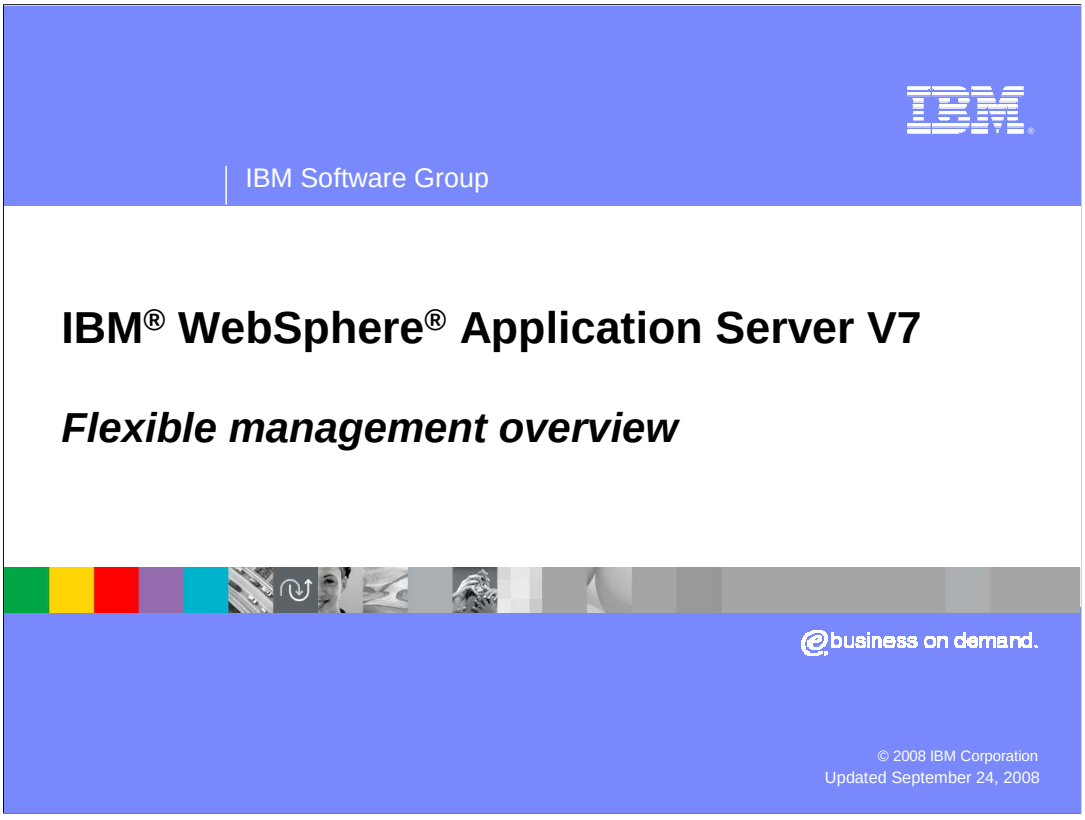


This presentation will explain the new flexible management model introduced in WebSphere Application Server Version 7. This model differs from the cell model in several ways such as loose coupling of systems, no central repository for configuration data, and asynchronous processing of most administrative commands. The presentation also describes the main components associated with flexible management.

Agenda

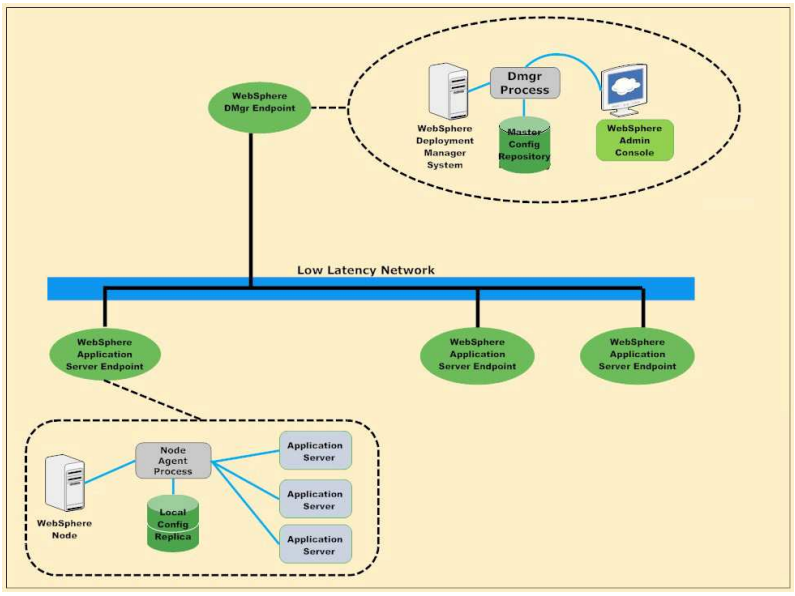
- Overview
- Flexible management components

This presentation will offer an overview of flexible management, a new model for system administration introduced in WebSphere Application Server Version 7. This includes a discussion of the problems and limitations associated with the cell model, and an explanation of how these are overcome using the flexible management model.

It then presents a description of the major components of flexible management, the job manager, and the administrative agent.

The next section will provide an overview of flexible management describing the problems that it addresses and showing the ways in which it differs from the network deployment environment.

Network deployment model



This slide shows the topology used by the network deployment model. In this model, a single deployment manager controls the administration of the collection of systems. This collection is known as a cell. All configuration data is maintained by the deployment manager in a collection of files and directories known as the master configuration repository. This single repository is the only place where changes can occur in the configuration for any node in the cell. In a network deployment environment, administration programs such as the administrative console and wsadmin must connect to the deployment manager, not to other nodes in the cell. Security for each server in the cell is controlled by the security setting of the deployment manager a single username and password applies to the entire cell.

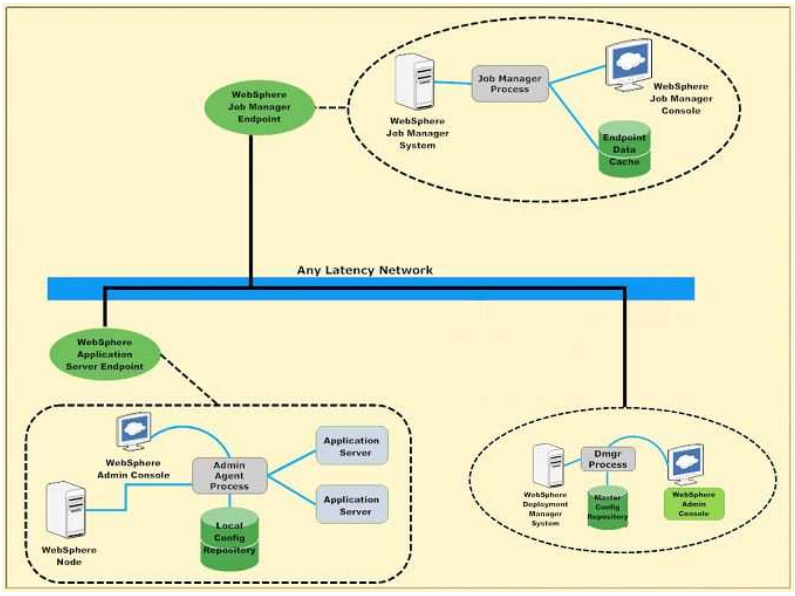
The deployment manager connects across a network to one or more WebSphere Application Server endpoints. These endpoints are abstract connections containing a node agent process, zero or more application servers, and a local configuration repository. The local configuration repository is just a copy of parts of the master configuration repository used for faster access of data. Configuration information cannot be changed by modifying the local configuration repository.

Network deployment model limitations

- Model expects tight coupling, highly synchronous environment
- Management is at the individual server level
  - Does not support management at the node level
- Scalability
  - Problems managing very large number of base servers
- Synchronous model has problems with high latency remote branch servers

This slide shows some of the limitations found in the network deployment model. The entire system is tightly coupled and commands from the deployment manager to the servers are processed synchronously. This requires a high speed, low latency network to maintain an acceptable level of performance. Additionally, the synchronous handling of requests can cause significant problems when trying to scale this environment to include large numbers of servers.

Flexible management topology



This slide shows the topology used in a flexible management environment. In this environment, there can be one or more job manager endpoints, each containing a job manager process and running code for a job manager console. There is also a cache of endpoint information to minimize the time needed to fetch some information. If there are multiple job managers, they are not clones of each other but are completely independent entities.

The job managers connect through a network to one or more WebSphere Application Server endpoints. Each of these endpoints contains a WebSphere node. The node contains a process called the administrative agent which runs code for an administrative console known as the administrative agent console. The node also contains a local configuration repository and some number of application servers.

It is also possible to have a job manager control one or more deployment managers as shown in the bottom right section of the slide.

Flexible management characteristics

- Loose coupling of various pieces
- Offers asynchronous job queuing mechanism for administration purposes
- An alternative to the cell model
- Offers administrators additional management options not previously available
- Management of multiple base servers, up to a server farm containing hundreds of base servers
- Coordinate management actions across multiple deployment managers

Flexible management environments rely on asynchronous processing of work units (known as jobs) from the job manager. This lends itself to large scaling and can support many application servers without degrading performance. It also reduces latency and bandwidth requirements on the network; even dialup lines to remote sites can work well without slowing down the overall system. Additionally, configuration information does not exist beyond the node level so there is no bottleneck associated with accessing a master configuration repository.

Flexible management is not a replacement for the network deployment model but can be used as an alternative to it, and the two can be combined by having a job manager coordinate management actions across multiple deployment managers.

Capability comparison

	Cell	Flexible management
Remote administration	√	√
Fine-grained administration in administrative console	√	X
Administration when administrative process is down (local connectivity)	√	X
Clustering – Workload management	√	X
Clustering – Failover	√	X
Plug-in based HTTP request routing	√	X
Data replication (Memory-based session replication)	√	X
Centralized backup and restore of configuration	√	X
Server performance monitoring	√	X
Scheduling of administrative function	X	√

While flexible management enables some management scenarios, including very large server farms and remote branch operations, there are also some capabilities that are not available outside of a cell environment, including clustering, memory-to-memory data replication, and performance monitoring from the administrative console.

Section

Flexible management components

The next section will discuss the key components of flexible management.

Administrative agent

- New profile type to support flexible management
- Register base application server profiles with the administrative agent
  - Reduces application server footprint
  - Migrates administrative functions to administrative agent
  - Most administrative function is removed from base application servers
  - Maintains isolation between base nodes; no master repository or synchronization
- Register base application server profiles with the job manager through the administrative agent
- Administrative agent polls job manager for jobs on behalf of application servers

The administrative agent is a new server type that was added to support flexible management. It is a new profile type and the various tools that can create profiles have been modified to support creation and maintenance of this profile. The administrative agent does many things, as shown on this slide.

To participate in flexible management, base servers first register themselves with the administrative agent. When a base application server registers with an administrative agent, much of the administrative code that was in the base server is subsumed by the administrative agent. This results in a significantly smaller and faster starting base server.

When a base server registers with the job manager, it first contacts the administrative agent which handles the registration.

The administrative agent can be used to manage application servers, even in the absence or failure of the job manager.

Finally the administrative agent polls the job manager for jobs on behalf of the application servers.

Job manager

- New profile type to support flexible management
- Use administrative agent to register base server profiles with a job manager
- To manage multiple cells, register deployment managers with job manager directly
- Use job manager to queue jobs for registered profiles
- Registered profiles retain autonomy and can be managed without the job manager
- Scales to support large number of registered profiles

The job manager is a new server type that was added to support flexible management. It is a new profile type, and the various tools that can create profiles have been modified to support creation and maintenance of this profile. The job manager is absolutely central to flexible management.

To participate in flexible management, a base server first registers itself with the administrative agent. The base server must then register with the job manager. If a deployment manager wants to participate in an environment controlled by a job manager, the deployment manager registers directly with the job manager; no administrative agent is involved in this case.

The main use of the job manager is to queue jobs to application servers in a flexible management environment. These queued jobs are pulled from the job manager by the administrative agent and distributed to the appropriate application server or servers.

Characteristics of flexible management jobs

- Have semantics tied to the underlying node
  - For example, application management jobs
- Have few parameters
  - Most application installation bindings are stored with the application.
- Are asynchronous, with activation and expiration times, and can recur
- Can send e-mail notification upon completion
- Have status that shows # of nodes succeeded, failed, or pending

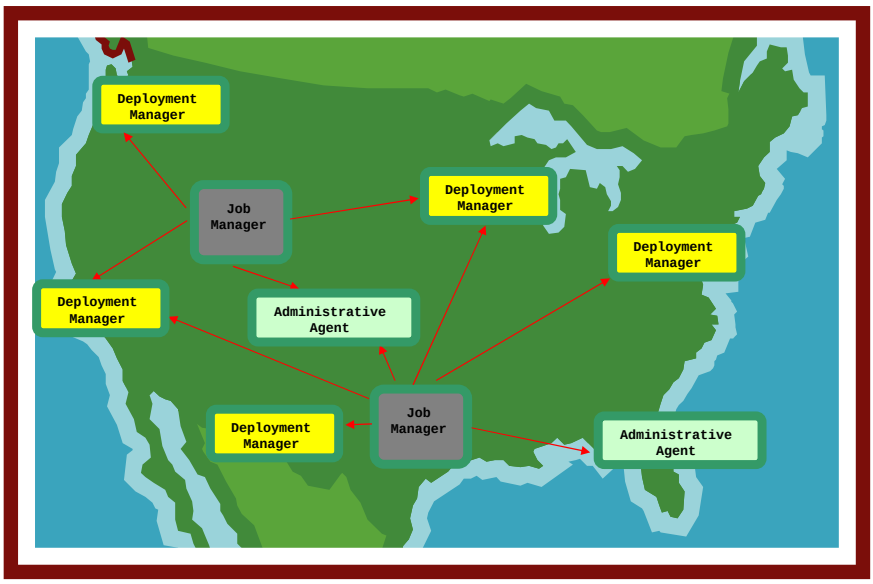
The units of work that are handled by the flexible management environment are known as jobs. The semantics of these jobs are typically straightforward, and the jobs require few parameters. The jobs are processed asynchronously and can have an activation time, expiration time, and a recurrence indicator. You can specify that an e-mail notification be sent upon completion of a job. Additionally, you can view the current status of a job by issuing a status command.

Examples of flexible management jobs

- Examples
  - Download application binaries
  - Install applications
  - Create/start/stop application servers
  - wsadmin scripts

Examples of jobs in flexible management are installing an application, creating an application server, running a wsadmin script on a remote node, and many others.

Example of flexible management topology



This example shows a possible topology combining flexible management and the traditional network deployment environment. Several network deployment cells are being managed by two job managers. When a network deployment cell is managed by a job manager, only the deployment manager is registered. The node agents and application servers are managed by the deployment manager of their cell. The diagram also shows that a job manager can control a combination of administrative agents with their associated application servers and deployment managers.

The slide shows that a deployment manager can register with multiple job managers. A base application server can also register with multiple job managers through a single administrative agent. Registering with multiple job managers gives multiple points of control and improves availability.

Section

Summary

Next is a summary of the presentation.

Summary

- Flexible management is an asynchronous, scalable deployment architecture
- Flexible management components include the administrative agent and job manager

In this presentation you have seen an overview of the new flexible management model introduced in WebSphere Application Server Version 7. You have seen some of the problems and limitations associated with the network deployment model and how flexible management overcomes some of these.

You have been introduced to the main components of flexible management, the administrative agent, and the job manager and seen their function in a flexible management environment.

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