IBM Software Group

IBM® WebSphere® Application Server V7

Runtime provisioning

This presentation covers the runtime provisioning component of WebSphere Application Server Version 7.

Overview

- V7 runtime provisioning
    - ▶ Historical start time and runtime memory footprint
    - ▶ Benefits of runtime provisioning
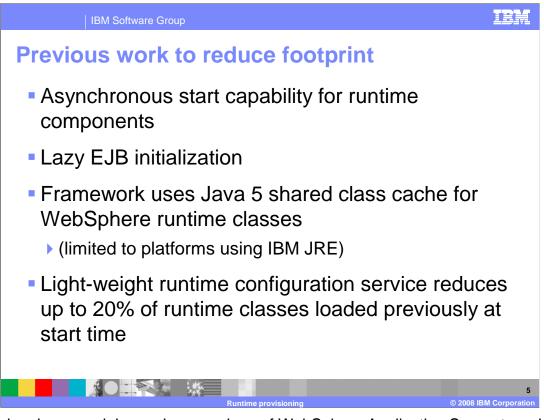   - ▶ A little information on how it works

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First, a discussion of historical runtime and memory footprint aspects of WebSphere Application Server Version 7 is provided, followed by the benefits of the runtime provisioning component and how it works.

Section

WebSphere Application Server historical start time and runtime

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This section discusses the historical aspects of the start and runtime of WebSphere Application Server.

Historical facts and figures

- Historically since WebSphere Application Server V4.0 start time and memory footprint have grown
  - Approximately 15% growth in start time per release
  - Approximately 15% growth in memory footprint per release
  - Approximately 16 Meg increase in JVM™ footprint per release
  - Result of significant new functionality per release
- Pre V7 servers aggressively start components that might not be used by deployed applications

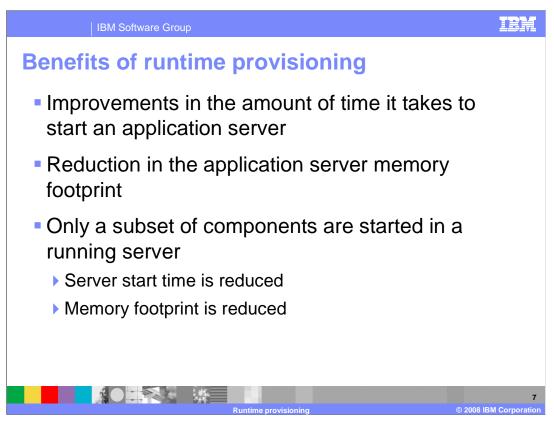Runtime provisioning

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In the past, with significant new functionality included in each release of WebSphere Application Server, start time has grown slightly with each release, as has the application server's memory footprint. Before version 7, servers start components of the application server that might not be used by deployed applications.
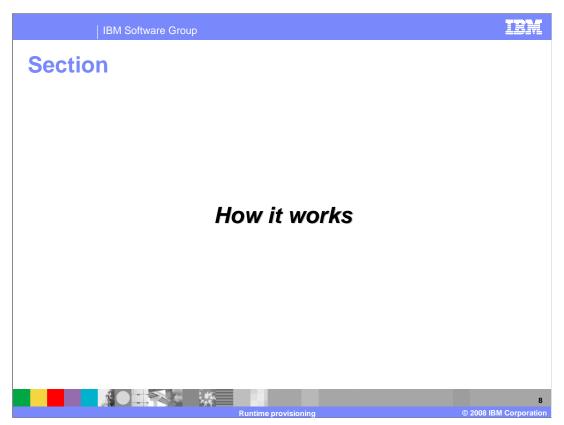
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Previous work to reduce footprint

- Asynchronous start capability for runtime components

- Lazy EJB initialization

- Framework uses Java 5 shared class cache for WebSphere runtime classes
  - ▶ (limited to platforms using IBM JRE)

- Light-weight runtime configuration service reduces up to 20% of runtime classes loaded previously at start time

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There has been work in previous versions of WebSphere Application Server to reduce the amount of growth in the memory footprint. This work has included the introduction of an Asynchronous start capability for runtime components and the lazy initialization of EJBs, where EJBs are not loaded into memory at deploy time of an Enterprise application, but instead are loaded at the time they are referenced. The framework of WebSphere V6.1 uses the Java version 5 shared class cache for runtime classes, which helped to reduce the memory footprint of the framework by allowing classes to be shared by common components.
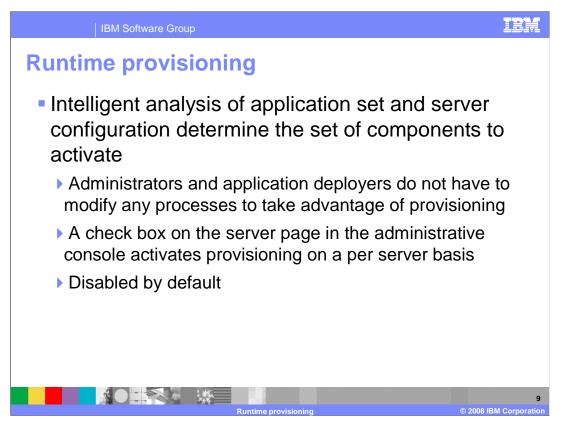
Section

Runtime provisioning

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This section discusses the benefits of the runtime provisioning component that has been added to WebSphere Application Server Version 7.

Benefits of runtime provisioning

- Improvements in the amount of time it takes to start an application server

- Reduction in the application server memory footprint

- Only a subset of components are started in a running server
  - ▶ Server start time is reduced
  - ▶ Memory footprint is reduced

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There are several benefits that the runtime provisioning component adds to WebSphere Application Server Version 7, such as reducing the time it takes to start an application server. The memory footprint of a Web application is reduced by starting only the components that are needed to run the application, while still keeping the application server in compliance with the Java EE 5 specification.
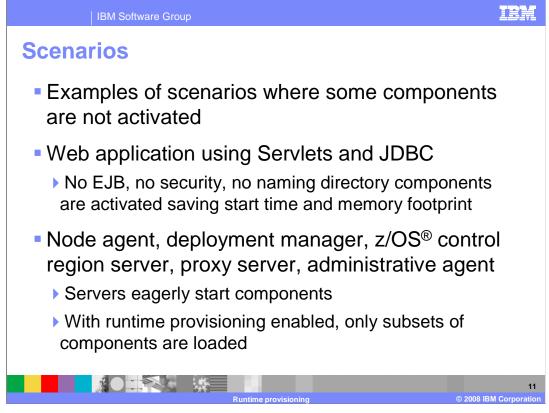
Section

How it works

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This section discusses how the runtime provisioning component works.

Runtime provisioning

- Intelligent analysis of application set and server configuration determine the set of components to activate
  - ▶ Administrators and application deployers do not have to modify any processes to take advantage of provisioning
  - ▶ A check box on the server page in the administrative console activates provisioning on a per server basis
  - ▶ Disabled by default

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The runtime provisioning component is disabled by default on the application servers in WebSphere Application Server Version 7. A check box has been added to the server configuration page in the administrative console that allows administrators to enable the runtime provisioning aspect of the application server. The runtime provisioning component analyzes the deployed applications on the application server to determine which runtime components to enable to successfully run the application. If some components, for example the runtime for Enterprise Java Beans, is not required to run the deployed applications, that particular component will not be enabled, resulting in a lower memory footprint for the application server.
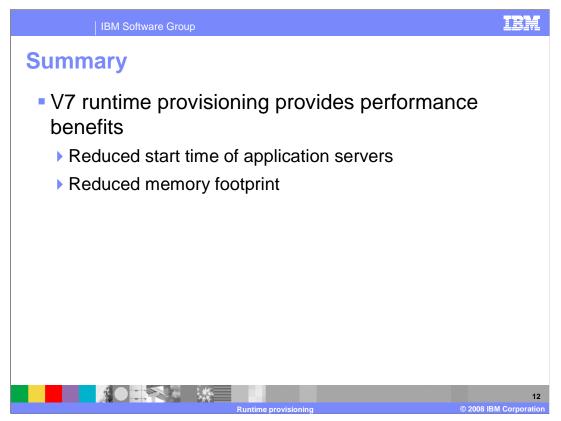
How to activate runtime provisioning

- In the administrative console
  - Application servers > serverName page > Start components as needed

This page shows the check box labeled "start components as needed" that has been added to the server configuration page of the administrative console. Checking this box on a servers configuration page in the administrative console enables runtime provisioning on this server.

Scenarios

- Examples of scenarios where some components are not activated

- Web application using Servlets and JDBC
  - No EJB, no security, no naming directory components are activated saving start time and memory footprint

- Node agent, deployment manager, z/OS® control region server, proxy server, administrative agent
  - Servers eagerly start components
  - With runtime provisioning enabled, only subsets of components are loaded
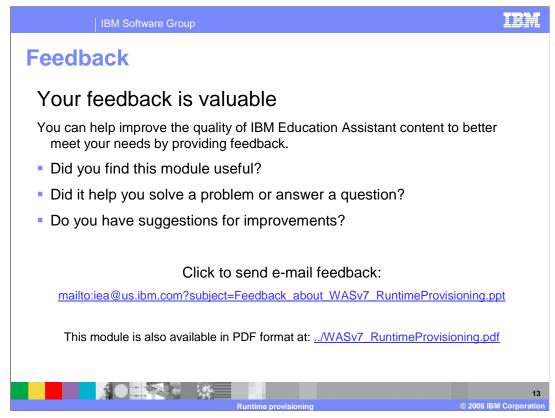
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Another example where some components may not be activated by enabling runtime provisioning on a server include a simple Web application. If a simple Web application is run on the application server with runtime provisioning enabled, not all server runtime components are enabled, for example security and Enterprise Java Bean supporting runtime classes. Servers potentially start more components than are needed by the applications that are deployed on them, so

enabling Runtime provisioning on WebSphere Application Server Version 7 allows only a subset of the entire runtime library to be loaded into memory, resulting in a smaller memory footprint and reduced start time.

Summary

- V7 runtime provisioning provides performance benefits
  - ▶ Reduced start time of application servers
  - ▶ Reduced memory footprint

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In Summary, the runtime provisioning component of WebSphere Application Server version 7 reduces the memory footprint and start time of applications that do not need all of the application server runtime libraries. Through intelligent analysis of the applications that are deployed on the server, the runtime provisioning component loads only a subset of the available runtime components that are needed to run them.

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Runtime provisioning

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