and start Relay Server test services This step can be accomplished by running *rs-test-setup.sh* script in the *install-dir/RelayServer/Apache/quicksetup_apache* directory.

The Relay Server for Apache consists of the following executables:

- *mod_rs_ap_client.so*
- *mod_rs_ap_server.so*
- *rshost*
- *dblgen12.res*
- *libdbtasks12.so*
- *libdbtasks12_r.so*
- *libdbicudt12.so*
- *libdbicu12_r.so*
- *libdblib12_r.so*
- *dbsupport*
- *dbfhide*
- *libdblib12.so*
- *mod_rs_ap_monitor.so*
- *mod_rs_ap_admin.so*

Deploy the Relay Server components to Apache on Linux

1. Create the Relay Server configuration file *rs.config*.

2. Copy *rs.config* into the *install-dir/relayserver/apache/bin??* directory. The server module expects the *rshost* executable to be in the same directory where you copied the *rs.config* file.

3. Edit the Relay Server configuration file *rs.config* using the following guidelines.

- The file should have four sections:
  - Relay server section
  - Backend farm section
  - Backend server section
  - Options section
- Each section starts with a section tag, made by enclosing a keyword that identifies the section name in square brackets.
- Add the appropriate properties to each section. A property is defined by specifying the property name on the left side of an equal sign and its value on the right side of the equal sign. For example, property name = value.
- The configuration file should contain only 7-bit ASCII characters.

4. The LD_LIBRARY_PATH environment variable needs to include the Apache *install-dir/lib??* and *install-dir/relayserver/apache/bin??* directories. Edit the */<apache-dir>/bin/envvars* file to set and then export LD_LIBRARY_PATH.

5. Edit the Apache *conf/httpd.conf* file.

   a. Add the following lines to load the Relay Server client and server modules:

   ```
   LoadModule iarelayserver_client_module install-dir/relayserver/apache/
   bin??/mod_rs_ap_client.so

   LoadModule iarelayserver_server_module install-dir/relayserver/apache/
   bin??/mod_rs_ap_server.so
   ```

   Note
   All modules are invoked using different URLs and all modules explicitly look for the string *iarelayserver* in the URL path. That part of the URL need not change.

   b. Add the following line to load the SQL Anywhere Monitor support module:

   ```
   LoadModule iarelayserver_monitor_module install-dir/relayserver/
   apache/bin??/mod_rs_ap_monitor.so
   ```

   c. Add the following line to load the Remote Administration support module:

   ```
   LoadModule iarelayserver_admin_module install-dir/relayserver/apache/
   bin??/mod_rs_ap_admin.so
   ```

   d. Add the following line to create a <*locationMatch*> section for the client module:

   ```
   <LocationMatch /cli/iarelayserver/* >
       SetHandler iarelayserver-client-handler
   </LocationMatch>
   ```

   e. Add the following line to create a <*location*> section for the server module:

   ```
   <Location /srv/iarelayserver/* >
       SetHandler iarelayserver-server-handler
       RSConfigFile "/install-dir/relayserver/apache/bin??/rs.config"
   </Location>
   ```

> **Note**
> You must specify an `RSConfigFile` directive which specifies the location of the Relay Server configuration file, *rs.config*. The *rs.config* file must reside in the same directory where the `rshost` executable is deployed.

f. Add the following line to create a <*location*> section for the SQL Anywhere Monitor module:

```
  <Location  /mon/iarelayserver/* >
     SetHandler iarelayserver-monitor-handler
 </Location>
```

g. Add the following line to create a <*location*> section for the Remote Administration module:

```
<Location /admin/iarelayserver* >
  SetHandler iarelayserver-admin-handler
</Location>
```

h. If the TimeOut directive is set, ensure it is set to at least 60 seconds.

6. On Linux, if any of the following environment variables are set globally when Apache spawns a process, then there is nothing further needed for the configuration of Apache: $TMP, $TMPDIR or $TEMP.

   If any of the above environment variables are not set globally, or if you want the default Relay Server log file to go in a specific temporary directory (for example, when the State Manager is started automatically but without customizations), then edit the file */<apache-dir>/bin/envvars* to set and then export TMP.

   For example, to edit $TMP in the envvars file, do the following:

```
set TMP="/tmp"
export TMP
```

   This sets the environment variable in the shell that Apache creates before it spawns its processes.

> **Note**
> The Apache user process must have write permissions to the specified *tmp* directory.

7. If you want to update the Relay Server configuration while it is started:

   a. Copy the updated configuration file to the *install-dir/relayserver/apache/bin??* directory. The configuration file must be called *rs.config* if auto start is used.

   b. From the *install-dir/relayserver/apache/bin??* directory, run the following command line to apply the configuration update:

```
rshost -u -f rs.config
```

   c. If the Relay Server is set up as a farm with more than one server, repeat the previous steps for each computer in the Relay Server farm.

Results

The Relay Server configuration file is deployed to all computers in the Relay Server farm.

Next

None.

For information about which versions of Apache on Linux are supported, see http://www.sybase.com/detail?id=1061806.

See also

- "Relay Server configuration file" on page 25
- "Performance tips" on page 10
- "Relay Server State Manager" on page 21
- "Relay Server State Manager as a service" on page 21
- "Relay Server State Manager command line syntax" on page 23
- "File Hiding utility (dbfhide)" on page 39

Concurrent connections

Relay Server version
This ONLY applies to Relay Server 12.0.x on Apache Web server. This does NOT apply to Relay Server 11.0.x on Apache Web server. For the Relay 11.0.x, see:

The Apache Web server controls concurrent connections (simultaneous requests) using the max clients directive. By default, the max clients directive is set to 256. If more than 256 concurrent connections are established with the Apache Web server, connections over the 256 limit are queued normally based on the listen backlog directive. By default, the listen backlog directive is set to 511.

For the Apache Web server to handle more than 256 concurrent connections, the max clients directive needs to be set in the *httpd.conf* file. If the max client directive is increased, the server limit directive must also be modified to increase the number of Apache processes in the Web server.

Relay Server 12.0.x incorporates a semaphore manager to manage semaphore use by the Relay Server. As a result, there is no need to increase the "semaphore sets" in the system when changing the max clients and server limit directives.

To increase the number of concurrent connections, add the following lines to *httpd.conf*:

```
ServerLimit 1000
MaxClient 1000
```

Other Apache directives that can be adjusted in busy Web servers include:

```
MaxSpareServers
MinSpareServers
StartServers
```

Relay Server State Manager

The Relay Server State Manager is a process that is responsible for maintaining Relay Server state information across client requests and Outbound Enabler sessions. The State Manager is also responsible for managing the log file used by the Relay Server. The State Manager can either be started automatically by the Relay Server or started as a service.

The default log file name is *ias_relay_server_host.log*. On Windows, this file is located in the directory specified by the TEMP environment variable. On Linux, the file is located in the directory specified by the TMP, TEMP, or TMPDIR environment variables. If none of those variables are set, a log file is created in the */tmp* directory.

Note
The Apache user process must have write permissions to the specified *tmp* directory.

On a graceful shutdown, the State Manager renames the log file to a file of the form *<yymmdd><nn>.log* where *<yymmdd>* represents the date on which the log file was renamed and *<nn>* is the sequential version number of the log file for that day.

Starting the State Manager as a service is the recommended method. Note that starting the State Manager manually on a command line is not supported.

It is possible to specify the options that are used by the Relay Server to start the State Manager. To change the options, set the **start** property in the options section of the Relay Server configuration file. For example:

```
[options]
start = "rshost -o c:\temp\myrshost.log"
```

Note that you must specify the name of the Relay Server State Manager executable (`rshost`) before the options.

Relay Server State Manager as a service

The State Manager can be started as a service by using the Service utility (dbsvc). The start property in the options section of the Relay Server configuration file should be set to **no**.

The Service utility is used to create, modify and delete services. For a full listing of usage information, run *dbsvc* without any options.

To set up an auto-started State Manager service named RelayServer on Windows

```
dbsvc -as -s auto -t rshost -w RelayServer "%SQLANY12%\RelayServer\IIS\BinXX
\Server\rshost.exe" -q -qc -f "%SQLANY12%\RelayServer\IIS\BinXX\Server
\rs.config" -o "c:\temp\ias_relay_server.log"
```

To set up an auto-started State Manager service named RelayServer on Unix

```
dbsvc -y -a <apache-user> -t rshost -w RelayServer -q -qc -f /<your-
director>/rs.config -os 100K -ot /tmp/rs.log
```

Remarks

The syntax of dbsvc on Windows is different than Unix. In Unix, you do not specify the full path of the executable as the first parameter after -w switch argument.

Use full paths only.

In Unix, use a user account (if possibly the same) so that Apache-user processes can attach to the State Manager shared memory and be able to read it and write to it.

Start the service

```
dbsvc.exe -u rs
```

To stop the service

```
dbsvc.exe -x rs
```

To uninstall the service

```
dbsvc.exe -d rs
```

See also

- "Options section" on page 30.

Relay Server State Manager automatic start

The State Manager process is started automatically when the first Outbound Enabler connects to the Relay Server. This is the default behavior when the start property in the options section of the Relay Server configuration file is not specified or is explicitly specified as auto. The default log file location is *%temp %\ias_relay_server_host.log*.

Relay Server State Manager automatic start with customized options

When auto start is desired but you want to override some default behavior such as verbosity level or log file location, you can use the start property in the options section of the Relay Server configuration file to explicitly specify your State Manager command line. The -f option cannot be used in this case and the configuration file must be named *rs.config* and be placed in the same directory as the server extension.

Note
If you are using IIS, do not specify a log file location under the wwwroot directory. Microsoft IIS does not allow a worker process to create a file under the published tree.

See also

- “Options section” on page 30
- “Relay Server State Manager command line syntax” on page 23

Relay Server State Manager command line syntax

rshost [*option*]+

Parameters

Options The following options can be used to configure the State Manager. They are all optional.

rshost options	Description
-f *filename*	Indicates the name of the Relay Server configuration file.
-o *filename*	Indicates the name of the file to use for logging.
-os *size*	Controls the size of the log file and provides additional information in the log file banner. When -os is specified, the old log is renamed using the *<yymmdd><nn>.olg* format. The log banner is rewritten to the new active log file, with the addition of the computer name, processor architecture, build target and operating system information.
-oq	Prevents a popup window if there is a startup error.
-q	Runs in a minimized window.
-qc	Closes the window on completion.
-u	Updates the configuration of a running Relay Server.
-ua	Archives the log file to *<yymmdd><nn>.log* and truncates the file.

Relay Server configuration file

A Relay Server configuration file is used to define both a Relay Server farm and the back-end server farms connecting to the Relay Server farm. The Relay Server configuration file is divided into following sections:

- Relay Server section
- Backend farm section
- Backend server section
- Options section

Each section starts with a section tag. A section tag is formed by enclosing a keyword that identifies the section name in square brackets. For example, [relay_server] denotes the start of the Relay Server section.

The section tag is followed by several lines defining various properties related to the section being defined. A property is defined by specifying the property name on the left side of an equal sign and its value on the right side of the equal sign. For example, `property name = value`. All section and property names are case insensitive. Comments are marked with pound sign (#) character at the beginning of a line.

The configuration file should contain only 7-bit ASCII characters. The sections can be specified in any order.

Relay Server configuration files can be created, imported and deployed using the Relay Server plug-in for Sybase Central.

See also

- "Relay Server plug-in for Sybase Central" on page 45
- "Relay Server farm configuration updates" on page 41

Relay Server section

The Relay Server section is used to define a single Relay Server, so there must be a Relay Server section for each Relay Server in the farm. This section is identified by the relay_server keyword.

Relay Server section properties

The following properties can be specified in a Relay Server section:

- **enable** Specifies whether this Relay Server is to be included in the Relay Server farm. Possible values are:

  - **Yes** Indicates that this Relay Server is to be included in the Relay Server farm.

  - **No** Indicates that this Relay Server should not be included in the Relay Server farm.

  The default is Yes. This property is optional.

- **host** The hostname or IP address that should be used by the Outbound Enabler to make a direct connection to the Relay Server.
- **http_port** The HTTP port that should be used by the Outbound Enabler to make a direct connection to the Relay Server. A value of **0** or **off** disables HTTP connections. By default, this property is enabled and set to 80.
  - **0 or off** Disable HTTP access from Outbound Enabler.
  - **1 to 65535** Enable HTTP at the specified port.
- **https_port** The HTTPS port that should be used by the Outbound Enabler to make a direct connection to the Relay Server. A value of **0** or **off** disables HTTPS connections. By default, this property is enabled and set to 443.
  - **0 or off** Disable HTTPS access from Outbound Enabler.
  - **1 to 65535** Enable HTTPS at the specified port.
- **description** Enter a custom description to a maximum of 2048 characters. This property is optional.

Backend farm section

The backend farm section specifies the properties of a back-end server farm. A back-end server farm is a group of homogeneous back-end servers. A client making a request through the Relay Server farm must specify the back-end server farm it is targeting. There is one backend farm section for each back-end server farm.

This section is identified by the backend_farm keyword.

Backend farm section properties

The following properties can be specified in a backend farm section:

- **active_cookie** Specifies whether or not a cookie is set to retain client-server affinity.
  - **yes** This is the default setting. To maintain client-server session affinity, the Relay Server injects a standard HTTP set-cookie command with a proprietary cookie name in the response.
  - **no** An active cookie is not set. Use this option when the back-end farm is serving a sessionless browser application. For example, when the back-end farm is providing a sessionless SQL Anywhere web service.

  For best results, set this control as follows:

Back-end server type	active_cookie setting	active_header setting
MobiLink	no	yes
SQL Anywhere	no	no

For a MobiLink server back end, setting both active_cookie and active_header to yes should always work. However, setting both to yes may put redundant session information in every HTTP request/response in a session. To potentially save on cumulative on-the-wire byte charges, you may be able to set either active_cookie to no. You should test all network scenarios to make sure the chosen settings work in all cases.

- **active_header** Specifies whether or not a header is set to maintain client-server session affinity.
  - **yes** This is the default setting. To maintain client-server session affinity, the Relay Server injects a proprietary header in the response in case intermediaries tamper with the active_cookie.
  - **no** A proprietary header is not set. Setting this option cuts down on traffic volume if the back-end farm is serving only browser applications, or if the active_cookie is working well for all the clients of this back-end farm.
- **backend_security** Specifies the level of security required of an Outbound Enabler in the back-end server farm to connect to the Relay Server farm. The possible values are:
  - **on** Indicates that all connections from the back-end farm must by made using HTTPS.
  - **off** Indicates that all connections from the back-end farm must be made using HTTP.

  This property is optional. If no value is specified, either HTTP or HTTPS can be used to connect.
- **client_security** Specifies the level of security the back-end server farm requires of its clients. The possible values are:
  - **on** Indicates that clients must connect using HTTPS.
  - **off** Indicates that clients must connect using HTTP.

  This property is optional. If no value is specified, clients can connect using either HTTP or HTTPS.
- **description** Enter a custom description to a maximum of 2048 characters. This property is optional.
- **enable** Specifies whether to allow connections from this back-end server farm. Possible values are:
  - **Yes** Allow connections from this back-end server farm.
  - **No** Disallow connections from this back-end server farm.

  The default is Yes. This property is optional.
- **id** The name assigned to the back-end server farm, to a maximum of 2048 characters.

- **forward_x509_identity** The SAP NetWeaver Gateway provides several means of authenticating clients, including X.509 certificate forwarding through trusted intermediaries. When this property is set to yes, Relay Server can extract forwarded client identity information from a trusted forwarder and forward it to the SAP NetWeaver Gateway or Web Dispatcher using HTTP headers. The default setting is no.

- **forwarder_certificate_issue** In the case where a chain of SAP intermediaries exists, the client identity headers may already be present in the request. However, not all clients may be granted permission to act as forwarders. The default behavior, therefore, is to replace the existing headers with the identity of the forwarder. To grant permission for a forwarder to forward other client identities, you can set **forwarder_certificate_issuer**=**<match-string>** and **forwarder_certificate_subject**=**<match-string>**, where **<match-string>** is checked against a serialized form of the corresponding compound name field in the certificate. You can use '?' to match any character and '*' to match any string. Use '\' as the leading escape character for '?', '*' or '\' if they need to be matched literally.

  For example:

  ```
  forwarder_certificate_issuer = 'CN = quicksigner, OU = security
  department, O = my org, L = my city, S = my state, C = my country'
  ```

- **forwarder_certificate_subject** In the case where a chain of SAP intermediaries exists, the client identity headers may already be present in the request. However, not all clients may be granted permission to act as forwarders. The default behavior, therefore, is to replace the existing headers with the identity of the forwarder. To grant permission for a forwarder to forward other client identities, you can set **forwarder_certificate_issuer**=**<match-string>** and **forwarder_certificate_subject**=**<match-string>**, where **<match-string>** is checked against a serialized form of the corresponding compound name field in the certificate. You can use '?' to match any character and '*' to match any string. Use '\' as the leading escape character for '?', '*' or '\' if they need to be matched literally.

  For example:

  ```
  forwarder_certificate_subject = 'CN = mySapWD??.my.com, OU = Sybase, O =
  SAP, *'
  ```

- **verbosity** You can set verbosity to the following levels:

  - **0** Log errors only. Use this logging level for deployment. This is the default.
  - **1** Request level logging. All HTTP requests are written to the log file.
  - **2** Request level logging. Provides a more detailed view of HTTP requests.
  - **3 or higher** Detailed logging. Used primarily for technical support.

  Errors are displayed regardless of the log level specified, and warnings are displayed only if the log level is greater than 0.

Backend server section

The backend server section defines a back-end server connection. It specifies the information that is used by the Outbound Enabler when it connects to the Relay Server farm on behalf of a back-end server. There is a backend server section for each Outbound Enabler connecting to the Relay Server farm. The backend server section also assigns a back-end server to a back-end server farm.

The following back-end servers are supported for use with the Relay Server:

- Afaria
- Mobile Office
- MobiLink
- Mobile Office
- SQL Anywhere
- Unwired Server
- Sybase Unwired Platform

Note
Refer to your license agreement or the SQL Anywhere Components by Platforms page for information about which back-end servers are supported. See http://www.sybase.com/detail?id=1061806 .

This section is identified by the backend_server keyword.

Backend server section properties

The following properties can be specified in a backend server section:

- **description** Enter a custom description to a maximum of 2048 characters. This property is optional.
- **enable** Specifies whether to allow connections from this back-end server. Possible values are:
  - **Yes** Allows connections from this back-end server.
  - **No** Disallows connections from this back-end server.

  The default is Yes. This property is optional.
- **farm** The name of the back-end server farm that this back-end server belongs to.
- **id** The name assigned to the back-end server connection, to a maximum of 2048 characters.
- **MAC** The MAC address of the network adapter used by the Outbound Enabler to communicate with the Relay Server. The address is specified using the IEEE 802 MAC-48 format. To get the MAC

address in the correct format, look in the Relay Server Outbound Enabler console or log. This property is optional. If it is not specified, MAC address checking does not occur.

- **token** A security token that is used by the Relay Server to authenticate the back-end server connection, to a maximum of 2048 characters. This property is optional.
- **verbosity** You can set verbosity to the following levels:
  - **0** Log errors only. Use this logging level for deployment. This is the default.
  - **1** Request level logging. All HTTP requests are written to the log file.
  - **2** Request level logging. Provides a more detailed view of HTTP requests.
  - **3 or higher** Detailed logging. Used primarily for technical support.

  Errors are displayed regardless of the log level specified, and warnings are displayed only if the log level is greater than 0.

Options section

The options section is used to specify properties that apply to each Relay Server in the farm. Only one options section is allowed.

This section is identified by the options keyword.

Options section properties

The following properties can be specified in an options section:

- **start** The method used to start the State Manager. The possible values are:
  - **auto** The State Manager is started automatically using the State Manager command line defaults.
  - **no** The State Manager is started externally as a Windows service.
  - **full path** Specify the full path to the State Manager executable (*rshost*).

  The default is auto. This property is optional.
- **shared_mem** Specifies the maximum amount of shared memory that the Relay Server uses for state tracking. The default is 10 megabytes. This property is optional.
- **verbosity** You can set verbosity to the following levels:
  - **0** Log errors only. Use this logging level for deployment. This is the default.
  - **1** Request level logging. All HTTP requests are written to the log file.

- **2** Request level logging. Provides a more detailed view of HTTP requests.
- **3 or higher** Detailed logging. Used primarily for technical support.

Errors are displayed regardless of the log level specified, and warnings are displayed only if the log level is greater than 0.

Relay Server configuration file format

This is the basic format of a Relay Server configuration file:

```
#
# Options
#
[options]
# List of Relay Server properties that apply to all Relay Servers
option = value

#
# Define a Relay Server section, one for each
# Relay Server in the Relay Server farm
#
[relay_server]
# List of properties for the Relay Server
property = value

#
# Define a backend server farm section, one for each back-end
# server farm
#
[backend_farm]
# List of properties for a back-end server farm
property = value

#
# Define a backend server section, one for each
# Outbound Enabler connecting to the Relay Server farm
#
[backend_server]
# List of properties for the back-end server connection
property = value
```

Outbound Enabler

The Outbound Enabler runs on the same computer as the back-end server. Its purpose is to:

- Open an outbound connection from the computer running in the corporate LAN to the Relay Server farm running in the DMZ.
- Forward client requests received from the Relay Server to the back-end server and forward back-end server responses back to the client via the Relay Server.

When the Outbound Enabler starts, it makes an HTTP request to retrieve the list of Relay Servers running in the farm. This is done using the server URL that maps to the web server extension component of the Relay Server. The server URL can map directly to a Relay Server or it can map to a load balancer. If the server URL maps to a load balancer, the load balancer forwards the request to one of the Relay Servers running in the farm. The Relay Server that receives the request from the Outbound Enabler returns the connection information for all Relay Servers in the farm. The Outbound Enabler then creates two outbound connections, called channels, to each Relay Server returned. One channel, called the up channel, is created using an HTTP request with an essentially infinite response. The response is a continuous stream of client requests from the Relay Server to the Outbound Enabler. The second channel, called the down channel, is created using an HTTP request with an essentially infinite content length. The request is formed by a continuous stream of server responses to client requests.

When the Outbound Enabler receives a client request on the up channel from one of the Relay Servers it has connected to, it forwards it to the back-end server that the Outbound Enabler is servicing. Once a response is received from the back-end server, it gets forwarded to the Relay Server from which it received the corresponding request using the down channel.

Note
The following back-end servers are supported for use with the Relay Server:

- Afaria
- Mobile Office
- MobiLink
- Mobile Office
- SQL Anywhere
- Unwired Server
- Sybase Unwired Platform

Refer to your license agreement or the SQL Anywhere Components by Platforms page for information about which back-end servers are supported. See http://www.sybase.com/detail?id=1061806 .

Outbound Enabler syntax

rsoe [*option*]+

rsoe @{ *filename* | *environment-variable* } ...

Parameters

Options The following options can be used with the Outbound Enabler. Options that have defaults are optional. At a minimum, the Outbound Enabler needs to supply the connection string for the Relay Server (-cr), the farm (-f) and server (-id) names. If a security token is configured, it must also be specified (-t).

rsoe options	Description
@data	Reads options from the specified environment variable or configuration file. If you want to protect passwords or other information in the configuration file, you can use the File Hiding utility to obfuscate the contents of the configuration file. See "File Hiding utility (dbfhide)" on page 39.

rsoe options	Description
-cr *"connection-string"*	Specifies the Relay Server connection string. The format of the Relay Server connection string is a semicolon separated list of name-value pairs. The name-value pairs consist of the following: ○ **host** IP address or hostname of the Relay Server. The default is localhost. See "host" [*MobiLink - Client Administration*]. ○ **port** The port the Relay Server is listening on. This is required. See "port" [*MobiLink - Client Administration*]. ○ **http_userid** Userid for authentication. Optional. You should consult your web server (or proxy) documentation to determine how to set up HTTP authentication. See "http_userid" [*MobiLink - Client Administration*]. ○ **http_password** Password for authentication. Optional. You should consult your web server (or proxy) documentation to determine how to set up HTTP authentication. See "http_password" [*MobiLink - Client Administration*]. ○ **http_proxy_userid** Userid for proxy authentication. Optional. You should consult your web server (or proxy) documentation to determine how to set up HTTP authentication. See "http_proxy_userid" [*MobiLink - Client Administration*]. ○ **http_proxy_password** Password for proxy authentication. Optional. You should consult your web server (or proxy) documentation to determine how to set up HTTP authentication. See "http_proxy_password" [*MobiLink - Client Administration*]. ○ **proxy_host** Specifies the host name or IP address of the proxy server. Optional. See "proxy_host" [*MobiLink - Client Administration*]. ○ **proxy_port** Specifies the port number of the proxy server. Optional. See "proxy_port" [*MobiLink - Client Administration*].

rsoe options	Description
	○ **url_suffix** URL path to the server extension of the Relay Server. Required. By default, the rsoe requires the url_suffix to be specified. See "url_suffix" [*MobiLink - Client Administration*]. ○ **https** 0 - HTTP (default) 1 - HTTPS By default, MobiLink starts up the TCPIP communication protocol. When starting MobiLink for use with the RSOE, be sure to start the communication protocol required by your RSOE configuration. For example, if you specify HTTPS as the back-end security, then MobiLink must be started with HTTPS. See "-x mlsrv12 option" [*MobiLink - Server Administration*]. When the https=1 parameter is included in the -cs option, the default port changes to 443. For **https=1**, the following options can also be specified: ○ **tls_type** RSA or ECC ○ **certificate_name** Common name field of the certificate. ○ **certificate_company** Organization name field of the certificate. ○ **certificate_unit** Organization unit field of the certificate. ○ **identity** Provides the credentials to establish mutually-authenticated TLS between the Outbound Enabler and the back-end server. Note that mutual authentication is required for the back-end server. ○ **identity_password** Provides the credentials to establish mutually-authenticated TLS between the Outbound Enabler and the back-end server. Note that mutual authentication is required for the back-end server. ○ **fips** Yes or no. ○ **trusted_certificates** A file containing a list of trusted root certificates. To verify the back-end server, and only the back-end server, set this property to **backend_server_public_cert_filename**.

rsoe options	Description
	`trusted_certificates=backend_server_public_cert_filename` For Windows, if **trusted_certificate** is not set, the operating system certificate store is used. For more information, see "MobiLink client network protocol options" [*MobiLink - Client Administration*].
-cs *"connection-string"*	Sets the host and port used to connect to the back-end server. The default is `"host=localhost;port=80"`. To enable periodic back-end server status requests, add the status_url parameter to -cs. The status_url parameter is specified in the format `status_url=/your-status-url`. The following example shows how to specify status_url with -cs. `-cs "host=localhost;port=80;status_url=/getstatus/"` Use the -d option to specify the frequency of the back-end server status requests.
-d *seconds*	Sets the frequency of the back-end server liveness ping and back-end server status request. The default is 5 seconds.
-dl	Use this option to display log messages in the Relay Server Outbound Enabler console. By default, log messages are not displayed for verbosity levels 1 and 2.
-f *farm*	Specifies the name of the farm that the back-end server belongs to.
-id *id*	Specifies the name assigned to the back-end server.
-o *file*	Specifies the file to log output messages to.
-oq	Prevents the appearance of the error window when a startup error occurs.
-os	Sets the maximum size of the message log files. The minimum size limit is 10 KB.
-ot	Truncates the log file and logs messages to it.
-q	Run with a minimized window on startup.
-qc	Shuts down the window on completion.
-s	Stops the Outbound Enabler.

rsoe options	Description
-t *token*	Sets the security token to be passed to the Relay Server.
-uc	Starts the rsoe in shell mode. This is the default. Applies to Unix and Mac OS X. You should only specify one of -uc, -ui, -um, or -ux. When you specify -uc, this starts the rsoe in the same manner as previous releases of the software.
-ud	Instructs the rsoe to run as a daemon. This option applies to Unix platforms only.
-ui	Starts the rsoe in shell mode if a usable display is not available. This option is for Linux with X window server support. When -ui is specified, the server attempts to find a usable display. If it cannot find one, for example because the X window server isn't running, then the rsoe starts in shell mode.
-ux	For Linux, opens the rsoe messages window where messages are displayed. When -ux is specified, the rsoe must be able to find a usable display. If it cannot find one, for example because the DISPLAY environment variable is not set or because the X window server is not running, the rsoe fails to start. To run the rsoe messages window in quiet mode, use -q. On Windows, the rsoe messages window appears automatically.
-v *level*	Set the verbosity level to use for logging. The *level* can be **0**, **1**, **2**, or higher (higher levels are used primarily for technical support): ○ **0** Log errors only. Use this logging level for deployment. ○ **1** Session level logging. This is a higher level view of a synchronization session. ○ **2** Request level logging. Provides a more detailed view of HTTP requests. ○ **3 or higher** Detailed logging. Used primarily for technical support. Levels 1 and 2 are only written to the log file and are not displayed. To have all log messages displayed, use the -dl switch.

File Hiding utility (dbfhide)

The File Hiding utility (dbfhide) uses simple encryption to obfuscate the contents of configuration files and initialization files.

Syntax

dbfhide *original-configuration-file encrypted-configuration-file*

Option	Description
original-configuration-file	Specifies the name of the original file.
encrypted-configuration-file	Specifies a name for the new obfuscated file.

The Relay Server and Outbound Enabler detect that a configuration file has been obfuscated using dbfhide and process it.

This utility does not accept the @data parameter to read in options from a configuration file.

Integrated Outbound Enabler (recommended for MobiLink)

By using the **oe** protocol for the -x option for mlsrv12, you can use an integrated Outbound Enabler instead of the stand-alone Outbound Enabler invoked with the **rsoe** command. Using the integrated Outbound Enabler has the following advantages:

- Reduced use of system resources, especially sockets.
- Provides a single, integrated log file. Lines printed to the MobiLink server log from the integrated Outbound Enabler will have the prefix **<OE>**.
- Deployment is simplified.
- Liveness checks between the Outbound Enabler and the MobiLink server are eliminated.

For more information about how to use the integrated Outbound Enabler, see "-x mlsrv12 option" [*MobiLink - Server Administration*].

Deployment considerations

The following considerations should be noted when using the Outbound Enabler:

- **Outbound Enabler as a service** The Outbound Enabler may also be set up and maintained as a service using the Service utility.
- **Authentication** You cannot use simple or digest authentication. The *rsoe.exe* does not support simple or digest authentication with web servers, regardless of the web server type or operating system.

See also

- "Outbound Enabler as a service" on page 40

Outbound Enabler as a service

The Outbound Enabler can be started as a service by using the Service utility (dbsvc). The Service utility is used to create, modify and delete services. For a full listing of usage information, run *dbsvc* without any options.

To set up an auto-started RSOE service named oes (Outbound Enabler service) on Windows

```
dbsvc -as -s auto -t rsoe -w oes "%SQLANY12%\BinXX\rsoe.exe"
-cr "host=relayserver.sybase.com;port=80 " -cs "host=localhost;port=80 " -f
FarmName -id ServerName -t token
```

To set up an auto-started RSOE service named oes (Outbound Enabler service) on Unix

```
dbsvc -y -a <some-user-account> -t rsoe -w oes @/<full-dir-path>/oe.config
```

Remarks

The syntax of dbsvc on Windows is different than Unix. In Unix, you do not specify the full path of the executable as the first parameter after -w switch argument.

Use full paths only.

On Unix, specify the Outbound Enabler parameters in a command file only. Do not use command line switches in the setup dbsvc command.

Start the service

```
dbsvc.exe -u oes
```

To stop the service

```
dbsvc.exe -x oes
```

To uninstall the service

```
dbsvc.exe -d oes
```

See also

- "SQL Anywhere web services high availability and scale-out solutions" [*SQL Anywhere Server - Database Administration*]

Relay Server farm configuration updates

A Relay Server farm configuration is defined by the contents of the Relay Server configuration file. Each Relay Server in a Relay Server farm shares the same Relay Server configuration file, so when you update a Relay Server farm configuration you must update the Relay Server configuration file at each Relay Server in the farm. Updates include any of the following:

- Adding a new Relay Server to the Relay Server farm.
- Creating a new back-end server farm and allowing it access to the Relay Server farm.
- Adding a new back-end server to an existing back-end server farm.
- Changing the properties of a Relay Server, back-end server farm, or a back-end server.
- Changing options.

One way to update a Relay Server configuration is to shutdown all Relay Servers, replace the Relay Server configuration file with the updated version, and restart all the Relay Servers. However, shutting down and restarting the Relay Servers means that users of the Relay Server may incur a service interruption.

The preferred method of updating a Relay Server configuration is to use the Relay Server State Manager to update the configuration while a Relay Server farm is running without interrupting service.

Updating a Relay Server configuration is done by launching a new instance of the Relay Server State Manager using the following command line format:

```
rshost -u -f filename
```

The -u option instructs the Relay Server State Manager to perform an update operation. The -f option specifies the name of the configuration file containing the updated configuration.

Below is an overview of the steps required to update a Relay Server farm configuration:

1. Make your changes to the master copy of the Relay Server configuration file.
2. On each computer running an instance of a Relay Server that belongs to the Relay Server farm being updated, do the following:
    a. Replace the old configuration file with the updated configuration file.
    b. Run the Relay Server State Manager with the updated configuration file.

See also

- "Relay Server State Manager" on page 21

Updating a Relay Server configuration for Microsoft IIS on Windows

You may need to occasionally update Relay Server configuration files to add or change Relay Servers or Relay Server farms and change server and farm properties and options

Prerequisites

A relay server configuration file for an existing Relay Server farm.

Context and remarks

Many.

Update a Relay Server configuration for Microsoft IIS on Windows

1. For each computer that belongs to the Relay Server farm you are updating, copy the updated configuration file to the *%SQLANY12%\RelayServer\IIS\BinXX\Server* directory under the Relay Server web site home directory. The configuration file must be called *rs.config* if auto start is used.

2. From the *%SQLANY12%\RelayServer\IIS\BinXX\Server* directory, run the following command line to apply the configuration update:

   ```
   rshost -u -f rs.config
   ```

3. Repeat the previous steps for each computer in the Relay Server farm that is being updated.

Results

The Relay Server configuration is updated.

Next

None.

Updating a Relay Server configuration for Apache on Linux

You may need to occasionally update Relay Server configuration files to add or change Relay Servers or Relay Server farms and change server and farm properties and options

Prerequisites

A relay server configuration file for an existing Relay Server farm.

Context and remarks

Many.

Update a Relay Server configuration for Apache on Linux

1. Copy the updated configuration file to the */modules* directory under the Apache install directory. The configuration file must be called *rs.config* if auto start is used.
2. From the */Apache-install/modules* directory, run the following command line to apply the configuration update:

   ```
   rshost -u -f rs.config
   ```

3. Repeat the previous steps for each computer in the Relay Server farm that is being updated.

Results

The Relay Server configuration is updated.

Next

None.

Relay Server plug-in for Sybase Central

The Relay Server plug-in for Sybase Central provides an easy way to work with the Relay Server. Use the Relay Server plug-in to do the following:

- Create, import, and deploy Relay Server configuration files.
- View Relay Server configuration file properties.
- Add Relay Servers, Relay Server farms, back-end servers and back-end server farms.
- View and edit Relay Servers, Relay Server farms, back-end servers and back-end server farms.

Working with Relay Server configuration files (Sybase Central)

You can use Sybase Central to work with Relay Server configuration files. From Sybase Central you can:

- Create a Relay Server configuration file.
- Open a Relay Server configuration file.
- Import a Relay Server configuration file.
- Deploy a Relay Server configuration file.

Create a Relay Server configuration file

1. In the **Folders** view of Sybase Central, right-click **Relay Server 12** and click **New** » **Configuration File**.
2. Browse to the directory where you want the configuration file saved on the computer running Sybase Central. This is not the same as the deployment location.
3. In the **File Name** field, type the name of the configuration file. Normally this would be *rs.config*.
4. Ensure the *.config* extension is selected in the **Save As Type** field.
5. Click **Save**. A Relay Server farm is automatically created, to which you can add the necessary Relay Servers and back-end servers.

Open a Relay Server configuration file

1. In the **Folders** view of Sybase Central, right-click **Relay Server 12** and click **Open Configuration File**.
2. Browse to the directory where the configuration file is located, click the file and click **Open**.

Import a Relay Server configuration file

1. In the **Folders** view of Sybase Central, right-click **Relay Server 12** and click **Import Configuration File**.

2. Enter the URL for the existing Relay Server.
3. If the Relay Server requires authentication, enter the **User Name** and **Password** and click **OK**.

Note
If the Relay Server requires HTTPS communication, the root certificate for the server needs to be stored in the Java Key and Certificate Management Utility. This can be accomplished using the Java Keytool utility. Sybase Central accesses the Java Key and Certificate Management Utility when the root certificate is required for communication.

Deploy a Relay Server configuration file

1. In the **Folders** view, right-click the Relay Server configuration file you want to deploy and click **Deploy**.
2. Enter the URL for the Relay Server.
3. If the Relay Server requires authentication, enter the **User Name** and **Password** and click **OK**.

Note
If the Relay Server requires HTTPS communication, the root certificate for the server needs to be stored in the Java Key and Certificate Management Utility. This can be accomplished using the Java Keytool utility. Sybase Central accesses the Java Key and Certificate Management Utility when the root certificate is required for communication.

4. The **Server List** page shows existing Relay Servers. To deploy the configuration file to one or more of the Relay Servers, select the server(s) from the list and click **Add**.

   To remove a Relay Server from the list, select the server(s) and click **Remove**.

Managing Relay Servers and Relay Server farms (Sybase Central)

You can use Sybase Central to manage Relay Servers and Relay Server farms. From Sybase Central you can:

- Add Relay Servers to a Relay Server farm.
- View or edit Relay Server properties.
- View or edit Relay Server farm properties.

Add Relay Servers to a farm

1. In the **Folders** pane under the configuration file you want to work with, right-click the Relay Server farm you want to add Relay Servers to and click **New** » **Relay Server**.
2. Ensure **Enable this Relay Server** is selected.
3. Enter the path information for the **Host** you want to connect to. Click **Ping** if you want to check that a connection can be established to the specified host.

4. Select the communication protocol to use. This can be **HTTP** or **HTTPS**.
5. Specify the port(s) to be used for the selected protocol(s).
6. If desired, type a description of the Relay Server in the **Description** field.
7. Click **Apply** if you want to continue adding Relay Servers or **OK** to add the Relay Server and close the **Create Relay Server** window.

View or edit Relay Server properties

1. In the **Folders** pane, click the Relay Server farm that contains the Relay Server you want to work with. The Relay Servers in that farm are listed in the right pane.
2. Right-click the Relay Server you want to edit or view, and click **Properties**.
3. Make the necessary changes to the Relay Server properties and click **Apply** or **OK**.

View or edit Relay Server farm properties

1. In the **Folders** pane, right-click the Relay Server farm you want to work with and click **Properties**.
2. Make the necessary changes to the Relay Server farm properties and click **Apply** or **OK**.

Managing back-end servers and back-end server farms

You can use Sybase Central to manage back-end servers and back-end server farms. From Sybase Central you can:

- Create a back-end server farm and add back-end servers to it.
- View or edit back-end server properties.
- View or edit back-end server farm properties.

Create a back-end server farm

1. In the left pane, right-click the Relay Server configuration file you want to work with, and click **New** » **Backend Server Farm**.
2. Ensure **Enable This Backend Server Farm** is selected.
3. Type the name associated with the new back-end server farm.
4. In **Client Security** choose a protocol for clients to use to connect to the back-end server farm.
5. In **Backend Security** choose a protocol for the Relay Server Outbound Enabler (rsoe) to use to connect to the back-end server farm.
6. For client-server affinity, choose the type of server you are using. For a MobiLink HTTP server with standalone Outbound Enabler or a MobiLink server with an embedded Outbound Enabler, click **MobiLink**. For a typical SQL Anywhere web service click **SQL Anywhere**. Advanced custom

settings are available by clicking **Custom** as the server type. Once the **Custom** server type is selected, you have full control over the following affinity settings:

a. Check the **Active Cookie** option if you want the Relay Server to use a standard HTTP set-cookie command to retain client-server affinity.

b. Check the **Active Header** option if you want the Relay Server to use a proprietary header to retain client-server affinity.

7. Optionally, type a description of the back-end server farm in the **Description** field.

8. Click **Apply** if you want to continue adding back-end server farms or **OK** to add the back-end server farm and close the **Create Backend Server Farm** window.

View or edit back-end server farm properties

1. In the **Folders** pane, right-click the back-end server farm you want to work with and click **Properties**.

2. Make the necessary changes to the back-end server farm properties and click **Apply** or **OK**.

Add servers to a back-end server farm

1. In the **Folders** pane, right-click the back-end server farm you want to work with and click **New** » **Backend Server**.

2. Ensure **Enable This Backend Server** is selected.

3. Type the name associated with the new back-end server.

4. To enforce MAC address checking, click the **Enforce MAC Address Checking** checkbox.

5. If you selected MAC address checking, enter the RSOE MAC address using the IEEE 802 MAC-48 format. To get the MAC address in the correct format, look in the Relay Server Outbound Enabler console or log. Multiple MAC addresses separated by an exclamation mark (!) are reported by the Outbound Enabler if multiple adapters are currently active on your back-end server computer. Select the most permanent one for the Relay Server to check against. The `ipconfig /all` command on Windows provides a detailed listing of your network adapters together with associated MAC addresses.

6. Specify the security token that is used by the Relay Server to authenticate the back-end server connection. You can use a maximum of 2048 characters.

7. If desired, type a description of the back-end server in the **Description** field.

8. Click **Apply** if you want to continue adding back-end servers or **OK** to add the back-end server and close the **Create Backend Server** window.

View or edit back-end server properties

1. In the **Folders** pane, click the back-end server farm that contains the back-end server you want to work with. The back-end servers in that farm are listed in the right pane.

2. Right-click the back-end server you want to edit or view, and click **Properties**.
3. Make the necessary changes to the back-end server properties and click **Apply** or **OK**.

Sybase Hosted Relay Service

The Sybase Hosted Relay Service is a farm of Relay Servers hosted by Sybase. It is intended to ease the development of mobile applications that use MobiLink data synchronization and to simplify the evaluation process for developers, especially where data is sent using public wireless networks. In particular, you do not need to ask your IT department to install anything or open any holes in your corporate firewall for inbound connections. All communication between MobiLink and the hosting service uses HTTP(S) via an outbound connection initiated by MobiLink.

The Sybase Hosted Relay Service is not intended for production deployments. Before deploying your production application, you must first install the Relay Server in your own corporate infrastructure.

Using the Sybase Hosted Relay Service

Subscribe to the Sybase Hosted Relay Service

To use the Sybase Hosted Relay Service you must first subscribe to it.

1. Go to http://relayserver.sybase.com/account. This takes you to the Sybase Hosted Relay Service home page.

2. Create an account by clicking **Register**.

3. You are asked to specify a **Subscription ID** (choose one that is unique to your organization) and **Password**, provide contact information for your self and your organization, and agree to the **Hosted Relay Service Terms of Service**. Click **Submit**.

   Once you have successfully registered, an email is sent to you confirming your registration.

Log in to the Sybase Hosted Relay Service

1. Log in to your newly created account by clicking **Log In**.

2. Enter the **Subscription ID** and **Password** you entered during the registration process. Once logged in, you are taken to the **Account Information** page. The account information page allows you to modify subscriber information and specify the back-end server farm(s) that will be accessing this service.

Add a server farm

1. Click the type of farm you want to add. Choose from:
   - **Add New MobiLink Farm**
   - **Add New SQL Anywhere Web Read-Write Farm**
   - **Add New SQL Anywhere Web Read Farm**
   - **Add New SQL Anywhere Web Read-Only Farm**
   - **Add New SQL Remote Message Server Farm**
   - **Add New Afaria Farm**
   - **Add New iAnywhere Mobile Office Farm**
   - **Add New Sybase Unwired Platform Farm**
2. Enter a unique **Farm Name** to describe the server farm.
3. Provide a unique name for each server in the farm. You can specify a maximum of two servers.
4. Click **Create Farm**. A confirmation is displayed if the farm was successfully added.
5. Click **Configuration Instructions** to learn more about using the service. The instructions are based on the information you provided.
6. Click **Log Out** when you are done.

The Relay Server with MobiLink

The following sections provides information about using the Relay Server with MobiLink.

See also

- For information about which operating systems and browsers are supported for the Relay Server, see http://www.sybase.com/detail?id=1002288
- For information about deploying the Outbound Enabler, see "MobiLink server deployment" [*MobiLink - Server Administration*]

Connecting a client to the Relay Server farm

Once a Relay Server farm has been properly configured, a client connects to the Relay Server farm using the following URL:

http://*<Relay Server client extension URL>*/*<farmname>*

Options

Option	Description
<Relay Server client extension URL>	For Microsoft IIS on Windows, *<domain name><relay-server.sybase.com>/ias_relay_server/client/rs_client.dll* For Apache on Linux, *<domain name>/cli/iarelayserver* Use *relayserver.sybase.com* as the *<domain name>* if you are using the publicly available Sybase Hosted Relay Service. For information about subscribing to the service as well as instructions for setting up your back-end servers, see "Using the Sybase Hosted Relay Service" on page 51.
<farmname>	Identifies the back-end farm (a group of back-end servers) that Relay Server forwards the client request to.

SQL Anywhere MobiLink client connection example

A SQL Anywhere MobiLink client should specify the following options to connect to server farm **F1**:

```
-e "ctp=http;
     adr='host=relayserver.sybase.com;
        url_suffix=/rs/client/rs_client.dll/F1'"
```

For HTTPS, change `http` to `https`.

UltraLite/UltraLiteJ MobiLink client connection example

An UltraLite/UltraLiteJ MobiLink client should set the following properties in the ULSyncParms class to connect to server farm **F1**:

- Set the stream type to HTTP or HTTPS.
- Set the stream parameters to the following:

```
"host=relayserver.sybase.com;url_suffix=/rs/client/rs_client.dll/F1"
```

QAnywhere client connection example

A QAnywhere client should specify the following options to connect to server farm **F1**:

```
-x "http(host=relayserver.sybase.com;url_suffix=/rs/client/rs_client.dll/F1"
```

Sample scenario

Before MobiLink clients can connect to a farm, you must configure and deploy the configuration file with the appropriate settings.

Prerequisites

For the purposes of this scenario, use the Microsoft IIS version of the Relay Server.

Context and remarks

Suppose company ABC has developed a mobile application and now wants to set up the deployment run-time to service the mobile application. Initially, the mobile deployment consists of 10000 devices and grows in the future. The customer therefore wants a fault tolerant and load-balanced environment that is able to handle the load today and be easily extended to handle more mobile deployments in the future. Based on the data synchronization characteristics of the mobile application, the customer has determined that the following configuration is needed:

- 2 MobiLink servers
- 2 Relay Servers
- 1 load balancer

- Each Relay Server is deployed on its own computer. Two computers, with host names **rs1.abc.com** and **rs2.abc.com** are used.
- Each MobiLink server is deployed on its own computer. The two MobiLink servers are assigned names **ml1** and **ml2** and belong to the back-end server farm called abc.mobilink.
- The load balancer is addressable using the host name **www.abc.com**.
- For maximum security, HTTPS is used by all clients and Outbound Enablers connecting to the Relay Servers. It is assumed that all web servers are equipped with a certificate from a well known Certificate Authority (CA), and the back-end server computers all have the corresponding trusted root certificates in their standard certificate store.

Set up the Relay Server farm

1. The first step is to create the Relay Server configuration file.

   The filename containing the configuration must be called *rs.config*. For this particular scenario, the following configuration file is used:

   ```
   #
   # Options
   #
   [options]
   verbosity = 1

   #
   # Define the Relay Server farm
   #
   [relay_server]
   host = rs1.abc.com

   [relay_server]
   host = rs2.abc.com

   #
   # Define the MobiLink back-end server farm
   #
   [backend_farm]
   id = abc.mobilink
   client_security = on
   backend_security = on

   #
   # List MobiLink servers that are connecting to the Relay Server farm
   #
   [backend_server]
   farm = abc.mobilink
   id = ml1
   token = mltoken1

   [backend_server]
   farm = abc.mobilink
   id = ml2
   token=mltoken2
   ```

2. Deploy the configuration file *rs.config* along with the Relay Server components to the two computers that are running the Relay Server.

3. Start MobiLink server on the two computers that are running the MobiLink servers using the Integrated Outbound Enabler.

   On the computer running MobiLink server with id ml1:

   ```
   mlsrv12 -x oe<config=oe1.txt> -zs ml1 <other ML options>
   ```

   where oe1.txt = `-f abc.mobilink -id ml1 -t mltoken1 -cr "host=www.abc.com;port=443;https=1"`

   On the computer running MobiLink server with id ml2:

   ```
   mlsrv12 -x oe<config=oe2.txt> -zs ml2 <other ML options>
   ```

where oe2.txt = `-f abc.mobilink -id ml2 -t mltoken2 -cr "host=www.abc.com;port=443;https=1"`

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

Results

Once all servers and Outbound Enablers are running, MobiLink clients are able to connect to the farm using the following connection information:

- **HTTPS** protocol
- **host** www.abc.com
- **url_suffix** /rs/client/rs_client.dll/abc.mobilink

Next

None.

See also

- "End-to-end encryption" [*SQL Anywhere Server - Database Administration*]

Index