

AS/400e™



Installing VisualAge® RPG and CODE/400 for AS/400®

Version 3.2.3 for Windows®

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Note!

Before using this information and the product it supports, be sure to read the general information under "Notices" on page 61.

Fourth Edition (April 2000)

This edition applies to Version 3, Release 2, Modification Level 3, of IBM VisualAge RPG and Cooperative Development Environment for AS/400 (Program 5769-CL3) and to all subsequent releases and modifications until otherwise indicated in new editions.

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About This Book

This guide explains how to install the IBM VisualAge RPG and Cooperative Development Environment for AS/400 (VisualAge RPG and CODE/400) program, which consists of the following features:

- VisualAge RPG
- Cooperative Development Environment/400 (CODE/400)

This manual leads you through the following steps:

1. Planning for installation, which includes installing and configuring prerequisite products
2. Installing VisualAge RPG and CODE/400
3. Configuring communications
4. Starting the VisualAge RPG and CODE/400 program
5. Maintaining the VisualAge RPG and CODE/400 program

Who Should Use This Guide

This guide is intended for AS/400 application developers or analysts who want to install VisualAge RPG and CODE/400 on a programmable workstation.

You should have a general knowledge of the Application System/400 (AS/400) product line. If you are the system administrator at your site, you should also be familiar with the RSTLICPGM command.

We also suggest experience with a programmable workstation and experience with either the Windows[®] 95, Windows 98, or Windows NT operating system.

Keeping in Touch

Contact us in one of the following ways:

- Visit our World Wide Web page at <http://www.ibm.com/software/ad/varpg>. You can also get to this page from the IBM[®] Software home page (<http://www.ibm.com/software>), following the Application Development link.

Information that you can find on the Web site include:

- Service Pack and PTF information and downloads
- VisualAge RPG and CODE/400 tips and techniques
- Sample Editor macros and VisualAge RPG programs

- Subscribe to the CODE400-L internet mailing list, which is moderated by a CODE/400 customer for VisualAge RPG and CODE/400 discussions, tip sharing, questions, and so on. While IBM does not own or maintain this mailing list, we do monitor it. To subscribe to the list, send an e-mail message to CODE400-L-SUB@midrange.com. To unsubscribe from the list, send an email message to CODE400-L-UNSUB@midrange.com.

- Follow the VisualAge RPG and CODE/400 newsgroups and post your questions at:

VisualAge RPG newsgroup

news://news.software.ibm.com/ibm.software.varpg/

CODE/400 newsgroup

news://news.software.ibm.com/ibm.software.code400/

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– Comments on books:

Internet: torrcf@ca.ibm.com

IBMLink: [toribm\(torrcf\)](mailto:toribm(torrcf)@ca.ibm.com)

– Comments on the AS/400 Information Center:

RCHINFOC@us.ibm.com

Be sure to include the following:

- The name of the book
- The publication number of the book
- The page number or topic to which your comment applies.

Prerequisite and Related Information

Use the AS/400 Information Center as your starting point for looking up AS/400 technical information. You can access the Information Center from the AS/400e Information Center CD-ROM (English version: SK3T-2027-03) or from one of these Web sites:

<http://www.ibm.com/as400/infocenter>

<http://publib.boulder.ibm.com/pubs/html/as400/infocenter.htm>

The AS/400 Information Center contains important topics such as logical partitioning, clustering, Java™, TCP/IP, Web serving, and secured networks. It also contains Internet links to Web sites such as the AS/400 Online Library and the AS/400 Technical Studio. Included in the Information Center is a link that describes at a high level the differences in information between the Information Center and the Online Library.

For a list of related publications, see the “Related Publications” on page 59.

Conventions Used in this Guide

Directory names and file names appear **LIKE THIS**.

The drive letter d: is used as a generic disk drive designation.

Commands, coding examples, and any text that you enter appear **Like this**.

User interface controls appear **Like this**.

New terms appear *like this*.

Note: This book does not contain a glossary. Terms are defined when they first appear.

No special appearance is given to window titles, folder names, notebooks, notebook tabs, or keys (for example, the Enter key).

Mouse Button Naming Conventions

The following mouse button naming conventions are used in this guide:

- The left button is used to select an object, open a file, or start an application. It is the physical left button unless this button has been customized to do something else.
- The right button is used to move or manipulate an object. It is the physical right button unless this button has been customized to do something else.

You can define the function of each mouse button using the Windows Control Panel. If you are not sure how your mouse is configured, check the properties of the mouse item in your Windows Control Panel.

Chapter 1. VisualAge RPG and CODE/400 Quick Start

This section provides instructions for installing the product from the workstation CD and configuring TCP/IP communications for a quick start to using VisualAge RPG and CODE/400. For this quick start, ensure that you have the following prerequisites:

- AS/400™ host with OS/400® V4R3 or later
- All of the most recent PTFs installed on your AS/400 host. The list of PTFs is available at: <http://www.ibm.com/software/ad/varpg/support>
- TCP/IP for communications with the AS/400 host

It is recommended that you refer to “Chapter 2. Preparing for Installation” on page 3 for a complete list of prerequisite actions prior to installing.

If you do not have the above prerequisites, or wish to use other installation or communication configuration methods, refer to “Chapter 3. Installing VisualAge RPG and CODE/400” on page 9 and “Chapter 4. Configuring Communications” on page 17.

Installing from the Workstation CD

To install the product from the workstation CD:

1. Insert the CD-ROM into the CD drive.
2. Follow the online instructions.

If the installation utility does not start automatically, perform the following steps:

1. From the Windows **Start** menu, select **Run**.
2. Type:
x:\qadtswin\setup.exe

Where x: is your CD-ROM drive.

TCP/IP Configuration

VisualAge RPG TCP/IP Setup

To identify the server you want to use do the following:

1. Click **Start > Programs > VisualAge RPG and CODE400 > VisualAge RPG > GUI Designer**.
2. Select **Server** from the menu bar.
3. Select **Define TCP/IP Servers**.
4. Click **Add**. The **Add TCP/IP Server** dialog appears.
5. Enter the Host name or IP address of your AS/400 server.
6. Click **OK** and then **Close**.
7. Select **Define AS/400 Information**. The **Define AS/400 Information** notebook appears.
8. Click **Add**. The **Add Server Alias Name** dialog appears.
9. Enter your AS/400 Server alias name.
10. Select the correct remote location name from the combination box.
11. Click **OK** to leave the **Add Server Alias Name** dialog..
12. Click **OK** to save and close the notebook.

CODE/400 TCP/IP Setup

To start the daemon with an interactive emulation session and STRCODE command:

1. Click **Start > Programs > VisualAge RPG and CODE400 > TCPIP Communication Server**.
2. Start a 5250 emulation session if it is not already started and sign on.
3. On the host's command line, type STRCODE and then select PF4. Use the IP address of your workstation (where the TCPIP Communication Server is running) for the RMTLOCNAME parameter.
4. For the CMNTYPE parameter type *TCPIP.
5. Press Enter. The CODE/400 display appears on your 5250 emulation window.

Starting VisualAge RPG and CODE/400

For VisualAgeRPG, start the GUI Designer. Click **Start > Programs > VisualAge RPG and CODE400 > VisualAge for RPG > GUI Designer**.

For CODE/400, start the CODE Editor. Click **Start > Programs > VisualAge RPG and CODE400 > CODE400 Tools > CODE Editor**.

Chapter 2. Preparing for Installation

This chapter provides an overview for the planning required for installing VisualAge RPG and CODE/400. Planning for installation involves meeting hardware requirements, installing prerequisite software, uninstalling the product, and migrating files for components from previous releases.

Table 1 shows the sequence of tasks involved in installing VisualAge RPG and CODE/400. It also indicates where you can find more information about completing the task.

Table 1. Installation Overview

	AS/400 Host V4R3 or later		Workstation Windows 95/98/NT 4.0	
Stage	Task	More Information	Task	More Information
1	Ensure prerequisite AS/400 host software installed	"AS/400 Host Software" on page 6	Ensure prerequisite workstation host software installed	"Workstation Software" on page 5
2			Perform prerequisite tasks if you have previously installed the product	"Before You Begin" on page 7
3 (optional)	Install VisualAge RPG and CODE/400 on the host or LAN.	"Installing on the AS/400 Host" on page 9 "Installing on a LAN Server" on page 11		
4			Install the VisualAge RPG and CODE/400 workstation component from the AS/400 host, LAN or CD.	"Installing VisualAge RPG and CODE/400 on the Workstation" on page 13
5 (TCP / IP)	Configuration		Configure Windows networking (TCP/IP protocol).	"TCP/IP Configuration" on page 17
5 (SNA)	Configuration		Configure communications to include at least one AS/400 connection.	"SNA Communications" on page 20

Prerequisites

This section describes what you need to install VisualAge RPG and CODE/400.

Hardware Requirements

VisualAge RPG and CODE/400 has the following hardware requirements:

- **Workstation Hardware**

- **Minimum**

- Programmable workstation with an Intel® Pentium® processor 100 MHz
 - 64 MB of memory
 - 350 MB free hard disk space
 - SVGA (800x600) display
 - A mouse

- **Recommended**

- Intel Pentium processor 350 MHz or higher
 - 128 MB of memory
 - 425 MB free hard disk space
 - SVGA (1024x768) display or higher

- **AS/400 Hardware**

- **Recommended**

- 93 MB of available memory

The applications you create using VisualAge RPG will run on significantly smaller machines than those required for development. For example, a VisualAge RPG application can run on a PC with 12 MB of memory and 15 MB of disk space, and an AS/400 with 17 MB of available memory.

Also, the system requirements decrease if you choose to only install the components you want and if you choose to run the product from the LAN.

- **Communications Options**

- Twinaxial
 - SDLC
 - Ethernet
 - Asynchronous
 - Token ring

Appropriate communications adapters (as supported by the workstation operating system) are required as well.

Software Requirements

- **Workstation Software**

You need:

- Microsoft® Windows® 95, Windows 98, or Windows NT® 4.0 or above

For service support from your AS/400 host, you need one of the following products on at least one workstation:

- IBM® Client Access for Windows
- Client Access Express
- NetServer

Note: You can also download Service Packs from the World Wide Web, avoiding this pre-requisite.

For communications with the AS/400 host, choose one of the following:

- IBM Client Access for Windows
- IBM Personal Communications for Windows
- RUMBA (for use with CODE)
- TCP/IP

For 5250 emulation sessions, choose your preferred emulation program such as:

- IBM Personal Communications for Windows
- IBM Client Access or Client Express
- RUMBA

For client/server connectivity in your VisualAge RPG applications, choose one of the following:

- APPC
- TCP/IP

For editing support of IFS files, you need:

- Java™ 2 Software Development Kit, Standard Edition (J2SDK), v 1.2 or later
- AS/400 Toolbox for Java

Note: The AS/400 Toolbox for Java supports V4R2 and later of the AS/400 host.

For viewing the online help, choose your preferred frames-capable Web browser such as:

- Netscape Navigator 4.04 or later
- Microsoft Internet Explorer 4.01 or later

Note: Netscape Communicator 4.7 or Internet Explorer 5.0 is recommended.

For your convenience, the Netscape Communicator workstation CD has been included with the product.

See your IBM sales representative for product order numbers. Contact the IBM Support Center to obtain any updates to the products listed.

- **AS/400 Host Software**

You need:

- IBM Operating System for AS/400 (5769-SS1), Version 4 Release 3 or later.

Note: When using SNA communications, ensure you choose the Host Server option when installing your OS/400® operating system.

- IBM Application Development ToolSet for AS/400 (5769-xxx)

The following compilers are supported, but not required:

- RPG/400® and ILE RPG for AS/400
- COBOL/400® and ILE COBOL for AS/400
- CL and ILE CL for AS/400
- ILE C for AS/400
- ILE C++ for AS/400 (5799-GDW)
- SQL/400® and ILE SQL
- CICS/400® and ILE CICS®

For Java support, you need:

- AS/400 Developer Kit for Java (5769-JV1)

Before You Begin

This section provides information that you need to know prior to installing VisualAge RPG and CODE/400.

Before you install VisualAge RPG and CODE/400 onto the workstation, it is recommended that you do the following:

- For VisualAge RPG, you must deregister the .IVG filetype by doing the following:
 1. Select the **View** menu from any folder.
 2. Choose **Options**, then **File types**.
 3. Select **VisualAge RPG projects**.
 4. Click **Remove**.
- If you want to install both IBM® VisualAge for C++ and VisualAge RPG and CODE/400 on the same workstation, you must first install VisualAge for C++.

Uninstalling VisualAge RPG and CODE/400 from the Workstation

It is strongly recommended that you delete any previous versions of this product from the workstation before proceeding.

To remove all components of VisualAge RPG and CODE/400 from your workstation, do the following:

- Click **Start > Settings > Control Panel**.
- From the Control Panel folder, click **Add/Remove Programs**.
- Select **VisualAge RPG and CODE/400 V3R2M2** from the list.
- Click **Add/Remove**.

The uninstall process will remove all components and settings. However, some files and directories may be left on your system. The uninstall process should warn you about remaining directories and you can manually remove them before restarting your system.

Note: NetQuestion will not uninstall until all other programs that use NetQuestion are uninstalled.

Migration Notes for Specific Components

The following sections contain information that you should be aware of when migrating from one release to another.

Porting OS/2® Applications to the Windows platform

If you plan to port VisualAge RPG OS/2® applications to the Microsoft Windows platform, post your question on the VisualAge RPG newsgroup at: news://news.software.ibm.com/ibm.software.varpg/

CODE Project Organizer

If you choose to uninstall and re-install V3R2M3, you should backup the CPO actions files (listed below) to a new directory. All you need to do after re-installation is copy the files back to the base product directory (ADTSWIN by default). You can either copy the files manually, or copy the actions using the import feature in the CODE Actions dialog. CODE Project Organizer automatically updates the files to the V3R2M3 format the first time they are used.

The actions files are:

- evfactfm.cpa
- evfactfo.cpa
- evfactfj.cpa
- evfactfg.cpa
- evfactfp.cpa
- evfactpr.cpa
- evftypes.cpa
- evfactfl.cpa

CODE Program Generator

When you update your installation, a **CODE/400 Initialization** shortcut in the Startup folder creates a file called PGV3R2M0.OUT in the SYSTEM sub-directory of VisualAge RPG and CODE/400.

The file contains a list of all the Program Generator labels that need to be manually migrated. All the labels appear in the label list on the Program Generator window. However, they will have default settings after migration. You must re-create the settings listed in the PGV3R2M0.OUT file by entering them in the Options dialog.

Chapter 3. Installing VisualAge RPG and CODE/400

The VisualAge RPG and CODE/400 program consists of host components and programmable workstation components, shipped separately on an AS/400® and a workstation CD-ROM. This section guides you through the various methods of installing the product.

VisualAge RPG and CODE/400 can be installed on the user's workstation using the following methods:

1. Installing the product from the AS/400 host.
2. Installing the product from the LAN.
3. Perform silent installation from the LAN as part of a batch job.
4. Installing the product from the workstation CD-ROM.

The first three methods require that your system administrator install the product on the AS/400 host or LAN.

Installing on the AS/400 Host

This section provides instructions for installing and removing the VisualAge RPG and CODE/400 Version 3 Release 2 Modification Level 3 licensed program on the AS/400 host system.

Installing with GO LICPGM from a CD-ROM

If you are installing VisualAge RPG and CODE/400 from an AS/400 CD-ROM, use the **Work with Licensed Programs** menu. To invoke this menu, enter:

```
GO LICPGM
```

From this menu, you can perform all required program management functions for VisualAge RPG and CODE/400, such as installation and deletion. Even though you order the product using program number 5769-CL3, the ID used for installing components is different. The ID for components of this product is 5763CL2.

Do the following from the **Work with Licensed Programs** menu:

1. Go to option 10 – **Display Installed Licensed Programs**. Verify that no 5763CL2 parts that you want to install are in the list.
2. Go to option 11 – **Install Licensed Programs**

The **Install Licensed Programs** display shows the licensed programs available from IBM at the time your currently installed operating system release,

modification, or level became available. It also shows all licensed programs currently installed. You can use this list to select licensed programs and optional program parts to install on your system by typing 1 next to the selected part and pressing Enter. You can add licensed programs to this list if they are not present. The parts of this product are:

- Base - must be installed first
 - CODE/400 optional part
 - VisualAge RPG optional part
3. To install VisualAge RPG and CODE/400 if it is not in the list, type 1 5763CL2 and product option in the top blank field, and then press Enter. The product option can be one of the following:
- *BASE to specify the base part of the product (must be installed first)
 - 1 to specify the optional CODE/400 part
 - 2 to specify the optional VisualAge RPG part
 - *ALL to specify all available parts

The following is an example of how part of the screen would look like if you specify the base part for installation:

Opt	Licensed Program	Product Option
1	5763CL2	*BASE

4. After you press Enter, a message should say that 5763CL2 is added to the list. Scroll down the list to verify that this is true. Position the cursor at the line, type 1 and press Enter. You will enter the **Confirm Install of Licensed Programs** panel.
5. Press Enter again to go to the **Install Options** panel. For the Installation device category, enter OPT01. Press Enter. Installation will begin.

When the installation is complete, you will see the message "Work with Licensed Programs function has completed". To verify this, go back to the **Work with Licensed Programs** menu. Type 10 and then Enter to see a list of installed licensed programs. Verify that the program you installed is present. If you have additional parts to install, use option 11 and repeat the preceding process.

Installing with RSTLICPGM

To install VisualAge RPG and CODE/400 onto the AS/400 system from a CD-ROM, do the following:

1. Sign on to your AS/400 system with security officer (QSECOFR) authority.
2. Enter the Restore Licensed Program (RSTLICPGM) command:
RSTLICPGM LICPGM(5763CL2) DEV(XXXXX) OPTION(*BASE) LNG(*SAVVOL)

where XXXXX specifies the name of the CD-ROM used to restore the licensed program.

Installing the program creates a library and a folder on the system, both named QADTSWIN.

3. You can use RSTLICPGM with OPTION(1) (for CODE/400) or OPTION(2) (for VisualAge RPG). For CODE/400, a library and a folder are created called QCODEWIN. For VisualAge RPG, a library and a folder are created called QVRPGWIN.

The libraries contain product information, and the folders contain the files necessary for installing and running VisualAge RPG and CODE/400 on a workstation.

VisualAge RPG and CODE/400 Shared Folder Directories

When you install VisualAge RPG and CODE/400 on the AS/400 host system, the folder QADTSWIN is created. You can access this folder as a workstation directory by using the Client Access shared folders function.

Installing on a LAN Server

This section provides instructions for installing the VisualAge RPG and CODE/400 Version 3 Release 2 Modification Level 3 licensed program on a LAN server.

To copy necessary product files to a LAN server from the AS/400 host, use the CPY2LAN command to copy an image of the Client Access shared folders to the LAN. The QADTSWIN, QCODEWIN, and QVRPGWIN folders are copied.

Using a LAN Server for All Installation Files

You can use the following command to copy all files usually found in the shared folders to the LAN:

```
x:\QADTSWIN\CPY2LAN
```

where x: is a Client Access shared folder.

The CPY2LAN command uses Client Access to transfer all of the contents of the shared folders to your LAN server. LAN users do not need to run Client Access to do their individual installations.

Using a LAN Server for Compact Installation

Compact installation gives your LAN users the ability to install just part of the VisualAge RPG and CODE/400 product on their workstation. Common files can be kept on a centrally accessible server. This means your users save local hard disk space, and you can do central product updates if necessary.

Compact Installation Considerations:

1. If your site is running compact installations, ensure that you adhere to the VisualAge RPG and CODE/400 product license agreement.

2. Service support for a compact installation may require you to use the installation utility to update the workstation portion of the product occasionally.

To set up a server for use in compact installations, ensure that the directory to which you install matches the `ServerInstallation` entry in the `SETUP.CTL` file for your language. By default, this is `ADTSLAN`.

Silent Installation

Silent installation (also known as remote or unattended installation) can be useful for a network administrator who wants to install the product to a workstation. You can use silent installation for the product and its components.

There are five available files which will guide your installation depending on the result you want:

setup.iss	Installs the entire VisualAge RPG and CODE/400 product.
code.iss	Installs all the CODE/400 components.
varpg.iss	Installs all the VisualAge RPG components.
compact.iss	Installs only the required workstation files to the user's workstation. All other files are accessed from a common location on the LAN. For more information, see "Using a LAN Server for Compact Installation" on page 11.
service.iss	Installs the Service Pack. More information about this is available in the README file which comes with each Service Pack.

After installing the product on the LAN, you must do the following before performing silent installation on the workstation:

1. Modify the following entry in the `.iss` files, which are located in `x:\qadtswin` and `x:\qadtswin\mrm\nlsxxxx`, that you want to use for silent installation:

```
szDir = d:\dir
```

Where `d:\dir` is the drive and directory in which you want to silently install the product or one of its components.

2. Rename the `.iss` file to `setup.iss` before running your silent installation. For example, to silently install only the German CODE/400 components, rename the file `code.iss` to `setup.iss` in the `nls2929` subdirectory directory. This must be done because InstallShield only recognizes the file `setup.iss` during silent installation.

Note: You can have only one national language version of the VisualAge RPG and CODE/400 product on your LAN server to use silent installation.

If you have more than one language version, remove or rename the language folders or subdirectories you do not need. For example, if you want to use silent installation for the German version of VisualAge RPG and CODE/400, you can have only the files in directory `qadtswin\mrm\nls2929` present. If you have any other language subdirectories present (`nls2931`, `nls2986`, and so on), you must remove or rename these subdirectories.

Installing on the Workstation

To perform silent installation of the product or one of its components on the workstation, do the following:

1. Connect to your LAN.
2. Change the directory to `x:\qadtswin` where `x`: is the lan directory.
3. Run the following command on the workstation:

```
setup -s
```

Note: Silent installation assumes that the product is not installed, no checking is done for previously installed versions.

4. After installation is complete, the file `setup.log` is created in the same directory as the setup program. The `ResultCode=0` entry indicates that the installation is successful.
5. Restart the workstation after installation.

Adding Site-Specific Files to Your Installations

End-users at your site may write useful macros which should be available to all users of VisualAge RPG and CODE/400. You can make the macros, or any other files, available to people installing from an AS/400 shared folder or LAN server.

The `NEW.FLS` file contains a list of site-specific files. The files listed in the `NEW.FLS` file should be stored in the `QADTSWIN\MRM` subdirectory.

When you want to have the site-specific files installed on the end user machines, ask your users to select **User Additions** as a component during the workstation installation procedure.

Installing VisualAge RPG and CODE/400 on the Workstation

Note: NetQuestion, a search tool for the help system, will be installed in the root directory of the drive specified for product installation. For example, if the product is installed in `x:\qadtswin`, NetQuestion will be installed in `x:\imnq`. If NetQuestion is already installed, the existing version will be updated.

If you are installing on Windows 95 or 98 and receive an error message indicating NetQuestion cannot be installed, it is because the PATH statement in your autoexec.bat file is longer than 200 characters. The solution is to shorten PATH statement.

Installing from the AS/400 Host

To install the product from the AS/400 host:

1. Connect to your AS/400 host.
2. Access your Client Access shared folders using the type on a command line:

```
net use x: \\<as400_system_name>\qdl$
```

Where qdl\$ is the AS/400 shared folder system library.

3. Type:
x:\qadtswin\setup.exe
4. Follow the online instructions.

Installing from the LAN

To install the product that will run independent of the LAN:

1. Connect to the LAN resource.

Note: Ensure that the **Reconnect** checkbox is marked. That way your shared LAN drive will always be available and have the same drive letter.

2. Issue the following command:
x:\QADTSWIN\setup
3. Follow the online instructions.

To install the product that will run from the LAN (compact installation):

Compact installation gives you the ability to install only part of the VisualAge RPG and CODE/400 product on your workstation. Common files can be kept on a centrally accessible server. This means you save local hard disk space, and your LAN administrator can perform central product updates if necessary. However, depending on the speed and capacity of your LAN, you may notice decreased performance. Ensure that your system administrator has setup the LAN for compact installation.

1. Connect to the LAN resource.

Note: Ensure that the **Reconnect** checkbox is marked. That way your shared LAN drive will always be available and have the same drive letter.

2. Issue the following command:
x:\QADTSWIN\setup

3. Choose a compact installation.
4. Follow the online instructions.

By choosing a compact installation to a local workstation directory, the installation utility only copies a subset of product files. All other product files will remain on the LAN server and be accessed through the network as needed.

Installing from the Workstation CD

To install the product from the workstation CD:

1. Insert the CD-ROM into the CD drive.
2. Follow the online instructions.

If the installation utility does not start automatically, perform the following steps:

1. From the Windows **Start** menu, select **Run**.
2. Type:

`x:\qadtswin\setup.exe`

Where x: is your CD-ROM drive.

Custom Installation

Custom installation gives you the ability to install VisualAge RPG and CODE/400 components separately.

To install VisualAge RPG and CODE/400 components, select **Custom Installation** from the installation utility.

For information on adding and updating components for an existing installation, see “Adding and Updating Components” on page 38.

Enabling Java

You need to perform the following steps to enable the Java features in VisualAge RPG and CODE/400:

1. Install the Java 2 Software Development Kit, Standard Edition (J2SDK), v 1.2 or later, from JavaSoft on your workstation. You can download the J2SDK by following the links from The Source for Java Technology Web page at <http://www.javasoft.com/products/>.

Note: The J2SDK v 1.2 includes the Java 2 Runtime Environment, Standard Edition, v 1.2 (JRE) and the Java 1.2 plug-in support. Install these components as well.

2. When J2SDK installation is completed, update your PATH environment variable to include the appropriate J2SDK directory. For example, if you installed the J2SDK in directory `x:\jdk12`, then add the following information to your PATH variable: `x:\jdk12\bin`.
3. Install the Java Media Framework API if you plan to use the VisualAge RPG Media part.

Netscape Navigator and Microsoft's Internet Explorer do not currently support the same level of the J2SDK that VisualAge RPG uses. As such, applets created with the VisualAge RPG GUI Designer will not run directly with these browsers. To run VisualAge RPG applets in either of these browsers, you must have the Java Plug-in 1.2 installed (mentioned above), and the HTML Converter available from JavaSoft. You can download these by following the links from The Source for Java Technology Web page. The HTML Converter allows you to convert the HTML page with your applet tag in order to use the Java Plug-in. The conversion creates an object tag that tells the Web browser to use the Java Plug-in instead of its own Java 2 Runtime Environment.

Chapter 4. Configuring Communications

Before you can use the VisualAge RPG and CODE/400 product, you must define the communications between the host AS/400 and your workstation.

Determine whether you are using TCP/IP or SNA protocols and refer to the appropriate sections for configuration instructions.

TCP/IP Configuration

Follow the standard configuration instructions in the Windows help. You will need to know:

- Your workstation's IP address (or hostname if you have a domain name server)
- Your AS/400 system's IP address (or hostname)
- Gateway information, depending on the configuration of your LAN
- Domain name server information, if your network has one

In most work locations, the network administrator can provide you with any of the configuration information you do not have.

VisualAge RPG TCP/IP Setup

If your AS/400 system is running an OS/400 release older than V4R2, you need to complete the following setup on your AS/400 system before you can run VisualAge RPG applications using TCP/IP:

1. Install the latest VisualAge RPG PTF (see the README for details).
2. Create controller QCNSKSVR and device descriptions QCNSKSVS and QCNSKSVT as described in the appropriate OS/400 PTF cover letter (see the README):

```
CRTCTLAPPC CTLD(QCNSKSVR) LINKTYPE(*LOCAL)
```

```
CRTDEVAPPC DEVD(QCNSKSVS) RMTLOCNAME(QCNSKSVT)  
LCLLOCNAME(QCNSKSVS) CTL(QCNSKSVR) APPN(*NO)
```

```
CRTDEVAPPC DEVD(QCNSKSVT) RMTLOCNAME(QCNSKSVS)  
LCLLOCNAME(QCNSKSVT) CTL(QCNSKSVR) APPN(*NO)
```

```
VRYCFG CFGOBJ(QCNSKSVR) CFGTYPE(*CTL) STATUS(*ON)
```

Check that they are active.

Note: Make sure that the device descriptions QCNSKSVS and QCNSKSVT use the BLANK mode description.

3. Check that the remote command server is active. Use WRKACTJOB to look for job QZRCRSVSD under subsystem QSYSWRK. If you cannot find it, use STRHOSTSVR *ALL to start it.
4. Make sure that the QUSER profile is enabled and its password has not expired. (QUSER is used by the server at startup time.)
5. Add library QSYS2 to your library list if it is not already there.
6. Check that the mode description BLANK has the correct number of sessions and conversations configured. Use WRKMODD to work with the mode description BLANK. The numbers for the Maximum sessions and Maximum conversations should be greater than the number of applications that you plan to run. After you make the changes, vary on and vary off the device descriptions QCNSKSVS and QCNSKSVT.

Defining Server Information

To identify the server you want to use do the following:

1. Click **Start > Programs > VisualAge RPG and CODE400 > VisualAge RPG > GUI Designer**.
2. Select **Server** from the menu bar.
3. Select **Define TCP/IP Servers**.
4. Click **Add**. The **Add TCP/IP Server** dialog appears.
5. Enter the Host name or IP address of your AS/400 server.
6. Click **OK** and then **Close**.
7. Select **Define AS/400 Information**. The **Define AS/400 Information** notebook appears.
8. Click **Add**. The **Add Server Alias Name** dialog appears.
9. Enter your AS/400 Server alias name.
10. Select the correct remote location name from the combination box.
11. Click **OK** to leave the **Add Server Alias Name** dialog..
12. Click **OK** to save and close the notebook.

CODE/400 TCP/IP Setup

After you have installed the product, start the CODE Daemon (also referred to as TCP/IP Communication Server).

Note: Ensure that your user profile has a unique non-system library as its current library.

To start the daemon with an interactive emulation session and STRCODE command:

1. Click **Start > Programs > VisualAge RPG and CODE400 > TCPIP Communication Server**.
2. Start a 5250 emulation session if it is not already started and sign on.

3. On the host's command line, type STRCODE and then select PF4. Use the IP address of your workstation (where the TCPIP Communication Server is running) for the RMTLOCNAME parameter.

Tip: If your TCP/IP nameserver is properly configured, you can use your workstation's hostname in the RMTLOCNAME field.

4. If the CMNTYPE parameter type *TCPIP does not exist, apply the correct PTF for your AS/400 operating system (see the product README for details).

Important: Read the cover letter which accompanies the PTF and follow the instructions carefully.

5. For the CMNTYPE parameter type *TCPIP.
6. Press Enter. The Cooperative Development Environment/400 display appears on your 5250 emulation window.

CODE communications can also be used without an interactive emulator session and the STRCODE command.

To configure and define a VCOM server to use CODE/400 without the STRCODE command:

1. Follow the TCP/IP setup instructions for VisualAge RPG but do not define the server.
2. Start the TCP/IP Communications server. An icon will appear in your taskbar.
3. Right-click on the icon and select **Define TCP/IP servers**.
4. Click **Add**. The **Add TCP/IP Server** dialog appears.
5. Enter the Host name or IP address of your AS/400 server.
6. Click **OK**, then **Close**.

Due to the fact that VCOM servers run in a batch job, the following functions are unavailable to VCOM servers:

- Prompting CL commands in CODE Editor, CODE Program Generator, and CODE Project Organizer
- Prompting CL help in CODE Editor and CODE Project Organizer
- Running interactive programs
- Debugging interactive programs

Tip: You can start up to twenty connections to one or multiple AS/400 hosts. However, you must specify a unique server name for each host.

SNA Communications

SNA configuration involves many more steps than standard TCP/IP configuration. You must fully configure the prerequisite products you choose before you begin using VisualAge RPG and CODE/400. SNA setup must be done separately for VisualAge RPG and CODE/400 components.

VisualAge RPG SNA Setup

Ensure that you have one of the following products installed:

1. IBM Personal Communications Release 4.3 or later for Windows and IBM LLC2 protocol driver.
2. Client Access for Windows V3R1M2 or later and Microsoft DLC32 protocol driver.

Note: If you have both products installed, then Personal Communications will be used as the default.

Configuring Personal Communications

Install Personal Communications according to the instructions provided with the product.

To configure Personal Communications for VisualAge RPG in a LAN environment, click **Start > Programs > IBM Personal Communications > SNA Node Configuration**.

Configure node:

1. From the Configuration Options dialog, select **Configure Node**.
2. Click **New**.
3. In the Define a Node window, under **Basic**, type:

Fully Qualified CP Name:

xxx.yyy

Where xxx is your SNA network ID (obtained from your system administrator) and yyy is your workstation ID.

This will also be used as the name of the device description for your connection to the AS/400 server.

4. Click **OK**.

Configure devices:

1. From the Configuration Options dialog, select **Configure Devices**.
2. Click **New**.
3. In the Define a LAN Device window, click **OK** to create the device.

Note: If you are configuring multiple AS/400 servers, you need to create a device for each server. Change the local SAP to one that has not been used before by using the drop-down menu. The first one is 04, the next one is 08, and so on.

Configure connections:

1. From the Configuration Options dialog, select **Configure Connections**.
2. Click **New**.
3. In the Define a LAN Connection window, under **Basic**, type:

Link Station Name:

zzz

Where zzz is the name assigned to your AS/400 server.

Destination Address:

#####

Where ##### is the address of your AS/400 server. You can obtain this from your system administrator.

4. In the Define a LAN Connection window, under **Adjacent Node**, type:

Adjacent CP Name:

xxx.zzz

Where xxx is your SNA network ID and zzz is the name assigned to your AS/400 server.

Note: If you have multiple AS/400 servers, each one should have a unique device name.

5. Click **OK**.

Configure Partner LU 6.2:

1. From the Configuration Options dialog, select **Configure Partner LU 6.2**.
2. Click **New**.
3. In the Configure A Partner LU 6.2 window, under **Basic**, type:

Partner LU Name:

xxx.zzz

Where xxx is your SNA network ID and zzz is the name assigned to your AS/400 server.

Note: The Partner LU Alias will default to ZZZ in uppercase. The alias must match the remote location server name specified in your RST file. It is also the name that appears in your server list.

4. Click **OK**.

After completing the above steps, select **File > Save** to save the configuration.

To start the node, select **Start > Program > IBM Personal Communications > Administrative and PD Aids > SNA Node Operations**. In the SNA Node Operations window, select **Operations > Start Node**.

Configuring Client Access

To configure Client Access, do the following:

Configure the NetSoft Router for use with your AS/400 server:

1. Click **Start > Programs > NS Router > Configuration Wizard**.
2. At the dialog that contains Midrange Workspace, select **Next**.
3. Pick a Link Type of 802.2, then select **Next**.
4. The next few dialogs will prompt you for information about your AS/400 server, such as its Token Ring address, system name, your default user ID and password information, the SNA/APPC Network ID, PC location name, and so on. Use the computer name on the PC Information Panel.
5. Once you have provided this information, a summary appears. If correct, select **Finish**.

Check the connection:

1. Click **Start > Programs > NS Router > NS Administrator**.
2. In the NS Administrator window, change the label to the name of your AS/400 server by right-clicking on the router and selecting **Rename**.
3. Double-click on your AS/400 name. You will get an NS/Router dialog for the AS/400 server.
4. Highlight the system name, and then click **System > Connect System**. The program should report one of the following situations:
 - The connection was *successful*.
Click **System > Disconnect System** and proceed to the next step.
 - The connection *failed*.
Something may be wrong with your AS/400 server, or some element of Client Access has not been installed correctly. Please recheck your configuration.

Add Client Access information for the router connection you just confirmed:

1. From the **Program** menu, select **Client Access**, then double-click on **AS/400 Connections**.
2. In the AS/400 Connections dialog, click **Connection > New**. The **Add AS/400 Connection** wizard appears. Click **Next**.

3. From the **Provider** list, click **Netsoft NS Router**. Click **Next**.
4. Enter the name of your AS/400 server, then click **Next**. If asked whether this system is going to be your "Managing System", answer **Yes**.
The managing system provides the correct codepage tables for characters displayed on your workstation.
5. Enter your default user ID, then click **Next**.
6. Select the default view type you want for this connection. Your choices will depend on which Client Access components you have previously installed. You should select a view that includes one of the emulators that are provided by Client Access. If in doubt, select the default view (you can change it later from the **AS/400 Connections** menu). Click **Next**.
7. Click **Verify Connection**.
8. After you have verified the information, click **Finish**.
9. Select your system from the **AS/400 Connections** window and then click **Connection > Connect** to activate the connection.
10. Enter your password and then click **OK**.

CODE/400 SNA Setup

Ensure that you have one of the following products installed:

1. IBM Personal Communications Release 4.3 or later for Windows and IBM LLC2 protocol driver
2. Client Access for Windows and Microsoft DLC32 protocol driver
3. RUMBA

Configuring Personal Communications

Install and configure the product according to the instructions for VisualAge RPG in "Configuring Personal Communications" on page 20.

There are two transaction programs which must be configured for CODE/400, EVFCCL62 and EVFCACK. To set up the Transaction Program definitions, do the following:

1. From the SNA Node Configuration window, select **Configure Transaction Programs**.
2. Click **New**.
3. In the Define a Transaction Program window, enter:

TP Name:

EVFCCL62

Complete Pathname:

d:\ADTSWIN\SYSTEM\EVFCCL62.EXE

Program Parameters:

EVFCPCOM

Conversation Security:

None

4. Click **OK**.
5. Repeat the above steps to create a definition for EVFCACK. Use the following values:

TP Name:

EVFCACK

Complete Pathname:

d:\ADTSWIN\SYSTEM\EVFCACK.EXE

Program Parameters:

EVFCAKPC

Conversation Security:

None

Configuring Client Access

Follow instructions for VisualAge RPG but insert the following step after "Configure the NetSoft Router for use with your AS/400 server" in "Configuring Client Access" on page 22.

Set up transaction profiles using the NetSoft Administrator:

1. Click **Start > Program > NS Router > NS Administrator**.
2. Highlight **New NS/Router**. Right-click **Rename**, and enter your AS/400 name.
3. Right-click **Properties**. Configure the local transaction profiles (TPs) by clicking **Common > Advanced Properties > Local TP's > Add**. Enter the following information:

Profile Name:

EVFCCL62

TP Name:

EVFCCL62

TP FileSpec:

d:\ADTSWIN\SYSTEM\EVFCCL62.EXE (full filespec for evfccl62.exe including the drive where CODE/400 is installed on your workstation)

TP Parameters:

(leave this blank)

Conversation Security:

(leave unchecked)

Click **OK**.

4. Repeat step 3 for the transaction profile called EVFCACK, whose TP FileSpec is d:\ADTSWIN\SYSTEM\EVFCACK.EXE
5. Click **OK** again.

Continue with "Check the connection".

Configuring RUMBA

Install and configure RUMBA according to the instructions provided with that product.

There are two transaction programs which must be configured for CODE/400, EVFCCL62 and EVFCACK. To set up the Transaction Program definitions, do the following:

1. On the RUMBA APPC Configuration window, select **Programs**.
2. Click **Add**.
3. In the Configure Transaction Programs window, enter:

Full Name:

EVFCCL62

Executable File:

d:\ADTSWIN\SYSTEM\EVFCCL62.EXE

Command Line:

EVFCRMBA

4. Click **OK**.
5. Repeat the above steps to create a definition for EVFCACK. Use the following values:

Full Name:

EVFCACK

Executable File:

d:\ADTSWIN\SYSTEM\EVFCACK.EXE

Command Line:

EVFCAKRU

Additional Information for CODE/400 Users

Configuring Communications Between AS/400 Host Sessions and the Workstation

Communication between a VisualAge RPG and CODE/400 workstation and an AS/400 host system is based on SNA LU 6.2, supporting multiple asynchronous communications links between a workstation requester and a host server.

On the host side, to establish these links you must create a customized ICF file for each AS/400 host you will use VisualAge RPG and CODE/400 with. The file must reside in a library which appears in your library list. Follow the instructions in “Creating a Customized Intersystem Communications Function (ICF) File”.

On the workstation side, all necessary transaction profiles are created for you when you install VisualAge RPG and CODE/400. A transaction profile is a program that defines how communications should be handled between two systems.

In addition to the communications outlined in this chapter, the debugger requires a standard TCP/IP configuration for its communication. Use the steps outlined in the Windows help to setup your network connection for TCP/IP.

Creating a Customized Intersystem Communications Function (ICF) File

An ICF file is shipped with VisualAge RPG and CODE/400. Copy this file to your personal library, and ensure that this library is in your library list. Each user must have a personal copy of the file. To copy and customize it for your use, do the following:

1. Use your communications program to establish a host session and log on.
2. On the AS/400 command line, type:

```
CRTDUPOBJ
```

and press **F4** (Prompt). The Create Duplicate Object (CRTDUPOBJ) display appears.

3. Enter values on this display as follows:

```
                                Create Duplicate Object (CRTDUPOBJ)
Type choices, press Enter.
From object . . . > EVFCICFF00   Name, generic*, *AL
From library . . . > QCODE       Name, *CURLIB
Object type . . . > *FILE       *ALL, *ALRTBL, *AUT
                                + for more values
To library . . . > MYLIB       Name, *SAME, *FRO IB...
New object . . . > EVFCICFF    Name, *SAME, *OBJ
                                                                Bottom
F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
F24=More keys
```

Figure 1. Example: Create Duplicate Object display, with values entered

4. Specify ***YES** for the **Duplicate data** field.
5. Press **Enter**. You are returned to the AS/400 Main Menu, which now displays a message that this file has been created.

The ICF file required for VisualAge RPG and CODE/400 is now copied to your personal library. Your personal library must be in your library list for the ICF information to take effect.

SNA Startup Notes

The following sections deal with special notes about running your communications when working with CODE/400.

ICF Device Entry: If your workstation and the AS/400 host do not have the same network identifier (in other words, if they are not part of the same network), you must customize your ICF device entry.

If you are not sure whether your workstation and the AS/400 host are part of the same network, try specifying your remote location name the first time you start CODE (STRCODE). If VisualAge RPG and CODE/400 cannot establish a connection, you probably need to change the device entry for your ICF file.

For instructions on how to create an ICF file, refer to “Creating a Customized Intersystem Communications Function (ICF) File” on page 26.

For instructions on how to either customize or change your ICF device entry, see “Appendix B. Changing an Intersystem Communications Function (ICF) Device Entry” on page 43.

Starting a Single VisualAge RPG and CODE/400 Server: For the first execution of the STRCODE command, you must specify your LU name for the parameter RMTLOCNAME.

You can also use the same ICF file for a different workstation by specifying a different RMTLOCNAME on the STRCODE command. The RMTLOCNAME specified is remembered from one STRCODE execution to the next (that is, a CHGICFDEVE is done for you automatically when you specify a value for the RMTLOCNAME parameter).

Note: You cannot use the same ICF file to start two servers with different RMTLOCNAMEs at the same time.

Depending on how much resource is available on your workstation, you can use up to twenty servers linked to one or more host systems at any one time.

Chapter 5. Preparing Your Programs for Use with CODE/400

The CODE/400 host compilers use events files to store compile messages. If an events file is not created, these messages cannot be returned to the workstation. There are several methods you can use to ensure that an events file is created when you compile a program:

- If an events file is needed for the present compilation, add the following to the appropriate Create Program command:
OPTIONS(*EVENTF)
- For Original Program Model (OPM), add either:
OPTION(*SRCDBG) or OPTIONS(*LSTDBG)

Note: All of the predefined compile actions in CODE/400 already have the appropriate option specified.

If you are using the Application Development Manager/400 BLDPART command to compile programs, you will need to do one of the following:

- If events files are always desired, put the required parameter in **QDFT BLDOPT** in the root group.
- If events files are only desired at a certain group level, put the required parameter in **QDFT BLDOPT** at that level.
- Specify the option as a BLDOPT part with the same part name as the program part to be compiled.

The BLDOPT part template has a special CODE/400 section. To use the options contained in that section, uncomment the lines containing the appropriate command. For more information on BLDOPT parts, see *ADTS/400: Application Development Manager User's Guide*.

Chapter 6. Starting VisualAge RPG and CODE/400

To introduce yourself to the product, click **Start > Programs > VisualAge RPG and CODE400 > VARPG and CODE400 Information > Getting Started with CODE400 and VisualAge RPG.**

Alternatively, you can use an HTML-based tutorial, which is available for download on our Web site:

<http://www.ibm.com/software/ad/varpg/download/#interactive>. This interactive tutorial records your progress so you can easily return to the last exercise you completed. Quizzes at the end of each lesson help test your understanding of the unit.

Note: To use the tutorial, you will require a browser that can handle frames, Java, and Javascript. You also need a file extraction tool, like WinZip, that can handle long file names.

To start VisualAge RPG and CODE/400, click **Start > Programs > VisualAge RPG and CODE400**. Choose either **VisualAge for RPG** or **CODE400 Tools**. Finally select the component you want.

For VisualAge RPG, the primary component is the GUI designer. For CODE/400 the primary component is the CODE Editor.

Starting Communications

When using the STRCODE command and TCP/IP, you must start the CODE Daemon (also referred to as TCP/IP Communication Server) on the workstation.

To start the CODE Daemon, click **Start > Programs > VisualAge RPG and CODE400 > TCPIP Communication Server.**

Note: This daemon runs on port 4200 by default. If you have other TCP/IP processes which require that port, you can specify a different port by starting the daemon from the command line. For example:

```
x:\ADTSWIN\SYSTEM\EVFCTCPD /P=4800
```

Other command line options are listed in “Appendix A. CODE Daemon Reference” on page 41.

Before you begin using the STRCODE command, make sure your current library points to a user library (not a system library such as QTEMP or QGPL)

where the object *USRSPC can be created. This object stores your settings and PC location for the STRCODE connection. In the future, CODE will retrieve your settings from the library you defined.

To establish a CODE/400 host server for the first time, type STRCODE at an AS/400 command line and press F4. The Start CODE (STRCODE) display appears:

```
Start CODE (STRCODE)
Type choices, press Enter.
Host server name . . . . . OS400          Character value
Remote location name . . . . myibmpc
Communications type . . . . *TCPIP    *PRV, *APPC, *TCPIP
                                           Bottom
F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display      F24=More keys
```

Figure 2. Start CODE (STRCODE)

For the first execution of the STRCODE command, you must specify your host server, remote location name, and communications type.

Enter the name of your host server (the default is OS400).

Notes:

1. Any name (with the following exceptions) can be specified for the host server.
2. The following server names are reserved, and should not be used:
 - LOCAL
 - REMOTE
3. The name of the server should not start with a digit (0-9).

You must also specify your remote location name. This is the name of your remote workstation's Logical Unit (LU) or PC local name specified in the SNA base profile of your communications program. In this example it is MYIBMP.C.

For each subsequent execution of the STRCODE command, you can enter STRCODE without being prompted. You should only do this if your host server name is OS400. The STRCODE command does not save your host server name.

Press **Enter**.

The following screen appears:

```
EVFCLOGO                                TESAS999
      IBM CoOperative Development Environment/400
      Host Server: <OS400>
      (c) Copyright IBM Corp., 1992, 1998. All rights reserved.
01-01  SA      MW      KS      IM      II S1 TESAS999 KB
```

Figure 3. CODE Logo

This emulator session is now acting as a VisualAge RPG and CODE/400 server with the name OS400. The name of your server should appear as an option whenever you choose to select a file.

Using STRCODE in Batch

You can also issue the STRCODE command in batch. If you decide to do this, you should consider the following requirements:

- No interactive host commands can be issued from your programmable workstation.

Debugger Server

To use the IBM Distributed Debugger, the debugger server on the AS/400 host must be started. You or your system administrator can start this server using the following AS/400 command:

```
STRDBGSVR
```

Once this has been done, it need not be repeated.

Multiple Servers

The VisualAge RPG and CODE/400 product on your workstation can communicate with more than one AS/400 server. Multiple servers allow you to work with files on several different AS/400 host machines at the same time. You can edit files from different servers, and even cut and paste from a file on one server to a file on a different server.

You may also want to start several servers on the same AS/400 host. This lets you continue working if one server is tied up waiting for input or performing a task. This can be especially useful for debugging.

Note: You must specify a unique server name for the host you wish to connect to.

Servers and Break Messages

While the CODE server is active, VisualAge RPG and CODE/400 changes your job's break message state to *HOLD, and then restores it to its original state when the server is shutdown. This prevents break messages from causing your session to be temporarily suspended.

You may want to receive break messages while you are using a CODE server so that you can see how a job is progressing without leaving the CODE host session. To do this, use the same user profile to sign on to more than one session, and default your *USRPRF message queue in the first sign-on to *BREAK. You will not be able to obtain the *USRPRF message queue for *BREAK mode in subsequent sign-ons. Start the CODE server in one of the subsequent sign-ons so that the first sign-on will get the break messages rather than the one with the CODE server.

Note: None of the above will prevent messages sent with the SNDBRKMSG command from interrupting the CODE server.

Shutting Down CODE/400 Servers

If you want to shut down a server, right click the CODE daemon in the system tray and select **Work with STRCODE Servers** from the popup menu. The window that appears contains a list of all active servers. Select the one you wish to shutdown and then click **Shutdown**. You can also click **Start > Programs > VisualAge RPG and CODE400 > CODE400 Tools > Work with Servers** to open the same window.

If you want to shut down all active CODE servers, right click the CODE daemon in the system tray and select **Shutdown all STRCODE Servers** from the popup menu.

Starting VisualAge RPG and CODE/400 Tools from an AS/400 Host

It is also possible to create user-defined options through the AS/400 Programming Development Manager, Application Development Manager/400, and Application Dictionary Services/400 products. The following is an example of a user-defined option to invoke the CODE Editor from a list of members:

```
Change User-Defined Option
Type changes, press Enter.
Option . . . . . CE Value to change to
Command . . . . .
CALL QCODE/EVFCFDBK PARM('37' 'Y' 'OS400'
'<LOCAL> CODEEDIT "<>&L/&F(&N)''')
```

Figure 4. Change User-Defined Option display

User-defined options can also be created to use other commands like CODEBRWS and CODEFSTR.

Important Notes

- For SNA, in order to call the QCODE/EVFCFDBK command, the library containing the EVFCICFF communications file must be found in the library list of your interactive job.
- For TCP/IP, in order to call QCODE/EVFCFDBK command, the library that contains the object STRCODE of type *USRSPC (which was created in your current library when you issued the STRCODE command) must be found in the library list of your interactive job.
- If you want to invoke a local command on the workstation from the AS/400, you should have an active CODE server running on the workstation.
- The first three parameters of the QCODE/EVFCFDBK command must be specified. The parameters are the CCSID of the AS/400 job, to enable acknowledgement messages (Y/N), and the server name from the STRCODE command or the VCOM server name.
- The empty brackets (<>) shown in the example above specifies that the first CODE active server that is found will be used. You may choose to provide a specific server name, such as <OS400>.

Chapter 7. Maintaining VisualAge RPG and CODE/400

This section provides information on maintaining VisualAge RPG and CODE/400. Tasks that you may need to perform are deleting and uninstalling the product, adding components to the product, and applying service packs.

Deleting from the AS/400 System

There are two ways to delete VisualAge RPG and CODE/400 from the AS/400 system.

Method 1

To delete the VisualAge RPG and CODE/400 licensed program:

1. Sign on to your AS/400 system as security officer (QSECOFR).
2. Type the Delete Licensed Program (DLTLICPGM) command:

```
DLTLICPGM LICPGM(5763CL2) OPTION(*ALL)
```

Method 2

To delete the VisualAge RPG and CODE/400 licensed program:

1. Type on an AS/400 command line:

```
GO LICPGM
```

The Work with Licensed Programs display appears.

```
LICPGM                Work with Licensed Programs
Select one of the following:
  Manual Install
    1. Install all
  Licensed Programs
    10. Display installed licensed programs
    11. Install licensed programs
    12. Delete licensed programs
    13. Save licensed programs
  Secondary Languages
    20. Display installed secondary languages
    21. Install secondary languages
    22. Delete secondary languages
Selection or command
===> _____

F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=Information Assistant
F16=AS/400 Main menu
```

Figure 5. Work with Licensed Programs display

2. Type 12 on the command line to choose Delete licensed programs from the menu.
3. Type 4 beside 5763CL2 components you wish to delete.
4. Confirm your selections.

Uninstalling VisualAge RPG and CODE/400 from the Workstation

To uninstall the product from the workstation, see “Uninstalling VisualAge RPG and CODE/400 from the Workstation” on page 7.

Adding and Updating Components

To add or update selected components of an existing installation, issue the `x:\qadtswin\setup` command. The installation utility will detect the existence of the product on your system and you can choose one of the following options:

- Delete and re-install
- Update/add component(s) to current installation

Note: Selecting to update the component will result in the installation of the new version over the old version.

You will then be prompted to select which component(s) you want to install.

Service Packs

When you use an AS/400 system, you may get Service Packs from IBM. These Service Packs must be applied on your AS/400 and then downloaded to your workstation or a LAN. You can also download the Service Packs from our Web site at <http://www.ibm.com/software/ad/varpg>.

A service pack can be copied to a LAN server for enterprise-wide distribution. Alternatively, if you have access to a CD burner, you can create your own CD-ROM to distribute the service pack to all VisualAge RPG and CODE/400 license holders.

Instructions on using the Service Pack are found below.

Note: To see the latest information about a specific service package, click **Start > Programs > VisualAge RPG and CODE400 > Service Packs > Service README**

Installing from a Managing AS/400 System

The following method should be used if you have received the VisualAge RPG and CODE/400 Service Pack through the AS/400 PTF ordering process (either as an individual PTF order or as part of an OS/400 PTF cumulative

package). Once this Service Pack has been applied to the managing AS/400 system with the LODPTF and APYPTF AS/400 commands, it can be installed on individual PCs.

Client Access is required to attach to the AS/400 file system as a drive letter. Other communication products with the same function can be used as well.

To install, click **Start > Programs > VisualAge RPG and CODE400 > Service Packs > Start Service**.

If the AS/400 file system is not pointed to the QADTSWIN folder, you must specify QADTSWIN in the Service Pack source path.

Installing from a Local or Network Drive

The following method should be used if you received the VisualAge RPG and CODE/400 Service Pack as a set of installation image files, not as PTFs from an AS/400 server. This is the case if you downloaded the files from our Web site.

To install, click **Start > Programs > VisualAge RPG and CODE400 > Service Packs > Start Service**.

The Service Pack source path must point to the QADTSWIN folder to start collecting the new Service Pack information.

Once the install setup program has completed, you can remove the install image files from your Local or Network drive.

Silent Installation (Unattended)

Setup.iss is a configuration file used by the Service Pack Utility to support silent installation (unattended/remote installation). To install a Service Pack in Silent mode, type the command:

```
x:\adtswin\setup.exe -s -f service.ins
```

Where x: is the drive in which VisualAge RPG and CODE/400 is installed. A single message indicates that Silent Installation is running. All Service Pack parameters are now taken from the setup.iss configuration file. The following parameter must be changed to indicate from where to install the Service Pack:

```
szDir=N:\ADTSWIN\SPxxx
```

Where xxx is the version of the service pack.

This line should point to the directory in which the Service Pack is located. Silent Installation creates a file called SETUP.LOG that contains the line "ResultCode = 0" which means successful installation. Any other value means failure and you should talk to an IBM Service Rep. for help.

Removing the Service Pack

It is strongly recommended that you close all applications and restart your PC before removing a Service Pack to properly terminate any DLLs that are in use.

To remove Service Pack from your PC:

1. Click **Start > Settings > Control Panel**.
2. Double-click on the **Add/Remove Programs** icon.
3. Click the **Install/Uninstall** tab, click on the "VisualAge RPG and CODE/400 Service Pack xxx" item, and then click **Add/Remove**.
4. Follow the instructions on the screen.

Or you can click **Start > Programs > VisualAge RPG and CODE/400 > Service Packs > Start Service** and select the **Uninstall last Service Pack** option.

Copying a Service Pack

The option to copy Service Pack is designed mainly to copy a Service Pack from an AS/400 server to a Local or Network drive. It creates a small version of the product folder (QADTSWIN, QCODEWIN, and QVRPGWIN) with just the files needed to install a Service Pack. The same instructions apply to how the Source and Target locations are entered in the entry field, it should be: I:\source_directory where source_directory is where the folder QADTSWIN can be found.

Appendix A. CODE Daemon Reference

The following information explains the features of the new CODE Daemon (also referred to as TCP/IP Communication Server). The daemon is started by issuing the command EVFCTCPD. The command has several parameters, explained below.

Announce new connections

The daemon will display a message indicating the TCP/IP name or IP address of the system every time a connection request is received from an AS/400 server. If enabled, users will see this message whenever they issue STRCODE or when they submit a batch compile request that involves feedback.

/A (on)

/A+ (on)

/A- (off)

The default is off.

The STRCODE beep

If enabled, you will hear 3 beeps when STRCODE establishes a connection. On Windows 95 and 98, you may hear nothing because the default is no sound.

/B (on)

/B+ (on)

/B- (off)

The default is on.

Use TCP/IP domain name server (DNS) when reporting names

Any messages that include a reference to a host will use the TCP/IP name instead of the IP address. For instance "machine209.swlab.ibm.com" instead of "9.29.47.58".

/N (on)

/N+ (on)

/N- (off)

The default is off.

Use a different TCP/IP port number

You can specify a value in the range from 1-65536. This value should match whatever value is used for STRCODE on the AS/400 server. STRCODE defaults to port 4200.

/P=4200 (default daemon value)

/P=12345 (any value in 1-65536 range)

The daemon uses port 4200 by default.

Restrict daemon connections to a specific AS/400 system

For instance, to allow only connections from MACHINE209, specify /S=TORAS209. Connections from any other system will result in the daemon issuing an error message and then ending the connection. The [system name] is the actual name of the AS/400 server, not its TCP/IP name or IP address although the TCP/IP name may coincidentally be the same.

/S=[system name]

There is no default.

This parameter only takes effect if it is specified.

Restrict daemon connections to a specific AS/400 userid

For instance, to allow only connections from an AS/400 user named SMITH, specify /U=SMITH. Connections from any other userid will result in the daemon issuing an error message and then ending the connection. The [user id] is the AS/400 logon id or user profile name being used to connect to the daemon.

/U=[user id]

There is no default.

This parameter only takes effect if it is specified.

General notes:

- Parameters are not case sensitive. You can specify them in either upper or lower case.
- A dash '-' can be used in place of the slash '/' to indicate a parameter.
- To use these parameters, issue the command x:\ADTSWIN\SYSTEM\EVFCTCPD. There are no parameters specified in the daemon shortcut; defaults are used. You can update the shortcut by going into its properties, selecting **Shortcut**, then adding any parameters to the "target" string.
- None of the parameters are mutually exclusive. All can be specified in any order or combination. If you specify the same parameter more than once (for example EVFCTCPD /N+ /N-) then the last one (/N-) will take effect.
- Extra security related parameters:
 - /Y=[strcode user id] (restrict daemon connections via STRCODE userid)
 - /Z=[strcode password] (restrict daemon connections via STRCODE password)

Appendix B. Changing an Intersystem Communications Function (ICF) Device Entry

This section describes how to customize an ICF device entry if your workstation and the AS/400 host have different network identifiers. See “ICF Device Entry” on page 27 for related information.

1. On the AS/400 command line, type:
CHGICFDEVE
2. Press F4 (Prompt). The following display appears:

```
Change ICF Device Entry (CHGICFDEVE)
Type choices, press Enter.
ICF communication file . .      _____  Name
Library . . . . .             *LIBL      Name, *LIBL, *CURLIB
Program device . . . . .      _____  Character value
                                                    Bottom
F3=Exit  F4=Prompt  F5=Refresh  F12=Cancel  F13=How to use this display
F24=More keys
```

Figure 6. Change ICF Device Entry (CHGICFDEVE) display

3. Type the following values on this display:

ICF Communication file:

EVFCICFF

Library:

The name of the library in your library list where you copied the ICF file.

Program device:

CODE

The display is updated as follows:

```
Change ICF Device Entry (CHGICFDEVE)
Type choices, press Enter.
ICF communication file . . > EVFCICFF Name
Library . . . . . > MYLIB Name, *LIBL, *CURLI
Program device . . . . . > CODE Character value
Remote location . . . . . *SAME Name, *SAME, *REQUE
Communication type . . . . . *APPC *ALL, *APPC, *ASYNC
Bottom
F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display
F24=More keys
```

Figure 7. Change ICF Device Entry display, with initial values entered

4. In the **Remote location** field, type the remote location name that the AS/400 system uses to refer to your workstation.
5. Press Enter. A display similar to the following appears:
Enter the following values on this display:

```
Change ICF Device Entry (CHGICFDEVE)
Type choices, press Enter.
ICF communication file . . > EVFCICFF Name
Library . . . . . > MYLIB Name, *LIBL, *CURLIB
Program device . . . . . > CODE Character value
Remote location . . . . . > MYLUNAME Name, *SAME, *REQUESTER
Communication type . . . . > *APPC *ALL, *APPC, *ASYN...
Device . . . . . Name, *SAME, *LOC
Local location . . . . . Name, *SAME, *LOC, *NETATR
Mode . . . . . Name, *SAME, *NETATR
Remote network identifier. Name, *SAME, *LOC, *NETATR...
Format select . . . . . *SAME, *PGM, *RECID, *RMTFMT
Conversation type . . . . . *SAME, *SYS, *USER, *SRCPGM
Bottom
F3=Exit F4=Prompt F5=Refresh F12=Cancel F13=How to use this display
F24=More keys
```

Figure 8. Change ICF Device Entry display, with additional fields shown

Device:	*LOC
Local location:	*NETATR
Mode:	QPCSUPP

Remote network identifier: The name of your workstation's *network*. You must include this value if your workstation and the AS/400 host do not have the same network ID.

If you need to check it, issue the following command from an AS/400 command line.

DSPNETA

The *Local network ID* that appears in the *Display Network Attributes* display is the AS/400 network ID.

Format select: *PGM

Conversation type: *SYS

6. Press Enter. The AS/400 Main Menu appears, with a message at the bottom:

```
MAIN                      AS/400 Main Menu                      System:  SYSTEM1
Select one of the following:
  1. User tasks
  2. Office tasks
  3. General system tasks
  4. Files, libraries, and folders
  5. Programming
  6. Communications
  7. Define or change the system
  8. Problem handling
  9. Display a menu
 10. User support and education
 11. PC Support tasks
 90. Sign off
Selection or command
===>
F3=Exit  F4=Prompt  F9=Retrieve  F12=Cancel  F13=User support
F23=Set initial menu
Device changed in file EVFCICFF in library MYLIB.
```

Figure 9. AS/400 Main Menu, with completion message for Change ICF Device Entry (CHGICFDEVE) command

The ICF configuration for your VisualAge RPG and CODE/400 session is finished. The library to which the ICF File belongs should be in the library list for CODE communications.

Appendix C. VisualAge RPG SQL Setup

This section describes one configuration method that can be used to set up access for SQL processing. Refer to the following publications for details on DB2[®] setup and configuration:

- *DB2[®] Universal Database[™] for Windows NT Quick Beginnings, GC09-2835*
- *DB2[®] Connect[™] Enterprise Edition Quick Beginnings, GC09-2828*

The following products must be installed before you can set up access to an AS/400 database:

- DB2 Universal Database with: a type of client, a SDK with a local database, or a SDK with a server.
 - Choose a client if you always access databases on other workstations or hosts. Your own workstation cannot have its own database.
 - Choose an SDK with a local database if you access databases on other workstations, hosts, and on your own workstation.
 - Choose an SDK with a server if you want the capability of the client with local database choice and you want other clients to access databases on your own workstations.

If you choose standalone, you cannot connect to a remote database.

- DB2 Connect
- DB2/400

OS/400 releases prior to V4R2 only support the SNA protocol. Releases V4R2 and above support both TCP/IP and SNA.

To set up access to an AS/400 database, do the following:

- Set up your DB2 Connect system.
- Set up the AS/400 server.
- Set up the DB2 server.
- Set up the DB2 Client Application Enabler.
- Test the database connection.

Setting up your DB2 Connect System for a Remote Database Server

The following environment variables should be defined on the workstation where DB2 Connect is installed:

1. Click **Start > Settings > Control Panel**.
2. Double-click on the System icon.
3. Select the Environment page of System Properties.
4. Create or append these values to the following environment variables:

DB2CODEPAGE

Code page number that matches the code page defined for the user profile on the host.

DB2INSTANCE

DB2

DB2COMM

TCP/IP, APPC

It is easier to use TCP/IP to make the connection between the DB2 server and the remote clients if the DB2 server is on a platform that supports TCP/IP.

For SNA protocols, the following properties must be configured correctly before DB2 Connect can communicate with the host:

- AS/400 Server Properties
- APPC Local LU Properties
- APPC Mode Properties
- Host Connection Properties
- APPC Remote LU Properties
- APPC Symbolic Destination Name Properties

To set up the DB2 Server to accept connection requests from DB2 Clients, refer to *DB2 Connect Enterprise Edition Quick Beginnings* for step-by-step instructions on configuring a server-to-client connection using the TCP/IP protocol.

Setting up the AS/400 Database Server

To set up the AS/400 server:

1. Sign on to the AS/400 server.
2. Issue the command `CRTMODD IBMRDB`.
3. Issue the command `WRKRDBDIRE`.
4. In the Relational Database field, type a descriptive name for the AS/400 server system, for example, `DBon400`.
5. In the Remote Local field, type `*LOCAL`.
6. Issue the command `STRSQL`.
7. Issue the command `CREATE COLLECTION NULLID`.
8. Press F12 to exit `STRSQL`.
9. Issue the command `GRTOBJAUT NULLID/*ALL *ALL USER(your_userid)`.
10. Issue the following commands and include the appropriate parameters: `CRTJRNRV`, `CRTJRN`, and `STRJRNPf`.

Setting up the DB2 Server

To update the Database Manager Configuration File for APPC:

1. Select the DB2 Command Window from the Start menu.
2. Issue the following command:

```
db2 update database manager configuration
    using tpname 07F6C4C2
```

where 07F6C4C2 is the default value required by DB2.

3. Stop and then restart the database manager.

To complete the configuration, issue the following commands to catalog the remote database for the workstation server:

1. Update the node directory:

```
db2 catalog appc node appcnode
    remote DBon400 security program
```

where appcnode is a user defined name. DBon400 is the same name as the one defined in the AS/400 server setup. Note that this name is case sensitive.

2. Update the local system database directory:

```
db2 catalog database dbon400 as DBalias
    at node appcnode authentication dcs
```

where dbon400 is the database entry in the local system database directory. DBalias is the database alias. If the alias is not provided, the alias will be the same name as the database name. appcnode is the node from the previous step.

3. Update the dcs directory:

```
db2 catalog dcs database dbon400 as alias400
```

where dbon400 is the database entry in the local system database directory, and alias400 is a user-defined alias for the target database name. If the alias is not provided, the alias has the same name as the database name.

4. Stop and then restart the database manager.

To update the Database Manager Configuration File for TCP/IP:

1. Ensure the TCP/IP on NT has been configured correctly.
2. Define the connection port and interrupt port for the target AS/400 host.

Enter the following information to the file
\\WINNT\\SYSTEM32\\DRIVERS\\ETC\\SERVICES.

First specify the connection port number for the DB2 instance on the AS/400 server host by entering the command:

```
db2instlc 3700/tcp
```

Then specify the interrupt port number by entering the command:

```
db2instli 3701/tcp
```

Where `db2instlc` and `db2instli` are user-defined names and must be unique to your workstation. The port numbers also must be unique and differ by 1.

To complete the configuration, issue the following commands to catalog the remote database for the workstation server:

1. Update the node directory:

```
db2 CATALOG TCPIP node tcpnode remote DBon400 SERVER db2instlc SECURITY DCS
```

where `tcpnode` is a user-defined name. `DBon400` is the same name as the one defined in the AS/400 server setup. Note that the name is case sensitive. `db2instlc` is the alias set up for connecting ports.

2. Update the system database directory:

```
db2 CATALOG DATABASE dbon400 AS DBalias AT NODE tcpnode AUTHENTICATION DCS
```

where `dbon400` is the database entry in the system database directory. `DBalias` is the database alias. If the alias is not provided, the alias will be the same name as the database name. `tcpnode` is the node from the previous step.

3. Update the dcs directory:

```
db2 CATALOG DCS DATABASE dbon400 AS alias400
```

where `dbon400` is the database entry in the system database directory, and `alias400` is a user-defined alias for the target database name. If an alias is not provided, the alias has the same name as the database name.

4. Stop and then restart the database manager.

Binding the Utilities with the Remote Database

Do the following to bind the SQL utilities files:

1. Issue:

```
db2 connect to dbon400 user USERID using PASSWORD
```

where `dbon400` is the remote database name from previous step, and where `USER` and `PASSWORD` are the signon userid and password of the user profile on the host where the database is created.

2. Issue:

```
db2 bind drive:\sqllib\bnd\@ddcs400.lst blocking all
sqlerror continue messages ddcs400a.msg grant public
```

where drive: is the drive where DB2 Connect was installed.

3. Stop and then restart the database manager.

Testing the Database Connection

From the command entry screen, test the database connection by issuing the following commands:

1. db2 CONNECT TO dbon400 user *USERID* using *PASSWORD*
2. db2 SELECT * FROM *table-name* (*any select statement*)
3. db2 CONNECT RESET

If the database and the table exist, and if there is data in the database, the records you selected are displayed.

Appendix D. Secure Sockets Layer (SSL) Setup

Secure Sockets Layer (SSL) provides secure connections by encrypting the data exchanged between a client and an AS/400 server session and performing server authentication. SSL can be used only with a SSL capable AS/400 server running OS/400, Version 4 Release 4 or later. The use of SSL connection significantly decreases performance of the product compared to the use of connection without encryption. It is recommended that SSL be used only when the sensitivity of data transferred merits the decrease in performance.

This section provides instructions on configuring your AS/400 server for Secure Sockets Layer support.

Note: If any fixes are applied to the VARPG run time, the following procedures must be repeated. For SSL to work properly on the AS/400 server, the QSECOFR user profile password must not be expired.

SSL Considerations

- A good knowledge of SSL is required for setup. You should know how to use the Digital Certificate Manager (DCM) program on the AS/400 server to perform SSL related tasks, such as generating system certificates. For information on the DCM program, invoke its online help or go to the Web site at <http://www.ibm.com/as400/infocenter>.
- Ensure that you adhere to import and export regulations. IBM AS/400 Client Encryption products provide SSL version 3.0 encryption support using non-exportable 128-bit for U.S. and Canada use only and exportable 40-bit for international use. In customer configurations where Client Encryption products might be downloaded across national boundaries, the customer is responsible for ensuring that the non-exportable products are not made available outside the U.S. and Canada. Both the non-exportable and exportable Client Encryption products can be used in combination to allow the appropriate Client Encryption product to be downloaded on different Web sites.

Prerequisites

The following prerequisites must be met before setting up SSL:

- Software:
 - Cryptographic Access Provider licensed program (5769-AC1, 5769-AC2, or 5769-AC3)

- Client Encryption licenses program (5769-CE1, 5769-CE2, or 5769-CE3) where CE1 is for use in France, CE2 is for use in countries other than the US, Canada, or France, and CE3 is for use only in the US and Canada.
- Hardware:
 - IBM HTTP Server (5769-DG1)
 - Base operating system option 34 Digital Certificate Manager (DCM)
- Authorization:

Provide proper authorizations for users to access the SSL files. Follow these steps to change the authority:

 1. Enter the command:


```
wrklnk '/QIBM/ProdData/HTTP/Public/jt400/*
```
 2. Choose option **9** in the correct directory (SSL40, SSL56, or SSL128).
 3. Give users ***RX** authority to the directory.

Note: Individual users or groups of users can be authorized.

SSL Setup for the AS/400 Server

Follow the instructions below to setup your AS/400 server for SSL:

Start DCM:

1. Start the HTTP servers by using the command:


```
STRTCPSVR SERVER(*HTTP) HTTPSVR (*ADMIN)
```
2. Access the AS/400 Administration server by typing in your server's URL address and port number. For example:


```
http://your.server.name:2001/
```

The proper security officer authority, plus *secadm and *allobj authorities are needed.

3. Enter your AS/400 user ID and password.
4. From the AS/400 Tasks page, access DCM by selecting the DCM link.

Obtain a system certificate for your AS/400 server from the Digital Certificate Manager program:

Click on the ? icon for instructions on obtaining a system certificate. You can either obtain the system certificate from a trusted Certificate Authority (CA) or build your own.

- To obtain a system certificate from a trusted CA:

Note: This is what you should use if your application is an internet application and you need to distribute your run time.

Select a CA. You can get a certificate from one of the following companies:

- VeriSign, Inc.
- Integration Financial Network
- Thawte Consulting
- RSA Data Security

Obtain request data for submission to the trusted CA:

1. Click **System Certificates**.
2. Select **Work with Certificates**.
3. Click **Create**.
4. Once you receive the request data, copy and paste it into the request from required by your CA.

Your CA will process your request form and provide you with the certificate. To install it onto your system, use the **Receive a System Certificate** option.

- To obtain your own system certificate:

Note: This should only be used for an intranet because the run time created can only be used for your specific AS/400 server.

1. Create your CA on the AS/400 server.
2. Generate the system certificate from your own CA.

For information on creating a CA, on the DCM page click on **Certificate Authority**.

Apply the system certificate to your host servers:

1. If you obtained your certificate from a trusted CA, get the list of server applications from the **Work with Secure Applications** option.
2. Apply the certificate to the following server applications:

```
QIBM_OS400_QZBS_SVR_CENTRAL
QIBM_OS400_QZBS_SVR_DATABASE
QIBM_OS400_QZBS_SVR_DTAQ
QIBM_OS400_QZBS_SVR_NETPRT
QIBM_OS400_QZBS_SVR_RMTCMD
QIBM_OS400_QZBS_SVR_SIGNON
QIBM_OS400_QZBS_SVR_FILE
QIBM_OS400_QRW_SVR_DDM_DRDA
```

SSL Setup for Workstation

To set up SSL for the workstation, follow the steps below:

Download the appropriate version of the SSL Client Encryption software to your workstation from the AS/400 server:

Product	File to Download	Location for Download
5769-CE1	sslighxt.zip	/QIBM/ProdData/HTTP/Public/jt400/SSL40
5769-CE2	sslighxt.zip	/QIBM/ProdData/HTTP/Public/jt400/SSL56
5769-CE3	sslighu.zip	/QIBM/ProdData/HTTP/Public/jt400/SSL128

If you built your own certificate, perform the following steps to download the CA certificate:

1. Download SSLTools.zip from the directory in which you downloaded the SSL Client Encryption.
2. Add SSLTools.zip and sslighu.zip to your CLASSPATH statement.
3. Create a temporary directory. For example, c:\tempkey.
4. Create the following subdirectory under c:\tempkey:

```
com\ibm\as400\access
```

5. From the tempkey directory, run the following command in one line:

```
java com.ibm.sslight.nlstools.keyrng com.ibm.as400.access.KeyRing  
connect <systemname>:<port>
```

Where <systemname> is the name of your AS/400 server and <port> is your port number.

Note: The server port can be any of the host servers to which you have access. For example, you can use 9476, which is the default port for the secure sign-on server on the AS/400 server. When you are prompted to enter a password, enter toolbox. This is the only password that works. The SSL tool then connects to the AS/400 server and lists the certificates it finds.

6. Enter the CA certificate number. Be sure to use the CA certificate and not the site certificate. A message will be issued stating that the certificate is being added to com.ibm.as400.access.KeyRing.class.
7. Delete the file SSLTools.zip.

A KeyRing.class file has been created in the directory.

Create a customized varpg.jar file by following the instructions below:

1. Create a temporary directory. For example, c:\tempjar.
2. Copy the file sslighu.zip to c:\tempjar.

3. Run the following command:

```
jar xvf sslightu.zip
```

You will find the meta-inf and com\ibm\sslight subdirectories created for you in c:\tempjar.

4. If you built your own certificate:

- a. Under subdirectory c:\tempjar\com\ibm add subdirectory \as400\access.

- b. Copy the KeyRing.class file in c:\tempkey\com\ibm\as400\access subdirectory to the c:\tempjar\com\ibm\as400\access subdirectory.

5. Copy the varpg.jar file into c:\tempjar.

6. From c:\tempjar, run the following command:

```
jar uvf varpg.jar -C ./ com
```

Note: C is in uppercase.

Running this command updates the varpg.jar file so that it can be used with your SSL-enabled VARPG applications. This will also work for regular, non SSL-enabled applications.

Enable your application to use SSL:

1. Rename the varpg.jar in your VARPG install directory \ADTSWIN\JAVA.
2. Compile your application with the /SSL user-defined option in the **Build options** dialog.
3. Run the application with the customized file varpg.jar.

Related Publications

- *AS/400 Information Center and Softcopy Library CD-ROM*, SK3T-2027-03
- *ADTS/400: Application Development Manager User's Guide*, SC09-2133-01

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