



AS/400e

AS/400 Toolbox for Java Setup Guide

Version 4



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Note

Before using this information and the product it supports, be sure to read the information in "Notices" on page v.

Third Edition (May 1999)

This edition replaces SC41-5438-01. This edition applies only to reduced instruction set computer (RISC) systems.

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Programming Interface Information

This publication is intended to help you to install and configure the AS/400 Toolbox for Java licensed program. This publication documents General-Use Programming Interface and Associated Guidance Information provided by the AS/400 Toolbox for Java licensed program.

General-Use programming interfaces allow the customer to write programs that obtain the services of the AS/400 Toolbox for Java.

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About AS/400 Toolbox for Java Setup Guide (SC41–5438–02)

This guide describes the necessary steps for installing and configuring the AS/400 Toolbox for Java licensed program.

Who should read this book

This book is intended for people who are familiar with the basic operation of the AS/400 system.

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*) or from one of these Web sites:

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

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Setting up AS/400 Toolbox for Java

The AS/400 Toolbox for Java classes allow you to access AS/400 resources, data, and programs through Java applets and applications.

You must do the following tasks to install the AS/400 Toolbox for Java:


1. Ensure that your workstation meets the requirements for AS/400 Toolbox for Java.
2. Ensure that your AS/400 meets the requirements for AS/400 Toolbox for Java.
3. Install the program files.

You also need to consider the following:

- “Configuring an HTTP server for use with AS/400 Toolbox for Java” on page 5 if you want to use applets from an AS/400 that uses AS/400 Toolbox for Java classes served from the same AS/400.
- “Performance considerations related to installation location” on page 5 to understand when **significant performance impacts** may occur because of where and how you install the class files.
- “Copying the AS/400 Toolbox for Java class files on your workstation” on page 6 for information on copying files to your workstation.

Additional information on AS/400 Toolbox for Java:

All of the V4R4 Java information is provided on the *AS/400e Information Center*. This CD-ROM was shipped with your AS/400 system. The AS/400e series Information Center is also available at the following URL:



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

Workstation requirements for AS/400 Toolbox for Java

To run AS/400 Toolbox for Java, your workstation must have the following:

- **For Java applications:**

1. A Java Virtual Machine that fully supports JDK 1.1.6 or later. The following environments have been tested:
 - Windows 98
 - Windows 95
 - Windows NT Workstation 4.0

- AIX Version 4.1.4.0
 - Sun Solaris Version 2.5
 - AS/400 Version 4 Release 4
 - OS/2 Warp Version 4.0
2. TCP installed.
- **For Java applets:**
 1. A browser that fully supports JDK 1.1.6 or later. The following environments have been tested:
 - JavaSoft HotJava browser
 - Netscape Communicator 4.04 with the JDK 1.1 patch from <http://developer.netscape.com> 
 - Netscape Communicator 4.05 with the JDK 1.1 patch built-in
 - Microsoft Internet Explorer 4.0.
 2. TCP/IP installed.
 - Java programs that use only the *access* classes of the AS/400 Toolbox for Java need only a Java Virtual Machine. Java programs that use the graphical user interface classes of AS/400 Toolbox for Java also need Sun Microsystems Java Swing 1.0.3 (Java Foundation Classes (JFC)1.1). Download JFC 1.1 from <http://java.sun.com/products/jfc/index.html>. 

OS/400 requirements for running AS/400 Toolbox for Java

To run AS/400 Toolbox for Java, the AS/400 system to which you are connecting must have the following:



1. An AS/400 running one of the following:
 - OS/400 Version 4 Release 4
 - OS/400 Version 4 Release 3
 - OS/400 Version 4 Release 2

If you intend to run a Java program that uses the AS/400 Toolbox for Java classes on the AS/400 Java Virtual Machine (JVM), you must run the AS/400 Toolbox for Java at the same version and release level as the Operating System/400 program that is running on your system. Shipped with OS/400 are the parts of the AS/400 Toolbox for Java needed to improve performance when your application is running on the AS/400 JVM. To ensure compatibility, the level of the AS/400 Toolbox for Java must match the level of OS/400.

Level of OS/400	Compatible Level of AS/400 Toolbox for Java
V4R2	V3R2M0
V4R3	V3R2M1
V4R4	V4R2M0

2. If you are going to use the spooled file viewer functions (SpooledFileViewer class) of the AS/400 Toolbox for Java, you must ensure that host option 8 (AFP Compatibility Fonts) is installed on your AS/400.

Note: SpooledFileViewer, PrintObjectPageInputStream, and PrintObjectTransformedInputStream classes work only when connecting to V4R4 or later systems.

3. Host Servers option of OS/400 installed and started on the AS/400.
- The print support in AS/400 Toolbox for Java requires additional function in the OS/400 print server. You must have the appropriate PTF from the following list:
 - For V4R3, 5769SS1: PTF SF48498
 - For V4R2, 5769SS1: PTF SF46476
 - The JDBC driver requires a database server PTF. You must have the appropriate PTF from the following list:
 - For V4R2, 5769SS1: PTF SF46460
 - The process and accuracy of retrieving sign-on server CCSIDs have been improved. These PTRs are not required, but they do improve performance:
 - For V4R3, 5769SS1: PTF SF1257
 - For V4R2, 5769SS1: PTF SF1256
 - Ensure that the QUSER profile is enabled and has a valid password. To do this, enter **DSPUSRPRF USRPRF(QUSER)** on an AS/400 command line. The resulting display shows the status for QUSER.
 - Start the OS/400 host servers by running two commands from an AS/400 command line:
 - **STRHOSTSVR** (Start Host Server)
 - **STRTCPSVR SERVER(*DDM)** (Start TCP/IP Server command with *DDM specified for the Server parameter).
 - For more information on host server options, see the TCP/IP topic in the *AS/400e Information Center*, which is also available at <http://publib.boulder.ibm.com/html/as400/infocenter.html>. 
4. The TCP/IP Connectivity Utilities for AS/400 licensed program, 5769-TC1, is installed on the AS/400. For more information on TCP/IP, see the OS/400 TCP/IP Configuration and Reference, SC41-5420. 

5. If you are going to use the secure sockets layer (SSL), you need to have the following installed:
 - IBM HTTP Server licensed program, 5769-DG1
 - OS/400 Option 34 (Digital Certificate Manager)
 - One of the Cryptographic Access Provider licensed programs:
 - Cryptographic Access Provider (40-bit), 5769-AC1
 - Cryptographic Access Provider (56-bit), 5769-AC2
 - Cryptographic Access Provider (128-bit), 5769-AC3
 - One of the client encryption licensed programs:
 - AS/400 Client Encryption (40-bit), 5769-CE1
 - AS/400 Client Encryption (56-bit), 5769-CE2
 - AS/400 Client Encryption (128-bit), 5769-CE3

Note: You must install the same level of the Cryptographic Access Provider licensed program and AS/400 Client Encryption licensed program. In other words, 5769-AC1 and 5769-CE1 are a pair, 5769-AC2 and 5769-CE2 are a pair, and so on.

SSL connections perform slower than connections without encryption and can be only invoked from an SSL capable server, V4R4 or later.

For more information on SSL, see Secure sockets layer in the AS/400 Toolbox for Java topic of the *AS/400e Information Center*.

Note: Like the SpooledFileViewer, PrintObjectPageInputStream, and PrintObjectTransformedInputStream classes mentioned above, full Blob and Clob (JDBC) support and SSL are available only when connecting to V4R4 and later AS/400 systems.

Installing AS/400 Toolbox for Java on the AS/400

To install the AS/400 Toolbox for Java licensed program:

1. On the AS/400 command line, enter **GO LICPGM**.
2. Select **11. Install licensed program**.
3. Select **5769JC1 AS/400 Toolbox for Java**.

For more information on installing licensed programs, see the Software Installation book, SC41-5120. 

Configuring an HTTP server for use with AS/400 Toolbox for Java

If you want to use applets or the AS400ToolboxInstaller class, you must set up an HTTP server and install the class files on the AS/400 system. For more information on the IBM HTTP Server, see the IBM HTTP Server for AS/400 Webmaster's Guide, GC41-5434, at the following URL:

<http://www.as400.ibm.com/http>  From this URL, take the

Documentation link to a short list of books available on the IBM HTTP Server.

For information on the Digital Certificate Manager and how to create and work with digital certificates using the IBM HTTP Server, see the Getting started with IBM Digital Certificate Manager topic in the Internet section of the *AS/400e Information Center*.

Performance considerations related to installation location

You can install the AS/400 Toolbox for Java classes on your workstation or on the AS/400:

- In some cases, serving the classes from the workstation is a better solution than serving from the AS/400:
 - If a low-speed communication link connects the AS/400 and the workstation, the performance of loading the classes from the AS/400 to the workstation may be unacceptable.
 - If your Java application accesses classes via the CLASSPATH environment variable, you do not need a method of file redirection when the classes are on your workstation. If the classes are on the AS/400, you need a method of file redirection, such as Client Access for AS/400, to access the files on the AS/400.
- Choosing to install the AS/400 Toolbox for Java classes on your AS/400 gives you a centralized administration point for maintaining the classes.

Important performance tip regarding the CRTJVAPGM command:

If your Java program runs on the AS/400 Java Virtual Machine (JVM), you can **significantly improve performance** if you create an AS/400 Java program from the AS/400 Toolbox for Java zip file or jar file. Enter **CRTJVAPGM** on an AS/400 command line to create the program. You must run the **CRTJVAPGM** command at Level 30 to ensure proper protection of your program resources. (See the online help information for the **CRTJVAPGM** command for more information.) By using the CRTJVAPGM command, you save the AS/400 Java program that is created (and that contains the AS/400 Toolbox for Java classes) when your Java program starts. Saving the AS/400 Java program that is created allows you to save startup processing time. You

save startup processing time because the AS/400 Java program does not have to be re-created each time your Java program is started.

If you are using the V4R2 or V4R3 version of the AS/400 Toolbox for Java, you cannot run the **CRTJVAPGM** command against the `jt400.zip` file because it is too big. At V4R4, the AS/400 Toolbox for Java licensed program includes an additional file, `jt400access.zip`. `jt400access.zip` contains only the access classes, not the visual classes. If your Java program will be running on the AS/400, you should use `jt400access.zip` because you probably only need the access classes. The **CRTJVAPGM** command has already been run against `jt400access.zip`.

Copying the AS/400 Toolbox for Java class files on your workstation

Copying the class files to your workstation allows you to serve the files from your workstation. You can use the `AS400ToolBoxInstaller` class or rely on existing mechanisms for obtaining server updates on your workstation.

You can use either the `jt400.zip` file or the `jt400.jar` file on your workstation. (The `jt400.jar` file is smaller, but some tools and Java Virtual Machines (JVMs) accept only zip files. Use the file that works best for you.) The following instructions use the `jt400.zip` file, but these instructions also work for the `jt400.jar` file. To copy the files from the AS/400 to your workstation:

1. Decide what method you would like to use to copy files to your workstation. You can use the `AS400ToolboxInstaller` class or manually copy either the zip or jar file.
 - The AS/400 Toolbox for Java information fully documents the `AS400ToolboxInstaller` class. In the AS/400 Toolbox for Java information in the *AS/400e Information Center*, look under "Tips for Programming" and then "Install and update." Or if you are viewing this information through the Information Center, see Client installation and update classes.
 - Find the file named `jt400.zip`. It should reside in the `/QIBM/ProdData/HTTP/Public/jt400/lib` directory. Copy `jt400.zip` from the AS/400 to your workstation. This can be accomplished in a variety of ways. The easiest way is to use Client Access/400 to map a network drive on your workstation to the AS/400. Another method is to use file transfer protocol (FTP) to send the file to your workstation (ensure that you transfer the file in binary mode).
2. Update the `CLASSPATH` environment variable of your workstation by adding the location where you put the program files. For example, on a personal computer (PC) that is using the Windows 95 operating system, if `jt400.zip` resides in `C:\jt400\lib\jt400.zip`, add `;%C:\jt400\lib\jt400.zip` to the `CLASSPATH` variable.

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Version 4

Publication No. SC41-5438-02

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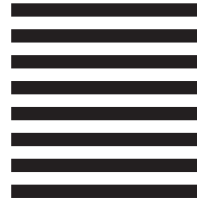
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