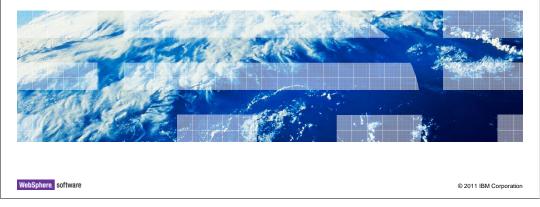


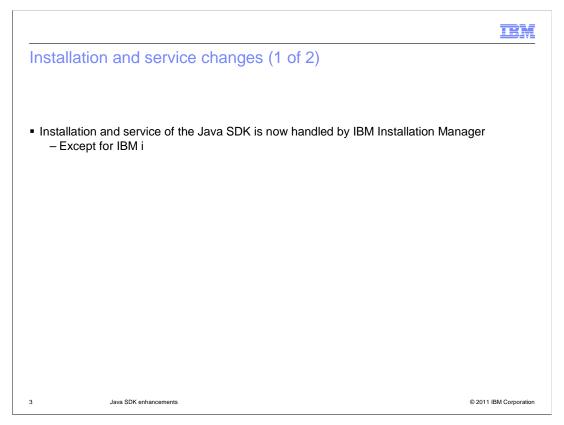
WebSphere Application Server Version 8.0 Java SDK enhancements



This presentation covers WebSphere® Application Server Version 8.0 Java™ SDK enhancements.

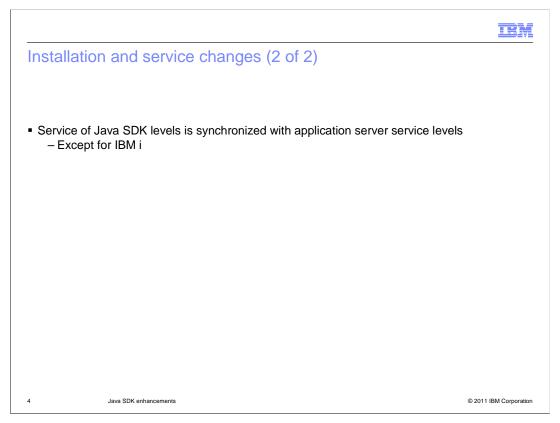
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This module covers installation and service changes, configuration changes, garbage collector policy changes, and heap dump changes for the Java SDK.



WebSphere Application Server Version 8.0 uses a new installer called IBM Installation Manager. This installer is common across an increasing set of IBM products and it is used not only for installation, but for service as well.

All platforms will use this to service the application server and the Java SDK except for IBM i, which uses the operating system installed Java SDKs.



Service of the Java SDK will occur as part of service of the WebSphere Application Server product. It is no longer handled separately, as has been the case in the past.

See the WebSphere Application Server Version 8.0 installation education module for further details.

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Java 6 R2.6 SDK configuration changes (1 of 2)

- The default garbage collection policy for the stand-alone Java SDK is now the Generational Garbage Collector
- Stand-alone Java SDK now defaults to using a persistent shared class cache for all platforms except z/OS®
 - AIX® 6.1 TL6 (AIX 6100-06) and later have an OS API to enable this.
 - AIX 6100-06 is the minimum supported platform for Java 6 R2.6
- Shared class caches for Java 6 R2.6 are unique from previous versions of Java 6
 - Will use more memory when running both on the same system

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There are several notable changes for configuring the Java SDK in WebSphere Application Server Version 8.0.

The first is that the default garbage collection policy is now the generational garbage collector. This can affect both server configurations and stand-alone thin clients.

In addition, the stand-alone Java SDKs now default to using a persistent shared class cache, except on the z/OS platform. These shared class caches are unique from other versions of Java 6 and will therefore consume additional memory when running multiple versions simultaneously.



Java 6 R2.6 SDK configuration changes (2 of 2)

- managesdk command added to configure environments with multiple Java SDKs available
 - Typically used on z/OS and IBM i for 31/32 bit and 64 bit SDK selection
 - Manages SDK used by profiles and default SDKs
 - Replaces enablejvm on IBM i. enablejvm is deprecated.
- Handling Endorsed Standards Override in stand-alone environments
 - --Djava.endorsed.dirs=WAS_HOME/runtimes/endorsed

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There is a new command line tool available to help manage and configure environments with multiple Java SDKs. Typically, this will be limited to z/OS and IBM i selection of 31 or 32 bit Java SDK versus 64 bit SDK selection. The tool can configure profiles and command line tools to use specific SDKs and can change the defaults for new profile creation. This tool will replace the enablejvm common line tool on IBM i, which is being deprecated.

When running stand-alone SDKs, there are APIs that should be overridden with current versions. Use the java.endorsed.dirs system property to reference the appropriate runtime jar file. This will be handled automatically for server configuration.



Java 6 R2.6 SDK garbage collection policy changes (1 of 3)

- Garbage collection policy subpool is now an alias for garbage collection policy optthruput
- New verbose garbage collection format
 - Handle more concurrent garbage collection policies
 - Infer start / stop from event stream
 - Better format for tools

7 Java SDK enhancements

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Some of the garbage collection policies have also changed. The subpool policy is no longer needed and is now an alias for the optthruput policy.

In addition, a new verbose garbage collection log format has been defined to support additional garbage collection policies. The format is less hierarchical and provides better support for analysis by tools. Start and stop of various garbage collection phases may be inferred by examining the event stream.

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Java 6 R2.6 SDK garbage collection policy changes (2 of 3)

- New balanced garbage collection policy for large heaps (> 4 GB, 64 bit only)
 - Use -Xgcpolicy:balanced -Xcompressedrefs
 - Supported platforms are Windows® x86, Linux® x86, AIX, Linux POWER®, z/OS, z/Linux
 - Partial garbage collections should be the norm, but global garbage collection phases can be triggered by a system garbage collection and startup

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A new garbage collection policy has been added for large heaps, generally of 4 GB or more, but it is only supported on 64 bit systems with compressed references turned on and only on some platforms. The balanced garbage collection policy tries to reduce pause times for garbage collection by performing partial garbage collection phases on subsets of the heap. Partial garbage collection phases should be the norm in the event log, but a global garbage collection phase may be triggered by a system garbage collection or during startup as the heap is growing.



Java 6 R2.6 SDK garbage collection policy changes (3 of 3)

- New balanced garbage collection policy for large heaps (> 4 GB, 64 bit only)
 - Typically reports less free memory than gencon policy; fragmented free memory is not reported
 - May require approximately 7% more heap than other policies to manage space
 - Use global garbage collection frequency and global mark phase frequency versus gencon concurrent garbage collection frequency to identify appropriate heap size
 - Processor saturation can affect partial garbage collections

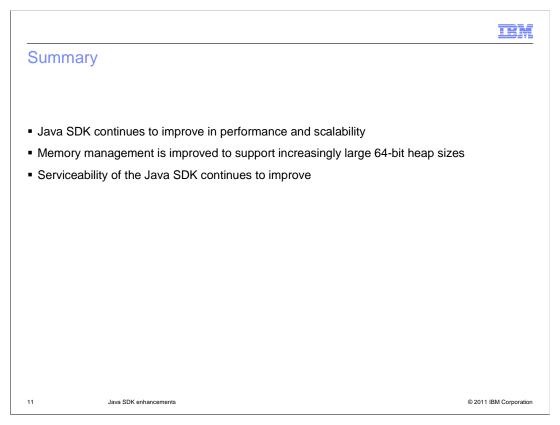
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It should be noted that the balanced garbage collection policy will typically report less memory available than other garbage collection policies since fragmented free memory in the heap is not counted. Also, this policy may use about 7% more heap memory due to memory management structures that are kept. When tuning this policy, look at the global garbage collection phase frequency and global mark phase frequency versus the gencon concurrent garbage collection phase frequency to help identify appropriate heap sizes. Also, processor saturation can affect partial garbage collection phase completion and cause greater global garbage collection phase frequency.

		IBM
Java 6 F	R2.6 SDK heap dump changes	
Format for	or heap dump has changed	
 Requires updates to analysis tools like IBM Support Assistant 		
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Finally, the heap dump format has been changed to include more information. This will affect tools that are used to analyze heap dumps. In particular, the latest level of IBM Support Assistant should be used to analyze the heap dump format used by the Java 6 R2.6 SDK.



This presentation has covered changes to the Java SDK in the areas of performance, memory management, and serviceability.

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