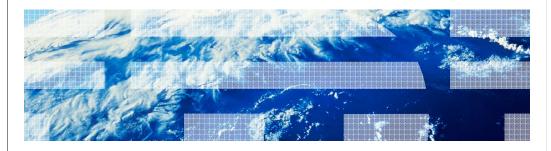# IBM WebSphere Application Server V7.0

## Reduce startup time for applications with EJB modules that use annotations

This presentation describes the feature titled "Reduce startup time for applications with EJB modules that use annotations", which is included in IBM WebSphere® Application Server V7.0.0.27. This feature was integrated as APAR PM74554.

The feature is specific to IBM WebSphere Application Server V7.0. The feature is already included in V8.0 and higher, and does not apply to versions before version 7.

## APAR PM74554

- Performance improvement of application startup for applications with enterprise bean (EJB) jars enabled for annotations.
- Performance improvement of Web Server Plug-in Configuration Generation.
- Performance improvements are relative to the number and size of EJB jars.
- Enabled by ifix installation and setting a custom property.

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This feature is a performance enhancement for applications that contain Enterprise Bean (EJB) jar files that are enabled for annotations. It enhances performance by enabling the reuse of EJB metadata that is written to disk when the application is deployed.

This feature is specific to applications with EJB jars that are enabled for annotations. An application that contains no EJB jars or that contains EJB jars that are not enabled for annotations will see no benefit.

The performance benefit is in proportion to the number and size of EJB jar files in an application relative to the overall size of the application. The intended target of the feature is an application that has many EJB jar files where the EJB jar files are most of the content of the application.

The largest benefit is seen when the application is made up almost entirely of annotation enabled EJB jar files. However, an application that has many annotation enabled EJB jar files along with other content like web modules will still see a benefit.

This feature provides a benefit for two main scenarios: Application Startup and Web Server Plug-in Configuration Generation. In addition, administrative operations may also see a benefit. Generally, it will provide a benefit for any scenario where the metadata of a deployed application must be read.

## Prerequisite criteria

- Annotation enabled enterprise bean (EJB) jar files:
  - Either, contains no deployment descriptor (META-INF/ejb-jar.xml),
  - Or, contains deployment descriptor configured to use enterprise beans 3.0 schema and not configured to metadata-complete.
- Enabled by setting a custom property.
- Feature enablement changes the file "META-INF/ejb-jar_merged.xml" from being only for debugging purposes to being an active file.
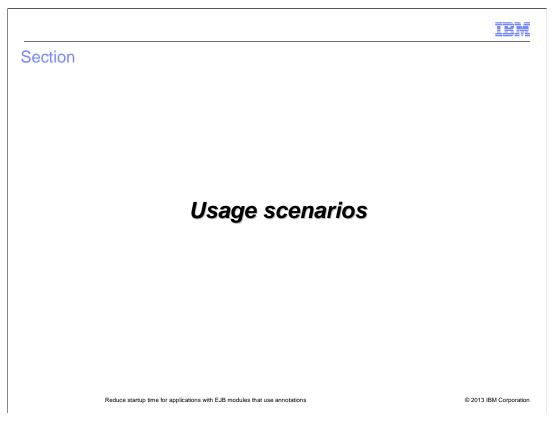
The key enabling factor for use of this feature is an application that contains annotation enabled Enterprise Bean (EJB) jar files. An annotation enabled EJB jar file is one that does not contain a deployment descriptor, or that contains a deployment descriptor that is set to use the enterprise beans 3.0 schema and is not set to metadata-complete.

The feature is enabled by setting the custom property "org.eclipse.jst.j2ee.commonarchivecore.enable.ejb.descriptor.cache" to true. The feature is disabled by default. For full enablement, this custom property must be configured on the Deployment Manager, and must be configured on the Application Server nodes to which the target application is deployed.

The feature affects all deployed applications. No re-deployment is necessary.

It operates by enabling the reuse of the file "META-INF/ejb-jar_merged.xml", which is written during the application deployment. Before this feature, this file was written but was not read during subsequent reads of the application data. With the feature enabled, the file is read in preference to regenerating application metadata.

Section

# *Usage scenarios*

This feature is used in these scenarios.

## Scenario outline

- Application startup
- Web server plug-in configuration generation
- Administrative operations that read application data

This feature impacts two key scenarios: application startup and web server plug-in configuration generation. In addition, administrative operations may also see a benefit. Generally, the feature will provide a benefit for any scenario where the metadata of a deployed application must be read.

Application startup includes application startup that is performed during server startup.

Administrative operations that perform reads of application metadata will see a benefit.

Application deployment typically does usually not see a benefit, because the file "META-INF/ejb-jar_merged.xml" is generated as a step during deployment. However, an application that is pre-populated with "META-INF/ejb-jar_merged.xml" will see a benefit.

## Scenario: Application startup

- Application startup, including application startup preformed during application server startup.
- Use when fast application startup is a important goal.

The most typical scenario that uses this feature is application startup. This includes application startup that is performed during server startup.

The feature should be considered when fast application startup is a important goal. A large application that is composed primarily of EJB jars that are enabled to use annotations can see up to a 40% reduction to application startup times.

## Scenario: Web server plug-in configuration generation

- The feature should be considered when plug-in generation is constrained.

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An additional scenario where you will see a benefit from this feature is web server plug-in configuration generation. The feature should be considered when plug-in generation is tightly  constrained, for example, when plug-in generation must be completed in a fixed time window.

## The merged enterprise beans deployment descriptor (1 of 2)

- This feature changes the file "META-INF/ejb-jar_merged.xml" from being only for debugging to being an active file.
- The file is written to the application deployment location, for example:
  - <PROFILE_HOME>/config/cells/<CELL_NAME>/applications/
  - <APPLICATION_NAME>.ear/deployments/<APPLICATION_NAME>/
  - <EJBJAR_NAME>.jar/META-INF/ejb-jar_merged.xml
- When the feature is enabled, the file "ejb-jar_merged.xml" is read in preference to regenerating the information contained in this file.
- Because the file becomes an active file, it should not be removed, and must be only be edited carefully.

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This feature makes use of the file "META-INF/ejb-jar_merged.xml". This file is generated during application deployment and is written as a part of the application metadata. The file is written to the resources location for the deployed application.

Specifically, the features enables the read of "META-INF/ejb-jar_merged.xml" in preference to regenerating the metadata contained in this file. Before this update, this file was written as a part of the application deployment, but was not read during subsequent reads of the application.

Before this update, the "META-INF/ejb-jar_merged.xml" file was only used for debugging purposes. The file had no active functional use and could safely be edited or removed. With the feature enabled, the file has an active functional use and must be edited with care. With the feature enabled, if the file is removed the performance benefit of the feature will be removed.

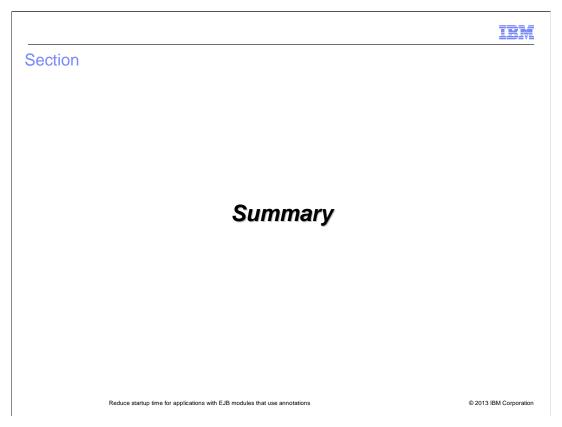## The merged enterprise beans deployment descriptor (2 of 2)

- Any "META-INF/ejb-jar_merged.xml" that is contained in an application that is deployed is used in preference to regenerating the information that is contained in this file.

- If any updates are made to enterprise beans metadata, the merged descriptor file "META-INF/ejb-jar_merged.xml" must be removed before application deployment.

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Previously, an application that already contained "META-INF/ejb-jar_merged.xml", for example, an application that was exported, could be safely deployed regardless of the presence of the file. When the feature is enabled, any "META-INF/ejb-jar_merged.xml" that is contained in an application that is deployed is used in preference to regenerating the metadata that is contained in this file. If the file is no longer valid, for example, because updates were made to "META-INF/ejb-jar.xml" or because EJB related annotations data was updated, the file "META-INF/ejb-jar_merged.xml" must be removed before deploying the application.

A scenario that will create an application that contains "META-INF/ejb-jar_merged.xml" is an export of a deployed application.

Section

# *Summary*

Reduce startup time for applications with EJB modules that use annotations
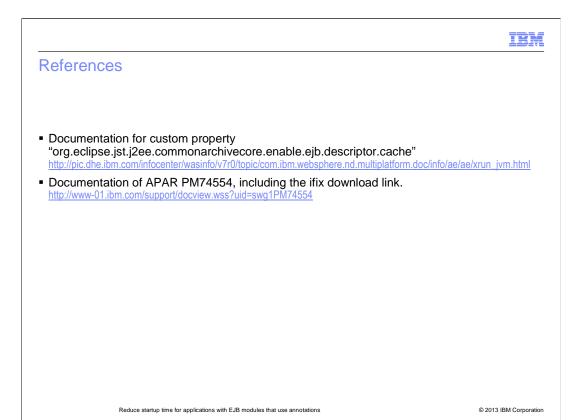
In summary ...

## Summary

- Provides a performance enhancement to application startup (up to 40%).
- Provides a performance enhancement to Web Server Plugin Configuration generation (up to 40%).
- Enablement by setting a custom property to true.
- Enables the read of "META-INF/ejb-jar_merged.xml" in preference to regenerating the information in this file.

The feature "Reduce startup time for applications with EJB modules that use annotations", which was integrated under APAR PM74554, provides a performance enhancement for application startup and for web server plug-in configuration generation for applications that contain many annotations enabled EJB jar files. The feature is enabled by setting the custom property "org.eclipse.jst.j2ee.commonarchivecore.enable.ejb.descriptor.cache" to true and provides a reduction of up to 40% for application startup and web server plug-in configuration generation. The feature functions by enabling reading the "META-INF/ejb-jar_merged.xml" file in preference to regenerating this information during reads of the application subsequent to application deployment.

## References

- Documentation for custom property
  "org.eclipse.jst.j2ee.commonarchivecore.enable.ejb.descriptor.cache"
  http://pic.dhe.ibm.com/infocenter/wasinfo/v7r0/topic/com.ibm.websphere.nd.multiplatform.doc/info/ae/ae/xrun_jvm.html
- Documentation of APAR PM74554, including the ifix download link.
  http://www-01.ibm.com/support/docview.wss?uid=swg1PM74554

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See these references for additional information about this feature.

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