IBM® WebSphere ® Extended Deployment V6

Edition Management Overview

This presentation will cover the Application Edition Management features of WebSphere XD V6.

Agenda

- Overview
- Operational scenarios

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This presentation will first give an overview of WebSphere XD's Application Edition Management features, then present a few operational scenarios that illustrate how Edition Management can be used.

Overview

- WebSphere XD supports managing multiple editions of an application in a WebSphere cell
  - ▶ Interruption-free rollout of application updates
  - ▶ Ability to "roll back" to a previous application version
  - ▶ "Validation mode" to verify functionality using a subset of users

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WebSphere XD allows you to install and manage multiple editions of the same enterprise application within a cell. You can use the Edition Control Center to manage the rollout of new editions to some or all of your servers without service interruption for your users, and you also have the ability to roll back to previous editions.
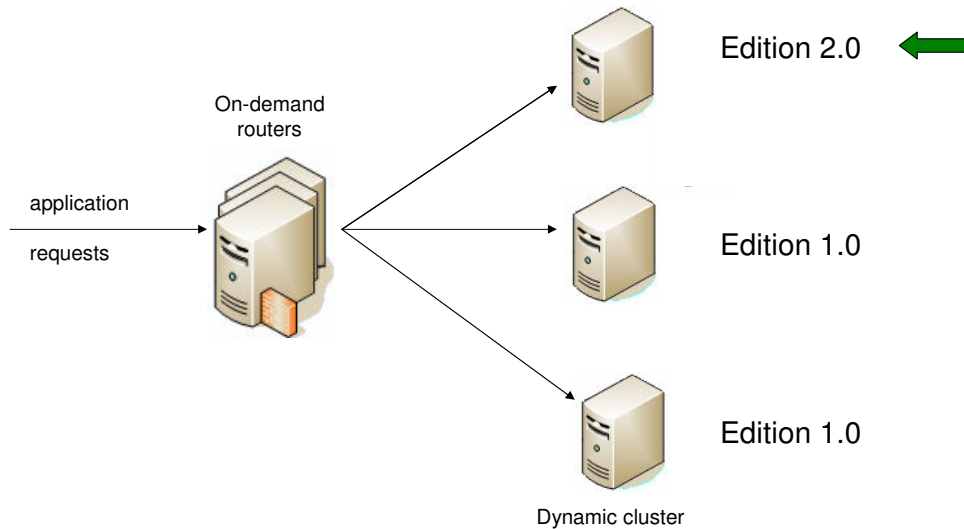
Application Editions

- An *edition* is a distinct instance of a Java™ 2 Enterprise Edition (J2EE) application (similar to *version*)

- Each edition is numbered (or named)

- An edition is a *deployment* version of an application
  - ▸ May be a distinct *build* version
  - ▸ May be the same build version with different deployment bindings (e.g., resource-ref)
  - ▸ May be both

An *edition* of an application is the term that is used to refer to a specific instance of a particular application. The term edition is used rather than version because two application editions could actually be the same 'build version' of the application, but deployed with different bindings.
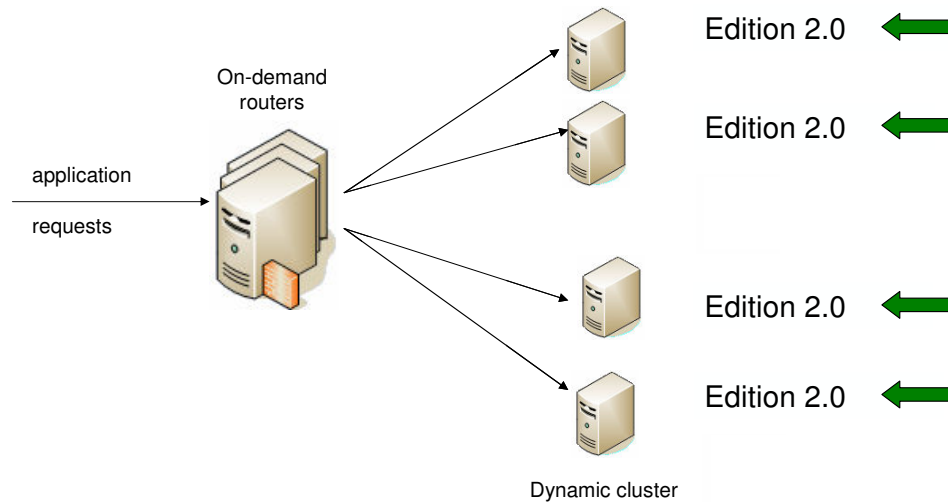
Shared libraries are not handled by the edition manager, and two versions of the same application cannot run within the same Java process.

Operational Scenarios: Group Rollout

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On-demand routers

application

requests

Edition 2.0

Edition 1.0

Edition 1.0

Dynamic cluster

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You have several options when rolling out an edition. The first is known as 'group rollout'. In this scenario, the new application edition will be rolled out across your cluster one server at a time. The On-Demand router stops routing new requests to one server, and when all existing requests have completed, the new version is installed and that server is restarted. The On Demand Router then resumes routing traffic to that server, and the process is repeated across the cluster. Keep in mind that when using group rollout, both versions of the application will be simultaneously serving traffic for a period of time.

Operational Scenarios: Atomic Rollout

On-demand
routers

application

requests

Edition 2.0

Edition 2.0

Edition 2.0

Edition 2.0

Dynamic cluster

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The second method, called 'atomic rollout' uses a 'divide-and-switch' technique to rollout a new edition across a cluster while ensuring that only one version is actively serving traffic at any given time. The On Demand Router will first quiesce traffic to half of the servers in the cluster, and when existing requests complete, the new edition is installed to those servers, and they are restarted. Traffic will then be quiesced on the other half of the servers. While waiting for those requests to finish, there may be a brief build-up of requests in the On Demand Router's dispatch queue, since no servers are receiving traffic. Once the existing requests have been served, requests (including those that built up in the queue) will start being routed to the first set of servers, which is now running the new edition of the application. The new edition will then be installed on the second set of servers. Once they have been restarted, the entire cluster will be running the new application edition.

Note that since your cluster will effectively be running at half capacity during this process, it is wise to perform an edition upgrade during a low-traffic time period.
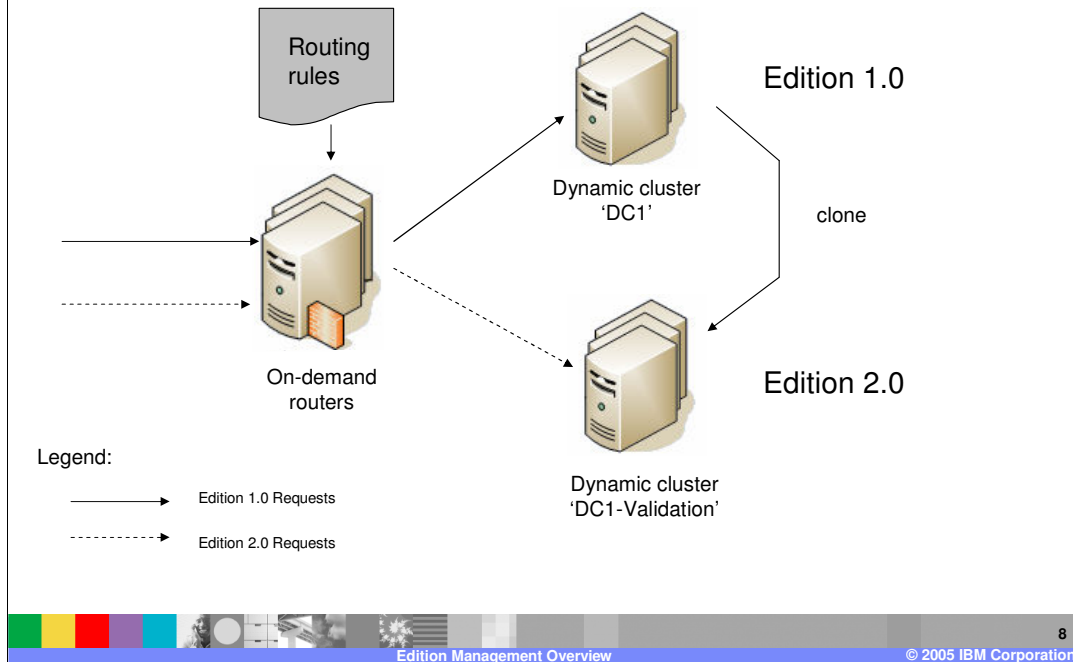
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Validation Mode

- Creates a 'clone' of the deployment target (Dynamic Cluster) in production environment and deploys new version

- Use routing policies to control edition visibility
  - ▸ Restrict new edition to only certain users, for example

- Use rollout function to move edition from validation mode to production
  - ▸ Edition deactivated on 'clone' environment
  - ▸ Edition rolled out on original deployment targets

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Another option is to 'validate' a new edition before rolling it out to your cluster. Validating an edition creates a clone of your dynamic cluster in your production environment, and deploys the new edition to that 'cloned' cluster, which is made available only to a limited subset of traffic. You can limit it to a certain group of users, a certain range of IP addresses, or many other limiting criteria, using routing policies. This gives you the ability to verify functionality of the new edition in your production environment without exposing it to your real users. You can later use the rollout feature to roll out the application into regular production mode and stop the validation cluster.

Operational Scenarios: Validation Mode

IBM Software Group

Routing rules

Edition 1.0

Dynamic cluster 'DC1'

clone

On-demand routers

Edition 2.0

Legend:

Edition 1.0 Requests

Edition 2.0 Requests

Dynamic cluster 'DC1-Validation'

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This diagram illustrates the scenario that was just described. The On Demand Router controls the subset of requests that get routed to the validation cluster based on routing policies that you have defined.

Operational Scenarios: Concurrent Activation
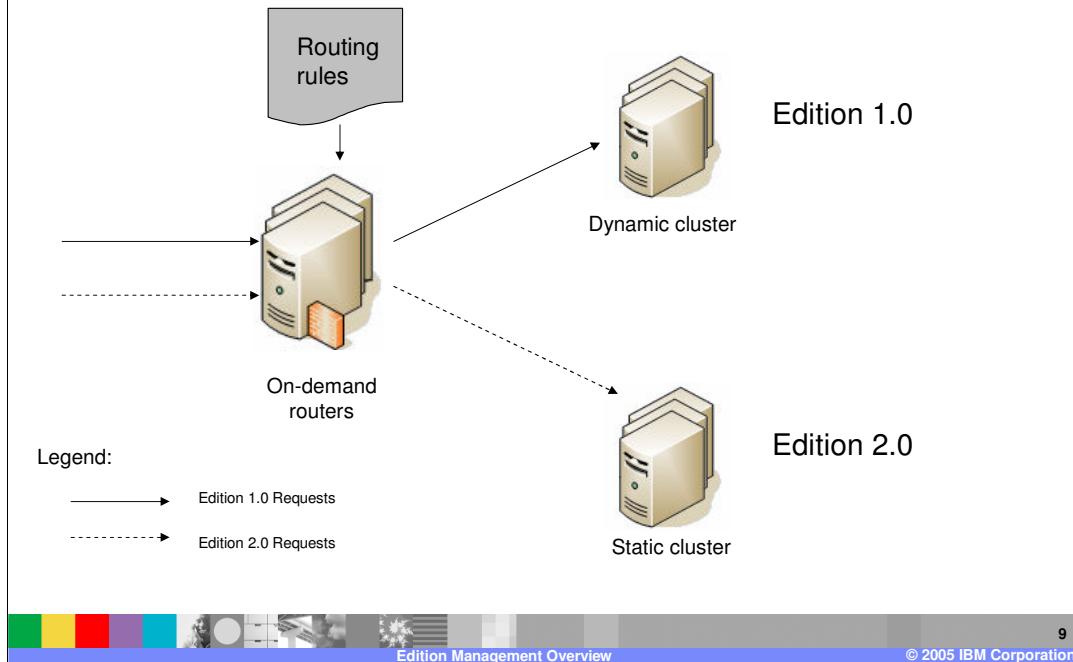
It is also possible to create a similar situation without using validation mode to 'clone' a cluster. You can choose to rollout the new edition to a cluster that you use for testing purposes, and configure routing policies in the On Demand Router that route only certain traffic to the new application edition. An edition can be rolled out to either static or dynamic clusters.

Rollout Considerations

- Scope of Interruption-free operation
  - ▶ Dynamic cluster, static cluster, single server
  - ▶ Only to the tier immediately behind the ODR
  - ▶ HTTP(S)-based requests only

- Compatibility
  - ▶ Backward compatible changes only

- Session Affinity
  - ▶ Option to wait or expire sessions during quiesce

- Restart granularity
  - ▶ Application or server

There are several factors to keep in mind when rolling out a new edition of an application. Since the management of incoming requests is handled by the On Demand Router, interruption-free rollout is only possible for HTTP and HTTPS requests, and in a multi-tiered environment, only for the application tier directly behind the On Demand Router. It is also important that you keep application compatibility in mind. A new edition that expects an incompatible database schema or different data types in the HTTP session will not roll out seamlessly.

Summary

- WebSphere XD enables management of multiple editions of an enterprise application

- New editions can be rolled out without service interruptions

- Validation mode
  - Verification of edition functionality within the production environment

- Routing policies
  - Rules used by the On Demand Router to determine which edition should handle the request

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In summary, WebSphere Extended Deployment enables you to manage multiple versions of an enterprise application within a cell. New editions can be rolled out seamlessly, without application downtime, and validation mode lets you verify that a new edition works properly in your production environment before fully rolling it out. The On Demand Router uses routing policies that you have defined to decide how to route individual requests to any concurrently deployed editions of an application.

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