webMethods JI

Installation and Configuration Guide

Version 4.5

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webMethods

This document applies to webMethods JI Version 4.5 and to all subsequent releases.

Specifications contained herein are subject to change and these changes will be reported in subsequent release notes or new editions.

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Table of Contents

About this Guide

Welcome to the *webMethods JI Installation and Configuration Guide*. This guide provides procedures and reference information for installing webMethods JI.

Before You Begin

This guide is intended for system administrators who are installing webMethods JI. Knowledge of UNIX and/or Microsoft® Windows™ system administration is required.

This guide provides information for the following procedures:

- Installing the webMethods JI server environment in UNIX and Windows environments.
- Installing the webMethods JI client libraries and interfaces in UNIX and Windows environments.
- Configuring the webMethods JI server environment and client components.

How This Book is Organized

This guide is organized as follows:

Formatting Conventions

The following formatting conventions are used in this manual:

Table 1. Formatting conventions

Convention	Used for..
Italics	Italics are used for files, directories, programs, and book titles. For example: *<JI_install_dir>/bin/ea_mapmaker.exe*.
`Monotype font`	A monotype font is used to represent examples of code, characters that the user enters, and prompts or messages from the system. For example: Type `ea_start` at the command prompt.
Sans-serif font	A sans-serif font is used to represent Graphical User Interface (GUI) features, such as buttons. For example: Press the Help button to display a list of help topics.
Serif bold font	This font is used for notes and warnings that require special attention. For example: Warning: You must install webMethods JI in an empty directory.

Documentation Set

webMethods JI is supplied with the manuals shown below. The documentation is delivered in Adobe Acrobat Reader Portable Document Format (PDF). No hardcopy documentation is provided, but you can print the PDF files on your local printer.

Use this guide in conjunction with other manuals provided with webMethods JI:

Table 2. webMethods JI documentation set

Title	Description
webMethods JI Release Notes	Provides information about additions and revisions to the current release of webMethods JI. The release notes are distributed in two forms, as a PDF and as a text file
webMethods JI Installation and Configuration Guide	Details installation procedures for webMethods JI.
webMethods JI Tutorial	Provides hands-on instruction about how to write webMethods JI services using MapMaker
webMethods JI User's Guide	Describes how to configure the webMethods JI environment, as well as how to use webMethods JI graphical development and system monitoring tools.
webMethods JI Client Developer's Guide	Describes how to design and develop webMethods JI client applications, as well as how to integrate webMethods JI services into third-party development environments.
webMethods JI Integration Guide	Contains information about integrating webMethods JI Services with other technologies, such as Siebel eBusiness Applications, MQSeries, Web Services, and more.
webMethods JI Supplemental Reference Guide	Contains additional information on webMethods JI commands, error codes, language translation, keyboard mapping, logging, licensing, file formats, and field attributes. This guide replaces the Appendices that were duplicated across the manual set.

Viewing the Documentation Online

Online documentation is available in the following locations:

- In webMethods JI Graphical User Interfaces (GUIs), click on the **Help** menu and select **Help Topics** to display the webMethods JI documentation.
- webMethods JI documentation is available on-line in Adobe® Acrobat™'s Portable Document Format (PDF). If the documentation has been installed, open the file *<JI_install_dir>/doc/_ji_doc.pdf* in Adobe Acrobat Reader™ or a Web browser (where *<JI_install_dir>* is the location of your webMethods JI installation).

You can also access the latest version of the documentation for Software AG products at http://documentation.softwareag.com/. As new versions become available, the documentation on this web site will be updated and the previous versions will be migrated to the Empower Product Support Web site at https://empower.softwareag.com/. If you have a maintenance contract, you can view all versions of documentation on this web site. You will find instructions for registering and obtaining a userid and password on the documentation web site.

Chapter 1. webMethods JI Installation

The webMethods JI installataion program (setup.bin for UNIX or setup.exe for Windows) is platform specific and contains all necessary files to install webMethods JI on a specfic target platform, as well as files to install webMethods JI client components in the Windows environment. This chapter outlines procedures for installing the server and client components in UNIX and Windows environments.

This chapter describes the following procedures for installing and configuring the webMethods JI environment on UNIX and Windows platforms:

Supported Operating Systems

The list of supported hardware platforms and operating systems for this release of webMethods JI can be found in the"Supported Platforms" section in the current version of the *webMethods JI Release Notes*.

Minimum System Recommendations

Any system that meets the requirements of a supported operating system for that hardware platform may be used to run webMethods JI.

Disk Space Requirements

The following table lists disk space requirements for a typical installation based on the operating system:

Operating System	MegaBytes Required
Windows	200 MB
Oracle Solaris	200 MB
HP HP-UX	200 MB
IBM AIX	200 MB
Linux	200 MB

Please verify that there is enough disk space on your selected drive prior to installing the product.

Temporary Directory for Installation

The webMethods JI installation program temporarily extracts data into a temporary directory. Approximately twice the disk space listed above must be available in the temporary directory. These files are removed from the temporary directory after installation is successfully completed.

UNIX

In UNIX, the installation program checks to see if enough space is available in the */tmp* directory. If there is not enough space, an error message is printed to the screen instructing the user to clear space in the */tmp* directory.

Windows

In Windows, the installation program extracts the file to the directory identified in the %TMP% environment variable. If there is not enough disk space on the temporary directory's disk partition to extract the data, the user is prompted to select another drive and directory for temporary extraction.

System Information

TCP Ports

webMethods JI requires three TCP ports for webMethods JI service components. Default port numbers are provided during installation, but these defaults may need to be modified to ensure that they are set to available ports on your server. These ports can also be given symbolic names in your *services* file (or NIS/YP, if appropriate), which serves to "allocate" these port numbers as far as the server is concerned. However, webMethods JI programs cannot use the symbolic names directly; port numbers must be used.

The following table lists the default port numbers allocated during installation for each service component:

Service Component	Default Port at Installation
Resource Database	30000
Environment Manager system port	30001
RMI port	30002
Tomcat Server (optional)	8080

Software Requirements

The following software is required to use webMethods JI.

Java Software Requirements

The list of supported Java development kits for this release of webMethods JI can be found in the current version of the *webMethods JI Release Notes*.

To use the MapMaker graphical development environment's code generation capabilities, the Tomcat Server or the `ea_admin plist` command, the Java Development Kit (JDK) is required, and should be pre-installed before installing webMethods JI.

Note: Due to the nature of Java technology where objects are exchanged across a network, it is recommended that all webMethods JI Java-based programs, regardless of platform, be run using the same version of the Java Virtual Machine, in order to avoid any JVM version incompatibilities.

Java Policy File

In order to use the webMethods JI server environment, a grant of "all permissions" must be included in your webMethods JI Java policy implementation. A default Java policy is included with every webMethods JI installation program. The webMethods JI installation program will automatically configure all webMethods JI programs to use the included Java policy file, which is located in *<JI_install_dir>/etc*. After installation, no further policy file configuration is required.

To further customize your Java policy file configuration, see the information in the next section.

Customizing your Java Policy Implementation

The Java policy file can be customized, if desired, by using the following steps:

- Customize your policy file using Oracle's security guide (see http://docs.oracle.com/javase/8/docs/technotes/guides/security/policyfiles.html).
- For all webMethods JI configuration files (for example, the Environment Manager configuration file) that contain the java VM command line, the following default options can be edited as required:

  ```
  -Djava.security.manager -Djava.security.policy=<policy_file>
  ```

  For example, the following could be entered for the javacmd parameter in your Environment Manager's configuration file:

  ```
  javacmd=java -Djava.security.manager -Djava.security.policy=
  my_java.policy com.jacada.ea.envmanager.app.EAServer
  ```

- For all LAX files that contain the java VM command line, edit the following default options:

  ```
  java.security.manager=null
  java.security.policy=<policy_file>
  ```

  Example:

  ```
  java.security.manager=null
  java.security.policy=etc/.java.policy
  ```

  For more information about editing LAX files, see the *webMethods JI User's Guide*.

EA_ENV Environment Variable

In order to use the *ea_start* and *ea_shutdown* command, along with other administrative commands, the EA_ENV environment variable should be set to the <*JI_install_dir*>/*config*> directory. If this environment variable is not set, *ea_start* and *ea_shutdown* must be started using the following command line option:

```
-c <configuration directory>.
```

Also, the EA_ENV environment variable can be used by certain webMethods JI clients.

The environment.ccf File

The *environment.ccf* file must be located in the directory referenced by the EA_ENV environment variable, and must contain settings for the EA_HOME, EA_ENVMGR and DB_TCP_PORT properties:

- EA_HOME: The installation directory of your webMethods JI installation (i.e., <*JI_install_dir*>).
- EA_ENVMGR: The port number of the Environment Manager, used to determine if the Environment Manager is running.
- DB_TCP_PORT: The TCP port number of your resource database server.
- START_TOMCAT: Controls whether the embedded Tomcat servlet engine is started and stopped, by default, with the `ea_start` and `ea_shutdown` commands. The default setting is `true`.

Also, the EA_HOME, EA_ENVMGR, andDB_TCP_PORT properties can be defined as environment variables if the *environment.ccf* file is not used. The property settings in the *environment.ccf* will override the environment variables if both are set.

DISPLAY Environment Variable

In UNIX, when using webMethods JI graphical interfaces or opening a terminal window, the DISPLAY environment variable must be set to the appropriate IP address or host name of the machine on which your X-server software is running. This variable is set using the format `<host>:0.0` where <host> is the name or IP address of the host machine. For example:

```
export DISPLAY=127.0.0.1:0.0
```

TERMINFO Environment Variable

On HP-UX, the TERMINFO variable must be set for proper function key behavior within PATerm terminal windows. Set the TERMINFO environment variable to *<JI_install_dir>/lib/terminfo* directory.

webMethods JI Licenses

One or more webMethods JI licenses are required to use the webMethods JI environment. A licensing mechanism is included with webMethods JI that controls the following aspects of the webMethods JI environment:

- The capability of the MapMaker development tool to modify and generate webMethods JI Services.
- The number of concurrent servers (host machines) that are running webMethods JI Environment Managers. This limit is not tied to a specific server machine, which allows for flexibility in Environment Manager deployment. As long as the total number of Environment Managers in the user's environment does not exceed the license limit, the Environment Managers can be running on any server in the network.
- The number of concurrent webMethods JI Services running on each server (optional license mechanisms are available for customer requirement flexibility).

For more information, see the *webMethods JI User's Guide*.

Note: The licenses provided with webMethods JI 3.5 do not work with the 4.5 release. Consult webMethods JI Technical Support to obtain proper 4.5 licenses.

X11-Compatible Window Server

UNIX only: In order to be able to run the webMethods JI graphical installer or to use PATerms and JTerms, an X11-compatible window server is required.

JDBC Driver Included in Installation

A JDBC driver, tjFM, is included with installation of webMethods JI and is required to access previous versions of the Resource Database. The tjFM driver cannot be removed from webMethods JI and may not be used outside of webMethods JI except by acquiescence to tjFM's terms of agreement.

Communication Protocol Support

webMethods JI supports TCP/IP communication protocols for client connections and the following communication protocols for mainframe connections:

- TN3270/TN3270E Models 2-5: Models 3, 4, and 5 are supported with Java services only.
- TN5250 Standard (80 column and 132 column): The session capability of TN5250E is also supported, although no other aspects of TN5250E are implemented.
- Telnet (VT100, VT220, VT320 and ANSI emulation): Telnet is used for Character Mode and referred to as such throughout this manual.

See the *webMethods JI Supplemental Reference Guide*, Chapter 3: Keyboard Mapping, for keyboard mapping information. Protocol agent configuration information is located in the <*JI_install_dir*>/*lib*/*ProtoAgents* directory, where <JI_install_dir> represents the directory in which webMethods JI has been installed.

Installing webMethods JI Server Software

The webMethods JI installation program is a Java application which can be run on Windows or UNIX operating systems. A platform-specific version of the installation program is provided for each of the supported operating systems. By default, the installation program will run with a graphical user interface but may also be run with a console user interface. Console mode allows installation on systems which do not have a graphical user interface, for example, “headless” UNIX servers. Both methods will be described below.

GUI Mode Installation

The following steps outline how to use the webMethods JI GUI installation program.

Note: Before starting any *webMethods JI* installation, please shut down any existing installations that may be using the same TCP port numbers.

Step 1: Launch the GUI Installation

Windows

The following description assumes you have copied the approrpiate webMethods JI installer to a directory on the machine you wish to install it on.

To launch the installation program in Windows, select Run from the Start Menu. Type `<path_to_installer>\setup.exe`, where `<path_to_installer>` represents the directory path the webMethods JI installer was copied to. Press Enter or click on the **OK** button to launch the installation program. Alternatively you may browse to the directory containing the JI installer using the Windows Explorer and double-click on `setup.exe`.

UNIX

The following description assumes you have copied the approrpiate webMethods JI installer to a directory on the machine you wish to install it on.

1. Change directory to the directorycontinaining the webMethods JI installer:
   `cd <path_to_installer>`
2. Type `./setup.bin` or `<path_to_installer>/setup.bin` at the UNIX prompt. This will start the webMethods JI installation utility.

   Note: When running on UNIX and the InstallAnywhere installer exits silently, check your ENV environment variable and your .kshrc file. If your ENV environment variable points at your .kshrc file and your .kshrc file modifies your CLASSPATH environment variable, the installer exits silently with no error. The workaround is to not set CLASSPATH in your .kshrc file.

3. Observe the installer extracts a series of files.

Step 2: Introduction to webMethods JI Installation

The first window displayed during the execution of the installation program provides a visual indication of the loading of the installer. The next screen to appear is the Introduction to the webMethods JI installation program with an explanation of its navigational features (Figure 1).

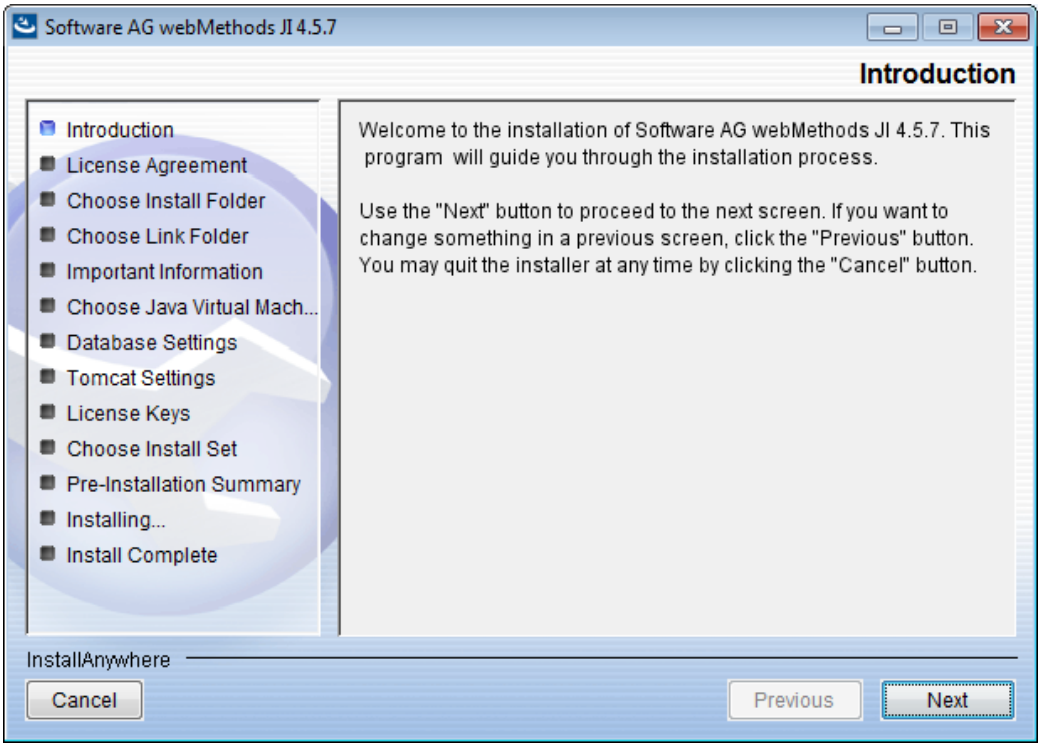

Figure 1. webMethods JI Installation Program Introduction

Click the **Next** button to proceed.

Step 3: The License Agreement

The next window displays the webMethods JI licence agreement (Figure 2).

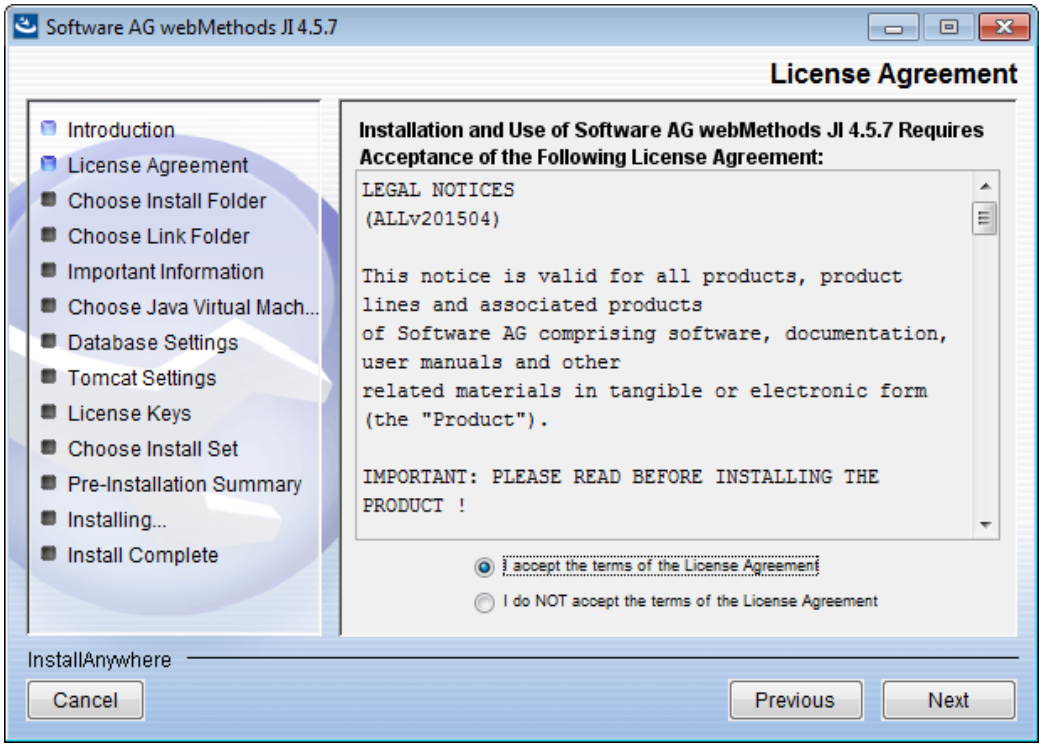

Figure 2. The webMethods JI Licence Agreement

To accept the license, select the **I accept the terms...** radio button and click the **Next** button to proceed with installation.

Next, a Readme file is displayed in the installation program's **Important Information** window. Click on the **Next** button to proceed.

Step 4: Select Install Folder

The next window is used to select the directory in which webMethods JI will be installed (Figure 3).

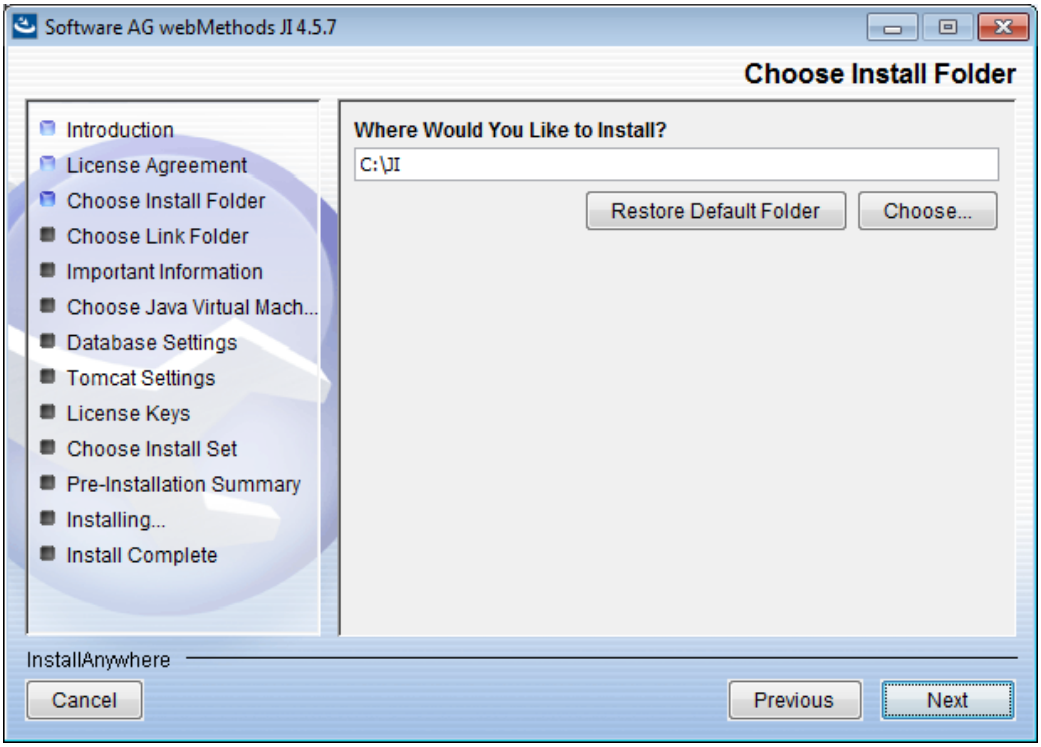

Figure 3. Select an installation directory

The default location for Windows is `C:\JI`. For UNIX, the default location is `<home>/JI`, where `<home>` is the installing user's home directory. A new directory will be created if it does not already exist. To change the default installation directory, select the **Choose...** button. Select the directory from the window provided.

Note: Installing webMethods JI over an older release is not supported. Installing webMethods JI over a previous installation of the same version, using the same directory, will result in files being overwritten. Should you wish to retain configuration file settings, back up the necessary configuration file settings and restore them upon completion of the installation.
You must have read/write privileges for the installation directory.
webMethods JI should be installed into an empty directory.

Directory Names that Contain Spaces

It is recommended that you do not install JI into the *C:\Program Files* on Windows directory or any directory tree that has spaces in the names of the directories. This restriction applies to both Windows and UNIX installations.

Step 5: Select the Location for the Shortcuts (Windows Only)

The next window is available for Windows installation only. This window allows you to select the location of your webMethods JI shortcuts (Figure 4).

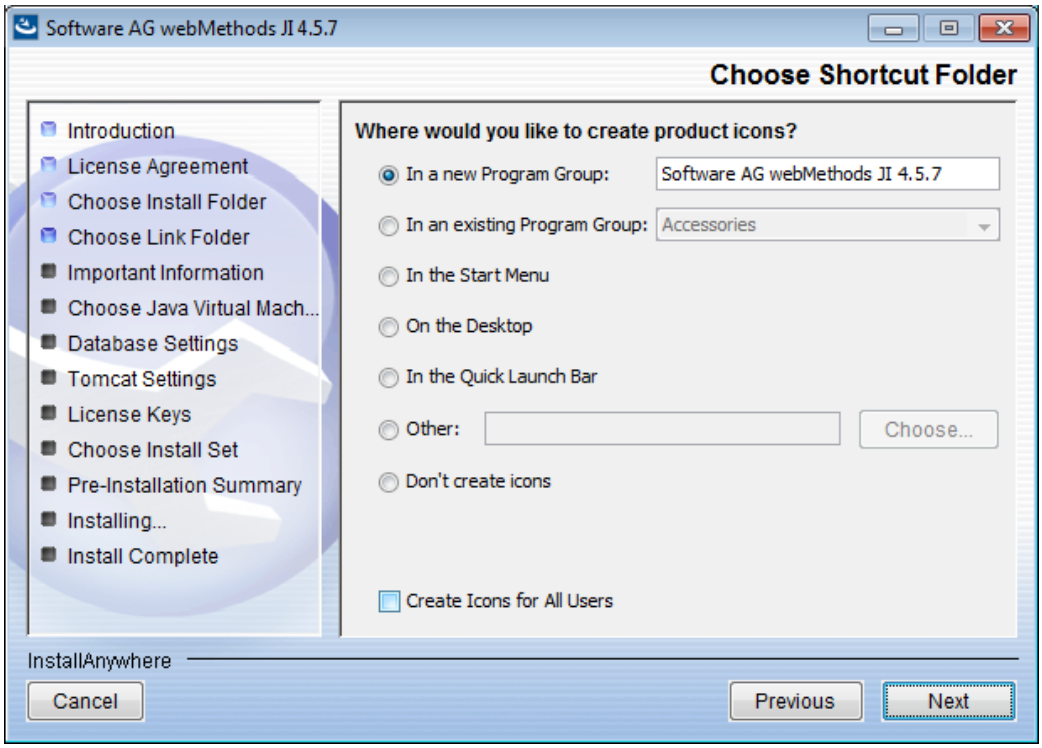

Figure 4. Define application shortcuts

Select the appropriate option and click the **Next** button.

Step 6: Select a Java Virtual Machine

Because a Java Virtual Machine (JVM) is required to run the webMethods JI server environment, you must select a JVM that is already installed on your file system.

Note: To use the service generation features of the MapMaker graphical development environment, a Java Developers Kit (JDK), is required. The JDK is not provided with this installation.

This window describes the JDK requirement for running the Tomcat application server (Figure 5).

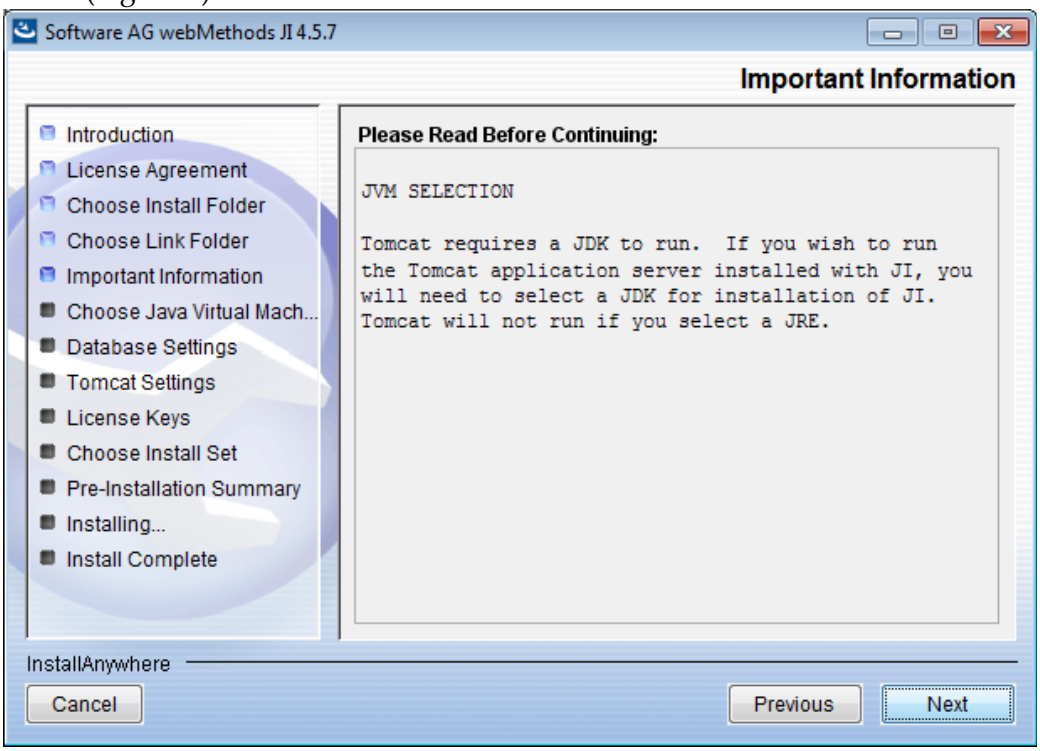

Figure 5. JVM Selection

After selecting a JVM during installation, the installation program updates files with the location of the JVM. As a result, if you choose at a later date to use a newer JVM or a different JVM from the one selected during installation, you will have to edit these files to change the location of the JVM. This affects the following areas in the installation:

- The Environment Manager configuration file. For more information about editing the Environment Manager configuration file, see the *webMethods JI User's Guide*.
- Lax files. Lax files are created by the installation program for use by webMethods JI commands. The lax files provide information to the commands, such as the location of the JVM used to launch the commands. For information about changing the JVM referenced in webMethods JI lax files, see the *webMethods JI User's Guide*.

This window allows you to select a JVM (Figure 6).

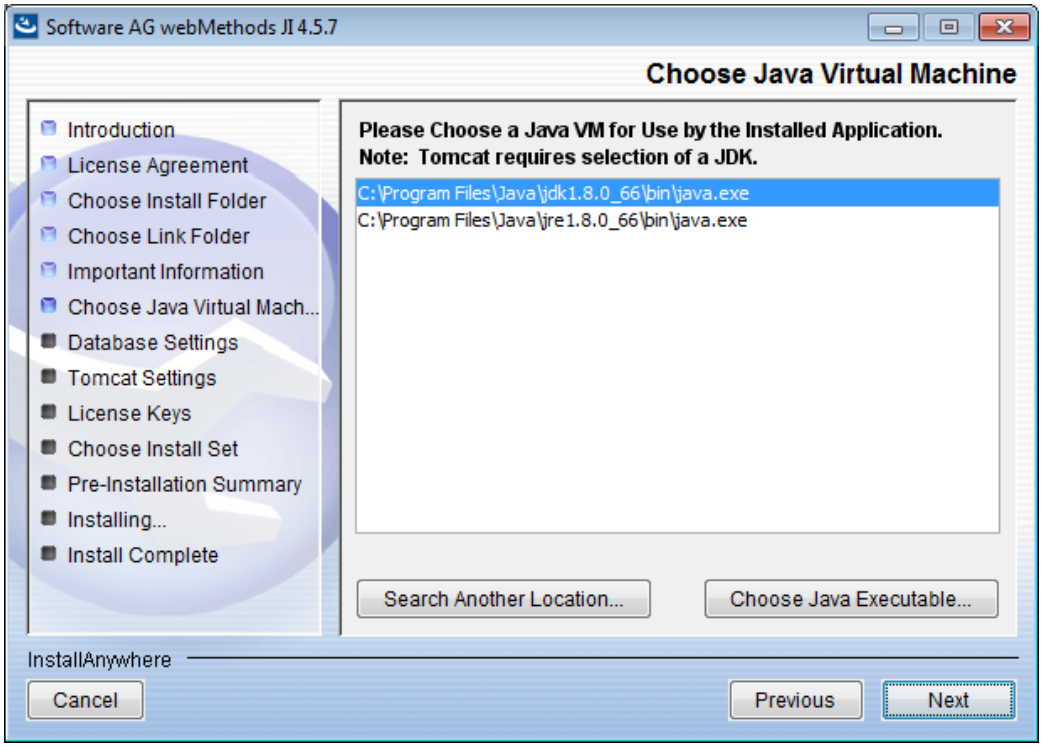

Figure 6. Select a Java VM for the application

To select a JVM, click the preferred JVM from the list. If the JVM you wish to select is not listed in the window, you can instruct the installation program to search for JVMs again or you can select the JVM manually by clicking the **Choose Another...** button and locating the JVM on your file system. The path specified for the JVM must be a full path to a JDK or JRE installation. Symbolic links are not supported in this path.

Step 7: Select the Database Settings

During installation of the server environment, the installation program will create a Resource Database, if one is desired. Should a Resource Database already exist, you may elect to use it instead of creating a new one. In that case, uncheck the **Create database** checkbox and continue to the next screen. If a new Resource Database is to be created, enter a unique port number and a name for the database (Figure 7).

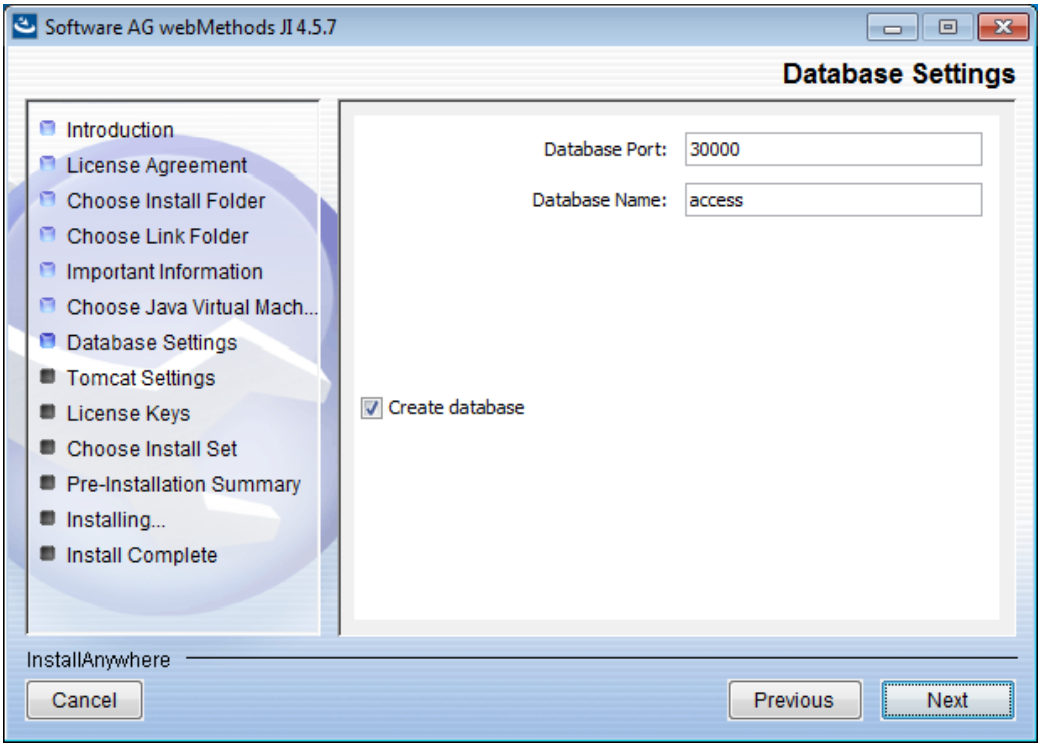

Figure 7. Identify or Create a resource database

To use an existing database, enter the appropriate port number for the database daemon and the database name, uncheck the **Create database** checkbox, then click the **Next** button. This will identify to the Configuration Manager the database to be used.

To create a new database, enter the appropriate port number for the database daemon and a name for the database, check the **Create database** checkbox, then click the **Next** button.

Note: If you later change the database name, you will have to edit the resource database location in the Configuration Manager prior to launching the Environment Manager, for more information, see *Step 4: Editing the Database Daemon Location and RDB Name* on page 18.

Step 8: Set the Tomcat HTTP Port Number

Next, define the Apache Tomcat HTTP port number. To do this, enter the port number for the Tomcat web server and click the **Next** button.

Step 9: Enter the License Keys

Enter the License Key name and license key(s) that were provided to you by Software AG. Multiple License Names and Keys may be entered at this screen. After entering the License Name and the License Key(s), click the **Add** button and observe that the License Key information appears in the License Keys display window, and the message `"License Key validated and added"` is displayed. Add additional license keys as required. When all license keys have been entered, click **Next** to continue the installation (Figure 8).

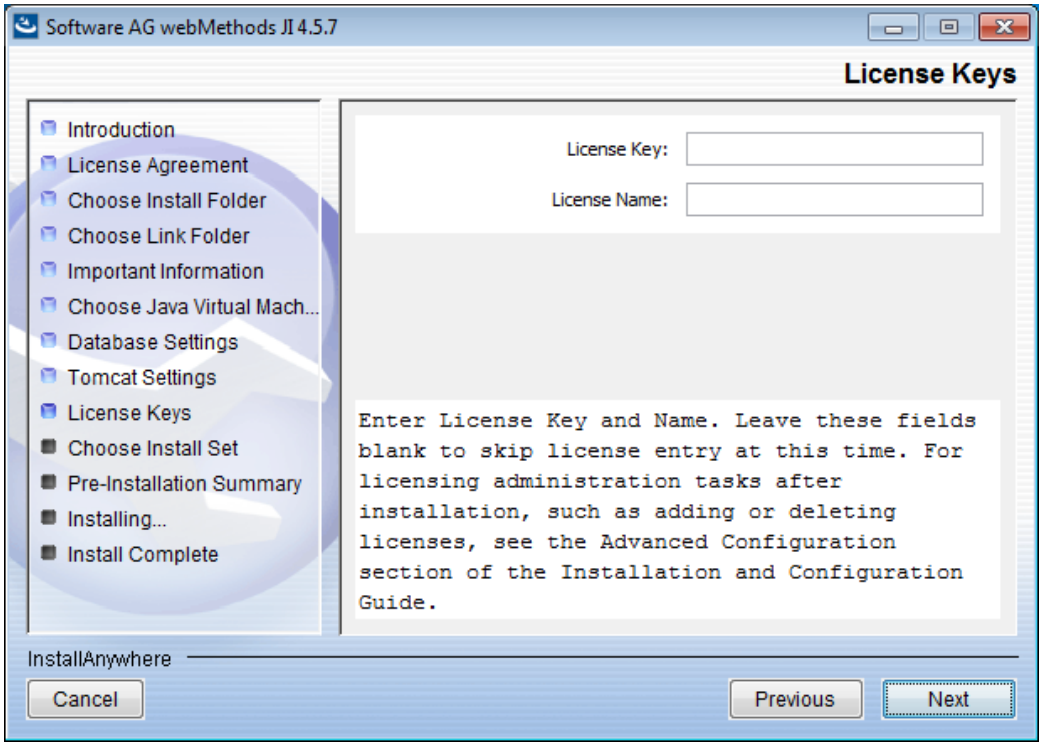

Figure 8. Installer- Enter License Keys Information

If license keys are not available at the time of the installation, you may skip this step by clicking Next. The license(s) may be entered later via the Configuration Manager.

If an invalid license key is entered, a message prompting you to enter a valid license key will be displayed in this panel.

Step 10: Select the Installation Set

The next window in the installation program allows you to select the files that should be installed. The following installation set options are offered (Figure 9):

- Full Server
- Full Client

- Custom

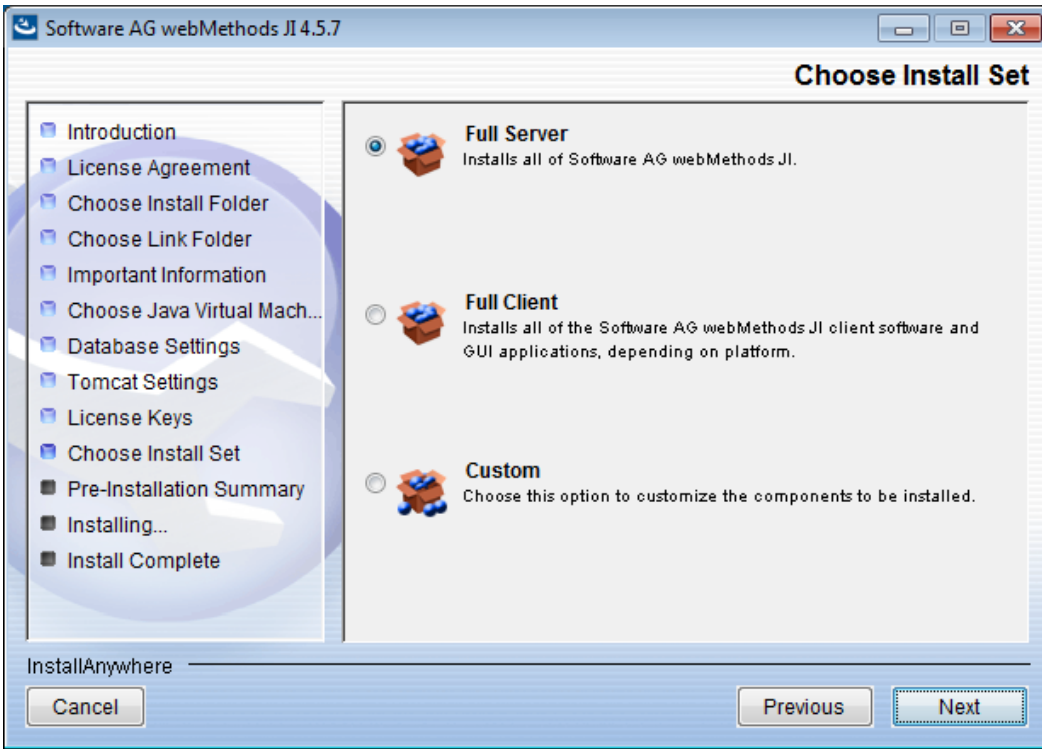

Figure 9. Select the installation set

Installation Set	Description
Full Server	The following items are installed by default when the Full Server installation is selected: • All components of the webMethods JI server environment. • All webMethods JI Graphical User Interfaces (GUIs). • All webMethods JI client libraries and interfaces. • All webMethods JI documentation, in PDF format.

Note: The GUIs are not installed on UNIX.

Installation Set	Description
Full Client	The following items are installed by default when the Full Client installation is selected: • All webMethods JI Graphical User Interfaces (GUIs). • All webMethods JI client libraries and interfaces. • All webMethods JI documentation, in PDF format. **Note:** The GUIs are not installed on UNIX.
Custom	This option represents the same installation as the typical server, except that each element is selectable to be included or excluded from the installation.

The components included with each installation set can be customized. For information about customizing the installation, see *Step 11: Customizing the Installation Set*, below. To install the default components without customizing the installation, select the appropriate installation set.

If the **Full Server** option was selected, observe that webMethods JI is installed on your system.

Step 11: Customizing the Installation Set

To customize the components that will be installed, select **Custom** and then click the **Next** button. The **Choose Product Components** dialog window will open (Figure 10):

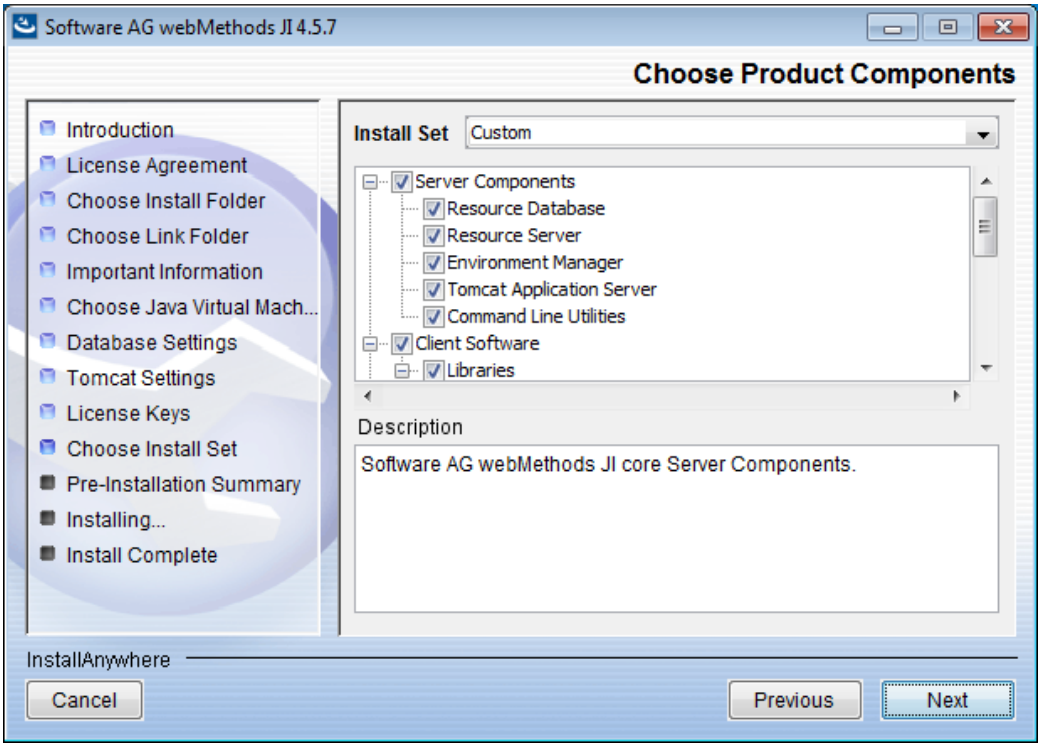

Figure 10. Customizing the installation set

To select or deselect items for installation, click on the check box next to the item. The following options are available for customized installation:

Option	Description
Server Components	Installs all components necessary to run the webMethods JI server environment. Included are the Environment Manager, Resource Server, Resource Database, configuration files, and all supported classes and other files required to run the environment.

Option	Description
Client Software	Installs the client libraries and interfaces included with webMethods JI. You can select individual client components for installation. Available components are: • Libraries: Installs the selected webMethods JI client libraries. • Gateways: Installs the webMethods JI HTTP Gateway or the MQ Gateway. • Siebel Integration Examples: Installs example files for integrating webMethods JI with Siebel applications. For more information about integrating webMethods JI and Siebel, see the *webMethods JI Client Developer's Guide*.
MapMaker	Installs the webMethods JI MapMaker graphical development environment.
Configuration Manager	Installs the webMethods JI Configuration Manager, a graphical user interface (GUI) application used to configure webMethods JI environments.
System Monitor	Installs the webMethods JI System Monitor, a GUI application used to monitor webMethods JI environments.
Documentation	Installs the complete set of webMethods JI documentation in PDF format.

After selecting the components for installation, click the **Next** button to display the Pre- Installation Summary.

Step 12: Pre-Installation Summary

The **Pre-Installation Summary** is a check screen to allow the user to review the installation choices made up to this point. If an error is discovered at this point (e.g., incorrect JVM selected), the user may return to the appropriate screen, using the **Previous** button to navigate back, and correct the errant entry. When all parameters have been entered satisfactorily, then click the **Install** button to proceed with the installation (Figure 11).

Note: In some cases, the JI installer may calculate the amount of free disk space incorrectly, requiring you to free disk space or quit the installation even though there is more than enough disk space available to install JI. To work around this problem, the environment variable "CHECK_DISK_SPACE" may be set to "OFF" prior to running the installer:

```
CHECK_DISK_SPACE=OFF
export CHECK_DISK_SPACE
setup.bin
```

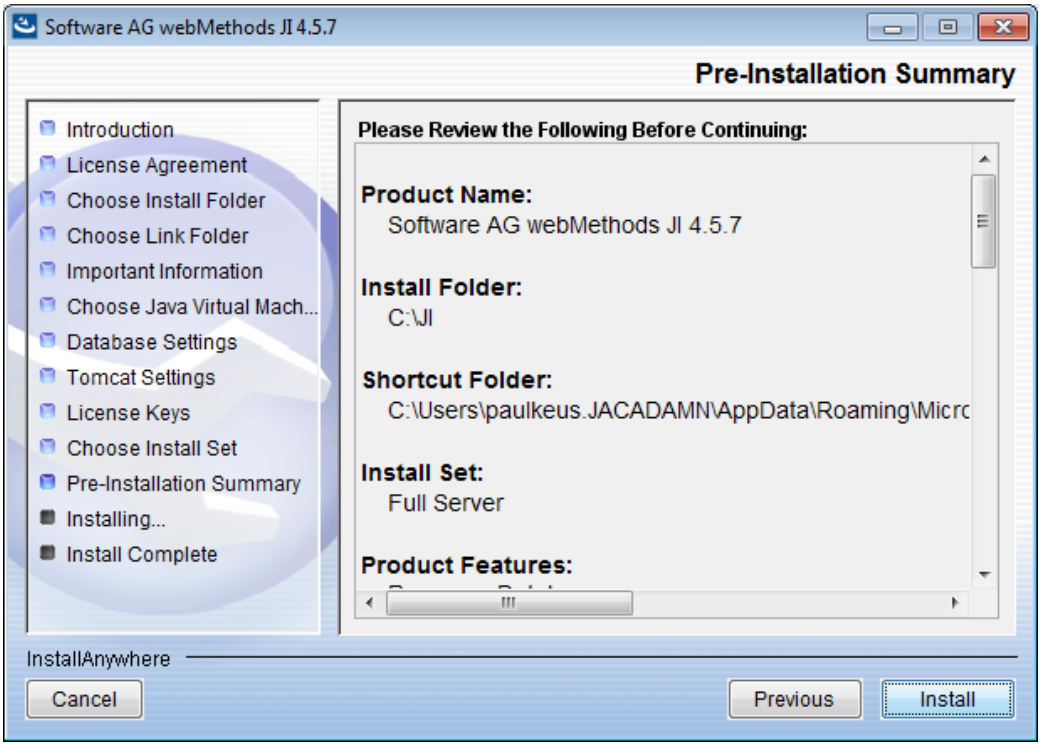

Figure 11. Pre-Installation Summary

The **Installing** window is displayed as the files are being installed on your system (Figure 12):

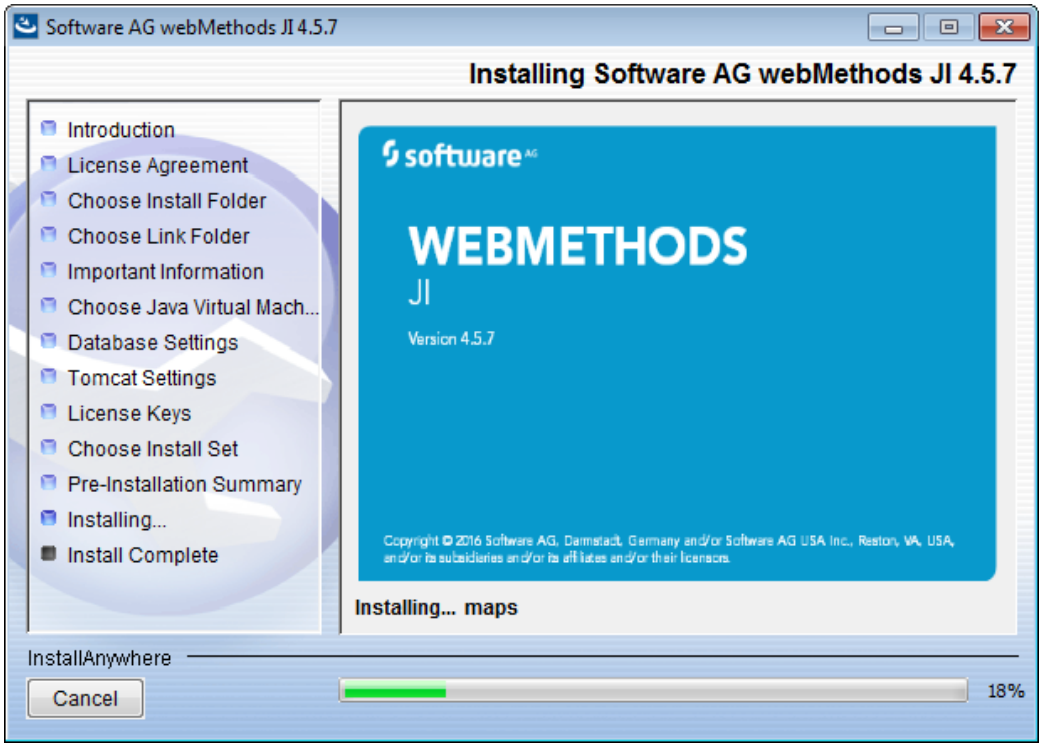

Figure 12. Installing

Observe the webMethods JI installation continues until finished and the **Install Complete** window is displayed. Click **Done** to close the window (Figure 13).

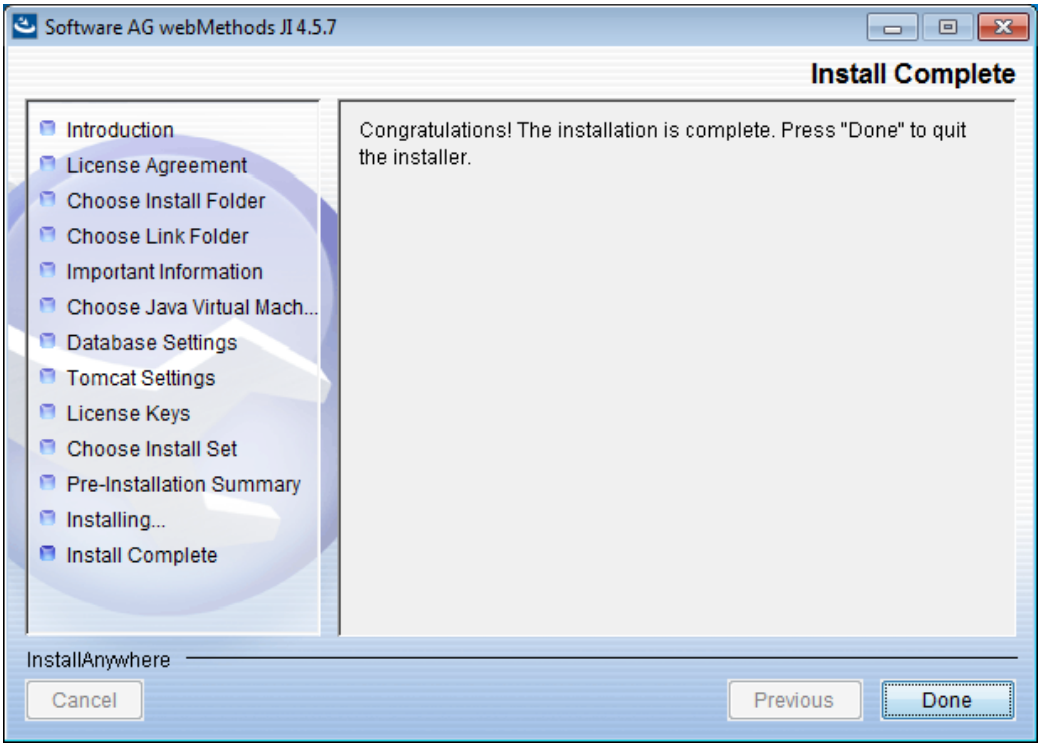

Figure 13. Install Complete

Console Mode Installation

The following steps outline how to run the webMethods JI installation in console mode.

Step 1: Launch the Console Installation

Windows

Copy the approrpiate webMethods JI installer to a directory on the machine you wish to install it on.

To launch the installation program in Windows, select Run from the Start Menu. Type `<path_to_installer>\setup.exe -i console`, where `<path_to_installer>` represents the directory path the webMethods JI installer was copied to. Press Enter or click on the **OK** button to launch the installation program in console mode.

UNIX

Copy the approrpiate webMethods JI installer to a directory on the machine you wish to install it on.

1. Change directory to the directorycontinaining the webMethods JI installer:
   `cd <path_to_installer>`
2. Type `./setup.bin -i console` or `<path_to_installer>/setup.bin` -i console at the UNIX prompt. This will start the webMethods JI installation utility in console mode.

   Note: When running on UNIX and the InstallAnywhere installer exits silently, check your ENV environment variable and your .kshrc file. If your ENV environment variable points at your .kshrc file and your .kshrc file modifies your CLASSPATH environment variable, the installer exits silently with no error. The workaround is to not set CLASSPATH in your .kshrc file.

3. Observe the installer extracts files, configures and proceeds to the first screen of the installation.

Step 2: Introduction to webMethods JI Installation

The first screen displayed during the execution of the console installation program provides a visual indication of the loading of the installer the Introduction to the webMethods JI installation program (Figure 14).

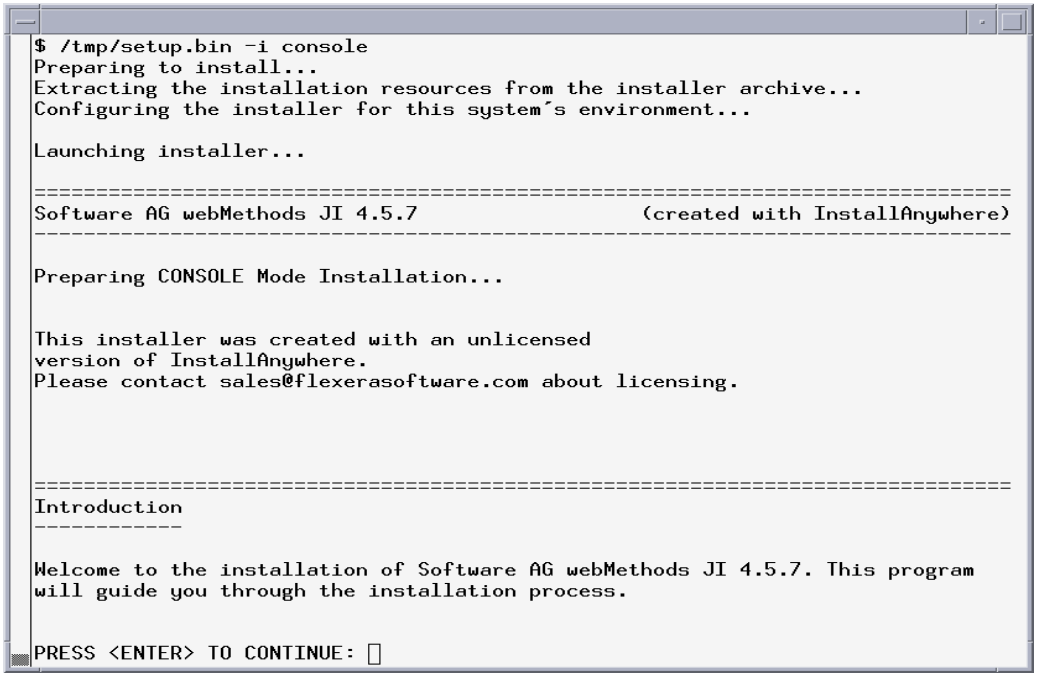

Figure 14. webMethods JI Console Installation Program Introduction

Press Enter to continue to the next screen.

Step 3: The License Agreement

The next screen displays the first page of the license agreement (Figure 15).

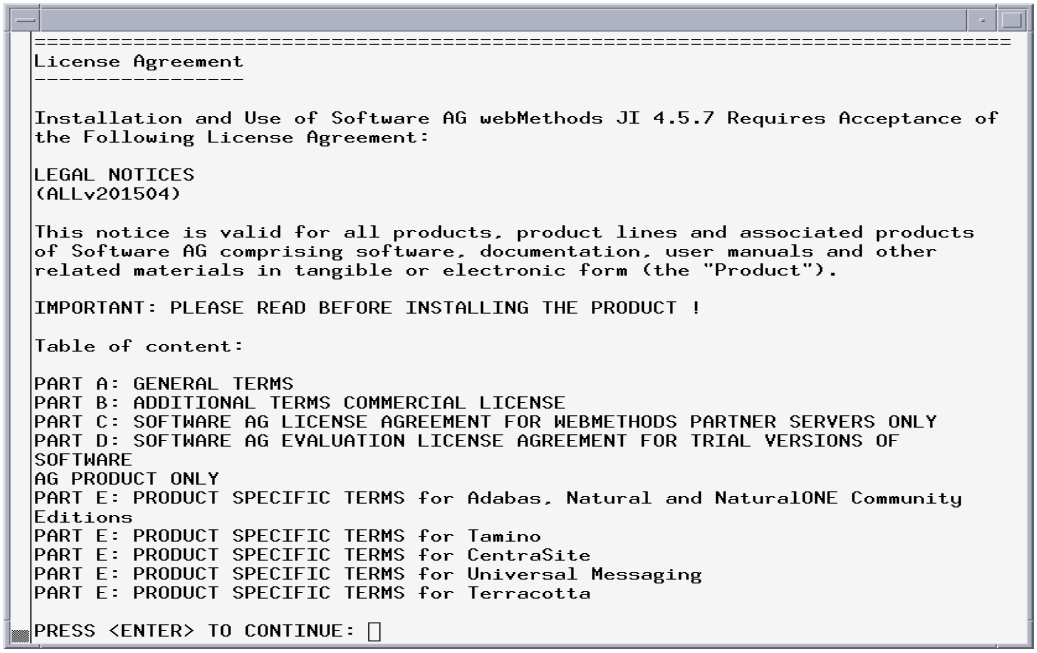

Figure 15. The webMethods JI License Agreement

Press Enter to continue through to the last page of the license agreement where you will be prompted to accept the terms of the license agreement (Figure 16).

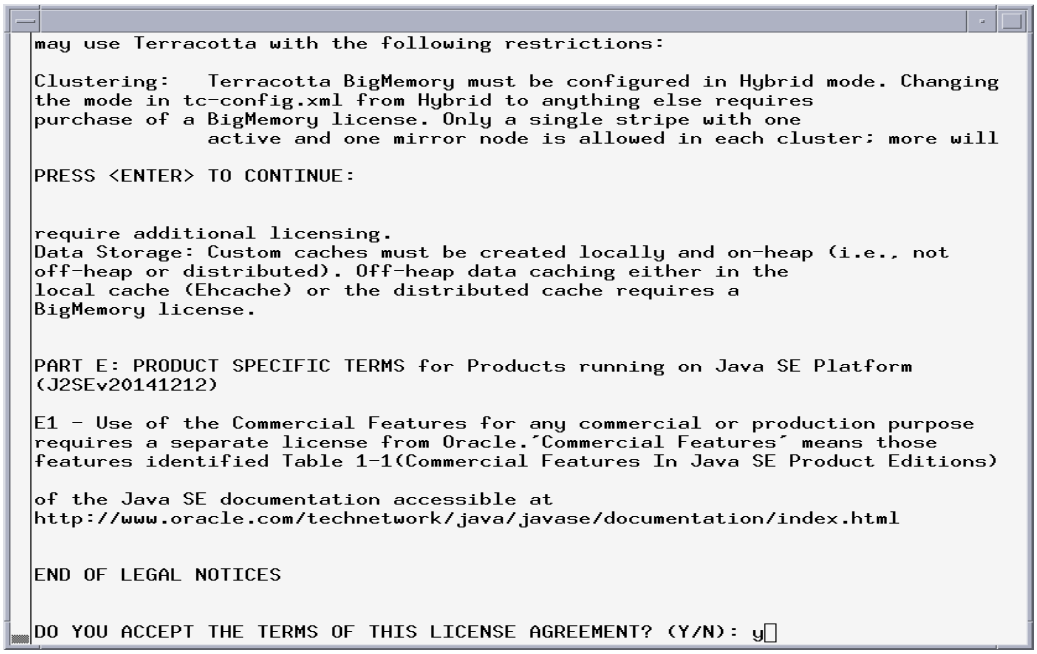

Figure 16. Accepting the webMethods JI License Agreement

To accept the license agreement and continue to the next screen, press Y and Enter.

Step 4: Select Install Folder

The next screen is used to select the directory in which webMethods JI will be installed (Figure 17).

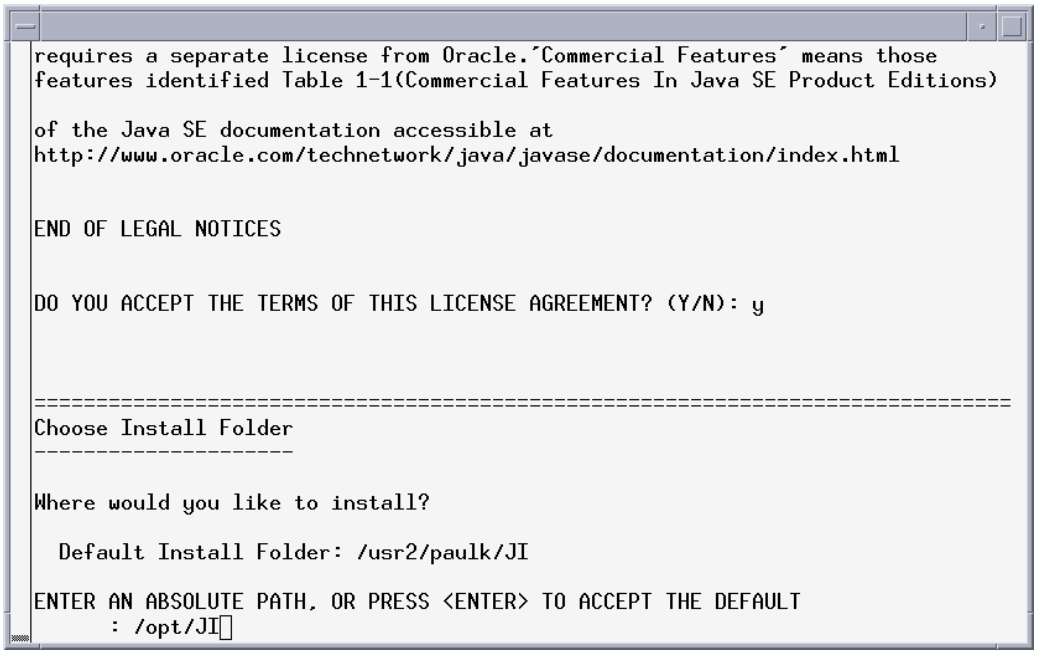

Figure 17. Select an installation directory

Press Enter to accept the default installation directory or type in the path of the directory you would like to use for the webMethods JI installation and press Enter. You will then be asked to confirm your installation directory selection. Type Y and press Enter to confirm the installation directory and continue to the next screen or type N and press Enter to re-enter the installation directory.

Step 5: Select the Location for Windows Shortcuts

The next screen is displayed for Windows only and allows you to select the location of the Windows shortcuts for webMethods JI (Figure 18).

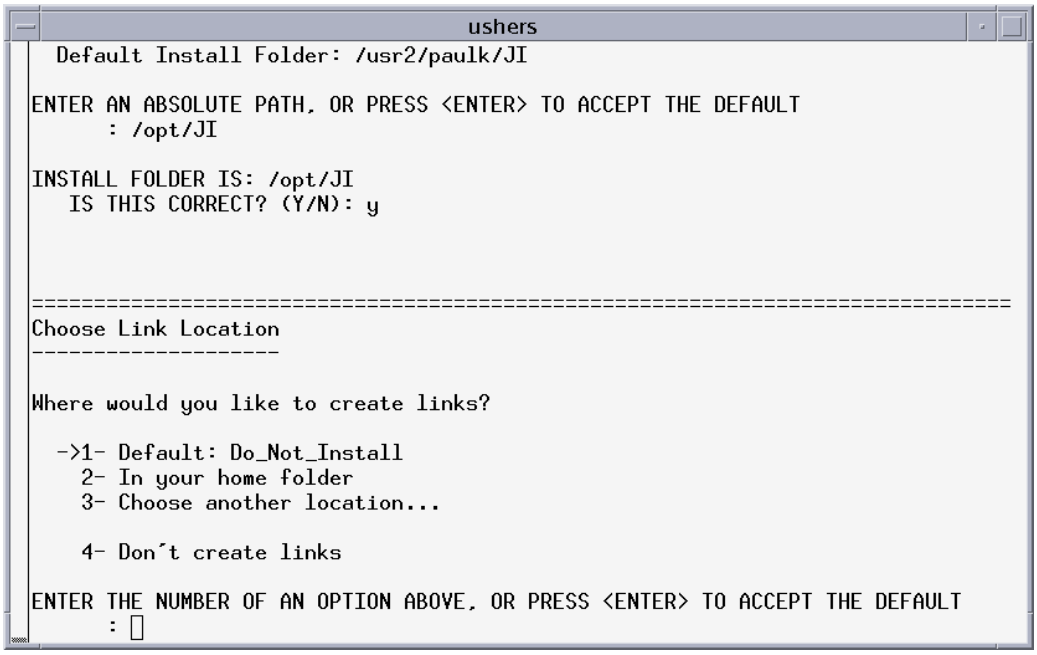

Figure 18. Choose Link Location

Select the approprate option and press Enter to continue.

Step 6: Select a Java Virtual Machine

Because a Java Virtual Machine (JVM) is required to run the webMethods JI server environment, you must select a JVM that is already installed on your file system.

Note: To use the service generation features of the MapMaker graphical development environment, a Java Developers Kit (JDK), is required. The JDK is not provided with this installation.

This screen describes the JDK requirement for running the Tomcat aplication server (Figure 19).

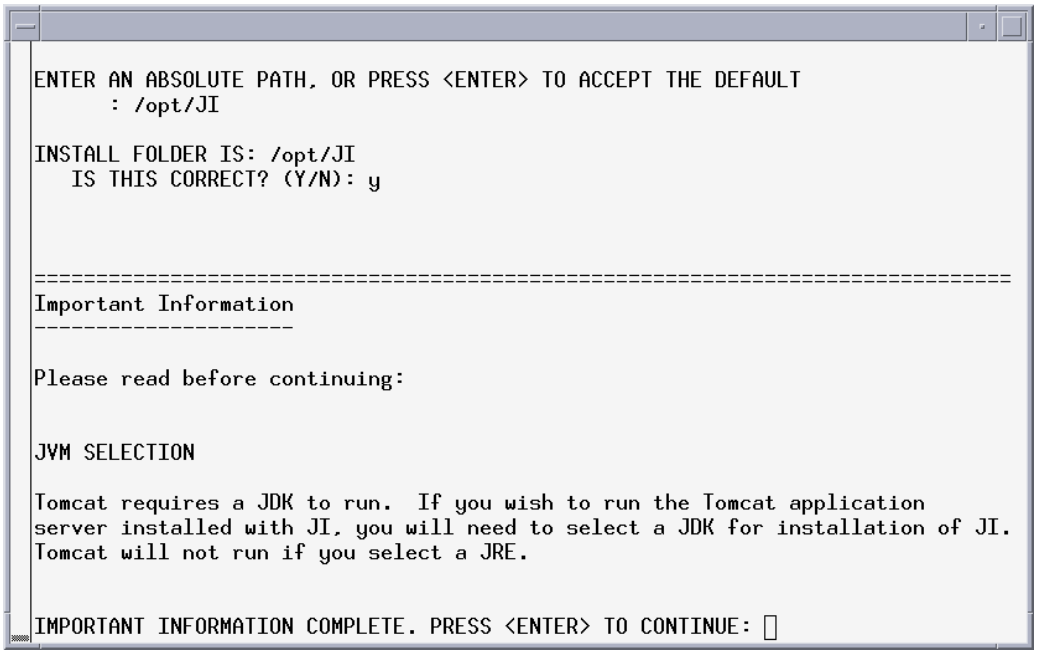

Figure 19. JVM Selection

After selecting a JVM during installation, the installation program updates files with the location of the JVM. As a result, if you choose at a later date to use a newer JVM or a different JVM from the one selected during installation, you will have to edit these files to change the location of the JVM. This affects the following areas in the installation:

- The Environment Manager configuration file. For more information about editing the Environment Manager configuration file, see the *webMethods JI User's Guide*.
- Lax files. Lax files are created by the installation program for use by webMethods JI commands. The lax files provide information to the commands, such as the location of the JVM used to launch the commands. For information about changing the JVM referenced in webMethods JI lax files, see the *webMethods JI User's Guide*.

This window allows you to select a JVM (Figure 20).

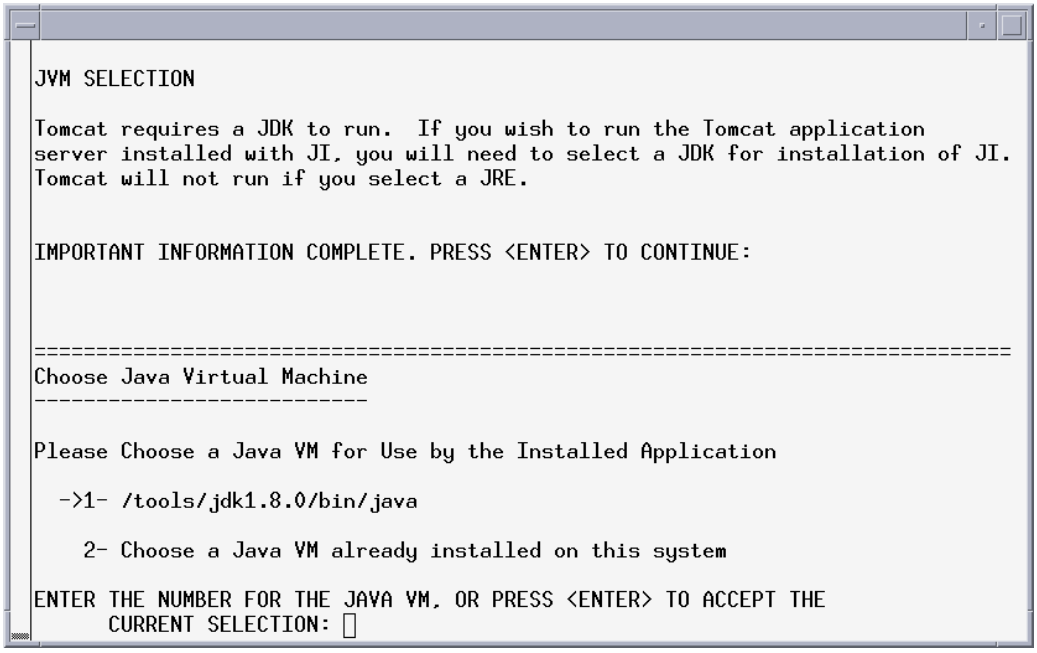

Figure 20. Select a Java VM for the application

To select a JVM, enter the number of the preferred JVM from the list or the number of the last entry in the list to enter the path of a JVM which is not presented in the list. The path selected must be an absolute path to a JDK or JRE installation. Symbolic links are not supported in this path.

Step 7: Select the Database Settings

Note: You must select a JVM that is compatible with Oracle's JDK 1.4.2_05 or newer. Multiple JVMs may be listed in this dialog box; not all of them are necessarily 1.4.2_05 compatible. For example, Microsoft JVMs may be listed in this dialog box. Make sure you select a 1.4.2_05 or newer compatible JVM.

The next screen allows you to configure the webMethods JI Resource Database settings and whether or not to create a new Resource Database at install time (Figure 21).

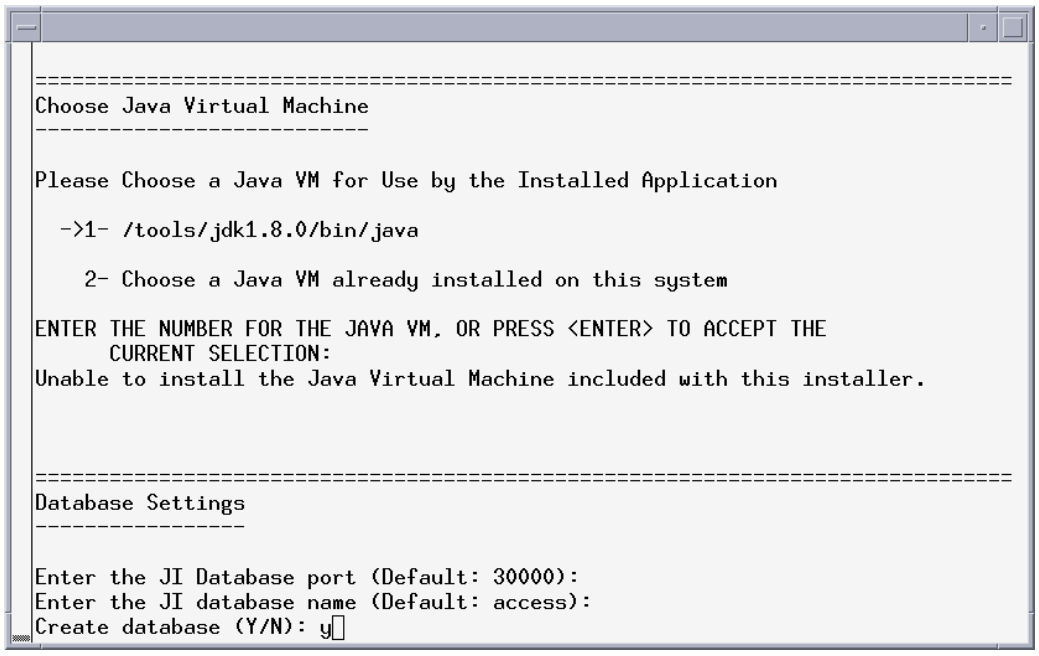

Figure 21. Identify or create a Resource Database

To use an existing database, enter the port number for the Resource Database server and the database name and type N and press Enter at the Create database prompt

To create a new database, enter the port number for the Resource Database server and the database name and type Y and press Enter at the Create database prompt.

Note: If you later change the database name, you will have to edit the resource database location in the Configuration Manager prior to launching the Environment Manager, for more information, see *Step 4: Editing the Database Daemon Location and RDB Name* on page 18.

Step 8: Set the Tomcat HTTP Port Number

The next screen allows you to define the Tomcat application server port number (Figure 22)

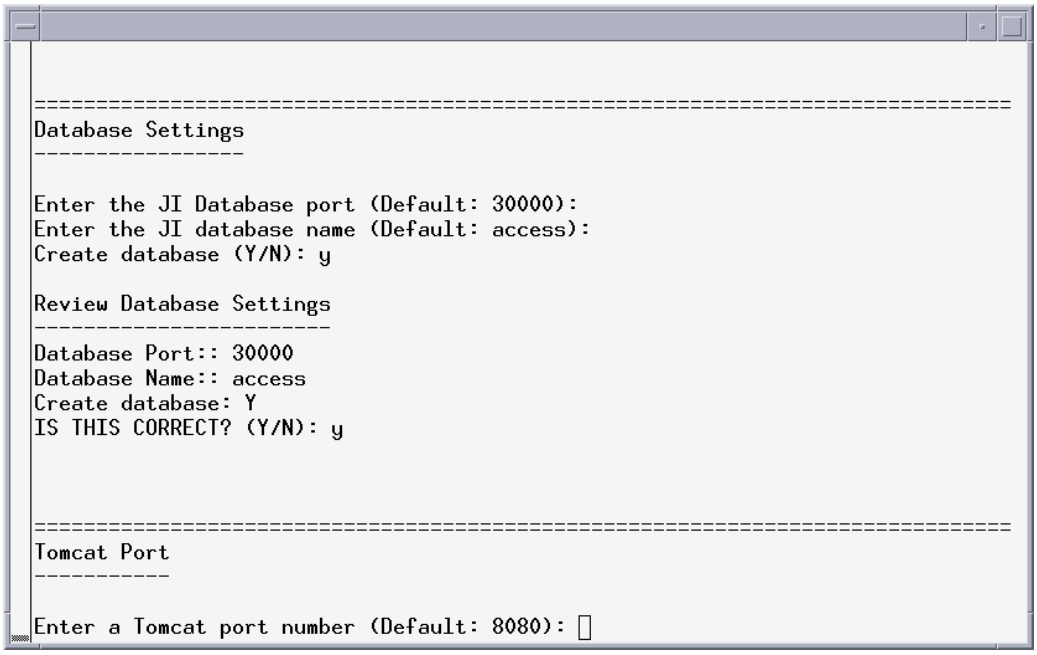

Figure 22. Enter a Tomcat port number

Enter the port number for the Tomcat application server or press Enter to accept the default port number.

Step 9: Enter the License Keys

Enter the License Key name and license key(s) that were provided to you by Software AG. Multiple License Names and Keys may be entered at this screen. After entering the License Name and the License Key(s), click the **Add** button and observe that the License Key information appears in the License Keys display

window, and the message "License Key validated and added" is displayed. Add additional license keys as required. When all license keys have been entered, click **Next** to continue the installation (Figure 23).

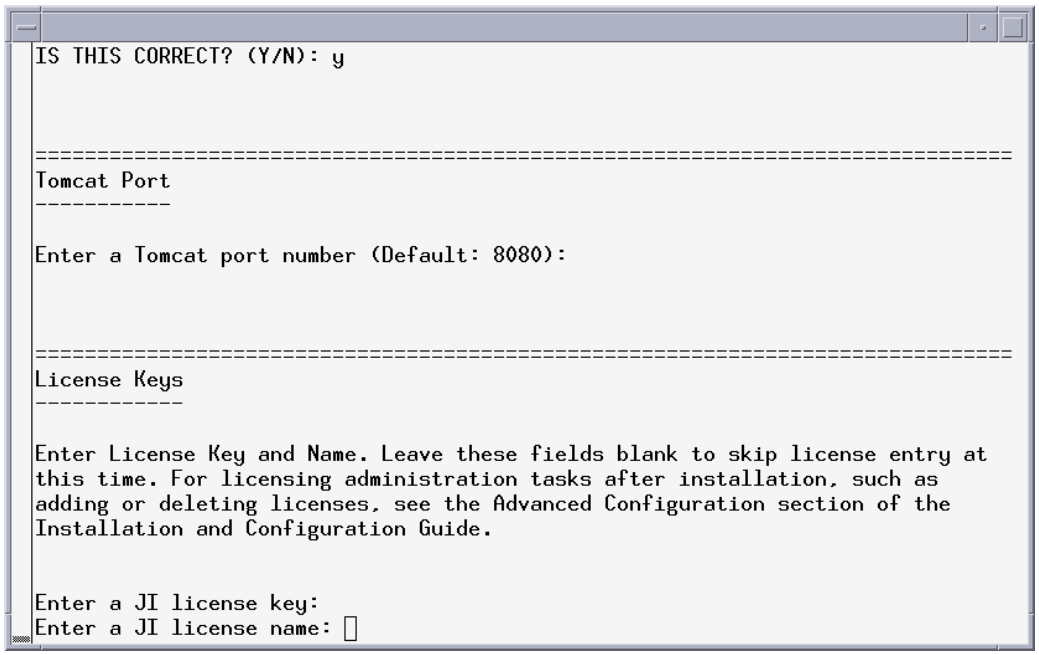

Figure 23. Enter webMethods JI license information

If license keys are not available at the time of the installation, you may skip this step by pressing Enter at the License Key and Name prompts and typing Y and pressing Enter at the IS THIS CORRECT prompt. The license(s) may be entered later via the Configuration Manager.

If an invalid license key is entered, a message prompting you to enter a valid license key will be displayed and the License Keys screen will be displayed again.

Step 10: Select the Installation Set

The next screen allows you to select the installation set or customize your webMethods JI installation. (Figure 24)

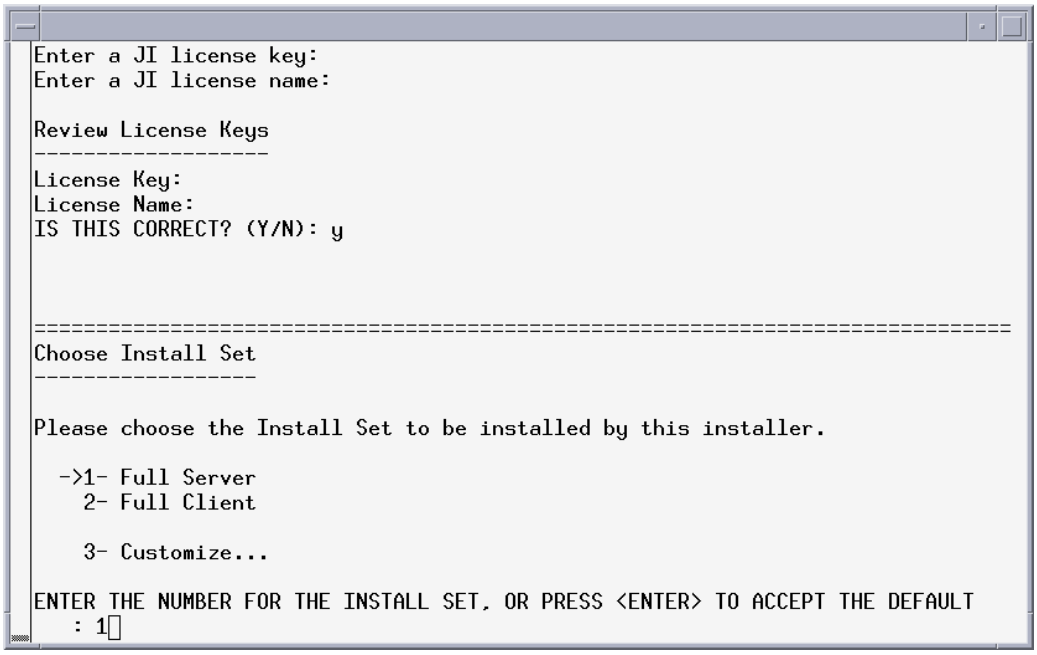

Figure 24. Select the installation set

Installation Set	Description
Full Server	The following items are installed by default when the Full Server installation is selected: • All components of the webMethods JI server environment. • All webMethods JI Graphical User Interfaces (GUIs). • All webMethods JI client libraries and interfaces. • All webMethods JI documentation, in PDF format.

Note: The GUIs are not installed on UNIX.

Installation Set	Description
Full Client	The following items are installed by default when the Full Client installation is selected: • All webMethods JI Graphical User Interfaces (GUIs). • All webMethods JI client libraries and interfaces. • All webMethods JI documentation, in PDF format. **Note:** The GUIs are not installed on UNIX.
Custom	This option represents the same installation as the typical server, except that each element is selectable to be included or excluded from the installation.

The components included with each installation set can be customized. For information about customizing the installation, see *Step 11: Customizing the Installation Set*, below. To install the Full Server or Full Client components without customizing the installation, type the appropriate number from the list and press Enter.

Step 11: Customizing the Installation Set

To customize the installation set type the appropriate number from the list and press Enter to continue to the ChooseProduct Features screen (Figure 25).

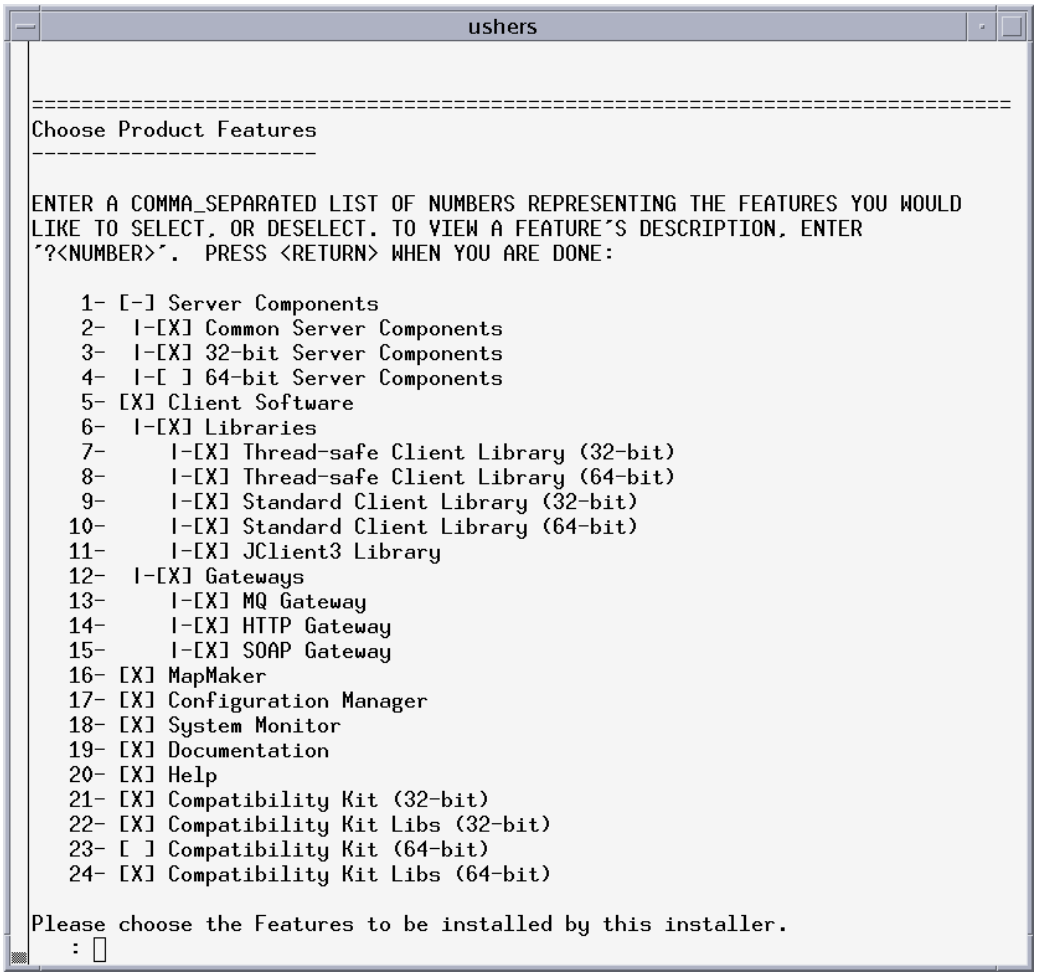

Figure 25. Customizing the installation set

To select or deselect items for installation, type a comma separated list of numbers representing the features you would like to select or deselect. Items with items with `[X]` next to them are selected for installation and items with `[ ]` next them are deselected. The following options are available for customized installation:

Option	Description
Server Components	Installs all components necessary to run the webMethods JI server environment. Included are the Environment Manager, Resource Server, Resource Database, configuration files, and all supported classes and other files required to run the environment.
Client Software	Installs the client libraries and interfaces included with webMethods JI. You can select individual client components for installation. Available components are: • Libraries: Installs the selected webMethods JI client libraries. • Gateways: Installs the webMethods JI HTTP Gateway or the MQ Gateway. • Siebel Integration Examples: Installs example files for integrating webMethods JI with Siebel applications. For more information about integrating webMethods JI and Siebel, see the *webMethods JI Client Developer's Guide*.
MapMaker	Installs the webMethods JI MapMaker graphical development environment.
Configuration Manager	Installs the webMethods JI Configuration Manager, a graphical user interface (GUI) application used to configure webMethods JI environments.
System Monitor	Installs the webMethods JI System Monitor, a GUI application used to monitor webMethods JI environments.
Documentation	Installs the complete set of webMethods JI documentation in PDF format.

After entering the list of components to select and deselect for installation, press enter to continue to the Pre- Installation Summary screen.

Step 12: Pre-Installation Summary

The **Pre-Installation Summary** (Figure 26) is a check screen to allow the user to review the installation choices made up to this point. If an error is discovered (e.g., incorrect JVM selected), the user must interrupt the instalation and start over.

Figure 26. Installation Summary

Press enter to start the installation. The installer will display a progress screen during the installation and the message Installation finished successfully will be displayed when the installation is complete (Figure 27).

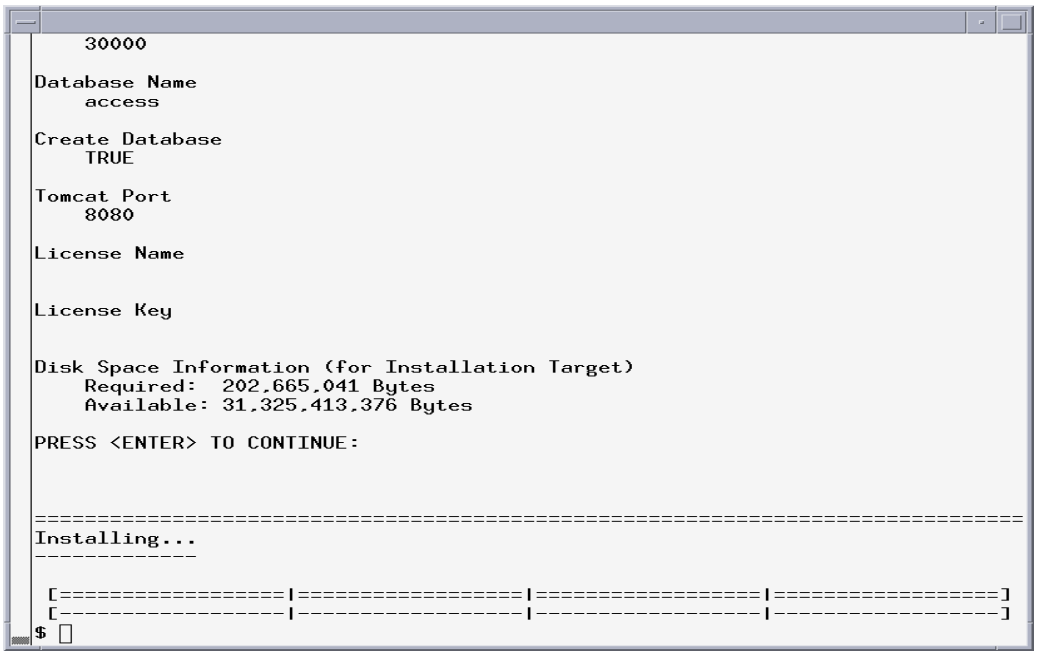

Figure 27. Installation complete

Note: In some cases, the JI installer may calculate the amount of free disk space incorrectly, requiring you to free disk space or quit the installation even though there is more than enough disk space available to install JI. To work around this problem, the environment variable "CHECK_DISK_SPACE" may be set to "OFF" prior to running the installer:

```
CHECK_DISK_SPACE=OFF
export CHECK_DISK_SPACE
setup.bin
```

Installing webMethods JI Server Software as a Windows Service

When webMethods JI is installed on a Windows server as a standard application, it cannot run unless a user is logged on to the Windows server. To provide continued, unattended access to webMethods JI, you can install it as a service within the Windows registry.

Note: webMethods JI Windows Service functionality is only supported on Microsoft's server operating systems.

As a Windows service, webMethods JI can be conveniently controlled through the Windows **Services** applet, which is accessed through the Control Panel (Figure 28).

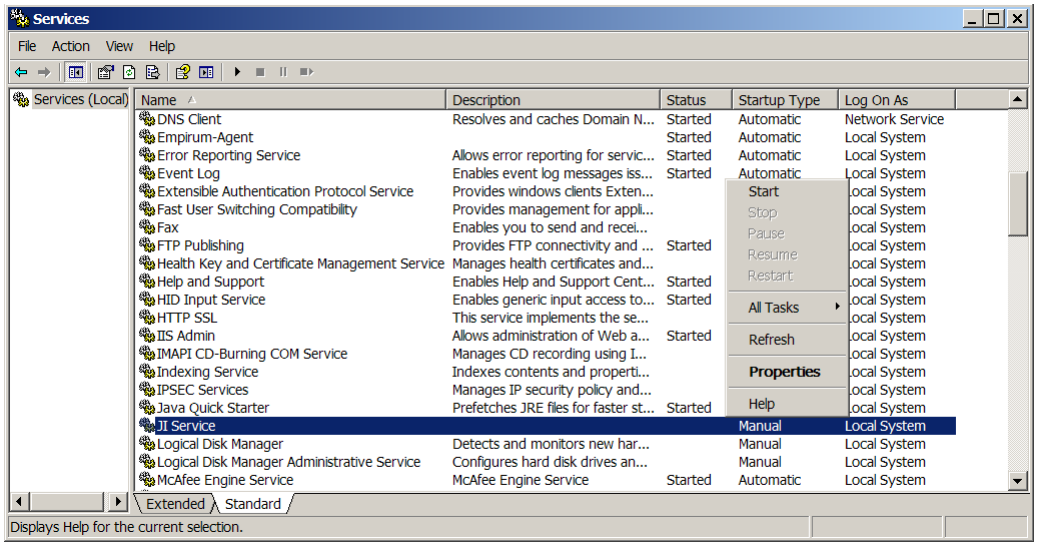

Figure 28. The webMethods JI Service in the Windows Services Applet

Installing the webMethods JI Service

The webMethods JI Server is installed (or removed) as a Windows service using the `ji_svc` program. Given a webMethods JI 4.5 installation in the `C:\JI` directory, the following command will perform the installation:

```
ji_svc -i -w C:\JI
```

The following table lists the default webMethods JI Service properties, as well as the commands used to modify these properties.

Property	Default Value	Modified Via...
Service Name	JIService	`-s <Service Name>`
Display Name	webMethods JI Server	`-d <Display Name>`

Property	Default Value	Modified Via...
Working Directory	C:\JI	`-w <Working Directory>`

For a detailed description of the `ji_svc` program, see the *webMethods JI Supplemental Reference Guide.*

Uninstalling the webMethods JI Service

The following command removes the previously installed webMethods JI 4.5 Windows Service:

```
ji_svc -r -s JIService
```

Note: When removing a webMethods JI Service, the `Service name` must be the same as the one used when the webMethods JI Service was installed.

Installing Multiple webMethods JI Services

Each webMethods JI Service is an instance of the webMethods JI Server, which has been installed as a Windows Service. There may be zero or more webMethods JI Services on any Windows system.

If there is more than one webMethods JI Service on a particular system, each instance must have a unique **Service name**. In addition, each Service instance should have a unique **Display name**, so that you can differentiate between these instances in the **Services** applet (see Figure 28).

Note: It is recommended that each webMethods JI Service instance has its own webMethods JI installation directory.

Upgrading From an Earlier Release of webMethods JI

For the purposes of this discussion, the currently installed environment will be referred to as the source environment and the upgraded environment will be referred to as the target environment. In addition, the example commands given below will assume the default values for database name, ports, etc. See the manual pages for the individual commands in the *webMethods JI Supplemental Reference Guide* for the command line options required for setting non-default values. The "webMethods JI Upgrade Procedure" below should used when upgrading from webMethods JI 4.5.6 and newer versions. "Converting a Database From MySQL to H2" describes the process to be used when upgrading from JI 4.5.5 and earlier to JI 4.5.6 and newer versions.

webMethods JI Upgrade Procedure

The following steps describe the procedure for upgrading from a previous release of webMethods JI when the source and target environments are both running the same database server software (MySQL or H2).

1. Start the source environment Resource Database

   `<src_env_dir>/bin/ea_start -m`

   Where `<src_env_dir>` is the path to the source JI environment installation directory.
2. Export the source Resource Database

   `<src_env_dir>/bin/ea_exportdb <exports_dir>/access.exp`

   Where `<exports_dir>` is the path to the directory containing the database export file.
3. Shut down the source Resource Database

   `<src_env_dir>/ea_shutdown -m`
4. Install the target JI environment

   See “Installing webMethods JI Server Software” on page 15 for detailed instructions on installing JI.

   Note: You may need to reboot the machine or reset the EA_ENV and PATH environment variables after installing the target JI environment.
5. Copy the maps from the source environment to the target environment
6. Start the target Resource Database and Resource Server

   `<trgt_env_dir>/bin/ea_start -D -r`

   Where `<trgt_env_dir>` is the path to the target JI environment installation directory.

7 Import the source database export file created in step 2 above into the target database

```
<trgt_env_dir>/bin/ea_importdb <exports_dir>/access.exp
```

8 Regenerate and redeploy your JI services

For each map:

a Load the map into MapMaker

b Update the map

c Generate the map

d Deploy the generated service(s) and/or web service(s)

9 Test the deployed services

Converting a Database From MySQL to H2

When upgrading from a webMethods JI 4.5.5 or earlier environment to a JI 4.5.6 or newer environment, the upgrade procedure must be modified slightly. The MySQL source database must be converted to H2 import format using the ea_convertdb command from the target environment before it can be imported into the target H2 database. The following steps describe the procedure for converting a MySQL Resource Database to H2 import format.

1 Install the target JI environment

See "Installing webMethods JI Server Software" on page 15 for detailed instructions on installing webMethods JI.

2 Start the source environment Resource Database

```
<src_env_dir>/bin/ea_start -i <src_env_dir> -c <src_env_cfg_dir> -m
```

Where *<src_env_dir>* is the path to the source JI environment installation directory and *<src_env_cfg_dir>* is the path to the source JI environment config directory.

3 Convert the source database to H2 import format using the *ea_convertdb* command

```
<trgt_env_dir>/bin/ea_convertdb -H <src_db_host> -p <src_db_port> -n
<src_db_name> access.exp
```

Where *<trgt_env_dir>* is the path to the target JI environment installation directory, *<src_db_host>* is the host name or address of the machine the source environment is running on, *<src_db_port>* is the source database TCP port and *<src_db_name>* is the name of the source database.

4 Shutdown the source Resource Database

```
<src_env_dir>/bin/ea_shutdown -c <src_env_cfg_dir> -i <src_env_dir> -m
```

5 Start the target Resource Database

```
<trgt_env_dir>/bin/ea_start -D
```

6 Import the converted source database export into the target database using the ea_importdb command

```
<trgt_env_dir>/bin/ea_importdb access.exp
```

Where *<exports_dir>* is the path to the directory containing the database export files.

7. Start the target Resource Server

```
<trgt_env_dir>/bin/ea_start -r
```

8. Regenerate and redeploy your JI services as described in step 8 of the "webMethods JI Upgrade Procedure" above

Chapter 2. Configuring the Environment

Preliminary Configuration Steps

This chapter discusses how to verify your installation and configure your webMethods JI server environment.

The following steps are required:

Step 1: Starting the Resource Database and the Resource Server

Step 2: Starting the Configuration Manager

Step 3: Entering your License Key

Step 4: Editing the Database Daemon Location and RDB Name

Step 5: Starting the Environment Manager

Step 6: Connecting to the Environment Manager in the Configuration Manager

Step 7: Editing Environment Manager Configuration Parameters

Step 8: Changing the Resource Server's RMI Port

Step 9: Changing the Resource Name for the Resource Database

Step 10: Editing the Environment Manager Configuration in the Resource Database

Step 11: Setting EA_ENV and Editing the environment.ccf File

Advanced Configuration

The steps in this chapter are for basic configuration tasks. Your configuration tasks may vary depending on the server components required. For more information about advanced configuration (i.e. load balancing, redundancy, proxy server configuration) of the webMethods JI server environment, see the *webMethods JI User's Guide*.

Step 1: Starting the Resource Database and the Resource Server

The Resource Database is a process that runs in the webMethods JI server environment and is used to provide storage for various data components. The Resource Database is built upon the embedded third-party H2 database engine. For more information about the Resource Database and H2, see the *webMethods JI User's Guide.*

The Resource Database is started using the following command:

UNIX:

```
cd <JI_install_dir>/bin
./ea_start -D
```

Windows:

```
cd <JI_install_dir>\bin
.\ea_start -D
```

The Resource Database can also be launched using shortcuts in Windows, if shortcuts were created during installation. For example, if shortcuts were added to the Start Menu during installation, the Resource Database can be started by selecting the ResourceDatabase shortcut from the Start Menu. Configuration information for the Resource Database can be changed at a later time (see *Step 4: Editing the Database Daemon Location and RDB Name*).

The Resource Server is a process that runs in the webMethods JI server environment, and is used to provide access to various data sources within the webMethods JI environment, including the license file and the Resource Database. For more information about the Resource Server, see the *webMethods JI User's Guide*.

The Resource Server is started using the following command:

UNIX:

```
cd <JI_install_dir>/bin
./ea_start -r
```

Windows:

```
cd <JI_install_dir>\bin
.\ea_start -r
```

The Resource Server can also be launched using shortcuts in Windows, if shortcuts were created during installation. For example, if shortcuts were added to the Start Menu during installation, the Resource Server can be started by selecting the Resource Server shortcut from the appropriate program menu in the Start Menu.

Note: If the Resource Server does not start, it could be because of a port conflict. By default, the Resource Server tries to start using an RMI port of `30002` (it can share this RMI port with the Environment Manager). In the event of a port conflict, change the Resource Server's RMI port using the `-p <rmiport>` command line option when launching the Resource Server:

```
cd <JI_install_dir>/bin
./ea_start -r -p <rmiport>
```

Where <rmiport> represents a valid port number of the Resource Server's RMI port (this port can be the same as the Environment Manager's RMI port).

Instructions for permanently changing the Resource Server's RMI port are found in *Step 8: Changing the Resource Server's RMI Port*, on page 66.

Step 2: Starting the Configuration Manager

```
cd <JI_install_dir>\bin.\ea_cfgmgr
```

The Configuration Manager can also be launched using shortcuts in Windows, if shortcuts were created during installation. For example, if shortcuts were added to the Start Menu during installation, the Configuration Manager can be started by selecting the Configuration Manager shortcut from the appropriate program menu in the Start Menu.

This will open the Configuration Manager graphical interface (Figure 29).

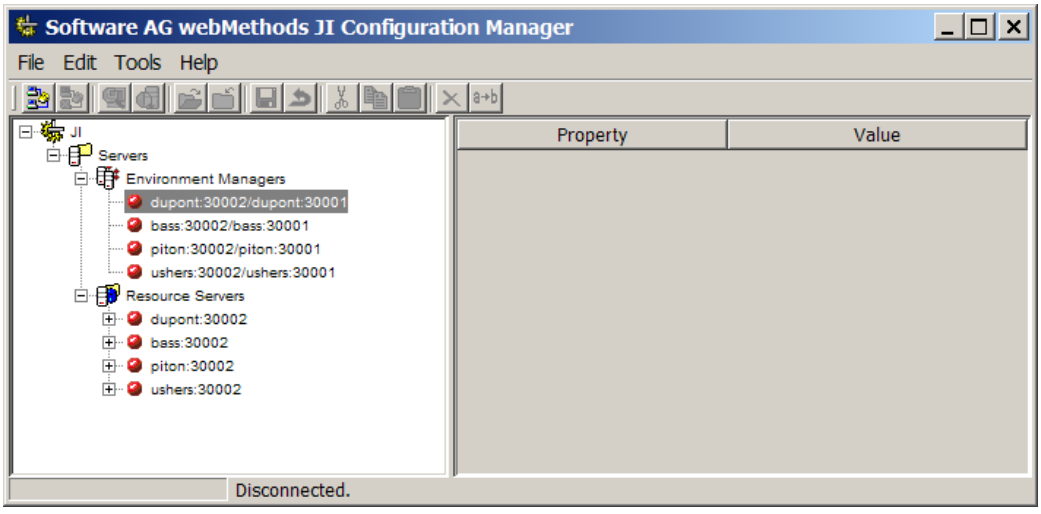

Figure 29. The Configuration Manager GUI

Step 3: Entering your License Key

If the license key information was not entered during the installation, follow these directions to enter your License Key in the Configuration Manager.

1 Under the Resource Server node, highlight your Resource Server (identified by the host name and port number of the Resource Server. See Figure 30).

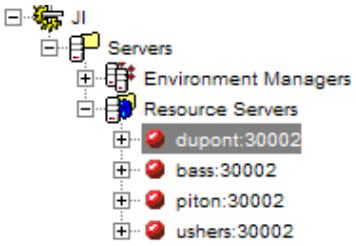

Figure 30. Select the resource server

2 Select **File** > **Connect** or click the **Connect** button  to connect to the Resource Server. The resources served by the Resource Server will be listed as subordinate to the Resource Server's node in the Tree (Figure 31).

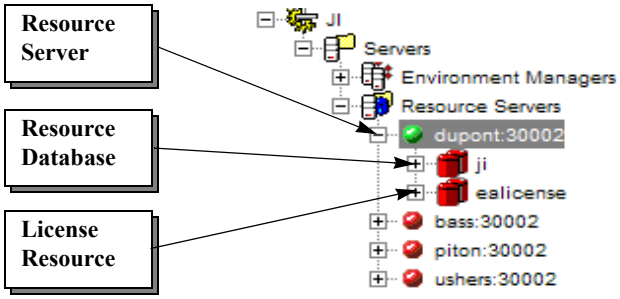

Figure 31. Resources served by the Resource Server

3 Highlight the license node and select **File** > **Open datasource** or click the **Open datasource** button  to open the license file for editing.

4 Next, right-click on the license node and select **New License Key Node** from the pop-up menu (Figure 32).

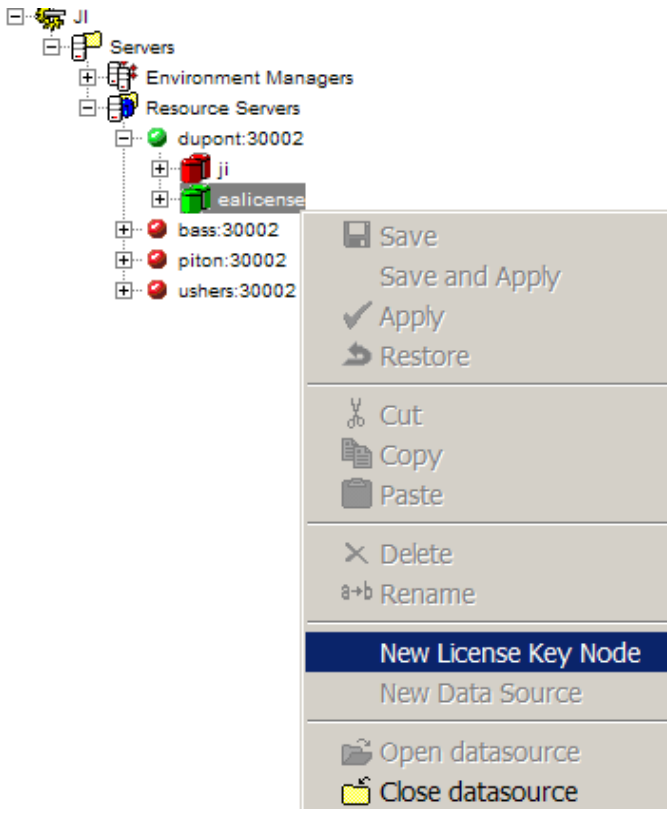

Figure 32. The license node control menu

A dialog box opens, requiring the license key and name (Figure 33).

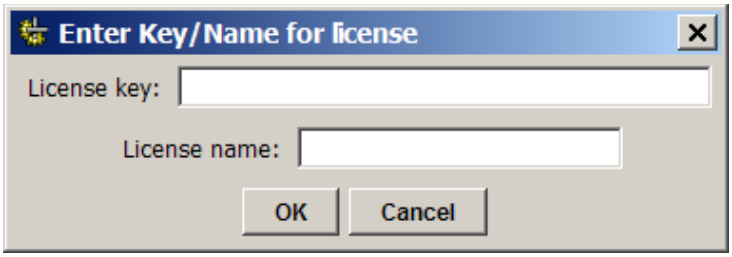

Figure 33. Enter key and name information

5 Enter the 64 character **License Key** and the **License name** that have been provided to you by Software AG.

Note: The license parameter in the `envmgr.cfg` file (located in the *<JI_install_dir>/config* directory) should match the license name entered here (the default name is SoftwareAG).

Step 4: Editing the Database Daemon Location and RDB Name

Note: This step is required only if you wish to change the database location and RDB name after the installation.

Next, we will use the Configuration Manager to identify the host and port on which the resource database server is running, along with the name of the Resource Database. There are two reasons why you might need to change the database location and name:

- During installation, a Resource Database can be created. If a database is created, and the database port and/or name is changed from their default settings, the values entered during installation should be changed in this step.
- If a database is not created during installation, the database host:port and name of the Resource Database must be changed to that of the desired Resource Database.

Default Settings

By default, the Resource Database's host is `localhost`, its port is `30000`, and the default name of the database is `access`. If default settings for these items are used, they do not need to be changed and you can proceed to *Step 5: Starting the Environment Manager*.

Steps to Change the Database Location and Name

The Resource Database is identified in the Configuration Manager tree by its Resource name. The default Resource name after installation is `ea`.

Note: This default resource name will be modified in *Step 9: Changing the Resource Name for the Resource Database*.

1 Highlight the Resource named `ji`, subordinate to the Resource Server node. The location and name of the Resource Database will be displayed as the value for the Data source address property in the Properties view (Figure 34).

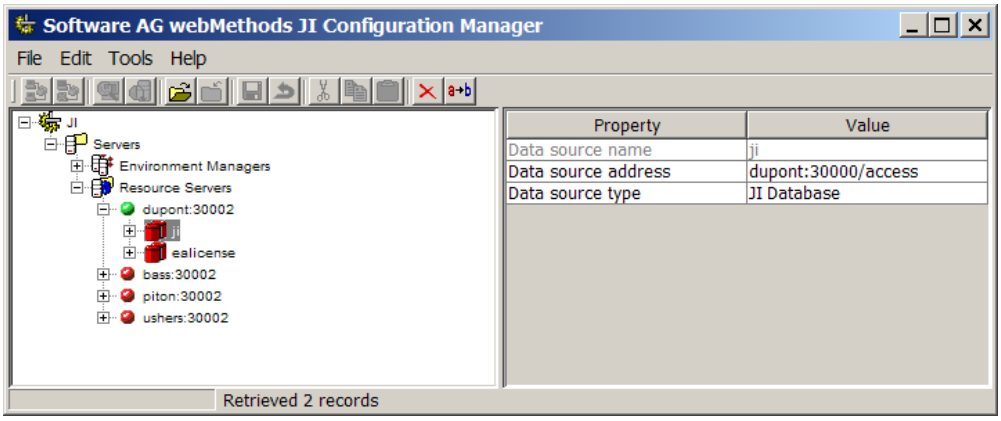

Figure 34. Selecting the Resource Named `ji`

2 Edit the Data source address field in the Properties panel to change the host, port, and/or database name. For example:

- For example, if the port and name were changed during installation (see *Step 7: Select the Database Settings on page 22*) to port `16524` and name `host1_rdb`, change the Data source address field to: `localhost:16524/host1_rdb`
- If the Resource Database was not created during installation, the host, port, and name of a running Resource Database should be entered: `host2:30000/host2_rdb`

3 Select **File > Save** or right-click and select **Save** from the pop-up menu to save the changes.

4 If the Resource Database port has been changed, the port number entered above must be used when the database is subsequently launched. There are two options to set the port when the database is launched:

- **Edit the DB_TCP_PORT property in the environment.ccf configuration file.** The DB_TCP_PORT property is used by the ea_admin, ea_ping, ea_start, ea_status, ea_shutdown and ea_shutsrvr commands to determine which TCP port the Resource Database server uses for accepting requests.

  Edit the *environment.ccf* file to change the value of the **DB_TCP_PORT** property: The *environment.ccf* file is located in the <*JI_install_dir*>/*config* directory, where <JI_install_dir> represents the installation directory (and drive letter, if appropriate) where webMethods JI system software was installed.

  DB_TCP_PORT=16524

- **Edit the database start, ping and shutdown command scripts.**

Note: This option applies only if you have set the DB_START_CMD, DB_PING_CMD and DB_SHUTDOWN_CMD properties in the environment.ccf configuration file and that you have not replaced or otherwise modified the *db_ping*, *db_shutdown* and *db_start* script distributed with webMethods JI.

- Edit the *db_ping.bat, db_shutdown.bat* and *db_start.bat* (Windows) or *db_ping.sh*, *db_shutdown,* and *db_start.sh* (UNIX) files to change the default port number. To do this, open each of the files in a text editor such as vi or Notepad. The files are located in the <*JI_install_dir*>*/bin* directory, where <JI_install_dir> represents the installation directory (and drive letter, if appropriate) where webMethods JI system software was installed.

  UNIX:

  To change the port number used by the *db_ping.sh* script, change the following lines:

  ```
  db_pass=""
  db_port="30000"
  debug=FALSE
  ```

  to:

  ```
  db_pass=""
  db_port="<db_port>"
  debug=FALSE
  ```

  where `<db_port>` represents the new port number. The same process should be repeated for the remaining *db_shutdown.sh* and *db_start.sh* scripts.

  Windows:

  To change the port number used by the *db_ping.bat* script, change the following lines:

  ```
  SET DB_HOST=""
  SET DB_PORT=""
  SET DB_USER=""
  ```

  to:

  ```
  SET DB_HOST=""
  SET DB_PORT="<db_port>"
  ```

```
SET DB_USER=""
```

where <db_port> represents the new port number.

- **Pass the port onthe command line.** The port can be passed on the command line when the database is launched. The command line option used depends on the command used to launch the database; for example, when launching the databas with the ea_start command, the -Q or --dbPort command line options:

  UNIX:

  cd <JI_install_dir>/bin
  ./ea_start -D -Q <db_port>

  Windows:

  cd <JI_install_dir>\bin
  .\ea_start -D -Q <db_port>

  Where <JI_install_dir> represents the directory in which webMethods JI is installed and <db_port> represents a valid port number for the Resource Database server. If Windows shortcuts are used to launch the Resource Database server, you will need to edit the shortcut to pass the port number at the command line. For information about editing shortcuts, see your Windows documentation.

Step 5: Starting the Environment Manager

The Environment Manager is a process that runs on an webMethods JI server, providing a central management and control point for webMethods JI server-side processing. For more information about the Environment Manager, see the *webMethods JI User's Guide*. Both the Resource Database and the Resource Server must be running prior to starting the Environment Manager.

The Environment Manager is started using the following command:

UNIX:

```
cd <JI_install_dir>/bin
./ea_start -e
```

Windows:

```
cd <JI_install_dir>\bin
.\ea_start -e
```

The Environment Manager can also be launched using shortcuts in Windows, if shortcuts were created during installation. For example, if shortcuts were added to the Start Menu during installation, the Environment Manager can be started by selecting the Environment Manager shortcut from the appropriate program menu in the Start Menu.

Note: If the Environment Manager does not start, it could be due to a port conflict. By default, the Environment Manager tries to start using a listening port of 30001, and an RMI port of 30002 (it can share this RMI port with the Resource Server). To change the port values, use the `-p <serverport>` and `-d <rmiport>` command line options when launching the Environment Manager:

```
cd <JI_install_dir>/bin
./ea_start -e -p <serverport> -d <rmiport>
```

Where <serverport> represents a valid port number for the Environment Manager's listening port and <rmiport> represents a valid port number of the Environment Managers's RMI port (this port can be the same as the Resource Server's RMI port).

Step 6: Connecting to the Environment Manager in the Configuration Manager

In this step, we will use the Configuration Manager to connect to the Environment Manager and verify that all the server components are running.

1. In the Configuration Manager, highlight the Environment Managers node. Select **File > Auto Find**, or click on the **Auto Find** button  to locate the Environment Manager.
2. After the Environment Manager has been located, it will be listed by its hostname and ports (both the listening port and RMI port are listed). Highlight the Environment Manager and select **File > Connect** or click the **Connect** button  to connect to the Environment Manager (Figure 35).

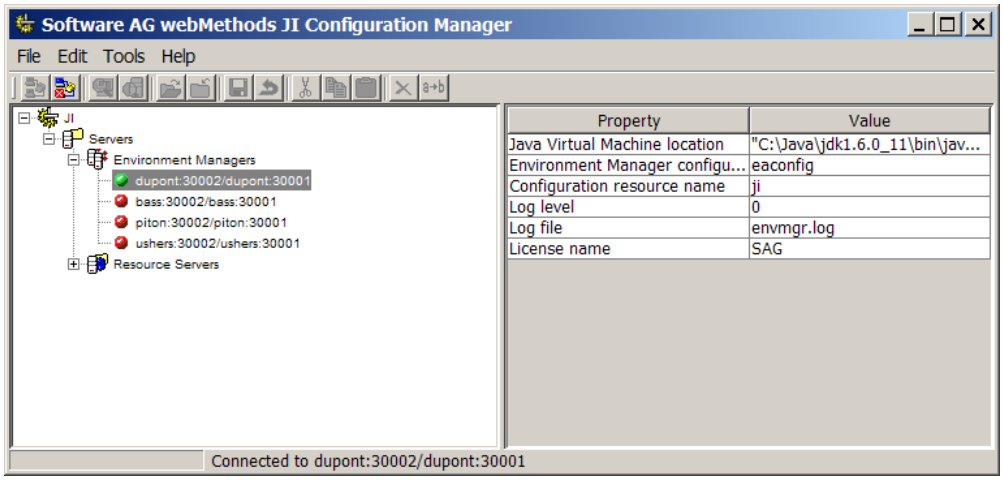

Figure 35. List of host names and ports

When you have successfully connected to the Environment Manager, you have verified that the three required server components are running:

- The Environment Manager.
- The Resource Server serving the Resource Database and other resources requested by the Environment Manager.
- The Resource Database requested by the Environment Manager.

At this point, if default settings are used for all remaining configurable items, installation and configuration is complete. Proceed to *Step 11: Setting EA_ENV and Editing the environment.ccf File* on page 70.

Step 7: Editing Environment Manager Configuration Parameters

With the Environment Manager highlighted, change the following information in the Properties panel for the Environment Manager:

- **Java Virtual Machine (JVM) location:** If the default JVM provided during installation is installed, this parameter does not need to be edited.

Note: If you wish to change the JVM selection after the installation, the correct path and filename of the JVM should be entered here.

- **Environment Manager configuration name:** Environment Manager configurations are located in the Resource Database and are used to store load balancing parameters, service details, and other information related to the Environment Manager. Environment Managers then "subscribe" to a configuration contained in a Resource Database by setting this parameter to

the name of the corresponding configuration in the Resource Database. See the *webMethods JI User's Guide* for more information about Environment Manager configurations.

The name entered here must correspond to an Environment Manager configuration name entered in the Resource Database. See *Step 10: Editing the Environment Manager Configuration in the Resource Database*.

- **Configuration resource name:** This parameter represents the name of the Resource Database that the Environment Manager will request. When the Environment Manager is launched, it sends out a multicasting request for the Resource Database using this name. The first Resource Server that serves a resource of this name will respond to the Environment Manager's request, and the Environment Manager and Resource Server will communicate. As a result, each Resource Database should have a unique Configuration resource name to guarantee that the correct Resource is served to the Environment Manager.

  The name entered here must correspond to the name of a Resource served by a Resource Server running in your webMethods JI environment. For information about changing the default Resource name for the Resource Database, see *Step 9: Changing the Resource Name for the Resource Database*.

Step 8: Changing the Resource Server's RMI Port

Remote Method Invocation (RMI) ports are used by Resource Servers and Environment Managers to allow these server components to interact. Both the Resource Server and Environment Manager must have an RMI port; if they are both running on the same machine they can share the same port. However, if the same RMI port is used for the Environment Manager and the Resource Server and the Resource Server goes down, the Environment Manager must then be restarted.

Running the Environment Manager and Resource Server on different RMI ports provides a slightly better fault tolerance, however, this requires an alternate usage of the *ea_shutdown* command. For this situation, the *ea_shutdown* command must be separately invoked using the "`-e -p <RMI port>`" options.

To change the Resource Server's RMI port, highlight the Resource Server in the Configuration Manager Tree and enter the new port for the RMI port number parameter (you must be connected to the Resource Server before you can view or edit its parameters. See Figure 36).

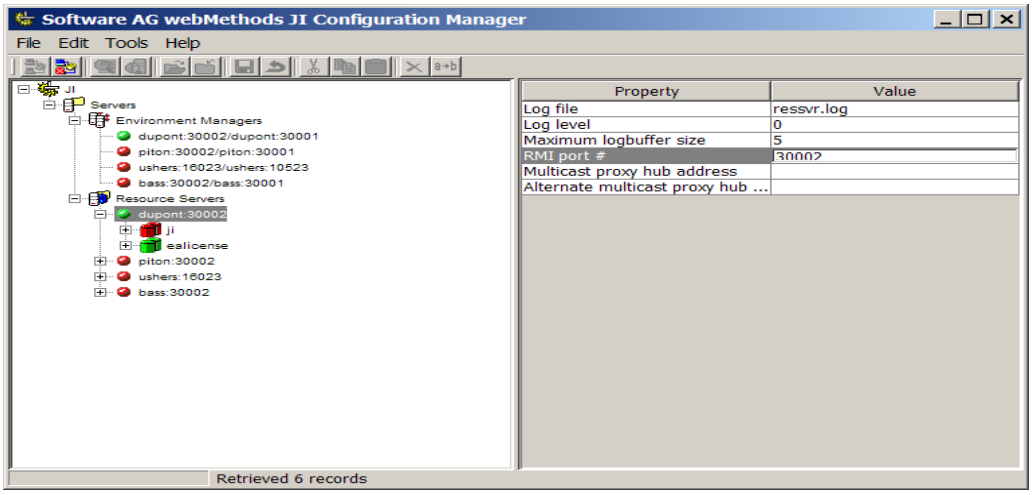

Figure 36. Change the resource server's RMI port

Step 9: Changing the Resource Name for the Resource Database

If the Configuration resource name parameter for the Environment Manager was changed above, the Resource name of the Resource Database should be changed to the new name. Highlight the Resource name, subordinate to the Resource Server in the Configuration Manager tree and select **Edit > Rename** or right-click and select **Rename** from the pop-up menu. Enter the Resource name as it was entered in the Environment Manager's Configuration resource name parameter (Figure 37).

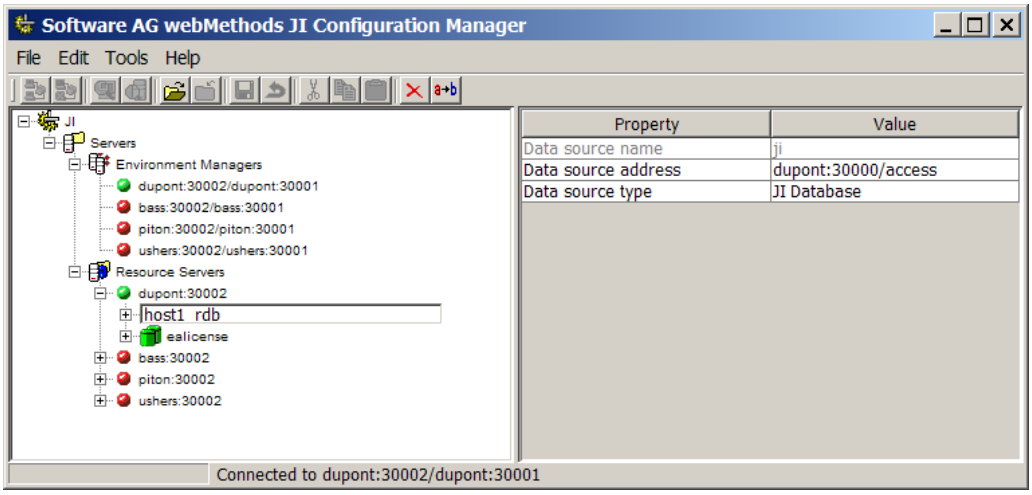

Figure 37. Change the resource name for the resource database

Step 10: Editing the Environment Manager Configuration in the Resource Database

The Resource Database contains configuration information related to Environment Managers listed in the Environment Manager Configuration node. Environment Managers then "subscribe" to a configuration contained in their Resource Database by setting their Environment Manager configuration name parameter (see *Step 7: Editing Environment Manager Configuration Parameters*, above).

The following items related to the Environment Manager configuration should be changed:

- The name of the configuration. The default name for the database's Environment Manager configuration is `eaconfig`. This should be changed to the name entered above for the Environment Manager configuration name parameter.
- The Environment Manager's listening port and RMI ports should be changed to the appropriate port numbers.

In addition, you may want to change configuration parameters, such as load balancing information, for Environment Managers. See the *webMethods JI User's Guide* for further information.

3 **Opening the database.** To edit the database's Environment Manager configuration, open the database by highlighting the database and selecting **File > Open** or clicking on the **Open** button (). This will open a new node in the Tree view, named Resources.

One of the subordinate nodes under Resources will be Environment Manager Configurations (Figure 38).

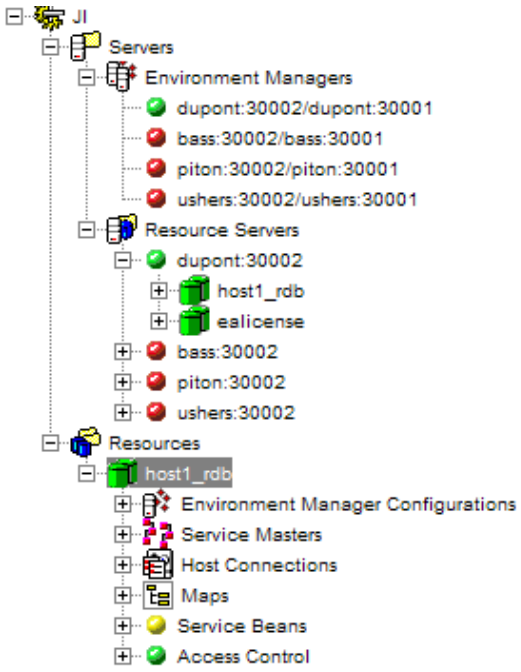

Figure 38. Opening the database

4 Expand the Environment Manager Configuration node by clicking on the "+" next to the node. The default configuration, `eaconfig`, will be listed as a subordinate node.

5 Highlight the `eaconfig` configuration.

A number of parameters are displayed in the Properties panel of the Configuration Manager (Figure 39).

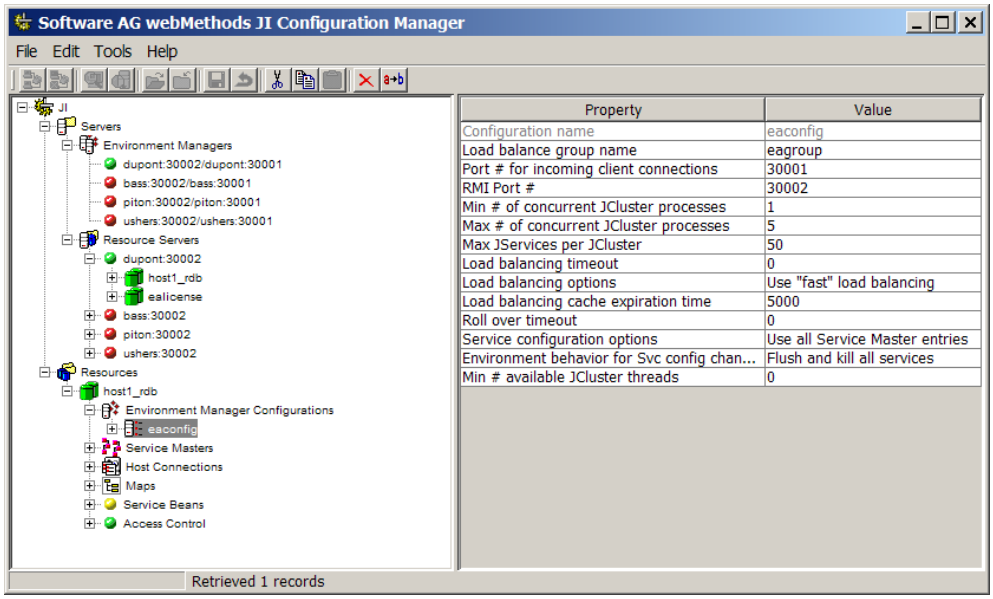

Figure 39. Properties in the Configuration Manager

6 To change the name of the Environment Manager configuration, select **Edit > Rename** or right-click and select **Rename** from the pop-up menu. Enter the name of the configuration. This name must correspond to the Environment Manager Configuration name parameter for all Environment Managers that will subscribe to this configuration (see *Step 7: Editing Environment Manager Configuration Parameters*, above).

7 Next, change the following parameters:

- **Load balancing group name.** This parameter is used for load balancing purposes. To balance load among multiple Environment Managers, the Load balancing group name should be the same for all configurations to which the Environment Managers subscribe. For more information about load balancing, see the *webMethods JI User's Guide*.
- **Port number for incoming client connections.** Enter the correct port number for the Environment Manager's listening port.
- **RMI port number.** Enter the correct port number for the Environment Manager's RMI port. If both the Resource Server and Environment Manager are both running on the same machine, they can share the same RMI port.

Additional Environment Manager configuration parameters govern service behavior and load balancing algorithms. For more information, see the *webMethods JI User's Guide*.

Step 11: Setting EA_ENV and Editing the *environment.ccf* File

This final step should be performed in order to use the *ea_start*, *ea_shutdown*, *ea_status*, and other administrative commands. These commands require that the EA_ENV environment variable be set, as well as four parameters in the *environment.ccf* configuration file.

1 Set the EA_ENV environment variable to the configuration directory of your webMethods JI installation.

UNIX (borne and korn shells):

```
set EA_ENV=<JI_install_dir>/config
export EA_ENV
```

UNIX (C shell):

```
setenv EA_ENV=<JI_install_dir>/config
```

Windows:

```
set EA_ENV=<JI_install_dir>\config
```

Where `<JI_install_dir>` represents the installation directory (and drive letter, if appropriate) of your webMethods JI installation.

2 Edit the *environment.ccf* configuration file. This file is located in *<JI_install_dir>\config*. Set the following parameters:

- EA_HOME. Represents the directory location of webMethods JI installation.

- DB_TCP_PORT. Port number of Resource Database server.
- EA_ENVMGR. The host name or IP address and port number of the Environment Manager.

Note: These parameters can be set as environment variables rather than using the environment.ccf file.

Shutting Down the Environment

After changing the ports and other information, your environment should be restarted to make sure the changes take effect. To shut down your environment, follow these directions:

To shut down the environment, enter the following at the command prompt:

UNIX:

```
cd <JI_install_dir>/bin
./ea_shutdown
```

Windows:

Chapter 3. Installing and Configuring webMethods JI Clients

About webMethods JI Clients

The following client libraries and interfaces are available with webMethods JI. For more information about the webMethods JI client libraries and supported platforms, see the *webMethods JI Client Developer's Guide.*

webMethods JI Client Libraries and Interfaces

The following client libraries and interfaces are available with webMethods JI:

- **The Java Client Library Version 3 (JClient3)**: JClient3 is a simplified client library written in Java. It is a set of Java packages that provide the functions required for clients developed in the Java programming language to interact with webMethods JI services. The JClient3 is available on all supported platforms and requires JDK 1.6 or newer.
- **Gateways**: Several gateways are provided with webMethods JI.
  - **XML Gateway:** A servlet-based connector that enables integration with a client using XML messaging over HTTP.
  - **SOAP Gateway:** A servlet-based connector that enables clients to invoke webMethods JI services as Web Services using SOAP messaging over HTTP.
  - **MQ Gateway:** A standalone gateway that allows MQ enabled clients and MQ networks to invoke webMethods JI Services.

Note: For a list of supported platforms and other system requirements, please refer to the webMethods JI Release Notes.

Installing webMethods JI Clients

webMethods JI clients are installed using the installation program, described in Chapter 1, "webMethods JI Installation". The client components can be installed with the server components, or can be installed separately by selecting the **Full Client** button in *Step 10: Select the Installation Set* (described on page 24). To install all the client components, select the **Full Client** button and click on the **Install**

button. To install one or more individual client components, select the **Customize** button and select the appropriate clients from the next window (see *Step 11: Customizing the Installation Set* on page 26).

Chapter 4. Creating Databases

This chapter describes how to create Resource Databases using the *ea_createdb* command. During installation, the webMethods JI installation program can be used to create a Resource Database (see *Step 7: Select the Database Settings* on page 22 in Chapter 1, "webMethods JI Installation"). However, there are some situations in which you choose not to create a Resource Database during installation, or where you may want to create additional databases.

Creating Databases Without Using the Installation Program

To create additional webMethods JI Resource Databases or to create a Resource Database without using the installation program, follow these directions:

Windows:

1. Start the Resource Database server. The database server can be started by selecting the ResourceDatabase shortcut, if shortcuts were created during installation, or at the command prompt by typing:

   ```
   cd <JI_install_dir>\bin
   .\ea_start -D
   ```

   where `<JI_install_dir>` represents the drive letter and directory of the webMethods JI installation.
2. Execute the *ea_createdb* program. At the command prompt, type:

   ```
   cd <JI_install_dir>\bin
   .\ea_createdb -n <DBname> -p <port> -d <JI_install_dir>
   ```

   where `<DBname>` is the name of the new database, `<port>` is the port name or number of the database daemon, and `<JI_install_dir>` represents the drive letter and directory of the webMethods JI installation.

For example:

```
.\ea_createdb -n access -p 30000 -d c:<JI_install_dir
```

will create a database named “access” using the Resource Database server running on port 30000. The database will be created in the directory that the database server is using as its database directory. By default, this directory is *<JI_install_dir>\databases*, but this default directory can be overridden using the `-a <path>` command line option to the ea_start command when the Resource Database server is started.

UNIX:

1 Start the Resource Database server at the command prompt by typing:

```
cd <JI_install_dir>/bin
./ea_start -D
```

where <JI_install_dir> represents the directory of the webMethods JI installation.

2 Execute the *ea_createdb* program. At the command prompt, type:

```
cd <JI_install_dir>/bin
./ea_createdb -H <host> -n <DBname> -p <port> -d <JI_install_dir>
```

where <host> is the host name of the host machine (the default is localhost), <DBname> is the name of the new database, <port> is the port name or number of the database daemon, and <JI_install_dir> represents the directory of the webMethods JI installation. For example:

```
./ea_createdb -n access -p 30000 -d /opt/<JI_install_dir>
```

will create a database named "access" using the Resource Database server running on the localhost, port 30000. The database will be created in the directory that the Resource Database server is using as its database directory. By default, this directory is *<JI_install_dir>/databases*, but this default directory can be overridden using the -a <path> command line option to the ea_start command when the Resource Database server is started.

Upgrading Previous Versions of the Resource Database

Customers using previous versions of webMethods JI (Jacada Integrator) must export their current data using the provided utilities. This data must then be imported for use with the desired version of webMethods JI.

Exporting your Database from Jacada Integrator Version 3.5

The Jacada Integrator version 3.5 ea_exportdb utility can be used to export a Jacada Integrator 3.5 Resource Database, as might be needed to migrate a 3.5 installation to a different machine. Please follow the instructions detailed in the previous section.

Importing your Database

In order to import your Jacada Integrator database file, the webMethods JI Resource Database server must be running. To start the database server from the command prompt, type:

```
<JI_install_dir>/bin/ea_start -D
```

Where <JI_install_dir> represents the directory (and drive letter, if applicable) where the webMethods JI software was installed.

When the Resource Database server is running, import the EDF file created above. Use the webMethods JI `ea_importdb` command to import the Resource Database export file created by the `ea_exportdb` utility. It is recommended that the import utility be run from the `bin` directory of the webMethods JI installation.

For example:

UNIX:

```
cd <JI_install_dir>/bin
./ea_importdb <filename>
```

Windows:

```
cd cd <JI_install_dir>/bin
.\ea_importdb <filename>
```

Where <*JI_install_dir*> represents the directory (and drive letter, if applicable) where the webMethods JI software is installed and <*filename*> is a valid export file name, such as `myea31db.exp` or `myea35db.exp`.

Exporting a Resource Database from Jacada Integrator Versions 2.x

To export your Jacada Integrator version 2.6 or 2.7 Resource Database information, use the ea_rdbexport utility found in the bin directory of your Jacada Integrator version 2.6 or 2.7 installation.

For example:

<Version 2.x EA_HOME>/bin/ea_rdbexport <filename>

Where <Version 2.x EA_HOME> is the directory of your Jacada Integrator version 2.6 or 2.7 installation and <filename> is a valid file name, such as myea2xdb.edf.

Note: Jacada Integrator versions 2.6 and 2.7 were available on UNIX only.

Importing your Jacada Integrator Version 2.x Export File

In order to import your Jacada Integrator version 2.x Resource Database export file into webMethods JI current version, the current version's Resource Database server must be running. Use the webMethods JI `ea_rdbimport` utility to import the Resource Database export file created by the `ea_rdbexport` utility. For example:

```
cd <JI_install_dir>/bin
```

```
./ea_rdbimport <filename>
```

Where <*JI_install_dir*> represents the directory where the webMethods JI software is installed and <*filename*> is a valid export file name, such as `myea2xdb.edf`.

Chapter 5. Uninstalling webMethods JI Software

The webMethods JI installation program creates an uninstall program to simplify removal of webMethods JI software. The uninstall program will remove everything that was installed into the webMethods JI installation directory, except for configuration information such as files in the <*JI_install_dir*>/*config* directory, and database files in the <*JI_install_dir*>/*databases* directory. Additionally, any files that are created in the <*JI_install_dir*> hierarchy after installation will cause the parent directory structure and the new files themselves to not be removed by the uninstaller.

This means that any changes to batch files, scripts, and *.lax* files will not be saved when the webMethods JI software is uninstalled. If you intend to reinstall webMethods JI and wish to use these files, you should back up any changed files and databases prior to uninstalling the webMethods JI software.

Uninstall

Follow these directions to uninstall the webMethods JI software:

Windows:

1. Select Start **Menu > Settings > Control Panel** to open the Windows Control Panel.
2. Double-click on the **Add/Remove Programs** icon in the Control Panel. This will open the Add/Remove Programs applet.
3. Highlight the webMethods JI entry in the list box and select the **Add/Remove** button to remove the webMethods JI software.

UNIX:

1. At the command prompt, change to the <*JI_install_dir*>/*UninstallerData*<*ji_version*> directory, where <ji_version> represents the version number of your webMethods JI installation.
2. Enter the following command:

   ```
   ./Uninstall
   ```

   This will remove the webMethods JI software.

An additional file, *mapmaker40.cfg*, is created the first time MapMaker is started by each user. This file contains configuration information related to MapMaker and is not editable. This file is not removed by the uninstall program, and by default, is located in the root of the user's home directory.

Glossary

ACL	Access Control List
Actions	Used by webMethods JI Java services to navigate from one legacy screen to the next on the legacy application. An action includes all data that was input by the user during trail recording in MapMaker, along with the AID key or Action that caused the screen transition.
Action Key	A key sequence that performs an action in the legacy application. Action keys are valid for the Telnet protocol and are similar in concept to AID keys.
Applet	A program written in the Java programming language that is accessed from a Web browser.
Application	A Java program run as a stand-alone program.
API	API - Application Programming Interface. The library of C or Java functions callable from UNIX and Windows programs. Used to develop webMethods JI clients and services.
AID Key	The Attention Identifier Key (AID). A single key on the keyboard that, when pressed by the user, performs an action in the legacy application. Typical AID keys include the Enter and PF keys, although the legacy application may change their usage or use other AID keys. AID keys are valid for the TN3270 and TN5250 protocols.
Browser	A program that allows users to access information on a Web server. Also known as a Web browser.
CGI	Common Gateway Interface. A standard method for external gateway programs to interface with Web servers.

Character Encoding	The format or encoding of a language-set character. Character encodings are usually 1, 2, 3, or 4 bytes. Unicode is an example of a 2-byte character encoding. Other examples are ASCII, EBCDIC, and UTF-8.
Character Mode	Character mode describes the functionality in webMethods JI that communicates with character-based applications over the Telnet protocol.
Client	In webMethods JI, client refers to one of two items: • A Runtime version of an application developed in Java that uses webMethods JI client APIs to communicate with webMethods JI services. • Also refers to a third-party software application that interfaces with webMethods JI services and functions similarly to an application developed with a webMethods JI client API.
Client Functions	The C or Java functions used to allow clients to connect to services, execute service methods, and input and extract data.
Content Pane	A content pane, also called a panel, is a GUI component that acts as a container for various GUI components. A content pane is basically a window that other GUI objects, such as buttons and text fields, are placed on.
Cookie	A general mechanism used by Web servers to both store and retrieve information on the client side of the connection.
Custom Classes	Classes that are used to “extend” or customize service code that was generated in MapMaker.
Data Field	A data field is an individual field on the legacy screen that is added to either a data template or a table template. Data fields are used in conjunction with output variables to extract data from the legacy screen.
Data Mapping	Refers to the mapping of data in the flow of a method. Every point in a method where data is sent to or retrieved from an external source requires data mapping. Data mapping is defined in the Data Mapping Editor.

Data Stream	The flow, or stream, of information between computer programs. Data on the data stream is represented using "character encoding" and is transferred using a mutually agreed upon protocol.
Data Template	A data template is a logical representation of non-repeating data fields on the legacy screen. Data templates are defined in MapMaker and are used in conjunction with output variables to extract data from the legacy application. Similar to table template, used to define repeating data fields.
Data Typing	Refers to the creation and definition of data types. Data types are defined and maintained in MapMaker's Business Entity Editor.
DBCS	Double-Byte Character Set.
DLL	Dynamically Linked Library. A library of function calls used in Windows environments.
DOM	Document Object Model (aka "random access" protocol for XML) – an XML parser that converts the XML document into a collection of objects, which can then be manipulated in any way you choose.
DTD	Document Type Definition for XML – an optional part of the XML document prolog that specifies the kinds of tags that can be included in an XML document and the valid arrangement of those tags.
EAServiceBean	The interface between webMethods JI Java service code and the JService that manages the service in the webMethods JI server environment. The EAServiceBean can be extended or customized to change the interface if required.
ECS	Extended Character Support.

EIS	Enterprise Information System - an application providing information of critical importance to the day-to-day planning and/or operation of a business. EISs are generally run on larger platforms, such as mainframes or minicomputers. EISs provide the information infrastructure for an enterprise. Examples of EISs include enterprise resource planning systems, mainframe transaction processing systems, relational database management systems, and other legacy information systems.
Enterprise System	A system involved in an organization's critical business processes. Typically, enterprise systems are large and complex, use database management systems (DBMSs), and run on mainframes or minicomputers.
Formatted Fields	Fields on the legacy application that have special formatting characteristics. MapMaker identifies all such fields on the legacy screen and uses the field layout to match screens (unless the fields are disabled and Tags are used to identify screens).
GBBasic	A Java package, *com.jacada.mapstudio.GBBasic*, that is included with webMethods JI and can be used to extend or customize Java service code that was generated in MapMaker.
GUI	Graphical User Interface. An application that allows users to interface with computer programs in a graphical environment. In webMethods JI, MapMaker, the Configuration Manager, and the System Monitor are all Graphical User Interfaces.
HTML	HyperText Markup Language, a format used to create Web documents.
Hos	**t**A computer machine where applications reside. In webMethods JI, hosts can be the machine on which components of the webMethods JI environment are running, the machine on which the telnet, TN3270, or TN5250 server reside, or the machine on which the legacy applications reside.
IBE	Internal Business Entity. Refers to data types that are used internally by the webMethods JI Service. A global variable may be defined of an IBE data type.
IDE	Integrated Development Environment. Refers to a graphical development tool that uses standard GUI components to facilitate application development.

Jacada Integrator	See webMethods JI**.**
Java	An object-oriented, platform-independent programming language developed by Oracle.
Java services	webMethods JI services developed using the Java programming language. Java services are generated from the MapMaker graphical development interface (GUI) and can be customized using the custom service classes included with webMethods JI.
JClient3	The Java Client Library version 3 is an improved version of the JClient, which allows webMethods JI clients to be developed using JDK 1.6 or newer.
JDBC	Java DataBase Connectivity.
JDK	Java Development Kit. The development environment for the Java programming language. Includes a Java Runtime Environment.
JRE	Java Runtime Environment. The minimum environment required to run Java applications. This is a combination of a JVM along with the core classes and files required to run Java applications.
JVM	Java Virtual Machine. A Java interpreter that converts Java code into executable code.
Legacy data	Data residing on a mainframe platform.
Legacy host	The machine or host on which legacy applications reside.
Map	The logical representation of the screens, fields, data input and AID keys that make up the user interaction with a legacy application. Maps are created in MapMaker. Note that webMethods JI's use of the term Map is distinct from the java.util.Map that is included with Java.

MapMaker	The graphical development interface provided with webMethods JI for the purpose of developing Java services. Used to record trails, maps, data and table templates, create methods and services, and then generate and optionally deploy the services into the webMethods JI server environment.
Methods	Object-oriented entity of one or more functions. A collection of methods, initialization code, and events make up a service.
MLM	Map-List-Map. Refers to an XBE data type used for communication with a client, such as a Java, C, or VB Client.
Multicasting	A connectionless IP networking communication in which applications on the IP network broadcast information over a well-known socket.
Multithread-safe	See thread-safe.
Multithreaded	See threaded.
Offset	Refers to the location of data on the legacy screen. The offset is determined using the following format: For an 80 column screen, the offset is (column # - 1) + 80 x (row # -1). For example, the first column of the second row is position 80: (1 - 1) + 80 x (2-1).
Package	A collection of java classes that are grouped together to form a logical combination of classes.
Presentation Space	A representation of the communications between the legacy host to the webMethods JI environment, including the screen and field information from the legacy application.
Protocol Agent	A software interface that governs the procedures used to exchange information between physically remote entities such as computer systems.The Protocol Agent governs the format of the messages, the generation of checking information, and the flow control, as well as the actions to take in the event of errors.
Proxy Server	Special instances of Resource Servers that allow multicasting communication to take place over multiple sub-nets.

Resources	The components of webMethods JI that are managed by the Resource Server. These components include Resource Databases and license files.
Resource Database	A database that is used in the webMethods JI environment to store environment and service configuration, along with service code and maps.
Resource Serve	**r**Manages the communication between environment managers and the webMethods JI resources.
RMI	Remote Method Invocation. A standard from Oracle that allows distributed Java objects to communicate with each other over TCP/IP networks.
Screen	The screen, as contained in the data stream, that is coming from the legacy host.
Screen Mapping	The process of marking the physical boundaries of, and defining the screen components found on, an external application screen. The components include tags, fields, areas, repeating areas, and repeating fields.
Service	A collection of methods which answer requests from a client.
SOCKS	SOCKS is a firewall proxy protocol.
System Monitor	The tool used to monitor the webMethods JI System. It allows you to monitor, log, and view real-time activity for all or selected Environment Managers, JClusters and JServices, clients, and services.
Table Template	A Table Template is a logical representation of the area on a legacy screen that contains repeating Data Fields. Table templates are defined in MapMaker and are used in conjunction with output variables to extract data from the legacy application. Similar to Data Template, used to define non-repeating Data Fields.
Tag	A user-defined component of the host application screen that most often serves as a label for fields. You can define any static screen text as a tag. MapMaker can identify external application screens by the tags that are defined for them.

Telnet	A TCP/IP-based terminal emulation protocol. Requires a Telnet server. Telnet is also used to describe the Character Mode functionality within webMethods JI.
Terminfo	UNIX terminal information database. See the UNIX terminfo(4) man page.
Thread-safe	Also multithread-safe (MT-safe). A description of a function or library that may be called in a threaded environment without any additional coding.
Thread	A single flow of control within a process or address space. Programs using two or more threads are referred to as threaded or multi-threaded.
Threaded	Also multithreaded. A form of multi-tasking that uses multiple independent execution threads.
TN3270	An implementation of the telnet protocol that is used to communicate between TCP/IP networks and IBM mainframe applications that use IBM 3270 terminals. A TN3270 server is required for connection from the TCP/IP network to the mainframe.
TN5250	An implementation of the telnet protocol that is used to communicate between TCP/IP networks and IBM AS400 applications that use IBM 5250 terminals. A TN5250 server is required for connection from the TCP/IP network to the AS400.
Trail	The linear path of all screens encountered during navigation through a host application. MapMaker records trails during host application interaction.
Unicode	A universal character code.
Web	A network of computers based on the client-server model. The Web uses Web browsers to access information from a Web server. A Web can be a part of the World Wide Web or can be a part of a separate network, also know as an “Intranet”.
Web browser	A program that allows users to access information on a Web server.

webMethods JI	Consists of one or more Environment Managers, Resource Servers, resources including the Resource Database, and webMethods JI clients and services.
XBE	eXternal Business Entity. Refers to data types that are used for the webMethods JI Service to send and receive data to and from an external source. Such external sources are Legacy Screens and Clients.
XML	eXtensible Markup Language – a text-based markup language that is fast becoming the standard for data interchange on the web.
XSD	XML Schema Definition. Specifies how to formally describe the elements in an XML document. One of the XBE data types supported by MapMaker is XML/XSD.

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