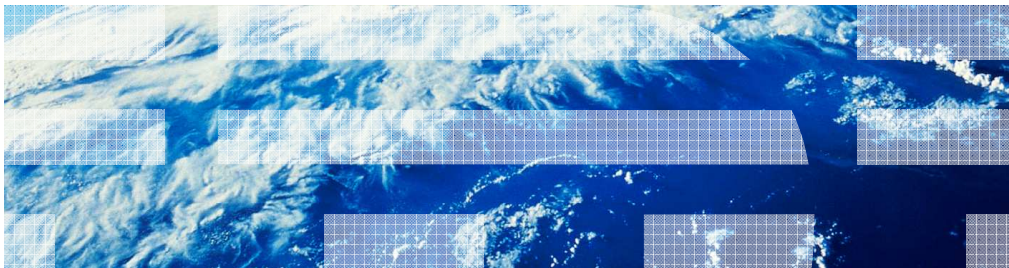


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# IBM WebSphere CloudBurst Appliance

## Intelligent Management Pack



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This presentation will cover the Intelligent Management Pack feature.

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## Table of contents

- Overview
- Intelligent Management Pack enablement
- Patterns
- Advanced options
  - Health management
  - Overload protection
  - Dynamic clustering
- Additional information
- Summary

This presentation starts by showing you how to enable your appliance to use the Intelligent Management Pack capabilities. Then, you are shown the new enhanced patterns that have been introduced in V2.0. This is followed by a new set of advanced options. Finally, a few links to external educational resources are provided.

Section

## ***Overview***

This section will cover the overview.

## Overview

- Intelligent Management Pack feature set is similar to WebSphere® Virtual Enterprise's feature set
- WebSphere CloudBurst™ Appliance benefits
  - Easily configurable WebSphere Application Server topologies with advanced functionality
  - Support “best practices” through pre-defined patterns and script packages
- Intelligent Management Pack benefits
  - Improve application performance and deliver response times to meet service level agreements
  - Increase application availability and minimize administration costs
- All integration features are supported on VMware, PowerVM™ and zVM platforms

The Intelligent Management Pack features are similar to the WebSphere Virtual Enterprise features. It must be emphasized that the Intelligent Management Pack and WebSphere Virtual Enterprise are similar, but not the same. The features are similar enough that existing WebSphere Virtual Enterprise documentation can be used as a training mechanism.

WebSphere CloudBurst allows users to quickly, easily and repeatedly deploy enhanced environments. The Intelligent Management Pack feature provides these important benefits:

Improved application performance and delivery response times to meet service level agreements;

Increased application availability and minimized administration costs;

and Performs interruption-free maintenance upgrades.

The Intelligent Management Pack features are supported on the three hypervisor platforms, VMware, PowerVM and zVM.

## ***Intelligent Management Pack enablement***

This section will cover Intelligent Management Pack enablement.

## Intelligent Management Pack enablement

- Navigate to: **Catalog -> Virtual Images**
- Enable Intelligent Management Pack capabilities by cloning the V7.0.0.11 pattern and choosing **Enable** in the **Intelligent Management Pack** field

Intelligent Management Pack:	Enable <input type="checkbox"/> Advanced features are enabled and may result in additional cost. Please refer to the license agreement.
Hypervisor type:	ESX
Operating system:	LINUX (RHEL5)
Version:	1.0
Image reference number:	acb201020.0
Product IDs (e.g., 5724-X89):	<div style="border: 1px solid red; padding: 2px;">5725-A26</div> ✖ 5725-A27 ✖ 5765-F41 ✖ <a href="#">Click to add</a>
Contains parts:	Administrative agents Custom nodes Deployment manager IBM HTTP servers <a href="#">[show less]</a> Job manager Standalone server <div style="border: 1px solid red; padding: 2px;">On demand routers</div>

Intelligent Management Pack unique product ID

Intelligent Management Pack virtual image part

IBM provides a WebSphere Application Server V7.0.0.11 virtual image, but the Intelligent Management Pack feature is disabled by default. To enable the Intelligent Management Pack capabilities you must first navigate to “Catalog->Virtual Images”. Locate the WebSphere Application Server V7.0.0.11 virtual image and clone it. Once the virtual image has been cloned choose “Enable” in the “Intelligent Management Pack” field. The Intelligent Management Pack capabilities are now enabled on this virtual image.

Notice two additions to the attributes page. First, a new virtual image part labeled “On demand routers” was added. Second, a new product ID was added. This product ID is used to track the license usage for this virtual image. The next step is to configure the available licenses based on this product ID that was just added.

## Intelligent Management Pack licensing

- Navigate to: **Catalog → Product Licenses → IBM products**
- Enable intelligent management pack by entering a value greater than zero into the **Licenses Owned (PVUs)** field

The screenshot shows the 'Product Licenses' page in the WebSphere CloudBurst interface. The 'Catalog' menu is open, and 'Product Licenses' is selected. The page displays options for license reporting and awareness, and a table of IBM products. The table has columns for Product, Product ID, Enforcement, and Licenses owned (PVUs). The 'Licenses owned (PVUs)' field for the 'IBM WebSphere Application Server Hypervisor Edition Intelligent Management Pack' is highlighted with a red box and set to 500.

Product	Product ID	Enforcement	Licenses owned (PVUs)
IBM WebSphere Application Server Hypervisor Edition	5724-X89	Warn	200
IBM WAS Hypervisor Ed for Novell SUSE Linux Enterprise Svr for System z	5725-A12	Ignore	0
IBM WebSphere Application Server Hypervisor Edition on AIX	5725-A25	Ignore	0
IBM WebSphere Application Server Hypervisor Edition on RHEL	5725-A26	Ignore	0
IBM WebSphere Application Server Hypervisor Edition Intelligent Management Pack	5725-A27	Ignore	500
IBM DB2 Enterprise Server Edition	5765-F41	Ignore	0

7

Intelligent Management Pack

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The next step in the Intelligent Management Pack enablement is to configure the product license. First, navigate to “Catalog->Product Licenses”. Located under the section titled “IBM products” you will find a list of all the IBM products residing in the catalog that have been registered with a product ID. Enablement of the Intelligent Management Pack feature will add another product to this list labeled “IBM WebSphere Application Server Hypervisor Edition Intelligent Management Pack”. Enter the number of PVUs in the field labeled “Licenses owned (PVUs).

Section

## ***Patterns***

This section will cover the Intelligent Management Pack enhanced patterns.



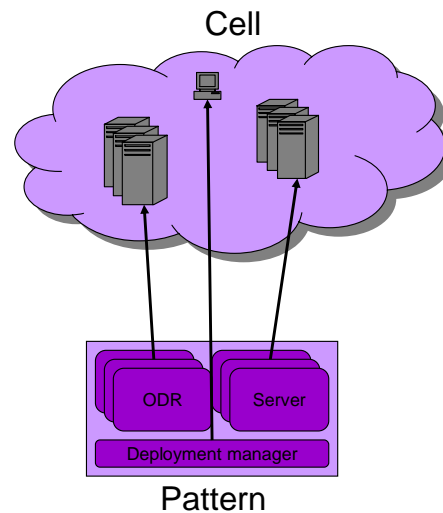
## Intelligent Management Pack enhanced patterns

- Two enhanced patterns come preloaded on the V2.0 appliance
  - WebSphere advanced cluster (development)
  - WebSphere advanced cluster
- If you are upgrading to V2.0 you will need to manually create the patterns if your scenario requires
  1. Upgrade firmware to V2.0
  2. Import V7.0.0.11 virtual image
  3. Clone V7.0.0.11 virtual image and enable Intelligent Management Pack
  4. Create pattern and source the parts from the Intelligent Management Pack enabled virtual image
  5. Lock the pattern

Two enhanced patterns come preloaded on the V2.0 appliance. The two patterns are called “WebSphere advanced cluster (development)” and “WebSphere advanced cluster”. Each of these patterns are discussed in detail in subsequent slides. If you are upgrading your appliance, then you will need to manually create the patterns if your scenario requires them.

## WebSphere advanced cluster (development)

- Single cell consisting of
  - One or more On Demand Routers (ODRs)
  - One or more application servers
  - One deployment manager
  - No web server
- ODR tier -> application server tier

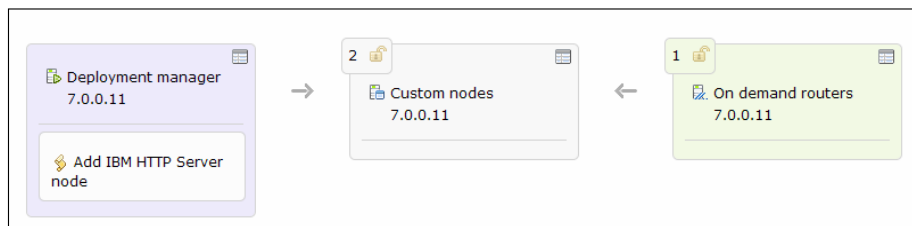


The “WebSphere advanced cluster (development)” pattern is used to create a single cell, consisting of one or more on demand routers (or ODRs), one or more application servers and one deployment manager. This pattern is targeted at the development environment and thus does not have a web server component. The number of on demand routers and application servers are configurable ensuring enough flexibility to meet the requirements of your use case.

The flow of a HTTP request comes in to the ODR tier and then goes to the application server tier.

## WebSphere advanced cluster (development) – default settings

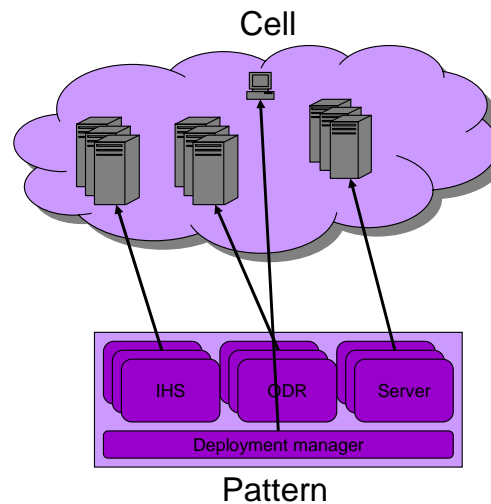
- “WebSphere advanced cluster (development)” pattern preloaded on the appliance
  - 1 Deployment manager
  - 2 Custom nodes
  - 1 On demand router (ODR)
- Custom node and on demand routers count can be increased or decreased depending on your scenario



This view shows the default preloaded pattern “WebSphere advanced cluster (development)” as seen in the Pattern Editor. Looking at the screen capture you can see that the pattern contains one deployment manager, two custom nodes and one on demand router. If you need to make adjustments to the number of custom nodes or on demand routers, you will need to clone the pattern.

## WebSphere advanced cluster

- Single cell consisting of
  - One or more web servers
  - One or more on demand routers
  - One or more application servers
  - One deployment manager
- Web server tier → ODR tier → application server tier

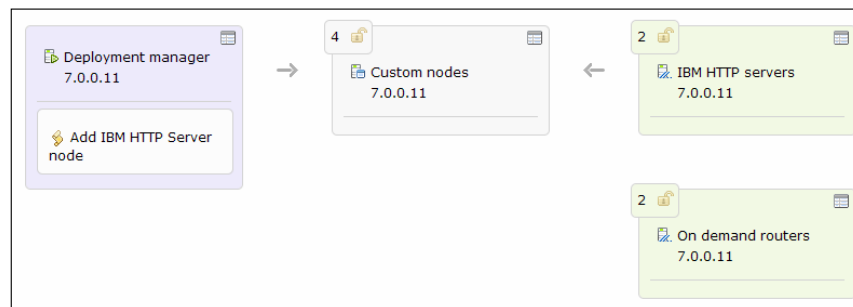


The “WebSphere advanced cluster” pattern is used to create a single cell, consisting of, one or more web servers, one or more on demand routers, one or more application servers and one deployment manager. This pattern is targeted at the production environment. The number of Web servers, on demand routers and application servers are configurable ensuring enough flexibility to meet the requirements of your use case.

The flow of an HTTP request comes in at the Web tier level, flows to the ODR tier and then finally ends up at the application server tier.

## WebSphere advanced cluster – default settings

- “WebSphere advanced cluster” pattern preloaded on the appliance
  - 1 Deployment manager
  - 4 Custom nodes
  - 2 On demand routers (ODR)
  - 2 web servers
- Custom node, Web server and on demand router count can be increased or decreased depending on your scenario



This view shows the default preloaded pattern “WebSphere advanced cluster” as seen in the Pattern Editor. Looking at the screen capture you can see that the pattern contains one deployment manager, four custom nodes, two on demand routers and two web servers. If you need to make adjustments to the number of custom nodes, on demand routers or Web servers you will need to clone the pattern.

## ***Advanced options***

This section will cover the intelligent management pack advanced options.

## Advanced options

- Intelligent management pack options added to the “Advanced Options” panel in the pattern editor view
  - Navigate to: **Patterns → your\_pattern → Edit → Advanced Options**
- Configure options
  - Health management
  - Overload protection
  - Dynamic clustering

Several new options were added to the “Advanced options...” button to support the Intelligent Management Pack feature. There are options for features such as “Health management”, “Overload protection” and “Dynamic clustering”. To configure these options navigate to “Patterns”, then click your particular pattern, click “Edit”, and then click “Advanced Options”.

This education module will briefly discuss each of the options. For an in-depth explanation or tutorial search the IBM Education Assistant or information center for WebSphere Virtual Enterprise. As mentioned earlier, the patterns and options made available by the Intelligent Management Pack are similar to the ones made available by WebSphere Virtual Enterprise. In fact, they are similar enough that the education provided for the WebSphere Virtual Enterprise product can be re-used here.

## Health management - standard policies

- Health management
  - Excessive heap usage
  - Memory leak
  - Maximum server age
  - Email notification list

**Configure standard health policies**

Excessive heap usage

**i** Starts when the memory usage exceeds a percentage of the heap size for a specified time.

Memory leak

**i** Starts when a memory leak is detected. The policy checks if trends in the free memory that is available to a server in the Java heap decreases over a period of time.

Maximum server age

**i** Starts after an application server has been running for a specified amount of time.

E-mail notification list

**i** Specifies a list of e-mail addresses to receive notification when a health condition is performed

Health management allows you to take a policy-driven approach to monitoring your environment and take corrective action when certain predefined criteria are met. The following standard policies are available:

Monitor when excessive memory is being consumed and take corrective action.

Monitor when a memory leak has been detected and take corrective action.

Monitor when a server reaches a certain age and recycle the server automatically.



## Health management – on demand router dependent policies

- Health management
  - Maximum requests served
  - Excessive number of timed out requests
  - Excessive average response time
  - Storm drain detection

**Configure on demand router-dependent health policies**

Maximum requests served

Excessive number of timed out requests

Excessive average response time

Storm drain detection

In addition to the standard policies defined in the previous slide, health management, provides you with on demand router dependent policies for these scenarios:

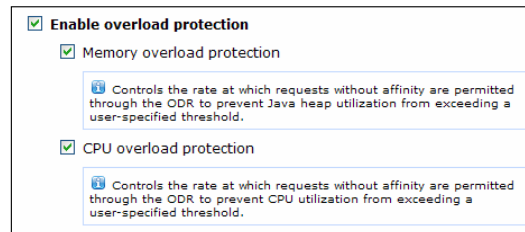
Monitor the incoming requests and take corrective action if a certain predefined threshold is met.

Monitor the number of timeout requests and take corrective action if a certain predefined threshold is met.

Monitor the average response time and take corrective action if the response times exceed a predefined threshold.

## Overload protection

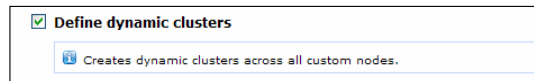
- Overload protection
  - Memory overload protection
  - CPU overload protection



Overload protection regulates the rate at which the on demand router forwards traffic to the application server tier to prevent memory and processor overload. These options are functions for which the on demand router is a key component, and thus are dependent on an enhanced pattern to be applied.

## Dynamic clustering

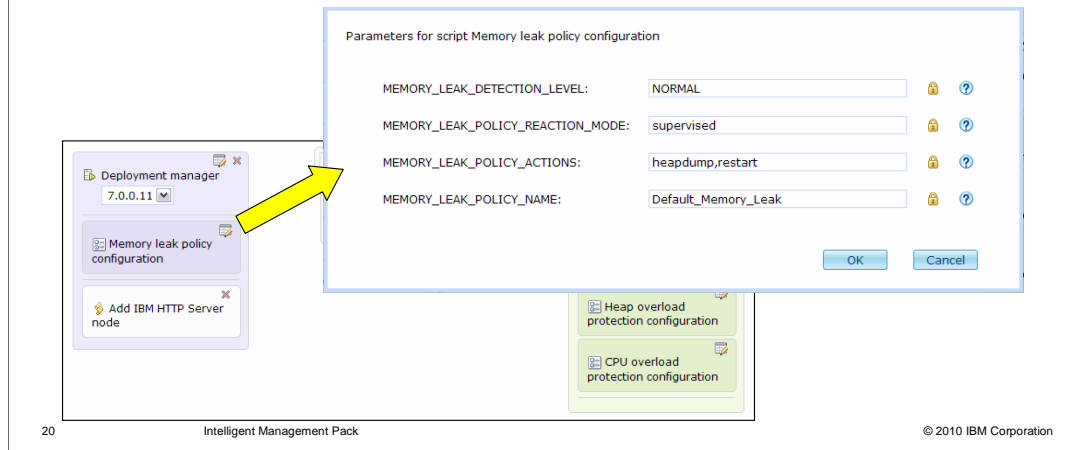
- Cluster configuration Options
  - Dynamic cluster



A dynamic cluster is an application deployment target that can expand and contract depending on the workload of the environment. WebSphere CloudBurst operates at the server virtualization level while dynamic clusters operate at the application server virtualization level. Put another way, WebSphere CloudBurst takes care of the machine level resources while the Intelligent Management Pack's dynamic clustering takes care of the resources inside the cell.

## Advance Option - configuration

- Configuring an advance option will result in script packages being created and applied to the virtual image parts
- Fine tune the advance option by modifying the parameters of the script packages



The “Advance Option” link provides the different high level options you can enable. When you enable an advance option WebSphere CloudBurst will attach a script package to the relevant virtual image part. By way of the attached script package you can further fine tune the advance option. The example in this slide shows the result of choosing the memory leak health policy. Notice the “Memory leak policy configuration” script package. To further fine tune this policy click the configure icon. This will bring up a new window with the available parameters for this policy. If you need help with any of the parameters click the question mark icon to the right of the field. This will bring you to the relevant location in the information center.

## ***Additional information***

This section contains a few pointers to external documentation.

## Additional information

- IBM Education Assistant (WebSphere Virtual Enterprise V6.1)
  - [http://publib.boulder.ibm.com/infocenter/ieduasst/v1r1m0/index.jsp?topic=/com.ibm.iea.wxd\\_v6/wxd/WXDv61\\_OO.html](http://publib.boulder.ibm.com/infocenter/ieduasst/v1r1m0/index.jsp?topic=/com.ibm.iea.wxd_v6/wxd/WXDv61_OO.html)
- IBM Information Center (WebSphere Virtual Enterprise V6.1)
  - [http://publib.boulder.ibm.com/infocenter/wxdinfo/v6r1/index.jsp?topic=/com.ibm.websphe.re.ops.doc/info/welcome\\_61\\_ooxd.html](http://publib.boulder.ibm.com/infocenter/wxdinfo/v6r1/index.jsp?topic=/com.ibm.websphe.re.ops.doc/info/welcome_61_ooxd.html)

As mentioned before, the Intelligent Management Pack feature set is similar to the WebSphere Virtual Enterprise V6.1 feature set. Similar enough that education developed for WebSphere Virtual Enterprise V6.1 can be used. This slide has a pointer to the IBM Education Assistant WebSphere Virtual Enterprise V6.1 content and the WebSphere Virtual Enterprise V6.1 information center.

Section

## ***Summary***

This section will cover the summary.

## Summary

- Intelligent Management Pack is now available in the WebSphere Application Server virtual image
  - Requires enablement
- Two new patterns are introduced to get you going quickly
- Powerful features now integrated
  - Health management
  - Overload protection
  - Dynamic clustering

Intelligent Management Pack provides a set of features similar to those provided by WebSphere Virtual Enterprise. The intelligent management pack features are not enabled by default and require activation and a separate license.

The appliance comes preloaded with two enhanced patterns that you can use to quickly get your enhanced environment up and running.

The “Health management”, “Overload protection”, and “Dynamic clustering” features have been integrated into the appliance. For an in-depth explanation or tutorial search the IBM Education Assistant or information center for WebSphere Virtual Enterprise. The patterns and options made available by the intelligent Management Pack are similar to the ones made available by WebSphere Virtual Enterprise. In fact, they are similar enough that the education provided for the WebSphere Virtual Enterprise product can be re-used here.





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