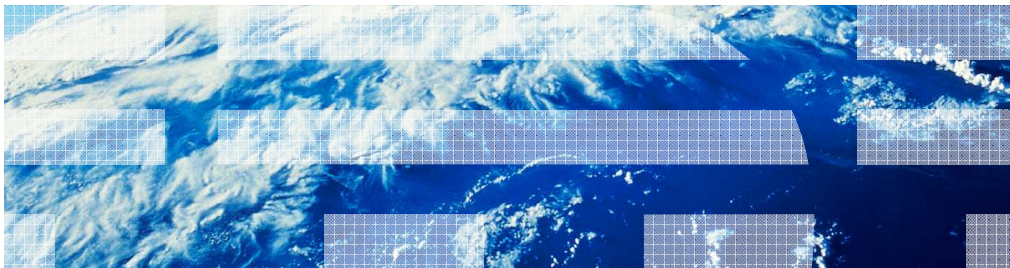

IBM WebSphere Application Server V8.5

Java 7



This presentation covers using Java 7 with IBM WebSphere Application Server version 8.5.

Table of contents

- Overview
- Installation
- Developer configuration scenario
- Administrator configuration scenario
- Soft real-time configuration scenario
- References

This module will cover the topics listed here.

Overview of Java selection

- Supports selection of which bit architecture to use
 - z/OS: 31 or 64 bit
 - IBM i: 32 or 64 bit
 - Distributed: only selectable during first install
- Supports selection of Java version to use
 - Java 6
 - Java 7 (including soft real-time capabilities)
- Only supports WebSphere provided SDKs
- Configure SDK used by command line scripts
- Configure SDK used by servers, proxy servers, and application clients
 - Configure existing servers, nodes, profiles, or installation
 - Configure defaults for new servers, nodes, and profiles

Java 7 is optionally supported by the product. In fact, the product supports several different Software Development Kits or SDKs.

Extensions in WebSphere Application Server version 8.0 provided support for selecting a Java SDK by bit architecture at any time. The z/OS platform allows selection of 31 or 64 bit SDKs. The IBM i platform allows selection of 32 or 64 bit SDKs. However, the distributed platform only allows the bit architecture to be selected during installation of the product and not at any point after that. Once the bit architecture choice has been made, only those SDKs that support that bit architecture are available for selection.

WebSphere Application Server version 8.5 adds Java version selection to the choice and bit architecture. The product comes with Java 6 as the default Java SDK. Java 7 can be added at any point in time to the installation, thereby adding Java 7 SDK selection to the possible choices of Java SDK that can be used. Java 7 also includes support for soft real-time capabilities, which are discussed later in the module.

In general, the product only supports Java SDK selection of WebSphere approved or provided SDKs. However, the Liberty Profile does support use other SDKs. See the Liberty documentation and education material for how to use other non-product provided Java SDKs.

Configuration of the SDK to use is generally split into selection of the SDK to use for command line scripts and selection of the SDK to use for servers and application clients. The scope of configuration can range from changing the default SDK to configuring a server, node, profile or entire installation.

Installing Java 7

- Product default Java SDK is Java 6
 - Installed as part of the offering installation
- Java 7 is a feature extension found in the IBM Installation Manager repositories as
 - IBM WebSphere SDK Java Technology Edition (Optional)
 - Version 7.0.0.0
- May only be installed on or with these installations
 - Application Client for IBM WebSphere Application Server
 - DMZ Secure Proxy Server for IBM WebSphere Application Server
 - IBM WebSphere Application Server
 - IBM WebSphere Application Server Network Deployment
 - Includes trial editions
- Generally installs in *WASHOME/java_1.7_bit* directory
 - Do not rely solely on this pattern

The WebSphere Application Server product does not include Java 7 as part of the default installation. Instead, Java 6 is included with the default product installation and is serviced as part of that product offering as well.

Java 7 is a feature extension that is included with the product and is in the IBM Installation Manager repository as IBM WebSphere SDK Java Technology Edition, noted as optional, with a version of 7.0 or later. This is similar to locating and installing the IBM HTTP Server for WebSphere Application Server. Note that on IBM i platforms, Java 7 is installed as part of the operating system rather than using IBM Installation Manager.

Installation of Java 7 can be done concurrently with the product installation or it can be done at any time after the product installation. However, Java 7 cannot be installed by itself. It must always be installed as part of the product. In addition, there are limitations in its use. Java 7 can only be installed with these offerings:

The Application Client for IBM WebSphere Application Server

The DMZ Secure Proxy Server for IBM WebSphere Application Server

The IBM WebSphere Application Server

And the IBM WebSphere Application Server Network Deployment

This Includes trial editions for all of these as well.

The installation location of Java 7 will generally follow a pattern of *java_1.7_bit* within the *WASHOME* installation directory, where *bit* is the bit architecture supported by the SDK. However, do not rely solely on this pattern as there can be multiple SDKs that support the same Java version and bit architecture. There are command line tools for determining the available list of SDKs that can be selected and information about them.

Configuring single server environments for Java 7

- Useful for developer scenarios
- Verify Java 7 is available to use:
 `-managesdk -listAvailable`
- Configure scripts to use Java 7 32 bit:
 `-managesdk -setCommandDefault -sdkName 1.7_32`
- Configure profile to use Java 7 32 bit:
 `-managesdk -enableProfile -sdkName 1.7_32 -profileName AppSrv01 -enableServers`
- Set default for profiles to use Java 7 32 bit:
 `-managesdk -setNewProfileDefault -sdkName 1.7_32`
- Security options
 `--user username -password password`

There are generally two ways to manage the SDK in use. One is by a command line tool, called `managesdk`, and the other is by use of administrative commands by way of the console or WSADMIN scripts. For typical developer scenarios where a single server is being used, `managesdk` will likely be used.

If a developer wants to list what SDKs are available to be selected from, they can use the `managesdk` tool with the `list Available` option. This will display a list of SDKs that have been installed and made available for selection. If Java 7 has not been installed, it is not listed as an available SDK. On the IBM i platform, `managesdk` will only list SDKs that are installed as part of the operating system and that IBM WebSphere Application Server approves of using.

Assuming that 32 bit Java 7 is the preferred SDK and that it is available, the `managesdk` tool is used to change the SDK used by the command line tools and the profile being used by you. To change the default for scripts, the `managesdk` tool is invoked with the `setCommandDefault` option and an `sdkName` option with a value of `1.7_32`. This latter value is one of SDK names displayed by the `list Available` operation above. Most scripts will run in the context of a profile and use the profile's SDK selection. If that is not the case, the command default is used instead. See the references for a full description of behavior.

Next, the current profile is changed to use Java 7 as well. The developer must know the name of their profile and use that for the command invocation. In this case, the `enableProfile` option is used with an `sdkName` of `1.7_32` and a `profileName` of the current profile. The `enableServers` option not only changes the profile's SDK, but also the SDK for any existing server of the profile.

Finally, to ensure that if you delete and re-creates profiles, the `managesdk` tool can be used to change the default SDK for new profiles. This is done by invoking the `managesdk` tool with the `setNewProfileDefault` option and specifying the `sdkName` of the SDK that is required.

At this point, any server restarts or command line invocations will use the specified SDK.

If administrative security is enabled, the commands shown here will also require a user and password option in order to operate.

Configuring servers in a cell for Java 7

- Useful for managed cluster environments
- Configure SDK using console Java SDKs panel

Select	Name	Version	Location	Bits	Default
You can administer the following resources:					
<input type="checkbox"/>	1.6_64	1.6	\${WAS_INSTALL_ROOT}/java	64	true
<input type="checkbox"/>	1.7_64	1.7	\${WAS_INSTALL_ROOT}/java_1.7_64	64	false
Total 2					

- Configure SDK using WSADMIN scripting tasks
- Caveats
 - Does not affect command line script defaults
 - Java 7 installation cannot be visible until cache is refreshed by server restart or other means

Use of the `managesdk` tool is fine for single server environments, but administrators that manage multiple machines, with many nodes and servers, can use administrative commands to manage the SDK usage. SDK selection can be done by using either the console or WSADMIN scripting tasks. However, it should be noted that these do not affect the command line script default SDK. In practice, this cannot be an issue since many command line scripts are associated with a profile and will use the profile's SDK instead. For more details, see Information Center topics and developerWorks articles and white papers regarding the use of `managesdk` or the `AdminSDKCmds` group administrative tasks.

The console now includes a Java SDKs link on the page for managing a particular server. This will display a panel of available SDKs and allow the selection of one of them to be the SDK in use as the default for that server.

Use of administrative scripting is a bit more complex, but generally follows the same pattern as the `managesdk` tool, and is shown in this presentation.

One other caveat is that caching can affect the visibility of Java 7 availability. Suppose, for example, that an existing WebSphere Application Server 8.5 cell exists, with all nodes using the default Java 6 SDK. If an administrator installs Java 7 on one of the installations and then uses the console to list the available SDKs for that node, the Java 7 installation will likely not be visible due to caching of node metadata on the deployment manager. This can be remedied by restarting a server on the affected node, such as the `nodeagent`, which will cause a rebuild and distribution of the node metadata to the deployment manager. The node metadata will now include information about Java 7 being available for that node.

Configuring Java 7 using WSADMIN scripting

- List available SDKs to select from
`-print AdminTask.getAvailableSDKsOnNode('[-nodeName myNodeName]')`
- Get install location for a 32 bit Java 7 SDK
`-AdminTask.getSDKPropertiesOnNode('[-nodeName myNodeName -sdkName 1.7_32 -sdkAttributes [location]]')`
- Set cluster to use a 32 bit Java 7 SDK
`-AdminTask.setServerSDK('[-clusterName myCluster -sdkName 1.7_32]')`

The following are examples of using Jython script to perform various actions:

To obtain a list of the available SDKs that can be selected from, use the AdminTask object `getAvailableSDKsOnNode` command by passing the `nodeName` as an argument.

To determine the Java SDK's install location, the `getSDKPropertiesOnNode` command can be used. This command requires arguments that specify the `nodeName` and `sdkName` of the SDK of interest and the particular attribute information that is required.

To set a cluster to use a 32 bit Java SDK, the `setServerSDK` command is used by specifying the `clusterName` to affect and the particular SDK name that the cluster should use.

Note that when modifying settings, servers must be restarted for those settings to take effect.

Java 7 soft real-time usage

- Must have a license for WebSphere Real Time v3
- Platforms
 - AIX, Linux
- Set Java garbage collection policy to metronome with 20% of time spent on garbage collection
 - `-Xgcpolicy:metronome -Xgc:targetUtilization=80`

Java 7 provides support for soft real-time operations, which can help ensure predictable garbage collection pauses while running. However, be aware that this functionality only exists for AIX and Linux platforms.

Under normal usage, this can only be used for evaluation purposes. However, if a license to the WebSphere Real Time Java product is obtained, it can be used for more than evaluation purposes without actually installing the WebSphere Real Time Java product.

WebSphere Application Server can be configured for soft real-time use by setting the garbage collection policy to metronome and indicating how much time should be spent on processing requests. In the example shown, the `-Xgc:targetUtilization` argument specifies that processing time should spend 80% of every 60 milliseconds on running Java code and therefore only 20% of the time on garbage collection.

References

- managesdk command Information Center topic
 - http://publib.boulder.ibm.com/infocenter/85/topic/com.ibm.websphere.nd.doc/ae/rxml_managesdk.html
- WSADMIN AdminSDKCmds group Information Center topics
 - http://publib.boulder.ibm.com/infocenter/85/topic/com.ibm.websphere.base.doc/ae/rxml_adminsdkcmds.html
- developerWorks white papers and articles
 - <http://www.ibm.com/developerworks/>
- Metronome Garbage Collector Information Center topic
 - http://publib.boulder.ibm.com/infocenter/realtime/v3r0m0/topic/com.ibm.wrt.linux.doc.30/realtime/metro_introd.html
- IBM SDK Java Technology Edition Version 7
 - <http://www.ibm.com/support/docview.wss?uid=swg21516002>
 - <http://publib.boulder.ibm.com/infocenter/java7sdk/v7r0/index.jsp>

This slide provides additional reference material for Java 7.



Feedback

Your feedback is valuable

You can help improve the quality of IBM Education Assistant content to better meet your needs by providing feedback.

- Did you find this module useful?
- Did it help you solve a problem or answer a question?
- Do you have suggestions for improvements?

Click to send email feedback:

[mailto:iea@us.ibm.com?subject=Feedback about WAS85 Java7.ppt](mailto:iea@us.ibm.com?subject=Feedback%20about%20WAS85%20Java7.ppt)

This module is also available in PDF format at: [../WAS85 Java7.pdf](..\\WAS85 Java7.pdf)

You can help improve the quality of IBM Education Assistant content by providing feedback.



Trademarks, disclaimer, and copyright information

IBM, the IBM logo, ibm.com, AIX, developerWorks, WebSphere, and z/OS are trademarks or registered trademarks of International Business Machines Corp., registered in many jurisdictions worldwide. Other product and service names might be trademarks of IBM or other companies. A current list of other IBM trademarks is available on the web at "[Copyright and trademark information](http://www.ibm.com/legal/copytrade.shtml)" at <http://www.ibm.com/legal/copytrade.shtml>

Linux is a registered trademark of Linus Torvalds in the United States, other countries, or both.

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

THE INFORMATION CONTAINED IN THIS PRESENTATION IS PROVIDED FOR INFORMATIONAL PURPOSES ONLY. WHILE EFFORTS WERE MADE TO VERIFY THE COMPLETENESS AND ACCURACY OF THE INFORMATION CONTAINED IN THIS PRESENTATION, IT IS PROVIDED "AS IS" WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED. IN ADDITION, THIS INFORMATION IS BASED ON IBM'S CURRENT PRODUCT PLANS AND STRATEGY, WHICH ARE SUBJECT TO CHANGE BY IBM WITHOUT NOTICE. IBM SHALL NOT BE RESPONSIBLE FOR ANY DAMAGES ARISING OUT OF THE USE OF, OR OTHERWISE RELATED TO, THIS PRESENTATION OR ANY OTHER DOCUMENTATION. NOTHING CONTAINED IN THIS PRESENTATION IS INTENDED TO, NOR SHALL HAVE THE EFFECT OF, CREATING ANY WARRANTIES OR REPRESENTATIONS FROM IBM (OR ITS SUPPLIERS OR LICENSORS), OR ALTERING THE TERMS AND CONDITIONS OF ANY AGREEMENT OR LICENSE GOVERNING THE USE OF IBM PRODUCTS OR SOFTWARE.

© Copyright International Business Machines Corporation 2012. All rights reserved.