



System i
Development tools
System i5 Debugger

Version 5 Release 4





System i
Development tools
System i5 Debugger

Version 5 Release 4

Note

Before using this information and the product it supports, read the information in “Notices,” on page 7.

Third Edition (February 2006)

This edition applies to version 5, release 4, modification 0 of IBM Toolbox for Java (product number 5722-JC1) and to all subsequent releases and modifications until otherwise indicated in new editions. This version does not run on all reduced instruction set computer (RISC) models nor does it run on CISC models.

© Copyright International Business Machines Corporation 2004, 2006.

US Government Users Restricted Rights – Use, duplication or disclosure restricted by GSA ADP Schedule Contract with IBM Corp.

Contents

System i5 Debugger	1
Printable PDF	1
System i5 Debugger components	1
Installing System i5 Debugger	3
Running System i5 Debugger	4

Appendix. Notices	7
Programming Interface Information.	9
Trademarks.	9
Terms and conditions	9

System i5 Debugger

IBM® System i5™ Debugger provides a graphical user debugging environment on the IBM System i5 platform. Use System i5 Debugger to debug and test programs that run on your system, including programs written in ILE and OPM languages, Java™, and programs that run in the i5/OS® PASE environment.

System i5 Debugger is packaged in a JAR file with IBM Toolbox for Java.

Printable PDF

Use this to view and print a PDF of this information.

To view or download the PDF version of this document, select System i5 Debugger (about 134 KB).

Saving PDF files

To save a PDF on your workstation for viewing or printing:

1. Right-click the PDF in your browser (right-click the link above).
2. Click the option that saves the PDF locally.
3. Navigate to the directory in which you want to save the PDF.
4. Click **Save**.

Downloading Adobe Reader

You need Adobe Reader installed on your system to view or print these PDFs. You can download a free copy from the Adobe Web site (www.adobe.com/products/acrobat/readstep.html) .

System i5 Debugger components

The components of the System i5 Debugger work together to provide a powerful debugging tool.

IBM System i5 Debugger consists of the following components:

- Client-based
 - “Debug Manager” on page 2
 - “System Debugger” on page 2
 - “i5/OS PASE System Debugger” on page 2
- Host-based
 - “Debug Hub” on page 2
 - “Debug Server” on page 3

The following descriptions provide only general information about the System i5 Debugger components. To learn more about the components, run System i5 Debugger, and from any System i5 Debugger window, click **Help**. For more information about running System i5 Debugger, see “Running System i5 Debugger” on page 4.

Debug Manager

Debug Manager registers the client with the Debug Hub, which enables using the graphical debugging mode for the selected systems. A registered client that issues the Start Debugging (STRDBG) CL command from an emulation session starts System Debugger.

Use Debug Manager to manage your debugging operations and connections:

- Add and remove systems
- Add and remove users
- Start debugging operations
- Start System Debugger and i5/OS PASE System Debugger

System Debugger

Use System Debugger to debug programs written in ILE and OPM languages and Java that run on the system. You can debug programs that are running in existing jobs on the server or use System Debugger to open and then debug programs in a system batch job.

You can configure System Debugger to start automatically, manually from a workstation command prompt, or by using the Debug Manager interface.

Use System Debugger to perform debugging activities that include:

- Setting breakpoints
- Stepping through programs
- Inspecting variables
- Examining the callstack
- Examining memory associated with program variables
- Examining thread activity

i5/OS PASE System Debugger

Use i5/OS PASE Debugger to debug programs that run in an i5/OS PASE environment. You can debug programs that are running in an existing process on the system or use i5/OS PASE Debugger to open and then debug a program.

You can start i5/OS PASE Debugger directly from the command line or by using the Debug Manager interface.

In addition to the debugging activities listed previously for System Debugger, you can use i5/OS PASE Debugger to perform i5/OS PASE-specific debugging activities that include:

- Using the program loadmap to debug
- Viewing a list of source files and methods
- Tracking parent and child processes
- Examining registers

Debug Hub

Debug Hub provides the following functions:

- Serves as a registry for clients that want to use System Debugger or i5/OS PASE Debugger
- Handles incoming requests for starting debug servers

Use the Debug Manager interface to register your client with Debug Hub. Registering a client stores both the user information and the TCP/IP address of the client in the registry. Using the Start Debugging (STRDBG) CL command from an emulation session contacts Debug Hub to see if the user executing the command is registered with Debug Manager. It also checks to see if the command being executed is from the same TCP/IP address as Debug Manager. If these qualifications are met, System i5 Debugger (the graphical application) is started instead of the traditional debug environment.

Debug Hub also serves as a single point of contact for all system debugging applications. When a System i5 Debugger component performs a start debug operation, Debug Hub submits a Debug Server job on behalf of the user and passes the associated TCP/IP connection to the job.

Debug Server

Debug Server is a TCP/IP server that is started by the Debug Hub when one of the debuggers issues a request to start debugging. The server job then services the job that is being debugged and issues the appropriate debugging APIs and commands.

Installing System i5 Debugger

Before installing System i5 Debugger on your workstation, you must meet some hardware and software requirements.

Hardware requirements

You must have the following hardware installed on your client:

- CPU: 400 - 500 MHz
- Memory: minimum 128 MB (256 MB recommended)

Software requirements

You must have the following software installed on your client:

- One of the following:
 - Java 2 Platform, either the Standard Edition (J2SE) or the Enterprise Edition (J2EE), version 1.3 or later
 - Java 2 Runtime Environment (JRE), Standard Edition, version 1.3.1 or later
- jhall.jar (one of the jar files in JavaHelp)

Note: Be sure to add jhall.jar to your client CLASSPATH environment variable.

For information about installing the previously mentioned software, see the Sun Java Web site  .

Installing the System i5 Debugger jar file

Before installing System i5 Debugger, ensure that your client system meets the previously listed hardware and software requirements.

IBM System i5 Debugger is packaged in a jar file, called tes.jar, as part of IBM Toolbox for Java. If you have not installed IBM Toolbox for Java on your client, you need to install it when you install the jar file that contains System i5 Debugger.

To install System i5 Debugger, complete the following steps:

1. Install IBM Toolbox for Java, making sure to copy jt400.jar and tes.jar to your client. For more information about installing IBM Toolbox for Java, see the Install and manage IBM Toolbox for Java topic.

Note: If you already installed IBM Toolbox for Java on your server, both the jt400.jar and the tes.jar files are in the same directory on the server:

```
/QIBM/ProdData/HTTP/Public/jt400/lib/
```

2. After copying the jar files to your client, add them to your client CLASSPATH environment variable.

Now you can use your client to run System i5 Debugger.

Running System i5 Debugger

Start the System i5 Debugger components using these instructions.

For information about running each component, see the following sections:

- “Starting Debug Manager”
- “Starting System Debugger”
- “Starting i5/OS PASE Debugger”

To learn more about System i5 Debugger, start System i5 Debugger and review the help information by performing one of the following actions:

- From the **Help** menu in any System i5 Debugger window, click **Help**.
- Press **F1**.

Starting Debug Manager

To start Debug Manager from a command prompt on your client, run the following command:

```
java utilities.DebugMgr
```

Starting System Debugger

To start System Debugger from a command prompt on your client, run the following command:

```
java utilities.Debug <args>
```

where <args> represents any of the following command arguments:

- -u = User
- -s = System name
- -j = Job description, in the form of: job number/job user/job name
- -p = Program to run, in the form of: program library/program name

Note: Once you use Debug Manager to register your client, you can issue the Start Debugging (STRDBG) CL command from an emulation session to start System Debugger. You can also start System Debugger directly from System Debug Manager.

Starting i5/OS PASE Debugger

To start i5/OS PASE Debugger from a command prompt on your client, run the following command:

```
java utilities.DebugPASE <args>
```

where <args> represents any of the following command arguments:

- -u = User
- -s = System name

- -p = Fully qualified path of program to run
- -pid = Process ID

Note: You can start i5/OS PASE Debugger directly from System Debug Manager. Unlike System Debugger, you cannot start i5/OS PASE Debugger from an emulator session.

Appendix. Notices

This information was developed for products and services offered in the U.S.A.

IBM may not offer the products, services, or features discussed in this document in other countries. Consult your local IBM representative for information on the products and services currently available in your area. Any reference to an IBM product, program, or service is not intended to state or imply that only that IBM product, program, or service may be used. Any functionally equivalent product, program, or service that does not infringe any IBM intellectual property right may be used instead. However, it is the user's responsibility to evaluate and verify the operation of any non-IBM product, program, or service.

IBM may have patents or pending patent applications covering subject matter described in this document. The furnishing of this document does not grant you any license to these patents. You can send license inquiries, in writing, to:

IBM Director of Licensing
IBM Corporation
North Castle Drive
Armonk, NY 10504-1785
U.S.A.

For license inquiries regarding double-byte (DBCS) information, contact the IBM Intellectual Property Department in your country or send inquiries, in writing, to:

IBM World Trade Asia Corporation
Licensing
2-31 Roppongi 3-chome, Minato-ku
Tokyo 106-0032, Japan

The following paragraph does not apply to the United Kingdom or any other country where such provisions are inconsistent with local law: INTERNATIONAL BUSINESS MACHINES CORPORATION PROVIDES THIS PUBLICATION "AS IS" WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF NON-INFRINGEMENT, MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. Some states do not allow disclaimer of express or implied warranties in certain transactions, therefore, this statement may not apply to you.

This information could include technical inaccuracies or typographical errors. Changes are periodically made to the information herein; these changes will be incorporated in new editions of the publication. IBM may make improvements and/or changes in the product(s) and/or the program(s) described in this publication at any time without notice.

Any references in this information to non-IBM Web sites are provided for convenience only and do not in any manner serve as an endorsement of those Web sites. The materials at those Web sites are not part of the materials for this IBM product and use of those Web sites is at your own risk.

IBM may use or distribute any of the information you supply in any way it believes appropriate without incurring any obligation to you.

Licensees of this program who wish to have information about it for the purpose of enabling: (i) the exchange of information between independently created programs and other programs (including this one) and (ii) the mutual use of the information which has been exchanged, should contact:

IBM Corporation

Software Interoperability Coordinator, Department YBWA
3605 Highway 52 N
Rochester, MN 55901
U.S.A.

Such information may be available, subject to appropriate terms and conditions, including in some cases, payment of a fee.

- | The licensed program described in this information and all licensed material available for it are provided
- | by IBM under terms of the IBM Customer Agreement, IBM International Program License Agreement,
- | IBM License Agreement for Machine Code, or any equivalent agreement between us.

Any performance data contained herein was determined in a controlled environment. Therefore, the results obtained in other operating environments may vary significantly. Some measurements may have been made on development-level systems and there is no guarantee that these measurements will be the same on generally available systems. Furthermore, some measurements may have been estimated through extrapolation. Actual results may vary. Users of this document should verify the applicable data for their specific environment.

Information concerning non-IBM products was obtained from the suppliers of those products, their published announcements or other publicly available sources. IBM has not tested those products and cannot confirm the accuracy of performance, compatibility or any other claims related to non-IBM products. Questions on the capabilities of non-IBM products should be addressed to the suppliers of those products.

All statements regarding IBM's future direction or intent are subject to change or withdrawal without notice, and represent goals and objectives only.

All IBM prices shown are IBM's suggested retail prices, are current and are subject to change without notice. Dealer prices may vary.

This information is for planning purposes only. The information herein is subject to change before the products described become available.

This information contains examples of data and reports used in daily business operations. To illustrate them as completely as possible, the examples include the names of individuals, companies, brands, and products. All of these names are fictitious and any similarity to the names and addresses used by an actual business enterprise is entirely coincidental.

COPYRIGHT LICENSE:

This information contains sample application programs in source language, which illustrate programming techniques on various operating platforms. You may copy, modify, and distribute these sample programs in any form without payment to IBM, for the purposes of developing, using, marketing or distributing application programs conforming to the application programming interface for the operating platform for which the sample programs are written. These examples have not been thoroughly tested under all conditions. IBM, therefore, cannot guarantee or imply reliability, serviceability, or function of these programs.

Each copy or any portion of these sample programs or any derivative work, must include a copyright notice as follows:

© (your company name) (year). Portions of this code are derived from IBM Corp. Sample Programs. © Copyright IBM Corp. _enter the year or years_. All rights reserved.

If you are viewing this information softcopy, the photographs and color illustrations may not appear.

Programming Interface Information

This System i5 Debugger publication documents intended Programming Interfaces that allow the customer to write programs to obtain the services of IBM Toolbox for Java.

Trademarks

The following terms are trademarks of International Business Machines Corporation in the United States, other countries, or both:

| IBM

Java and all Java-based trademarks are trademarks of Sun Microsystems, Inc. in the United States, other countries, or both.

Other company, product, and service names may be trademarks or service marks of others.

Terms and conditions

Permissions for the use of these publications is granted subject to the following terms and conditions.

Personal Use: You may reproduce these publications for your personal, noncommercial use provided that all proprietary notices are preserved. You may not distribute, display or make derivative works of these publications, or any portion thereof, without the express consent of IBM.

Commercial Use: You may reproduce, distribute and display these publications solely within your enterprise provided that all proprietary notices are preserved. You may not make derivative works of these publications, or reproduce, distribute or display these publications or any portion thereof outside your enterprise, without the express consent of IBM.

Except as expressly granted in this permission, no other permissions, licenses or rights are granted, either express or implied, to the publications or any information, data, software or other intellectual property contained therein.

IBM reserves the right to withdraw the permissions granted herein whenever, in its discretion, the use of the publications is detrimental to its interest or, as determined by IBM, the above instructions are not being properly followed.

You may not download, export or re-export this information except in full compliance with all applicable laws and regulations, including all United States export laws and regulations.

IBM MAKES NO GUARANTEE ABOUT THE CONTENT OF THESE PUBLICATIONS. THE PUBLICATIONS ARE PROVIDED "AS-IS" AND WITHOUT WARRANTY OF ANY KIND, EITHER EXPRESSED OR IMPLIED, INCLUDING BUT NOT LIMITED TO IMPLIED WARRANTIES OF MERCHANTABILITY, NON-INFRINGEMENT, AND FITNESS FOR A PARTICULAR PURPOSE.



Printed in USA