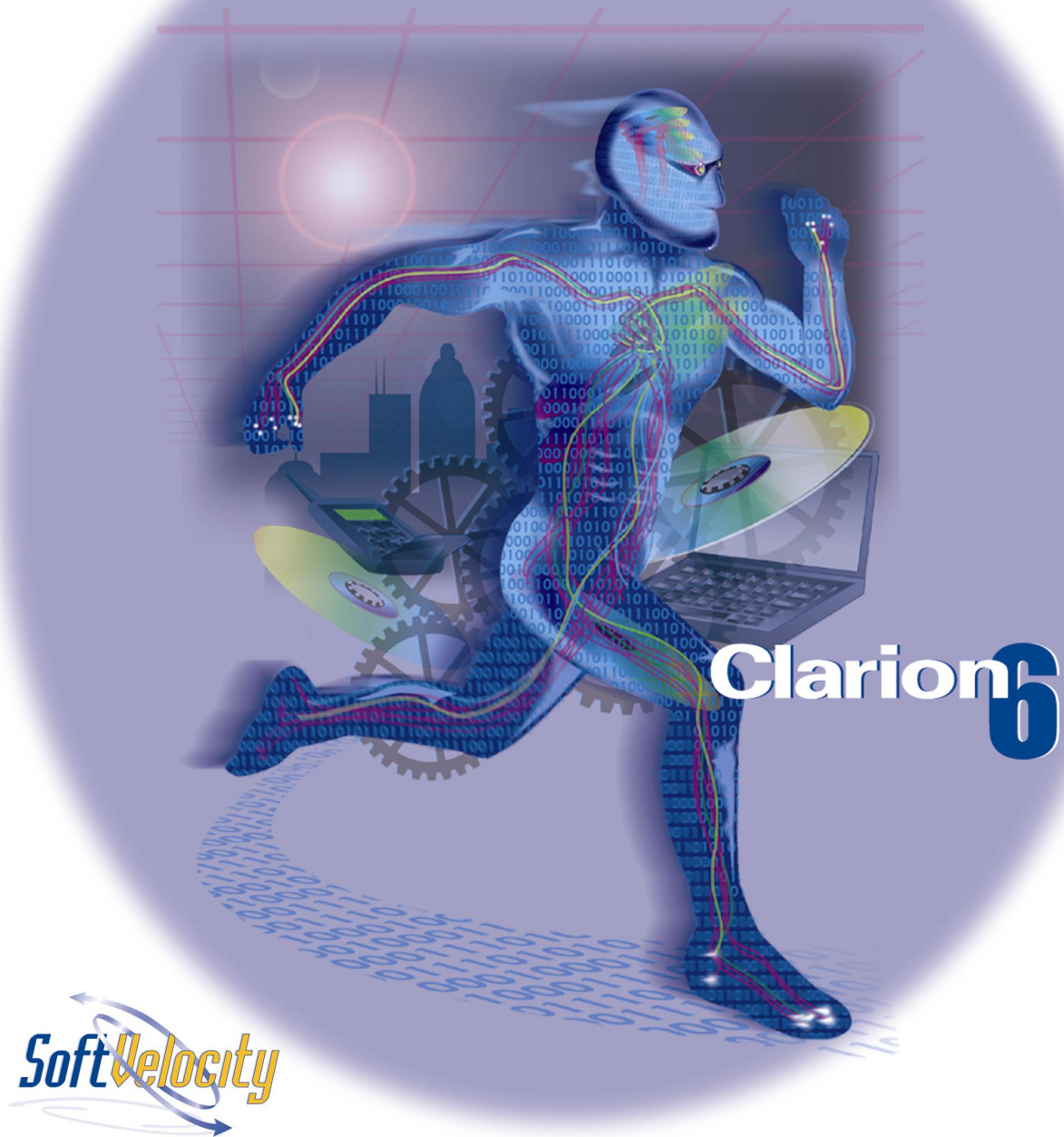


Application Broker



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Application Broker Service Edition

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1 - Introduction

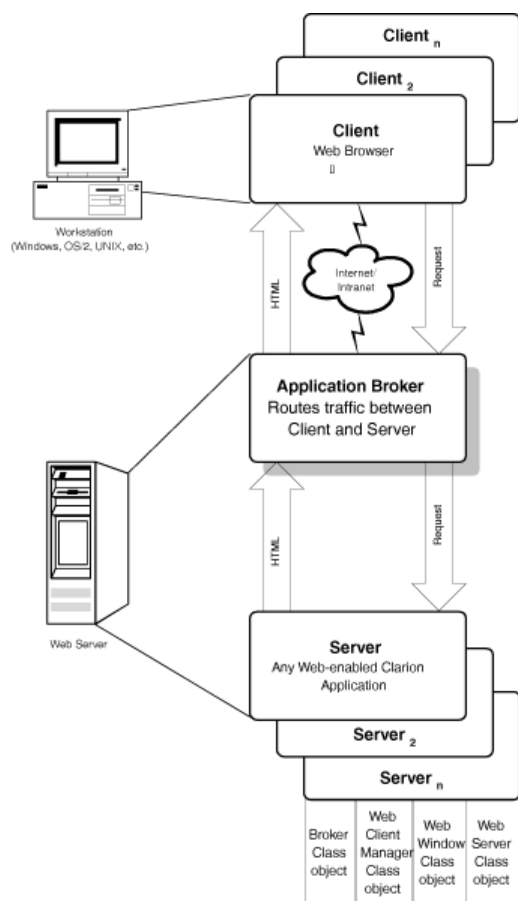
Welcome!

This book contains information on installation and setup of the Application Broker for applications created with both Internet Connect as well as Web Builder extensions.

The Application Broker is supported on Windows 95/98, Windows NT, Windows 2000, and Windows XP.

What is the Application Broker?

The Application Broker is your connection to Internet database applications made with Clarion. It allows end-users to manipulate Web-enabled applications running on a Web server using a browser.



There are two types of application brokers available. The *Standard* Application Broker is recommended for testing and deploying your Web-enabled application on any Web server. The *SE (Service Edition)* Application Broker provides SSL support, and can optionally be installed as NT service under Windows NT/2000/XP.

What You'll Find in this Book

The following lists the parts of this book and summarizes its content:

Introduction

Chapter One: the chapter you're reading now. This is an introduction to the Application Broker.

Setup

Chapter Two: System Requirements, and step-by-step instructions tell you how to install the Clarion Application Brokers

Running the Standard Application Broker

Chapter Three: Documents the standard executable version of the Clarion Application Broker.

Running the SE (Service edition) Application Broker

Chapter Four: Documents the SE (Service Edition) Application Broker, how to set it up as a service, and the supporting applet.

Deployment Checklist

Chapter Five: Documents the files needed in order to deploy a Clarion Web enabled application.

Documentation Conventions

Typeface Conventions

<i>Italics</i>	Indicates what to type at the keyboard, such as <i>Enter This</i> . It also indicates information displayed in a window's title bar.
Boldface	Indicates commands or options from a pulldown menu or text in a dialog window.
Courier New	Used for diagrams, source code listings, to annotate examples, and for examples of the usage of source statements.

Keyboard Conventions

F1	Indicates a single keystroke. In this case, press and release the F1 key.
ALT+X	Indicates a combination of keystrokes. In this case, hold down the ALT key and press the X key, then release both keys.

2 - General Setup

System Requirements

Server System

You can run the Application Broker and Web-enabled applications on Windows 95/98; however, we strongly recommend using Windows NT, 2000 or NT to host the deployment.

- ◆ Windows 95/98, 64 Megabytes of RAM recommended, static connection to Internet/Intranet.
- ◆ Windows NT, 2000, and NT, 128 Megabytes of RAM recommended, static connection to Internet/Intranet.

Performance depends on the speed of your server's connection to the Internet and the traffic you expect your application to handle. Applications can be delivered over a 28.8 kb modem connection, but we recommend ISDN or higher.

Client System

Clients can run a WebBuilder application under any platform for which a JavaScript Internet browser is available. A Java-enabled browser is required for an Internet Connect program. The applications that you develop with Clarion 6 Enterprise Edition will execute comfortably on computers that meet only the minimum requirements for these browsers. Performance is affected by the speed of the connection to the Internet, but most applications will perform well over a 28.8 kb modem connection.

Recommended Browsers:

Clarion Web-enabled applications running with the latest Application Broker should work under any browser type (Internet Explorer, Mozilla, Firefox, etc.) and version running through any operating system that supports Internet Protocol (Windows, Apple/MacIntosh, UNIX/LINUX, etc).

Standard Application Broker Installation

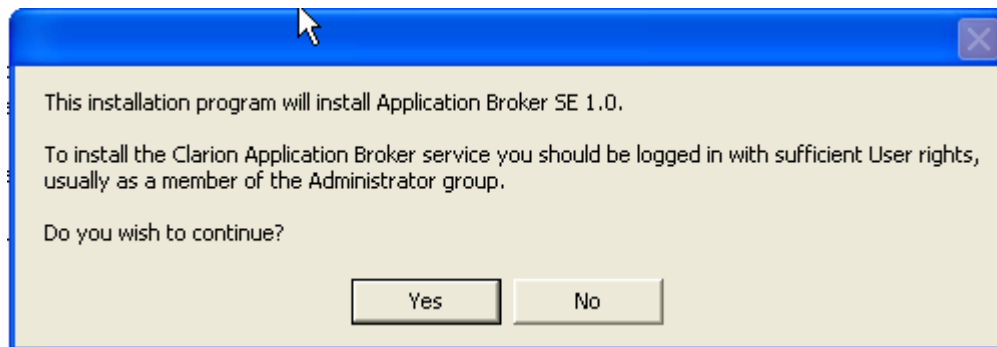
The Standard Application Broker installs automatically as part of the Clarion Enterprise Edition. You can also download the Standard Broker directly from the SoftVelocity web site.

By default, the Standard Broker is installed in the CWICWEB folder located in your Clarion Enterprise Edition root. Later, you can copy this folder to another location prior to testing and deployment.

SE (Service Edition) Application Broker Installation

The Service Edition version of the Application Broker is offered as an add-on to the Clarion development environment. To install the SE Application Broker, run *AppBrokerSE.exe*.

A message window will display:



This window simply notifies you that in order to install the SE Application Broker as a service, you need to have the appropriate rights to do so.

There are no other special windows in this standard install. Accept the License Agreement, enter a valid serial number, and choose the destination that the broker will be installed to.

In Chapter 4, we will describe in detail the configuration steps needed after the install.

3 - The Standard Application Broker

Running the Standard Broker

The Standard Broker must be started before it can be used. To start the Standard version of the Application Broker, DOUBLE-CLICK on *C60APS50.exe* (file that comes with the C6 install). This may also be added to your "Startup" group.

Web servers/services require binding to a specific port. The default port for HTTP is 80. The Application Broker defaults to this port. If you are running any other Web server which is using port 80, you must specify another port (e.g., 8080) for the Application Broker in its setup options or by creating a shortcut with the port as a command line parameter.

Note:

If you specify the port number on the command line, you cannot change it in the Broker's setup options. If you start the Application Broker, allow it to warn you that it cannot use the default port, then change the port setting, it saves that setting and you will not need to specify the port the next time it executes.

Using the Standard Broker

Clarion 6 Enterprise Edition contains a Standard Version of the executable Application Broker (*C60APS50.exe*). This version is designed for testing and limited deployment.

The Standard Version of the Application Broker functions exactly like the SE Application Broker. The only difference is that the Standard Version only allows for a limited number of simultaneous connections.

That means any of the following are allowed:

- ◆ As many as fifty (50) clients can run an application at the same time.
- ◆ As many as fifty (50) clients can run more than one copy of an executable by opening another browser window.
- ◆ As many as fifty (50) clients can run multiple executables by opening another browser window.

Note:

To release the connection and allow access to another user, all applications started by the client must be closed.

A client must exit the application for the application to close; simply closing the browser does not close an application. If the client does close the browser, the application won't close until a timeout occurs. The templates used to design the application set an application's timeout to 10 minutes by default. You can modify this timeout interval in the global extension used in the application.

Testing Concurrent Access

You can easily test any concurrency issues (i.e., issues in your application concerning more than one user) with multiple clients. You can also test with a single client by starting two instances of your browser and running a copy of the application in each.

To start a new instance of your browser:

In Internet Explorer 3.0x:

Choose **File ▶ New Window**.

In Internet Explorer 4.0x and higher:

Choose **File ▶ New ▶ Window**.

In Netscape Navigator 3.0x:

Choose **File ▶ New Web Browser**.

In Netscape Navigator 4.0x and higher:

Choose **File ▶ New ▶ Navigator Window**.

Connecting to your Applications using the Standard Broker

To run a Web-enabled application from a browser using the executable version of the broker, provide a Uniform Resource Location (URL) in the following format:

`http://nnn.nnn.nnn.nnn/appname.exe.0`

where *appname.exe* is your application's executable file name (make sure to add a dot zero (.0) after the executable name) and *nnn.nnn.nnn.nnn* is your IP address, or

`http://domain.ext/appname.exe.0`

where *domain.ext* is your domain name, if your IP address has a name registered with a Domain Name Server (DNS).

If you are running the broker on a port other than port 80 (the default HTTP port), include the port number in the URL.

Examples:

`http://nnn.nnn.nnn.nnn:8080/appname.exe.0`

`http://domain.ext:8080/appname.exe.0`

Note:

If your application is located in a subdirectory of \EXEC, then the full pathname must be placed between the domain name and executable file name (Example: `http://domain.ext:8080/exec/order/appname.exe.0` where ORDER is the subdirectory)

Using Hyperlinks to start an application

You can also create hyperlinks in standard HTML Web page to execute Web-enabled applications.

For example:

```
<A HREF="http://nnn.nnn.nnn.nnn/appname.exe.0">Click to start app</a>
```

or

```
<A HREF="http://nnn.nnn.nnn.nnn:8080/appname.exe.0">Click to start app</a>
```

Firewalls and alternate ports

Firewalls and proxy servers can be configured to restrict access to ports other than the default HTTP port (80). To facilitate access for users behind firewalls or proxy servers, you have the following options:

1. Run the Application Broker on port 80.
2. Have the network administrator remove the restriction to port 8080 (or the port you are using).

4 – Service Edition (SE) Application Broker

General Overview

The SE (service edition) SE Application Broker supports the following additional features in comparison with the Standard Application Broker:

- ✓ Provides SSL support
- ✓ Can optionally be installed as NT service under Windows NT/2000/XP

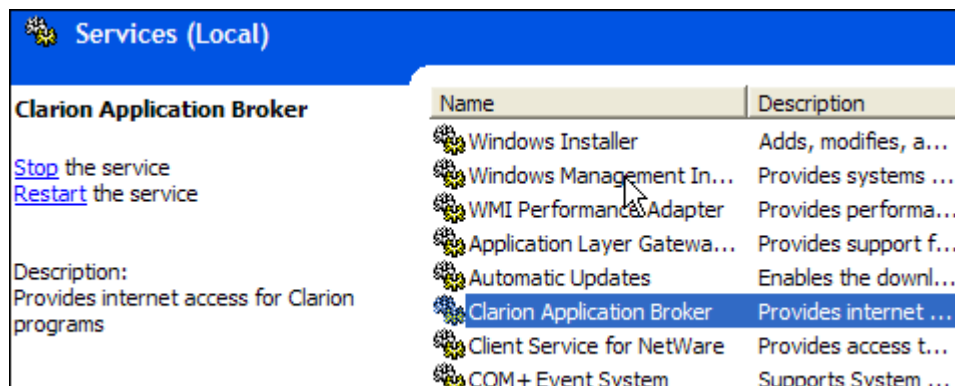
The implementation of the SE Application Broker as a service results in the following changes:

System services can be executed under the Local System Account or selected by user account. If you want to enable interaction with the Clarion debugger the service must be set to allow interaction with the desktop.

Changes to the SE Application Broker specific parameters take effect immediately except for changes to the communication ports and the public directory. Changes to these parameters only take effect after SE Application Broker Service is stopped and restarted.

Running the SE Application Broker

The SE Application Broker can be installed as a System Service under Windows NT/2000/XP, or it can be run as a standard application.



Under Windows NT/2000/XP the SE Application Broker starts when the OS is loaded (before any user login). The service may be configured to start automatically or manually.

The Communication port for SE Application Broker is defined at the time the AppBroker service is registered. By default port number 80 is used for standard non-secure communications and port 443 for secure communications.

Starting / Stopping the SE Application Broker

There are three ways to start and stop the SE Application Broker

1. Use the Control Service Manager panel
2. Shutting down or starting up the operating system
3. Stop and start the SE Application Broker as an application (modes)

A client must exit the application for the application to close; simply closing the browser does not close an application. If the client does close the browser without exiting the application, the application won't close until a timeout occurs. The templates used to design the application set an application's timeout to 10 minutes by default. You can modify this timeout interval in the global extension used in the application.

Connecting to your Applications using the SE Application Broker

If you are using Secure Socket Layers SSL for your web connections, type *https* instead of the usual *http*.

Examples:

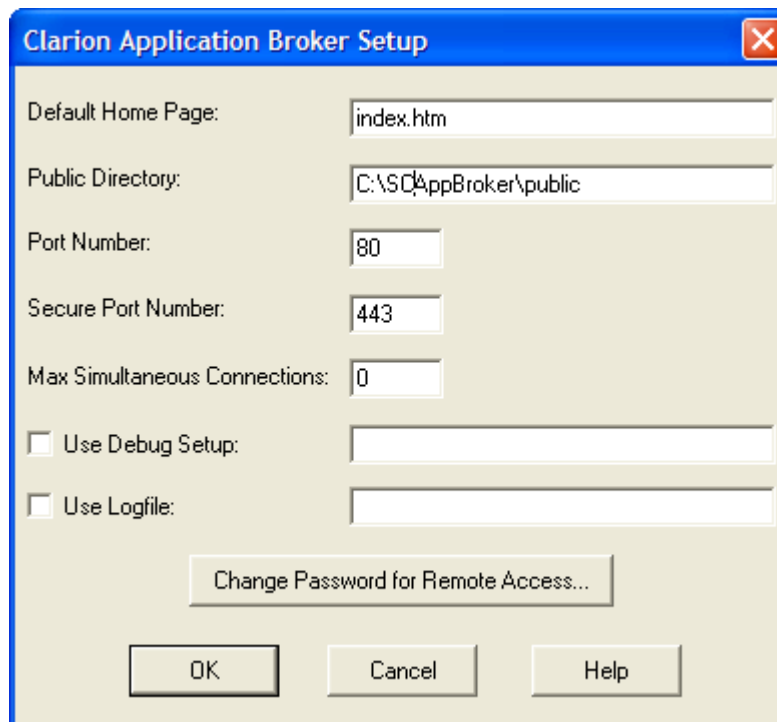
`https://nnn.nnn.nnn.nnn/appname.exe.0`

`https://domain.ext/appname.exe.0`

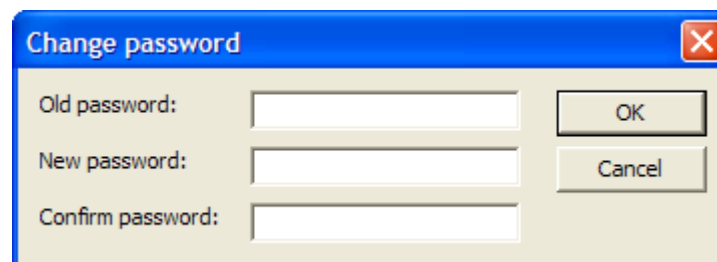
Changing the password for the administrator account

The SE Application Broker permits remote access to your your Clarion web applications. The remote access is password protected. To set the password:

1. Choose **Start ► Settings ► Control Panel ► Clarion Application Broker** to open the the configuration utility.
2. Press the **Change Password for Remote Access...** button.



3. In the *Change Password* dialog, type the old password and two times new password in the corresponding fields, and press **OK** button.



Remote HTTP Access

When you attempt to gain remote access and are prompted for the **UserName**, always enter “**CWIC**”. You can not change the name used for login to the broker, only the password can be changed.

Changes to the communication ports numbers and public directory take effect *after* the SE Application Broker is stopped and restarted.

Additional Notes:

- If the account used to run the service (a user account or the Local System account used for the App Broker service) does not have sufficient rights to the Public folder (Read-Write-Create-Execute), your applications will fail to execute.
- Passwords are used for administrative authentication only, and only for remote access from a Browser.

Registry Key Information

The SE Application Broker settings are stored in the following Windows Registry location:

HKEY_LOCAL_MACHINE\SYSTEM\ControlSetxxx\Services\Clarion Application Broker

(xxx is a transient number (001, 002, etc))

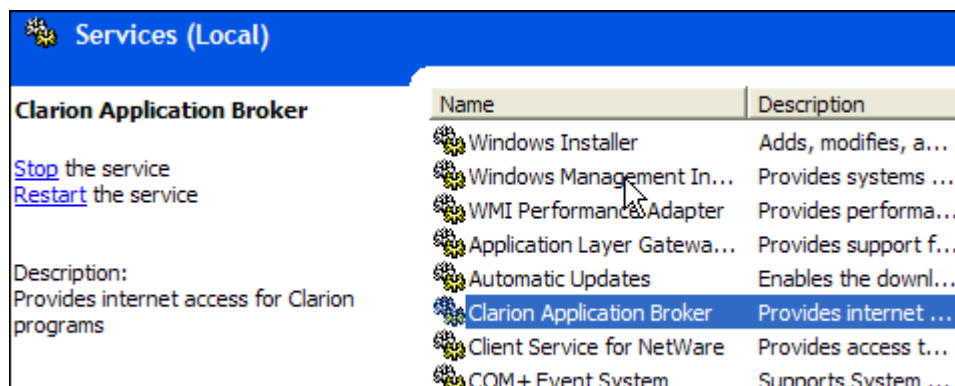
You can access and edit this key if you wish to manually change any of the SE Application Broker settings.

Debugging

As the SE Application Broker is a service, it needs to be able to interact with the desktop to allow a debugger to be opened. Therefore, the SE Application Broker service needs the **Allow service to interact with desktop** setting to be switched on.

To change the "Allow service to interact with desktop" setting:

1. Open the Windows **Services** application (**Control Panel ► Administrative Tools ► Services**) and from the list of services choose *Clarion Application Broker*.



Notes on OpenSSL support

OpenSSL is a cryptography toolkit implementing the Secure Sockets Layer (SSL v2/v3) and Transport Layer Security (TLS v1) network protocols and related cryptography standards required by them. **SSL can protect data in transit on a live connection, but it cannot protect data before it is sent or after it arrives.**

The *Openssl.exe* program is a command line tool for using the various cryptography functions of OpenSSL's crypto library. You can obtain the OpenSSL utilities from various Internet download sites.

OpenSSL is available for download in source format from <http://www.openssl.org/>

There are also pre-built binary versions available for download, one source for a Win32 binary version is the Win32 OpenSSL Installation Project available from: <http://www.slproweb.com/products/Win32OpenSSL.html>

To make use of SSL with your web-enabled application you need to deploy the *key pair* files. OpenSSL supports two standard formats for storing and exchanging key pairs. The format used with the SE Application Broker is PEM (Privacy Enhanced Mail), which is defined in RFCs 1421,1422,1423 and 1424. PEM data is base-64 encoded and provides abilities to encrypt the data before its encoded.

The SE Application Broker service accepts the certificate file specified as *CertificateFile* in the broker's registry key, or uses the "server.pem" file located in the directory that contains the Application Broker executable file, if the *CertificateFile* parameter is empty.

The SE Application Broker install contains a sample self-signed certificate file. For actual distribution, a valid signed certificate should be obtained from a proper certificate authority.

To obtain a valid certificate:

1. First, a private key should be generated:
openssl genrsa -des3 -out server.pem 2048
2. Next, a certificate request should be created:
openssl req -new -key server.pem -out cert.csr
3. Finally, the certificate request ('cert.csr') should be sent to a certificate authority. When the certificate authority finishes all required checks, it hands over your new certificate, which is then combined into one file with the private key for use.

Documentation and further information on OpenSSL is available at:

<http://www.openssl.org/related/>

In addition, O'Reilly publishes a very good book on OpenSSL: *Network Security with OpenSSL*, by John Viega, Matt Messier, and Pravir Chandra. ISBN: 0-596-00270-X

SSL Registry Support

The Application Broker requires a certificate file for SSL support. The service uses the certificate file specified in the following registry key:

HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\Clarion Application Broker\CertificateFile

Or, by default, it uses the *Server.pem* file located in the directory that contains the Application Broker executable, if the "CertificateFile" registry key is empty.

To specify an SSL Certificate edit the registry Key value listed above, and enter the file name and fully qualified path of the file that contains an SSL certificate and private key in PEM format. This file *must* be located in the same directory where the AppBroker is installed.

Example:

C:\ClarionAppBroker\server.pem

Notes on encoding

The Application Broker only supports requests in the ISO-8859-1 code page.

Uninstalling the SE Application Broker

If you should need to uninstall the SE Application Broker, the following steps must be observed:

1. Make sure to STOP the Clarion Application Broker service, and ensure that there are no Clarion Internet Connect or Web Builder applications running.
2. Open your Control Panel, and select the Add/Remove Programs option.
3. Select the **Application Broker SE** program item, and press the Change/Remove button to uninstall the SE Broker.

5 - Application Deployment

The following information applies to both the Standard and SE Application Brokers.

Directories

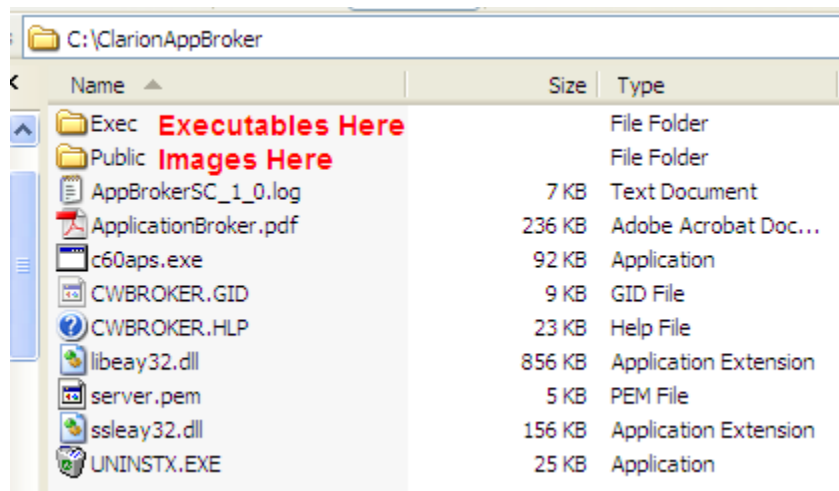
When using the Application Broker, the directory from which it is run is the virtual root directory for all executables. The \PUBLIC directory below the Broker directory is the virtual root for any downloadable files. For example, a link to an HTML document in the \Public directory would be addressed as:

```
http://nnn.nnn.nnn.nnn/index.htm
```

while an executable in the same directory as the Application Broker is referenced using a similar URL:

```
http://nnn.nnn.nnn.nnn/appname.exe.0
```

However, in most real world deployment, you should copy all executables to the **EXEC** folder or appropriate subfolder that is created by the Application Broker install.



Even though these files are in different directories, the Application Broker handles the routing and no relative directory information is required.

If you want to keep applications in different directories, you may call the application using its *relative* path. For example, with the executable version of the broker running in \ClarionAppBroker and an application named **myapp.exe** is deployed to \ClarionAppBroker \Exec\App1. You would call it using:

```
http://mydomain.com/exec/app1/appname.exe.0
```

Remote Access to the Application Broker

If you provide a Remote password in the Application Broker Setup, you can access your running broker from a remote site using a browser. This allows you to modify settings, suspend and enable access to an application, and see the status of the last request.

To access your broker's setup utility from a browser:

1. Type the following URL in your browser's Address or Location entry control, then press ENTER.

Using the Executable Broker, the URL should be in the following format:

HTTP://domainname.ext/appbroker/

or

HTTP://nnn.nnn.nnn.nnn/appbroker/

A password dialog appears.

2. Type *CWIC* in the Username field and the password you specified during the installation in the broker's **Remote Password** field.

Note:

You cannot use remote access to the Application Broker unless you have specified a Password in the broker's setup.

A Web page appears with hyperlinks for the following functions:

Setup

Provides access to modify the setup options. You can modify any of the setup options except the Port Number and the Remote Password. Those settings can only be changed on the server.

Suspend

Allows you to suspend access to any Web-enabled application deployed on the Application Broker site. This must be done in order to update the application or data files. If an application is running, the session is closed and the application is closed. Users who were running the program receive a message informing them that the application has been suspended for maintenance.

To suspend access, type in the full name of the executable file (including the extension), then press the OK button. If the application to suspend is deployed to a subdirectory, you need not specify that directory here. A Web page is returned listing the applications which are currently suspended.

Enable

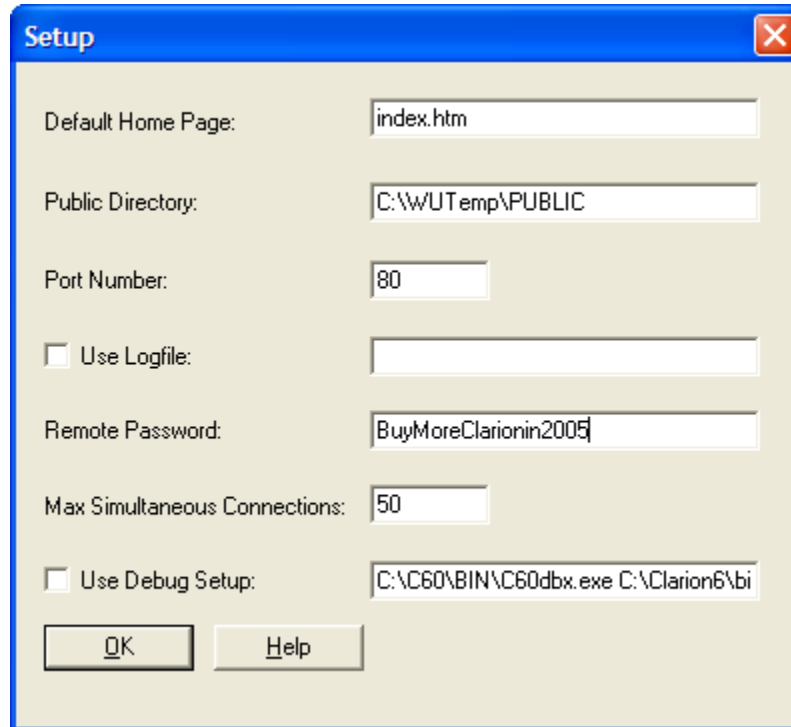
Allows you to re-enable access to any Web-enabled application on the Application broker site which has been suspended.

To re-enable access, type in the full name of the executable file (including the extension), then press the OK button. A Web page is returned listing the applications which are still suspended.

Status

This displays the current status of applications running on your broker site including the time of access and the IP address of the clients accessing applications.

Application Broker Setup Options

The image shows a Windows-style dialog box titled "Setup" with a blue title bar and a close button (X) in the top right corner. The dialog has a light beige background. It contains several configuration options, each with a label and a text input field. The options are: "Default Home Page:" with "index.htm" in the field; "Public Directory:" with "C:\WUtemp\PUBLIC" in the field; "Port Number:" with "80" in the field; "Use Logfile:" with an unchecked checkbox and an empty field; "Remote Password:" with "BuyMoreClarionin2005" in the field; "Max Simultaneous Connections:" with "50" in the field; and "Use Debug Setup:" with an unchecked checkbox and a field containing "C:\C60\BIN\C60dbx.exe C:\Clarion6\bi". At the bottom of the dialog are two buttons: "OK" and "Help".

From the Application Broker's Setup menu option, you can specify the following options:

Default Home Page

The document which is delivered by default if no specific URL is specified. The default is *index.htm*.

Public Directory

The directory where common deliverable files are deployed (HTML files, images, etc.). This is also the directory under which temporary directories containing the HTML files representing an application are created. The default is */Public*.

Port Number

The HTTP port to which the application broker is bound. If specified on the broker's command line, this is disabled and cannot be modified.

When a port other than 80 (the default HTTP port) is used, clients (or your hyperlinks) must specify the port in the URL. For example if the broker is attached to port 8080, you would specify:

```
http://nnn.nnn.nnn.nnn:8080/appname.exe.0
```

Use Log File

Checking this box enables server logging. This generates a logfile entry for each request made by clients accessing the Application Broker. The logfile contains the requester's IP address, the date and time of the request, and the request made. Keep in mind that the logfile will continue to grow as entries are appended to it.

Log File Name

Specifies the name of the logfile.

Remote password

Specify a password to enable remote access to the Application Broker. See *Remote Access to the Application Broker* for more information.

Note:

The remote password is case sensitive.

Max Simultaneous Connections

This specifies the maximum number of connections allowed. A notice is returned to users trying to access the broker when an attempt to exceed this number is made.

Use Debug Setup

This specifies to run applications in the debugger. You must have access to the Server machine to run the debugger. Specify the location of the debugger and redirection file in the entry field provided. For example:

C:\Clarion6\bin\C60dbx.exe C:\Clarion6\bin\C60EE.red

Deployment CheckList

1. Install and configure the appropriate Application Broker. Remember that the Standard version of the Application Broker is for testing or low traffic use.
2. Start the Application Broker on the server (this cannot be started remotely).
3. Deploy the application and any other files it needs (DLLs, data files, image files, etc.) to the directory from which the Application Broker will run (or a subdirectory). These should be placed in a subdirectory in or under **C:\ClarionAppBroker\EXEC**. Data files should be in the same directory as the executable, or if your application is created to use data files in a different directory or drive, this location must be visible to the application.

Note:

The following Clarion DLLs should be placed into the directory with your executable: C60RUNx.DLL, C60DOSx.DLL, C60ASCx.DLL, C60TPSx.DLL, C60IBCx.DLL, C60LAYx.DLL, and SKELETON.DLL. These files can be found in the \BIN\ directory of the C60 install. They are required even if you do not use them in your .APP.

Copy all C60 Web images to **C:\ClarionAppBroker\Public**. These images can be found in the **\Clarion6\CWICWEB\Public** directory. Images displayed in LISTS or BUTTONs must be deployed to this directory also.

4. The install creates a subdirectory below the broker directory named \Public. This directory is used to deliver files (such as the Java Classes from the Java Support Library, graphics or other HTML files) by the Application Broker.

The Application Broker will not deliver any files from its executable directory. This prevents downloading data files or executables from your site. Your application creates HTML files at runtime and automatically places them in a temporary subdirectory below either the \Public directory.

At runtime, a temporary directory is created for each client connection. These directories are automatically deleted when the connection terminates. Graphics in IMAGE controls are automatically extracted to this directory when they are not found in the /Public directory. Icons displayed in LISTS or on BUTTONs are not automatically extracted and must be deployed to the /Public directory.

5. Run the Application Broker on the server machine. It defaults to port 80. If you are running any other Web server which is using port 80, you must specify another port (e.g., 8080) for the Application Broker by creating a shortcut with the port as a command line parameter. You can also modify the port to which it is bound by using the Application Broker's Setup option.

If you specify the port number on the command line, you cannot change it in the Broker's setup options. If you start the Application Broker, allow it to warn you that it cannot use the default port, then change the port setting, it saves that setting and you will not need to specify the port the next time it executes.

6. Provide users who want to access the application a URL in the following format:

http://nnn.nnn.nnn.nnn/appname.exe.0

or

http://domain.ext/appname.exe.0

Appname.exe is your application's executable file name. Make sure the user adds a dot zero (.0) after the executable name.

If you are running the executable broker on a port other than 80 (the default HTTP port), users must include the port number in the URL. For example,

http://nnn.nnn.nnn.nnn:8080/appname.exe.0

If your application has any command line parameters, add a question mark and the command line parameter. For example:

`http://nnn.nnn.nnn.nnn/appname.exe.0?myargument`

Testing Locally

Although for true deployment of a Web-enabled application you will use a persistent IP address, you can use 127.0.0.1, as the local IP address for testing your application locally (with the broker and browser on the same machine).

Testing your TCP/IP Connection

There are several methods to test your TCP/IP Connection.

1. From a DOS Prompt, type

`PING 127.0.0.1`

This tests the TCP/IP connection on your local machine and returns the time it took to respond.

- 2 Start your Web browser, type the following URL to the server machine and target test page:

`http://server.domain.com/index.htm`

where *server.domain.com* is the IP address of your server.

If you assigned a different port to your Web server (other than the default port 80), you must also include the port number in the URL, as shown here:

`http://server.domain.com:XX/index.htm`

where XX is the port number assigned to your Web server.

If you don't have a TCP/IP connection or you want to test the connection from your local machine, you can use the following URL convention:

`http://localhost/index.htm`

or

`http://127.0.0.1/index.htm`

This is the internal local loopback address.

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