IBM WebSphere® Application Server V6

System Management

File Synchronization

@business on demand.

This presentation will focus on file synchronization.

Goal and Prerequisites

- Goal:
  - ▶ Describe IBM WebSphere Application Server V6 Network Deployment configuration file synchronization from Deployment Manager to Managed Nodes

- Prerequisites:
  - ▶ Basic understanding of WebSphere Application Server V6 architecture, topology and terminology
  - ▶ Basic understanding of Java™ 2 Enterprise Edition (J2EE) enterprise application packaging

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The goal of this presentation is to describe the file synchronization process.
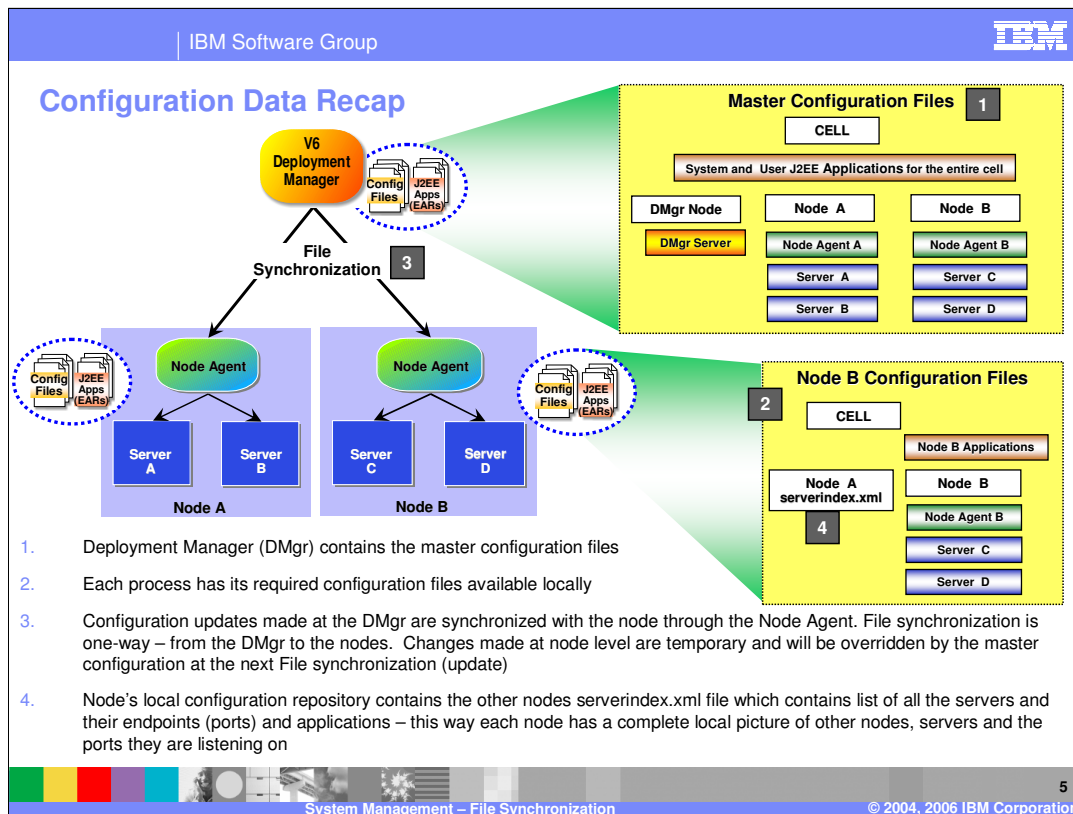
Agenda

- File synchronization from Deployment Manager to Managed Node

- Using the Administrative Console for the file synchronization setting in the Node Agent

The agenda for this presentation includes the file synchronization process and configuration.

Section

File Synchronization

4

This section will cover the file synchronization process.

Configuration Data Recap

V6 Deployment Manager

Config Files | J2EE Apps (EARs)

File Synchronization **3**

Master Configuration Files **1**

CELL

System and User J2EE Applications for the entire cell

DMgr Node	Node A	Node B
DMgr Server	Node Agent A	Node Agent B
	Server A	Server C
	Server B	Server D

Node Agent

Config Files | J2EE Apps (EARs)

Server A	Server B

Node A

Node Agent

Server C	Server D

Node B

Node B Configuration Files **2**

CELL

Node B Applications

Node A serverindex.xml **4**	Node B
	Node Agent B
	Server C
	Server D

1. Deployment Manager (DMgr) contains the master configuration files

2. Each process has its required configuration files available locally

3. Configuration updates made at the DMgr are synchronized with the node through the Node Agent. File synchronization is one-way – from the DMgr to the nodes. Changes made at node level are temporary and will be overridden by the master configuration at the next File synchronization (update)

4. Node's local configuration repository contains the other nodes serverindex.xml file which contains list of all the servers and their endpoints (ports) and applications – this way each node has a complete local picture of other nodes, servers and the ports they are listening on

System Management – File Synchronization

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This slide shows the configuration and application binary data in the network deployment environment. Each server has access to its own configuration files and application binary files needed for the server to start. The configuration data is in XML files, and the application data in EAR files. The servers read these files in during server startup which allows the servers to initialize themselves with the appropriate configuration.

The deployment manager maintains a master configuration repository at the cell level. This master repository contains all of the configuration files and EAR files for the entire cell. Node A contains the subset of XML files from the master repository that are needed for the servers running on that node, having the Server A and Server B configuration files, but not having the Server C and Server D configuration files. Although not specifically illustrated, that is also true of the EAR files, with Node A only having the EAR files needed for Servers A and B.

File Synchronization in Network Deployment

- Configuration updates made at the DMgr are synchronized with the Node through the Node agent – one way synchronization only

- DMgr and Node Agent use system application "Filetransfer" to transfer the file over HTTP
  - ▶ Updates are pulled by the Node Agent during file synchronization
  - ▶ Uses HTTPS if security is turned on

- Any changes to the configuration made at the node level are lost after the file synchronization

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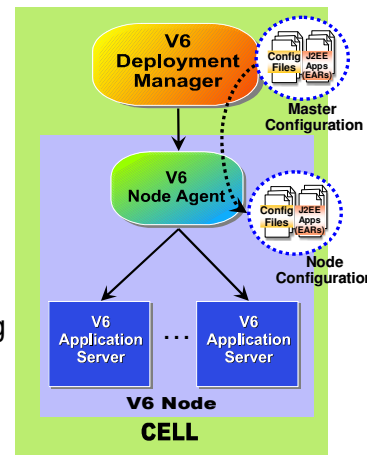
This slide takes a closer look at points where administration can occur, and the implications based on the relationship between the master configuration repository at the cell level and the configuration and application files at the node level.
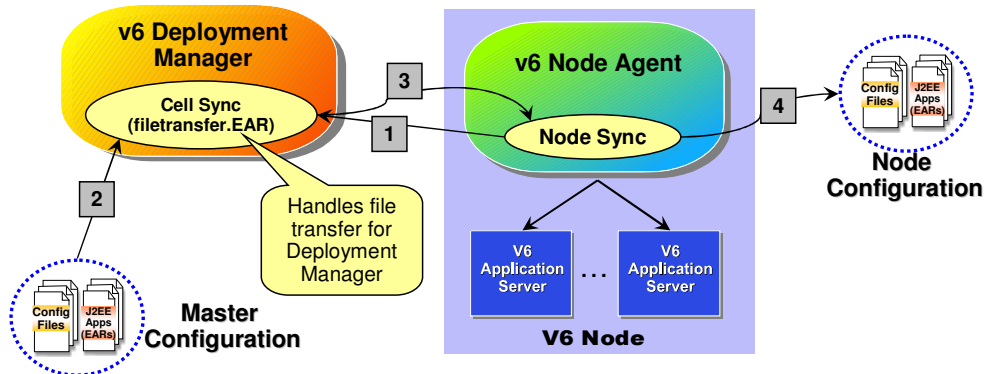
In the network deployment environment, all administration is expected to occur through the deployment manager. The deployment manager is configured with the Administrative Console application which allows you to use a a browser to update configuration data and issue operational commands. The deployment manager reflects these changes in the master repository, and through file synchronization with the node agents, the files are copied to the nodes.

Directly editing the node configuration XML files is not useful because and any such changes will be overwritten by the next synchronization operation.

Synchronization can occur based on different events, which will be covered in the next slide.

The Filetransfer system application transfers the configuration files using the HTTP protocol. When you enable security in the WebSphere Application Server product, the file transfer service uses certificate-based mutual authentication. You can use the default key files in a test environment, but for a production environment, you should change the default key file to secure your system

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File Synchronization Process in a ND Cell

v6 Deployment Manager

Cell Sync (filetransfer.EAR)

3

1

v6 Node Agent

Node Sync

4

Config Files | J2EE Apps (EARs)

Node Configuration

2

Handles file transfer for Deployment Manager

Config Files | J2EE Apps (EARs)

Master Configuration

V6 Application Server ... V6 Application Server

V6 Node

1. Node initiates synchronization operation

2. Cell reads master configuration repository and compares to node copy information

3. Cell returns update information and files

4. Node writes updates to local configuration files (all changes at once)

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This slide shows the sequence of steps involved in a file synchronization process.

When does File Synchronization Occur ?

- File synchronization settings are customizable per node using the setting at the Node Agent

- Can be Automatic or Manual

- Automatic
  - ▸ Automatic synchronization can be turned ON using Administrative clients
    - ▪ Default interval is 1 minute
  - ▸ Optional: full resynchronization on Server startup

- Manual
  - ▸ Force synchronization using Administrative Console or wsadmin
  - ▸ syncNode command line tool

- Recommendation: Define your own file synchronization strategy in production

System Administration -> Node Agents -> File Synchronization Service

General Properties

☑ Enable service at server sta

✱ Synchronization interval
`1`

☑ Automatic synchronization

☐ Startup synchronization

Exclusions

Node Agent

Files or patterns that should not be synchronized

| Add Node | Remove Node | Synchronize | Full Resynchronize |

Select	Name	Version	Discovery Protocol	St
☐	RHG	6.0.0.0	TCP	
☐	RHGNode1	6.0.0.0	TCP	

Nodes

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System Management – File Synchronization

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The file synchronization service is the administrative service responsible for keeping up to date the configuration documents that are distributed across the WebSphere Application Server cell. This service runs in the deployment manager and node agents, and ensures that configuration changes made to the cell's master repository are propagated to the appropriate nodes.

File synchronization is controlled by configuration settings. There is an Automatic Synchronization setting, which when enabled, the node agent will automatically contact the Deployment Manager periodically, as defined by the synchronization interval setting. This flag is enabled by default and the Synchronization Interval is set to 1 minute. The automatic synchronization setting will also cause a file synchronization to occur when either the node agent or deployment manager start and initially establish communication.

You can force a synchronization using wsadmin, the Administrative Console or a command line script provided by WebSphere. You can also force a full synchronization rather than just changed files. This can be used to ensure you have everything up to date.

Full synchronization does not mean all files are redistributed to the node. It means that a full comparison is done in order to catch manually edited files.

When the startup synchronization setting is enabled, it means that a file synchronization will occur whenever an application server is started, thus ensuring that the application server has the latest level of configuration.

It is important that you understand file synchronization, and that you define a file synchronization strategy you want to use. Your needs may be different for a production environment than they are for a development or test environment. For example, in production your strategy may be to only allow file synchronization to occur when you specifically request it rather than letting automatic synchronization occur.

What is Synchronized ?

- Node Agent sends document digests to the DMgr, where they are compared against the digests in the master repository

- Only changes made by administrative clients will be marked for synchronization
  - ▶ Changes made using text editors will not be marked for automatic synchronization
    - Changing configuration files outside the Administrative clients is not recommended
      – However, Full resynchronization will propagate these changes also

- Only changed files pertaining to a Node are synchronized for that Node

This slide examines what files get synchronized.

Summary

- Discussed File Synchronization process from the Deployment Manager to the Nodes

- Discussed automatic and manual Synchronization and what is synchronized

System Management – File Synchronization

In summary, this presentation has explained the file synchronization process.

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