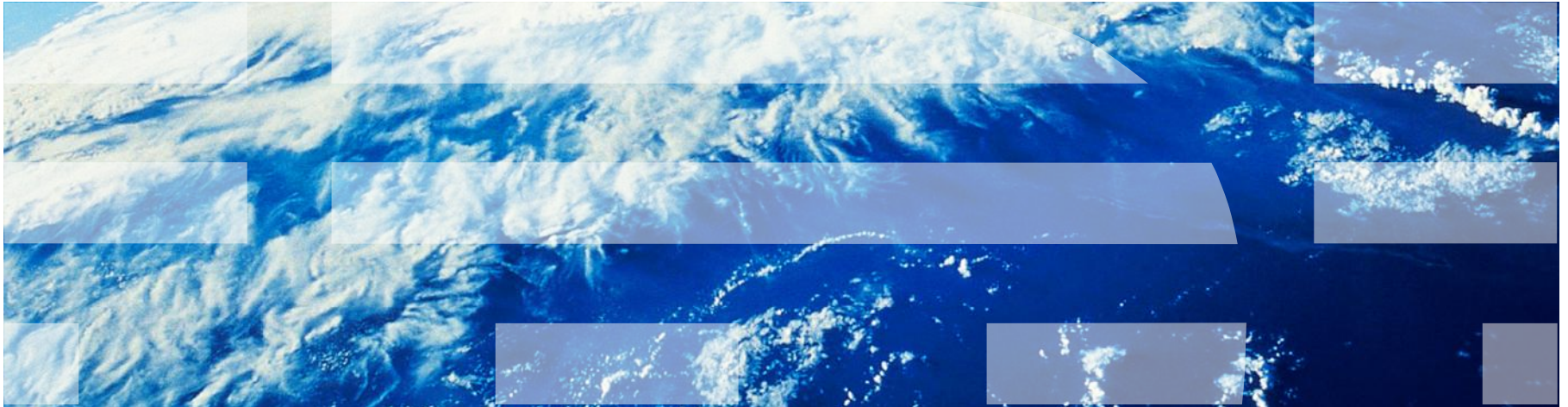
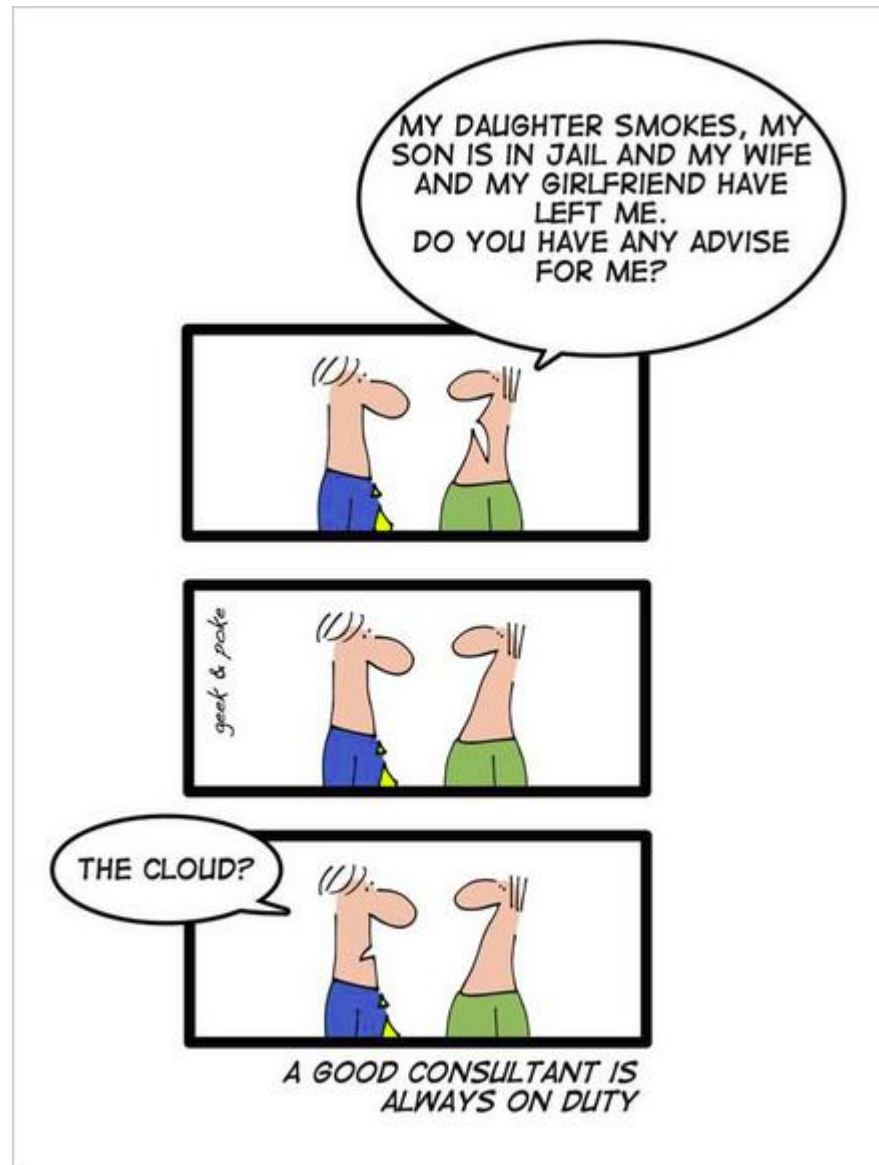


# Moving WebSphere towards the cloud



## What do we mean by cloud?



What do we mean by cloud?



Automation

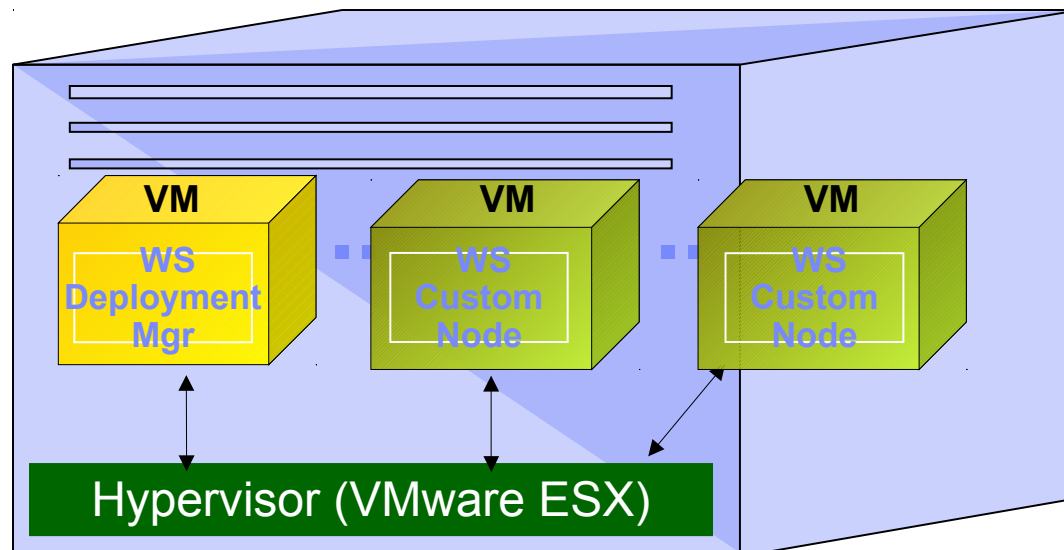


Virtualization

# VIRTUALISATION

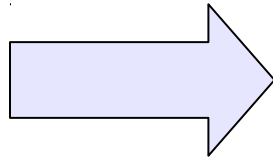
Allows you to run more than one logical machine on one physical machine; benefits being ...

1. **Increased resource utilization**
2. **Increased agility:** (start/stop and copy/modify of different configs quicker)
3. **Isolation**
4. **Portability**

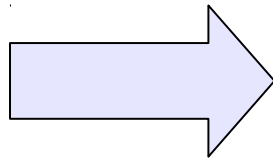


## STANDARDIZATION: Virtualized Middleware can be deployed as different constructs

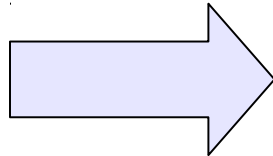
### *Developing reusable, standardized constructs*



- Script Packages  
Configuration  
Applications



- Patterns of Deployment (topologies)  
Standalone vs Clustered



- Virtual Images  
“Ready to go” Zero install

# AUTOMATION

These processes are executed serially for each new app environment:



**2-4 month lead time**

## Factor out repetitive tasks



Done once at cloud creation/expansion time



Done once at image/pattern creation/customization time

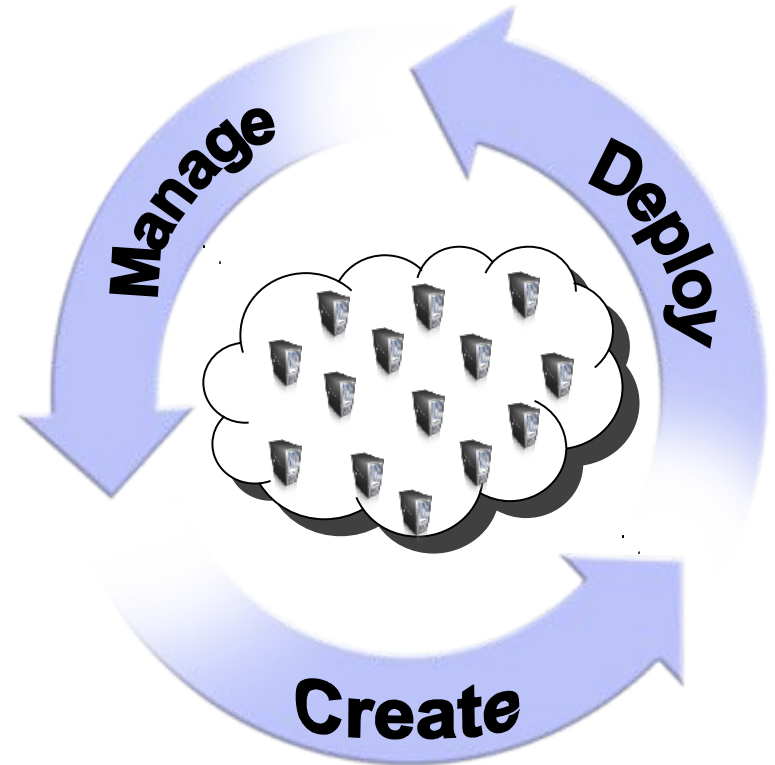


Done for each environment request

**Down to Hours or Minutes**

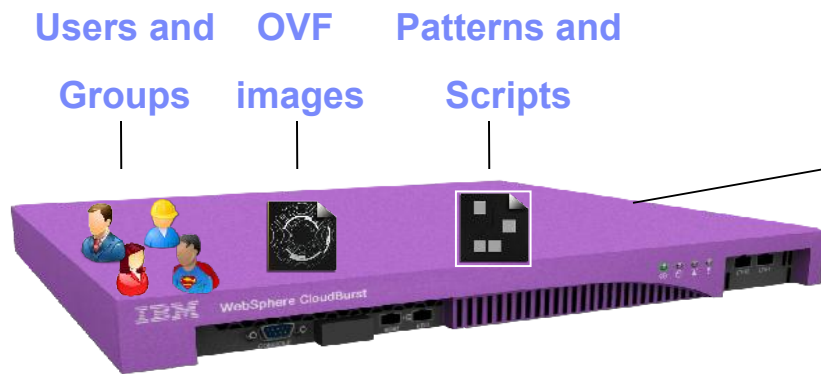
## ORGANIZATION

- Pattern Building
  - Create custom virtual images
  - Create custom patterns
  
- Self-provisioning
  - Provide custom deployment information
  - Use and then return capacity to pool
  
- Virtual system management
  - Monitor resource usage
  - Start, stop, and remove virtual systems
  - Create snapshots of virtual systems
  - Apply fixes and service level upgrades



1. An appliance from IBM...

2. ...that manages your on-premise cloud...



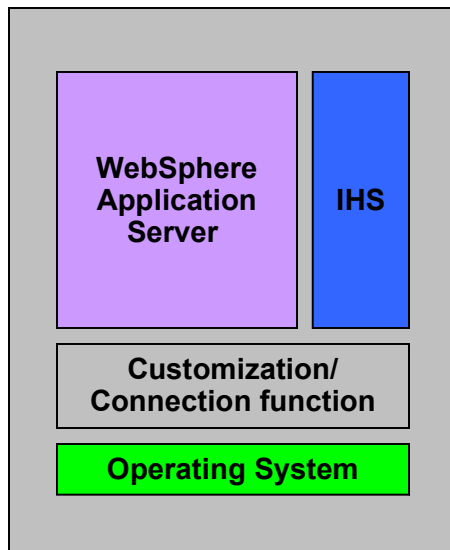
3. ... comprising Virtual Systems

*Web 2.0 UI, CLI, and REST APIs*



## *The building blocks for the virtual systems*

- Shipped ready to run on a hypervisor (VMware ESX, PowerVM, z/VM)
- Open Virtualization Format standard base packaging
- No installation required (just run)
- Maintenance, support, and fixes through IBM for entire image



WebSphere Application Server Hypervisor Edition

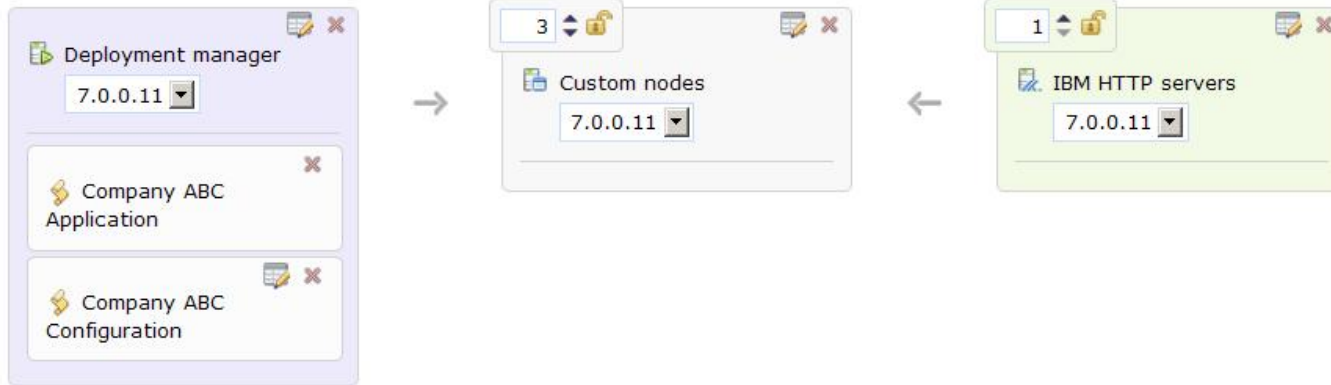
WebSphere Process Server Hypervisor Edition

WebSphere Business Monitor Hypervisor Edition

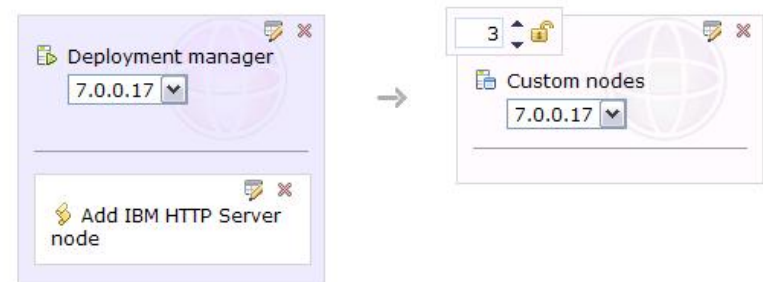
WebSphere Message Broker Hypervisor Edition

WebSphere Portal Hypervisor Edition

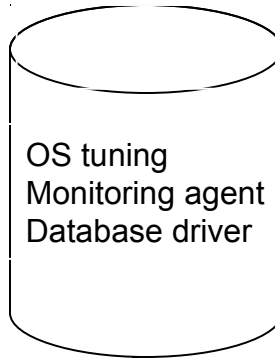
DB2 Enterprise Edition



OR

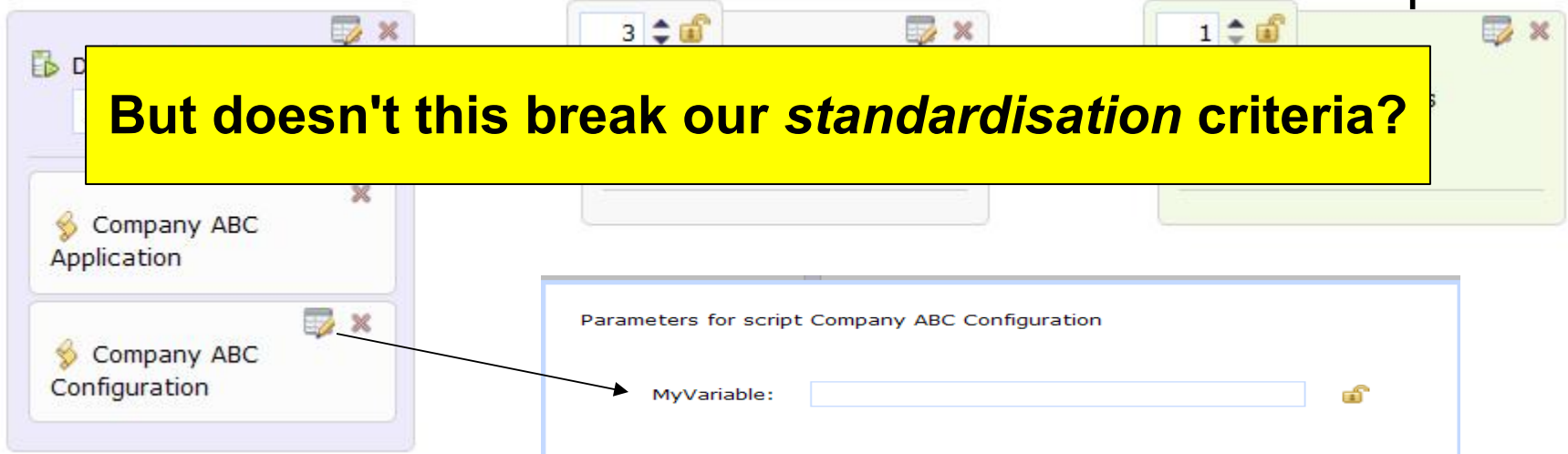


1. Within the Image  
Extend/Capture)




















2. Within the pattern

**But doesn't this break our *standardisation* criteria?**



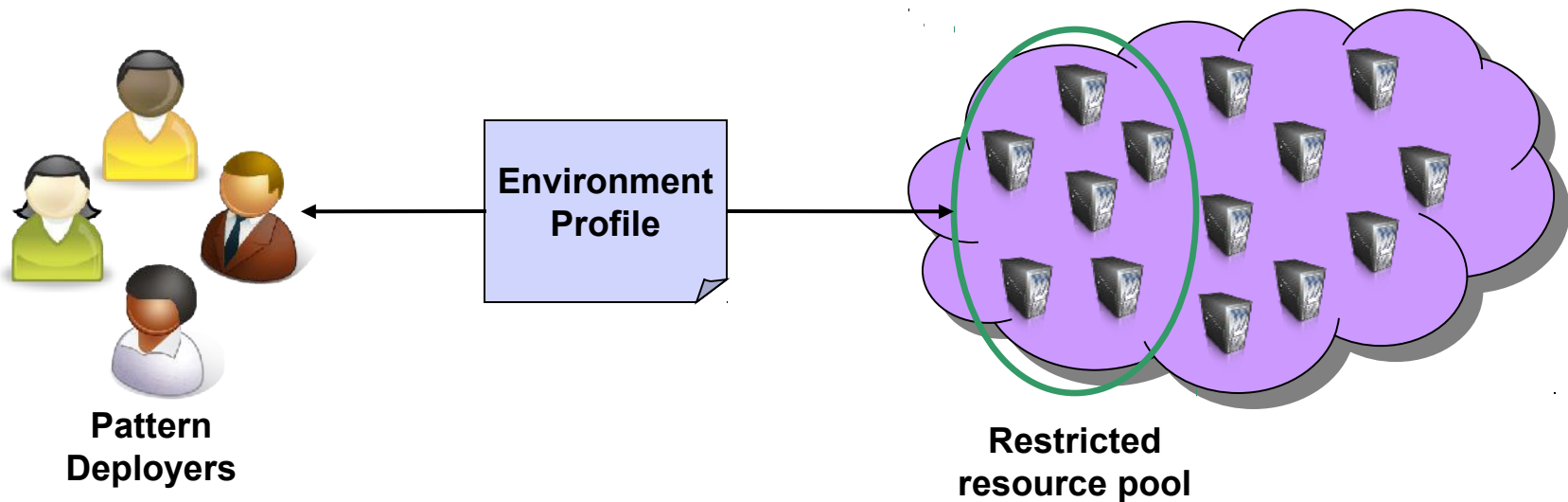
3. With script packages  
and parameters

 Construct a full WebSphere Application Server Cell in a single virtual machine <a href="#">Details</a> <a href="#">Download</a>	 Configure a data source for the WebSphere Application Server <a href="#">Details</a> <a href="#">Download</a>	 Create an application server on a WebSphere Application Server node <a href="#">Details</a> <a href="#">Download</a>
 Install an application on WebSphere Application Server <a href="#">Details</a> <a href="#">Download</a>	 Set custom properties on a WebSphere Application Server instance <a href="#">Details</a> <a href="#">Download</a>	 Set JVM properties on a WebSphere Application Server instance <a href="#">Details</a> <a href="#">Download</a>
 Set the trace specification on a WebSphere Application Server instance <a href="#">Details</a> <a href="#">Download</a>	 Configure an LDAP registry for WebSphere Application Server <a href="#">Details</a> <a href="#">Download</a>	 Create a cluster for the WebSphere Application Server <a href="#">Details</a> <a href="#">Download</a>
 Configure port settings for a WebSphere Application Server instance <a href="#">Details</a> <a href="#">Download</a>	 Configure ITM operating system agents in a WebSphere Application Server virtual machine <a href="#">Details</a> <a href="#">Download</a>	 Call a Rational Build Forge project during deployment <a href="#">Details</a> <a href="#">Download</a>
 Create a database for a DB2 instance <a href="#">Details</a> <a href="#">Download</a>	 Backup and restore configuration for a WebSphere Application Server cell <a href="#">Details</a> <a href="#">Download</a>	 Create reverse HTTP proxy information for an IBM HTTP Server <a href="#">Details</a> <a href="#">Download</a>
 Create virtual host configuration for WebSphere Application Server <a href="#">Details</a> <a href="#">Download</a>	 Configure WebSphere DataPower XC10 session management <a href="#">Details</a> <a href="#">Download</a>	

Available from  
<http://bit.ly/wcaSamplesGallery>

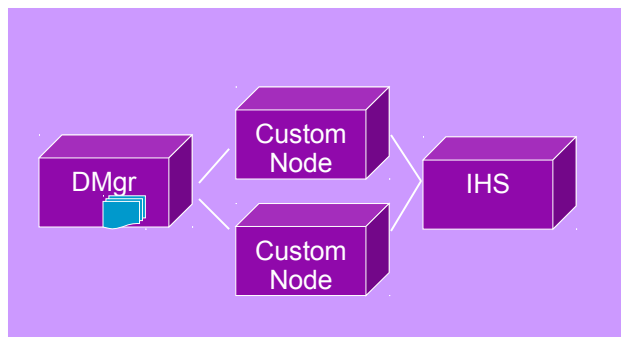
Specify a set of capabilities and parameters to a group of users

- Assign IPs, cloud group mappings, virtual machine names
- Set limits on cloud resource consumption (CPU, memory, storage)
- Provide data storage mapping rules for virtual machines

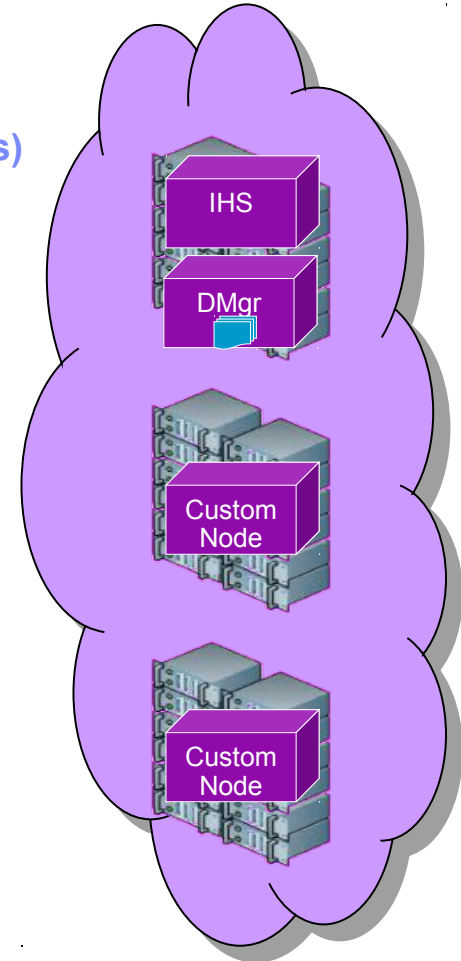




1. Choose hypervisor(s)
2. Create virtual machines
3. Inject IP addresses
4. Start VMs and software
5. Run scripts



Pattern



**Reduced deployment from 3 months to 3 hours**

**Dramatically reduced effort (cost) to obtain an environment**

**Creates new business opportunity**

**Improved quality of deliverables**

**Decommissioning of environments might actually happen!**





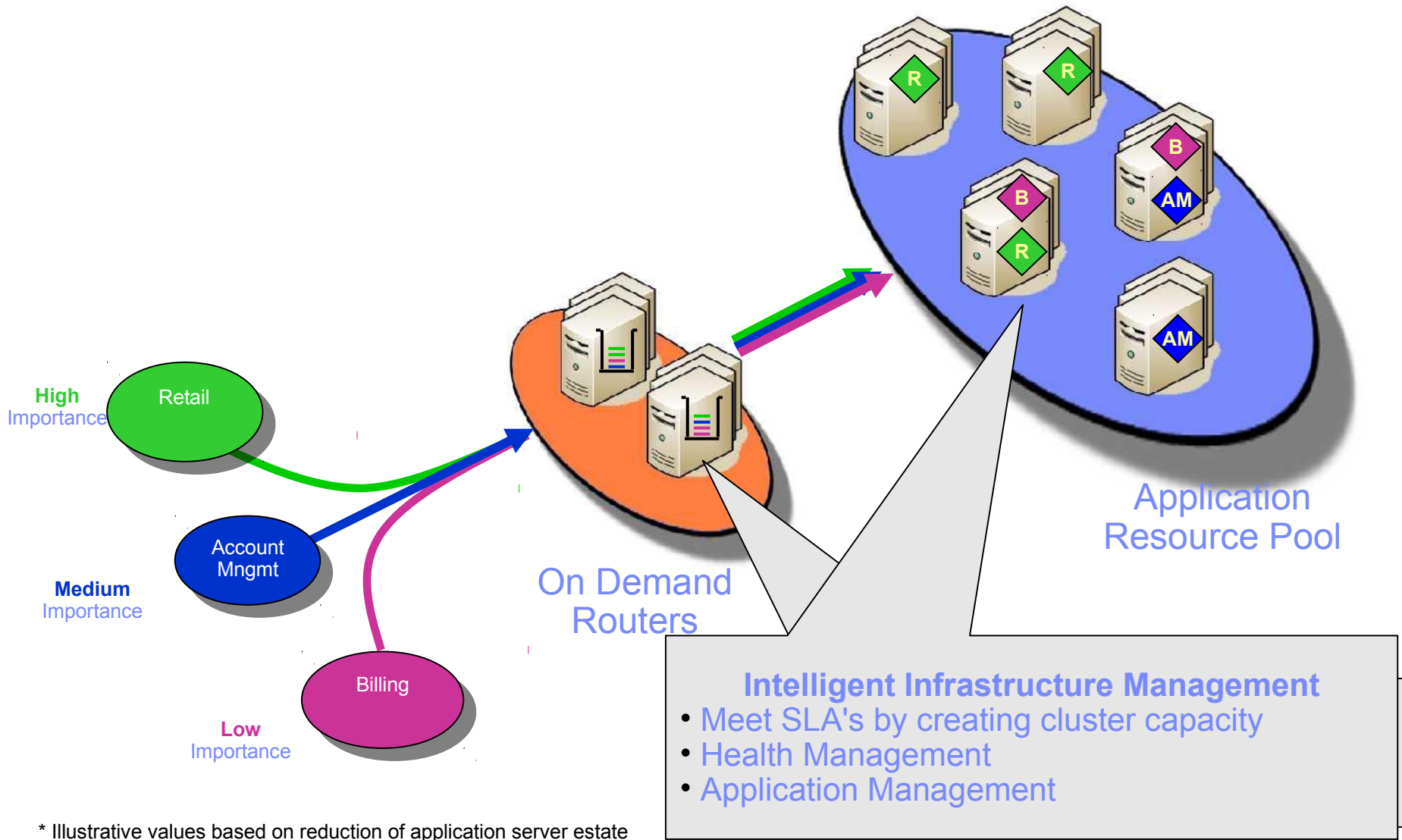
# Elasticity



- Capacity on demand (and shrink when not needed)
- Self-healing
- Seamless growth/stretching
- Commercial implications (pay as you go)

# Remember WebSphere Virtual Enterprise?

## Application Virtualisation



# Enable a self-optimizing private cloud with Intelligent Management Pack

## 1 Use the pattern editor to select the policy-based management options

### Define dynamic clusters

- Create dynamic clusters

Creates dynamic clusters across all custom nodes.

- Enable elasticity mode

Enables the feature that allows virtual enterprise to add a member to the dynamic cluster if additional processing is required to handle the requests by provisioning a virtual machine dynamically

### Enable overload protection

- Memory overload protection
- CPU overload protection

### Configure standard health policies

- Excessive heap usage
- Memory leak
- Maximum server age
- E-mail notification list

### Configure on demand router-dependent health policies

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

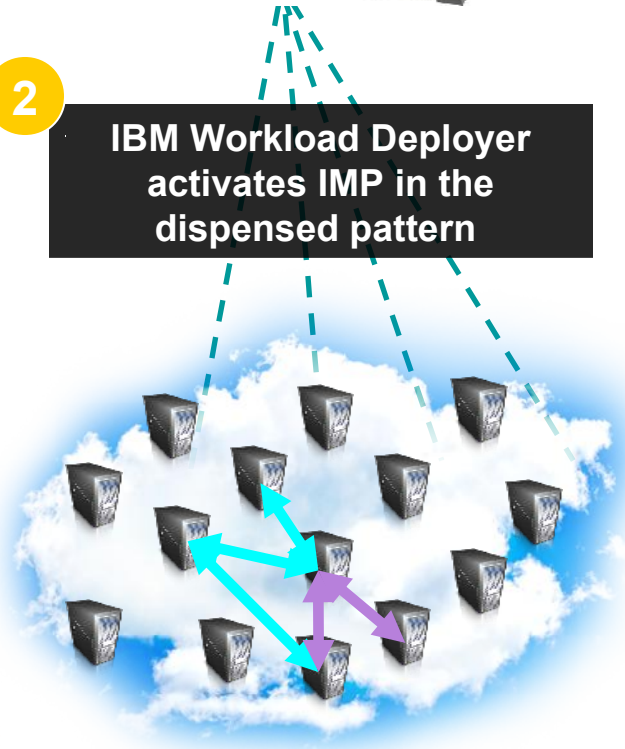


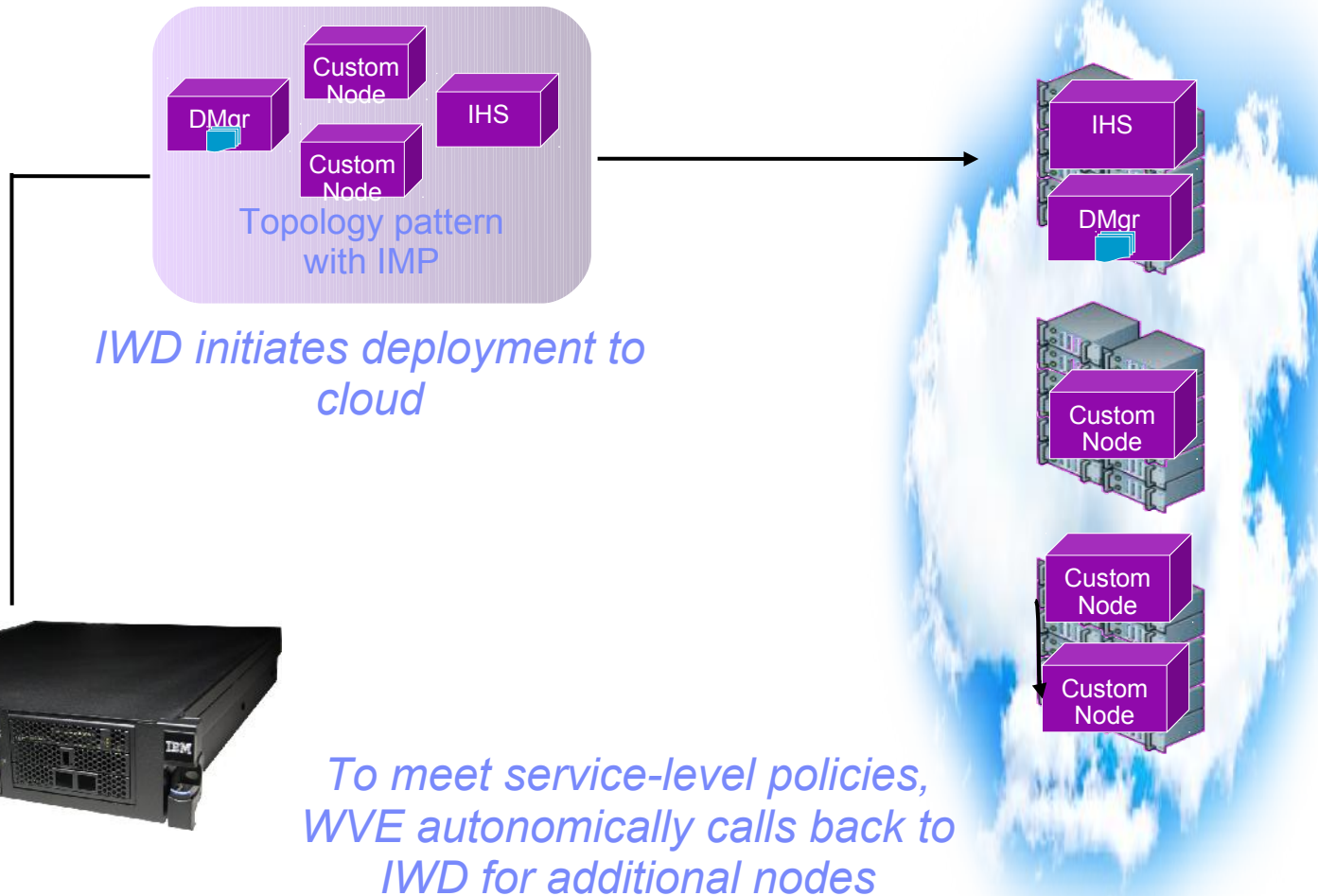
2

IBM Workload Deployer activates IMP in the dispensed pattern

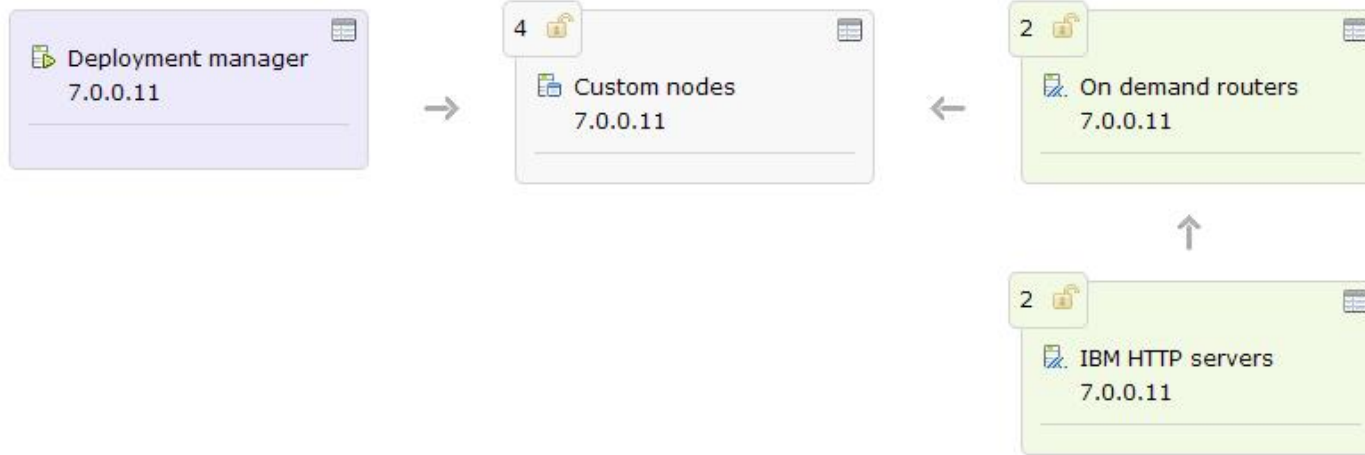
3

Policy-based management self-optimizes your private cloud

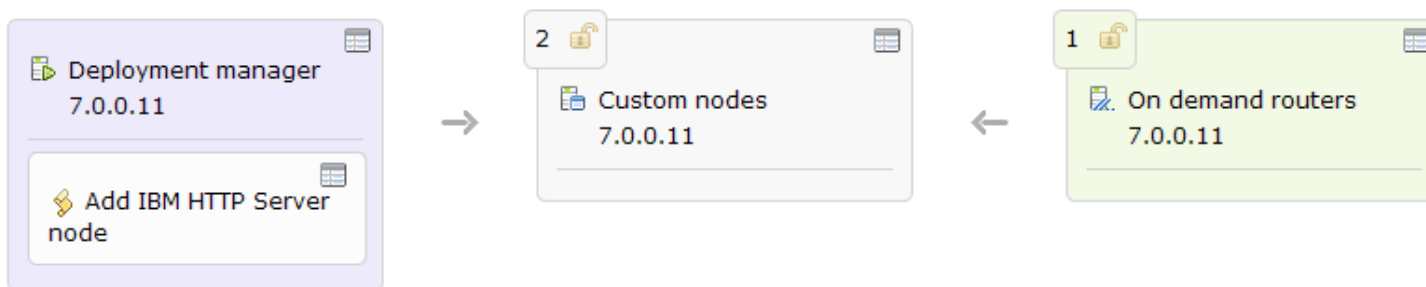




## WebSphere advanced cluster



## WebSphere advanced cluster (development)





*Cloud-based application  
middleware deployments*

IBM Workload Deployer



Deploy time

Run time

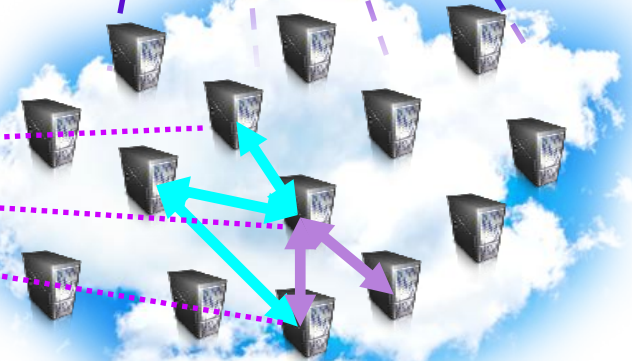
WebSphere Virtual Enterprise

*Incoming*

*Traffic*



*Policy-based request routing,  
health monitoring, application  
editioning*



## So that's private cloud then is it? Or is it?

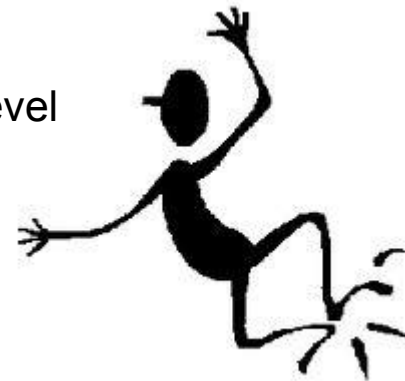
Why do we need to worry about...

- WebSphere version and patch levels
- Datasource configurations
- Cluster sizing
- Session failover
- Plugin configurations and routing



What do we really need to care about

- An application platform of a given Java EE prereq level
- Some sort of data resource
- May be constrain it to a defined user population
- Make it run fast enough and resilient
- Deliver it quickly! (it's cloud after all)





# Introducing Virtual Application Patterns (as opposed to Virtual System Patterns)

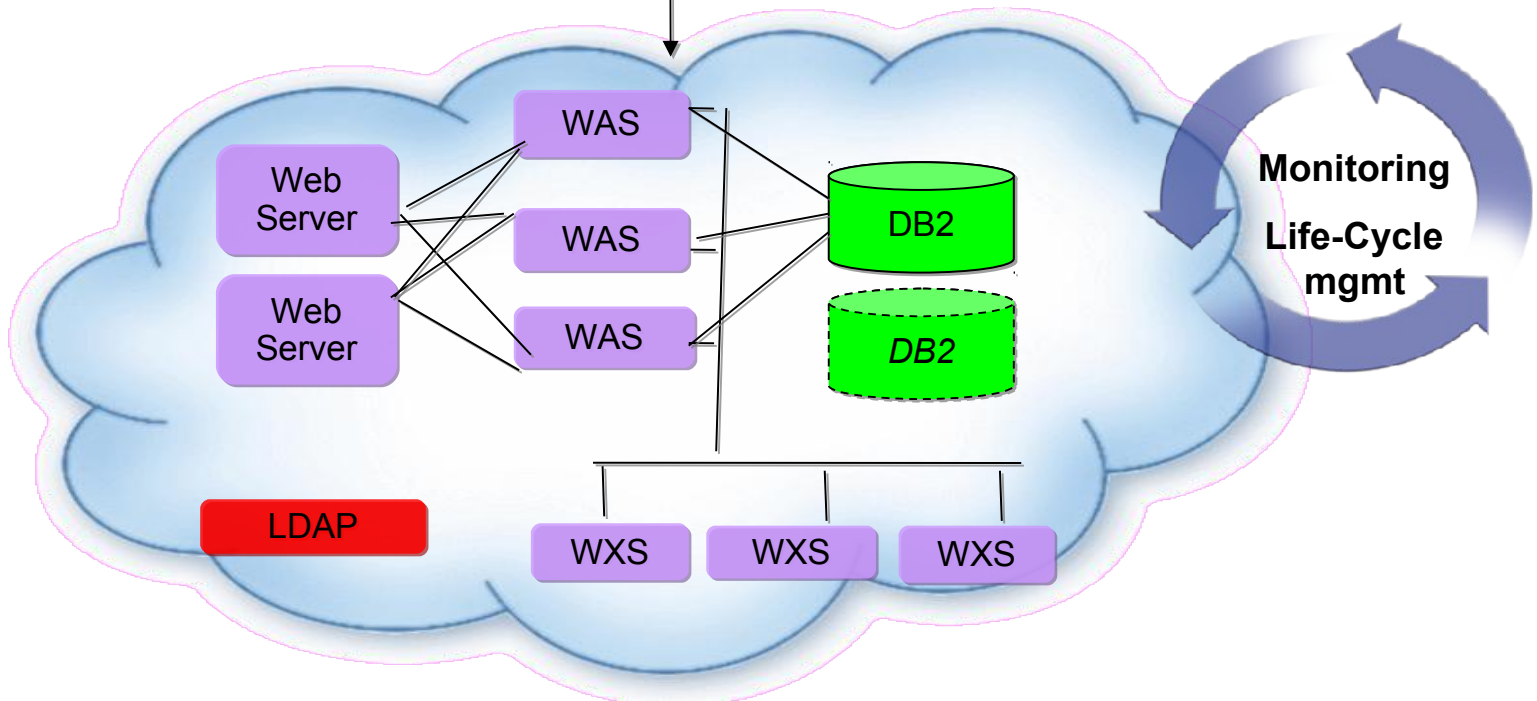
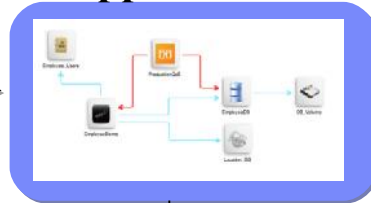


Application & Characteristics

Functional & Non-Functional Requirements

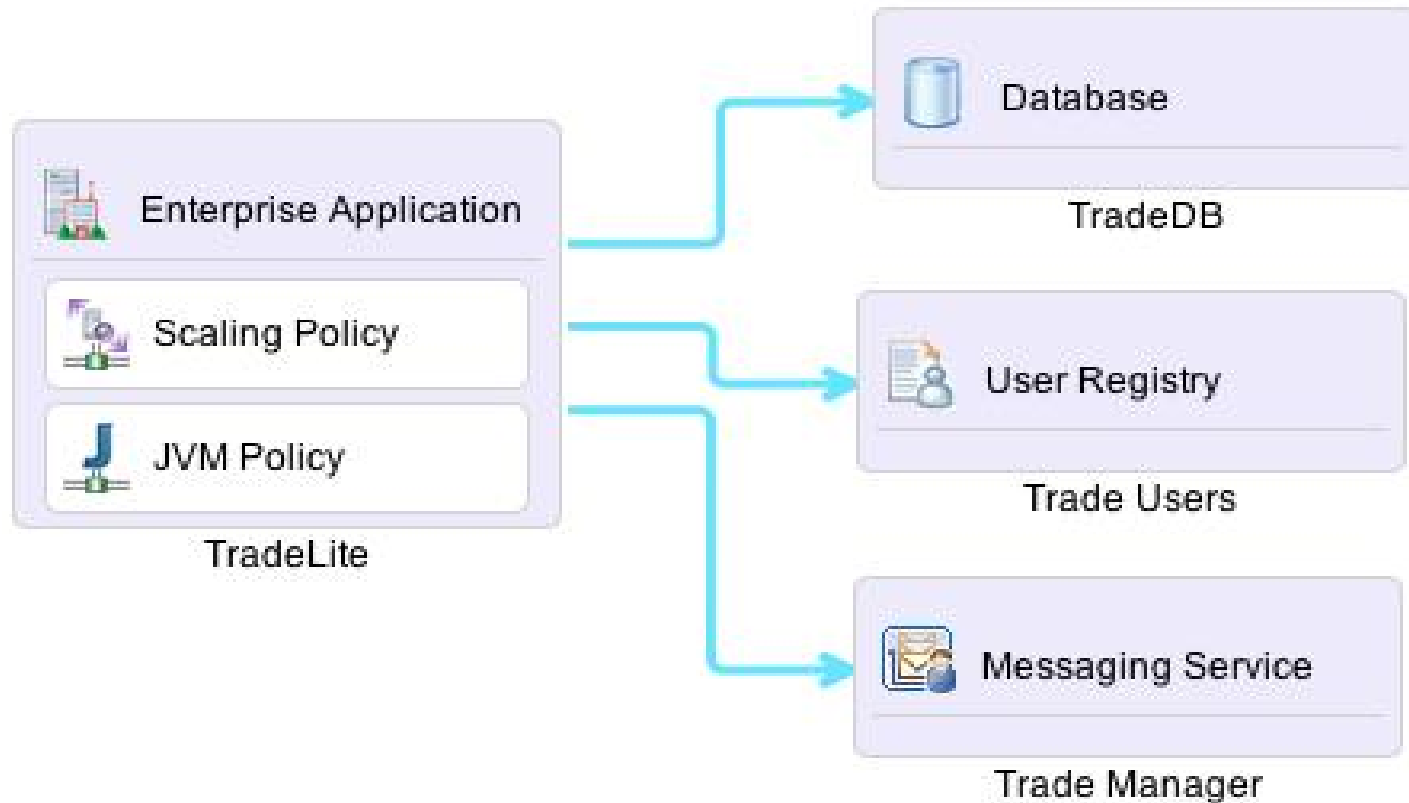
## IBM WD Pattern for Web Applications

NEW



## Introducing Virtual Application Patterns (as opposed to Virtual System Patterns)

Ah, that's better!



# Simplified model in the Cloud Application Builder



IBM Workload Deployer - [ Solution: webapp 1.0 ] Virtual Application Builder - [ ScalableDayTrader ]\*

Diagram | ListView | Source

Save | Save As | Layout | Undo | Redo

Assets

Asset name

- Application Components
  - Enterprise Application (WebSphere Application Server)
  - External archive file
  - Web Application (WebSphere Application Server)
- Database Components
  - Database (DB2)
  - Remote Database (DB2)
- Messaging Components
  - Messaging Service (WebSphere MQ)
  - Queue (WebSphere MQ)
  - Topic (WebSphere MQ)
- OSGi Components
  - External OSGi Bundle Repository
  - OSGi Application (WebSphere Application Server)
- Transaction Processing Components
  - CICS Transaction Gateway
- User Registry Components
  - User Registry (Tivoli Directory Server)
- Other Components

Layers

+ Add policy for application

```
graph LR; TradeLite[Web Application TradeLite] --> TradeDB[(Database TradeDB)];
```

Web Application (WebSphere Application Server)

Name: \* TradeLite

WAR File: \* artifacts/tradelite.war [Browse] [Delete]

Context Root: trade

Scaling Policy (Web/Enterprise Application)

Initial instance number: \* 2

Enable session caching: \*

Scaling Setting

Instance number range of scaling in/out: \* 1 - 10 Range: 10 - 10

Minimum time (sec) to trigger add/remove: \* 120

Application Scenario

- None
- Basic
- Web Intensive

Scaling in/out when CPU usage is out of threshold range(ms): \* Range: 20% - 80%

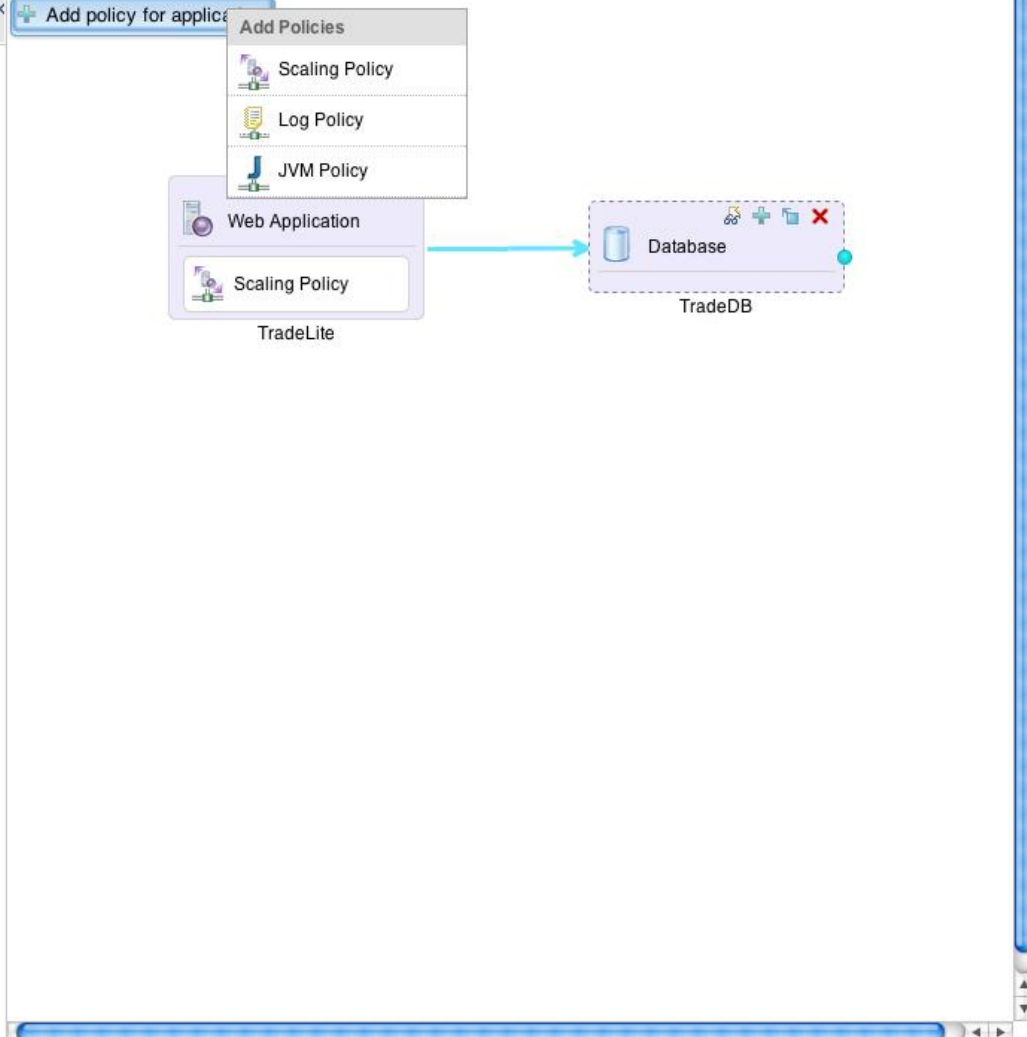
Scaling in/out when Web response time is out of threshold range(ms): \* Range: 1 - 10000

Diagram | ListView | Source  
 Save | Save As | Layout | Undo | Redo

**Assets**

Asset name

- Application Components
  - Enterprise Application  
WebSphere Application Server
  - External archive file
  - Web Application  
WebSphere Application Server
- Database Components
  - Database  
DB2
  - Remote Database  
DB2
- Messaging Components
  - Messaging Service  
WebSphere MQ
  - Queue  
WebSphere MQ
  - Topic  
WebSphere MQ
- OSGi Components
  - External OSGi Bundle Repository
  - OSGi Application  
WebSphere Application Server
- Transaction Processing Components
  - CICS Transaction Gateway
- User Registry Components
  - User Registry  
Tivoli Directory Server
- Other Components



**Database**  
DB2

**Name:** \*  
TradeDB

**Database Name:**  
sample

**Database Description:**  
Trading Database

**Maximal User Data Space(GB):**  
4

**SQL Type:**  
DB2


**Schema File (Warning: The schema file must have each SQL statement on its own line and not use any character as a statement terminator):**  
 artifacts/setup\_db.sql Browse Delete

Layers ?


- Designed to support common online web application and database workloads
- Pattern for Web Applications consists of application support based on
  - WebSphere Application Server,
  - Tivoli Directory
  - WebSphere eXtreme Scale
  - Connectors to remote systems
    - MQ, DB2, DB2/z, CICS, IMS, 3rd party DB (Oracle), Tivoli Directory
- All Patterns support
  - Integrated monitoring and logging extensions
  - Failure recovery and HA/Auto-Scaling\*
  - Sold as an integrated offerings
- *But you don't get a WebSphere admin console URL!*

**IBM Workload Deployer** Welcome, IBM Admin | Help | About

Welcome Instances ▾ Patterns ▾ Catalog ▾ Reports ▾ Cloud ▾ Appliance ▾ Profile Logout




## IBM Workload Deployer

 [Download command line tool](#)


▷ [Working with virtual appliances](#)

▷ [Working with virtual systems](#)


▽ [Setting up your private cloud](#)




**Step 1: Set up the appliance**  
Customize the appliance settings and create user accounts. You can also create user groups.  
[Customize settings](#) | [Create users](#)



**Step 2: Set up the cloud**  
Create the cloud by identifying IP groups and collections of hypervisors called cloud groups.  
[Add IP groups](#) | [Add cloud groups](#)



**Step 3: Add virtual images**  
Provide new virtual images to the catalog by uploading files or extending pre-built images.  
[Add virtual images](#) | [Add script packages](#)



**Step 4: Set up pattern types**  
Install and configure the pattern types to enable the creation of virtual application patterns.  
[Add pattern types](#) | [Settings for Platform Service](#)

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**IBM Workload Deployer** Welcome, IBM Admin | Help | About

Welcome Instances Patterns Catalog Reports Cloud Appliance Profile Logout

### Virtual Application Patterns

Search...  
WebApp Pattern Type 1.0  
Sample JEE web application  
Secured JEE web application

### Sample JEE web application

**Application ID:** a-11aa4209-1fcd-4e17-87fe-c322d74fde52

**Created by:** cbadmin

**Created on:** May 20, 2011 1:54:55 AM

**Last Modified by:** cbadmin

**Last Modified on:** May 20, 2011 1:54:55 AM

**Description:** DayTraderLite is a JEE web application simulating a stock trading system with WAS and DB2. Access DayTraderLite via `http://[IP]:9080/tradelite/`, where [IP] is the IP address of the deployed WAS VM.

**Preview:**

**Pattern type:** WebApp Pattern Type 1.0

**Access granted to:** cbadmin [owner]  
Everyone [read] [remove]  
Add more...

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The screenshot displays the IBM Workload Deployer web interface. At the top, the navigation bar includes 'Welcome, IBM Admin', 'Help', and 'About'. Below this, a secondary navigation bar contains 'Welcome', 'Instances', 'Patterns', 'Catalog', 'Reports', 'Cloud', 'Appliance', 'Profile', and 'Logout'. The main content area is titled 'Virtual Application Patterns' and shows a list of patterns, with 'Sample JEE web application' selected. The 'Application ID' is 'a-11aa4209-1fcd-4e17-87fe-c322d74fde52'. A modal dialog box titled 'Create Application' is open, prompting the user to 'Start building your virtual application.' and to 'Choose one template of selected pattern type to start building your virtual application.' The dialog lists two options under 'Pattern type': 'Blank application' and 'Blank JEE web application'. The 'Blank JEE web application' option is selected. The 'Description' is 'Application template for simple JEE Web application including WAS and DB2'. A 'Preview' section shows a diagram of a server icon connected to a database icon. At the bottom of the dialog are 'Start Building' and 'Cancel' buttons. Below the dialog, the 'Access granted to:' section shows 'Everyone [read] [remove]' and an 'Add more...' dropdown. The footer contains the copyright notice '© Copyright IBM Corporation 2011. All Rights Reserved.' and the version number '3.0.0.0-32825 / 20110519-2145-820'.



**IBM Workload Deployer - [ Pattern Type: WebApp Pattern ]** Virtual Application Builder - [ Sample JEE web application ]

Diagram | ListView | Source

Save | Save As | Layout | Undo | Redo

Assets

Asset name

- Application Components
  - Additional archive file
  - Enterprise Application (WebSphere Application Server)
  - Existing Web Service Provider Endpoint
  - Policy Set
  - Web Application (WebSphere Application Server)
- Database Components
- Messaging Components
- OSGi Components
- Transaction Processing Components
- User Registry Components
- Other Components

Layers ?

+ Add policy for application

```
graph LR; application[Enterprise Application] --> database[(Database)];
```

Virtual Application

**Name:** \*  
Sample JEE web application

**Description:**  
DayTraderLite is a JEE web application simulating a stock trading system with WAS and DB2. Access DayTraderLite via http://[IP]:9080

**Type:** \*  
 Application  
 Template

**Locked pattern type:** \*

The screenshot displays the IBM Workload Deployer interface for a "WebApp Pattern" virtual application builder. The main workspace shows a diagram with an "Enterprise Application" component containing "Scaling Policy" and "Routing Policy" sub-components, connected to a "Database" component. The left sidebar lists various "Assets" such as "Application Components", "Database Components", and "Messaging Components". The right sidebar contains configuration panels for "EAK File", "Interim fixes URL", and "Scaling Policy".

**Assets Panel:**

- Application Components
  - Additional archive file
  - Enterprise Application (WebSphere Application Server)
  - Existing Web Service Provider Endpoint
  - Policy Set
  - Web Application (WebSphere Application Server)
- Database Components
- Messaging Components
- OSGi Components
- Transaction Processing Components
- User Registry Components
- Other Components

**Diagram:**

- Enterprise Application (application)
  - Scaling Policy
  - Routing Policy
- Database (database)

**Configuration Panels:**

- EAK File:** artifacts/tradelite.ear (Browse, Delete)
- Interim fixes URL:** Click select button to update (Select)
- Total transaction lifetime timeout (sec):** 120
- Async response timeout (sec):** 120
- Client inactivity timeout (sec):** 60
- Maximum transaction timeout (sec):** 300
- Scaling Policy (Web/Enterprise Application):**
  - Enable session caching:
  - Scaling Type: Static (dropdown menu showing Static, CPU Based, Response Time Based, Web to DB)
  - HTTP:
  - HTTPS:
  - Virtual Hostname: \*

The screenshot displays the IBM Workload Deployer interface for configuring a virtual application. The main window title is "IBM Workload Deployer - [ Pattern Type: WebApp Pattern ] Virtual Application Builder - [ Sample JEE web application ]".

**Assets Panel (Left):** Lists various components including Application Components, Enterprise Application, Existing Web Service Provider Endpoint, Policy Set, and Web Application.

**Diagram (Center):** Shows an "Enterprise Application" component with a "Scaling Policy" and a "Routing Policy" attached. A blue arrow points from the application to a "Database" component.

**Right Panel (Properties):** Contains configuration options for the application and its policies.

- EAR File:** artifacts/tradelite.ear (with Browse and Delete buttons)
- Interim fixes URL:** Click select button to update (with a Select dropdown)
- Total transaction lifetime timeout (sec):** 120
- Async response timeout (sec):** 120
- Client inactivity timeout (sec):** 60
- Maximum transaction timeout (sec):** 300
- Scaling Policy (Web/Enterprise Application):**
  - Enable session caching:
  - Scaling Type: Static
  - Number of Instances: 2
- Routing Policy (Web/Enterprise Application/OSGI EBA):**
  - HTTP:
  - HTTPS:
  - Virtual Hostname: (empty field)

## Built-in support for shared cloud services

- Lifecycle Management of the Service itself
- Support for programmatic access to service resources
- Automated wiring of workload patterns into service capabilities

## Initial Services

- Caching Service - Based on WebSphere eXtreme Scale
  - Used for HTTP Sessions automatically
- Proxy Service
  - Based on secure Java proxy technology
  - Support for dynamic registration of new endpoints

## IBM Workload Deployer

Welcome, IBM Admin | [Help](#) | [About](#)

[Welcome](#) | [Instances](#) | [Patterns](#) | [Catalog](#) | [Reports](#) | **[Cloud](#)** | [Appliance](#) | [Profile](#) | [Logout](#)

### Shared Services

Search... ↑↓

Foundation pattern 1.0

- CachingService
- PROXY**

#### PROXY

<b>Application ID:</b>	a-2412c05a-1b1f-4df4-8001-fc6d70504b2e
<b>Created by:</b>	cbadmin
<b>Created on:</b>	May 20, 2011 1:52:29 AM
<b>Last Modified by:</b>	cbadmin
<b>Last Modified on:</b>	May 20, 2011 1:52:29 AM
<b>Description:</b>	ELB proxy Service
<b>Status:</b>	STOPPED

**No deployment is found**

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IBM Workload Deployer
Welcome, IBM Admin | [Help](#) | [About](#)

Welcome
Instances ▾
Patterns ▾
Catalog ▾
Reports ▾
Cloud ▾
Appliance ▾
Profile
Logout

### Virtual Application Instances

All

Sample JEE web application

### Sample JEE web application

**Virtual application instance ID:** d-5fea74be-23bf-4e32-b127-9c1b2bb87c8e    **Status:** ✔

**Created by:** test

**Created on:** May 26, 2011 4:05:11 PM

**Access granted to:** test [owner]

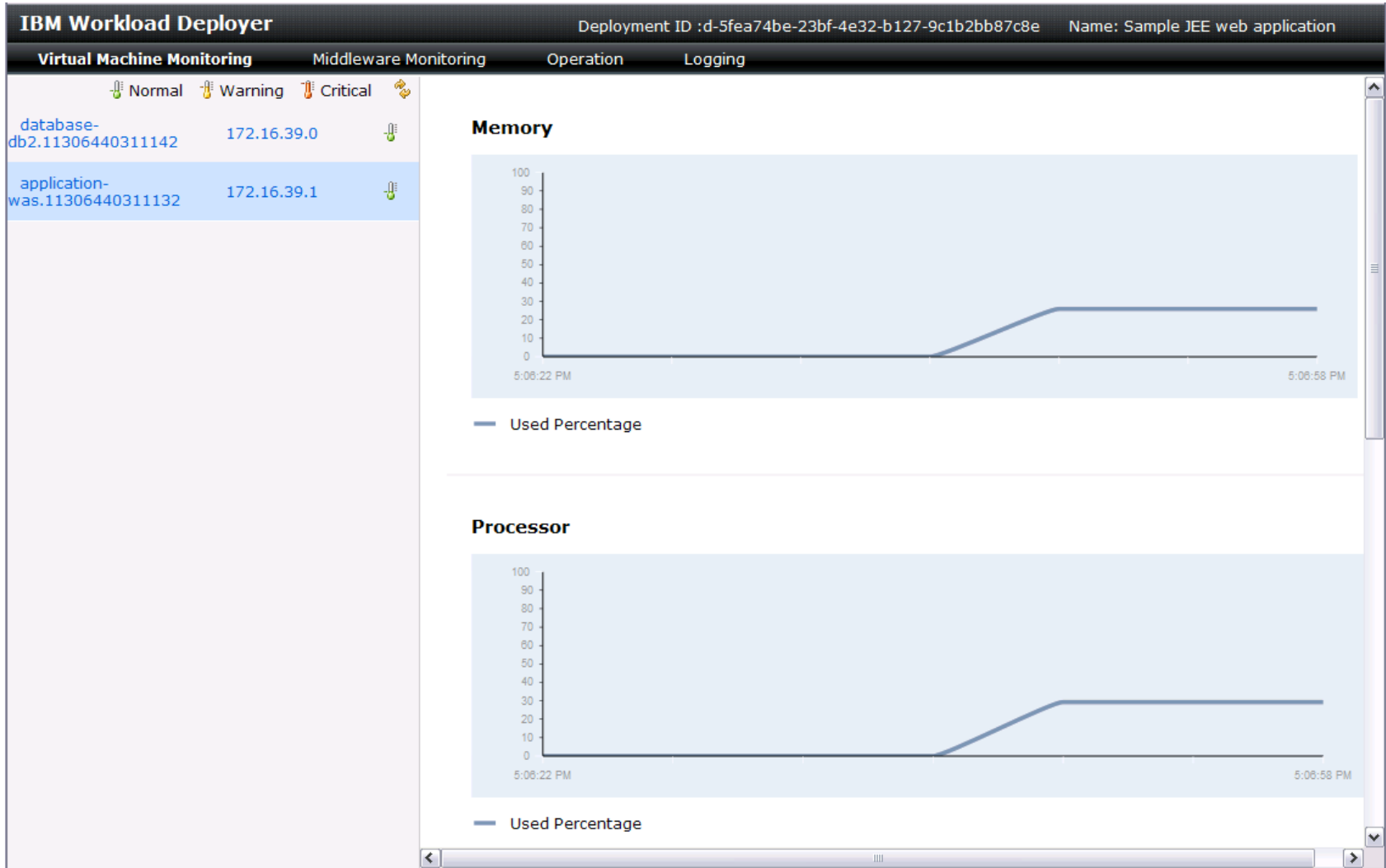
**Access granted to:**

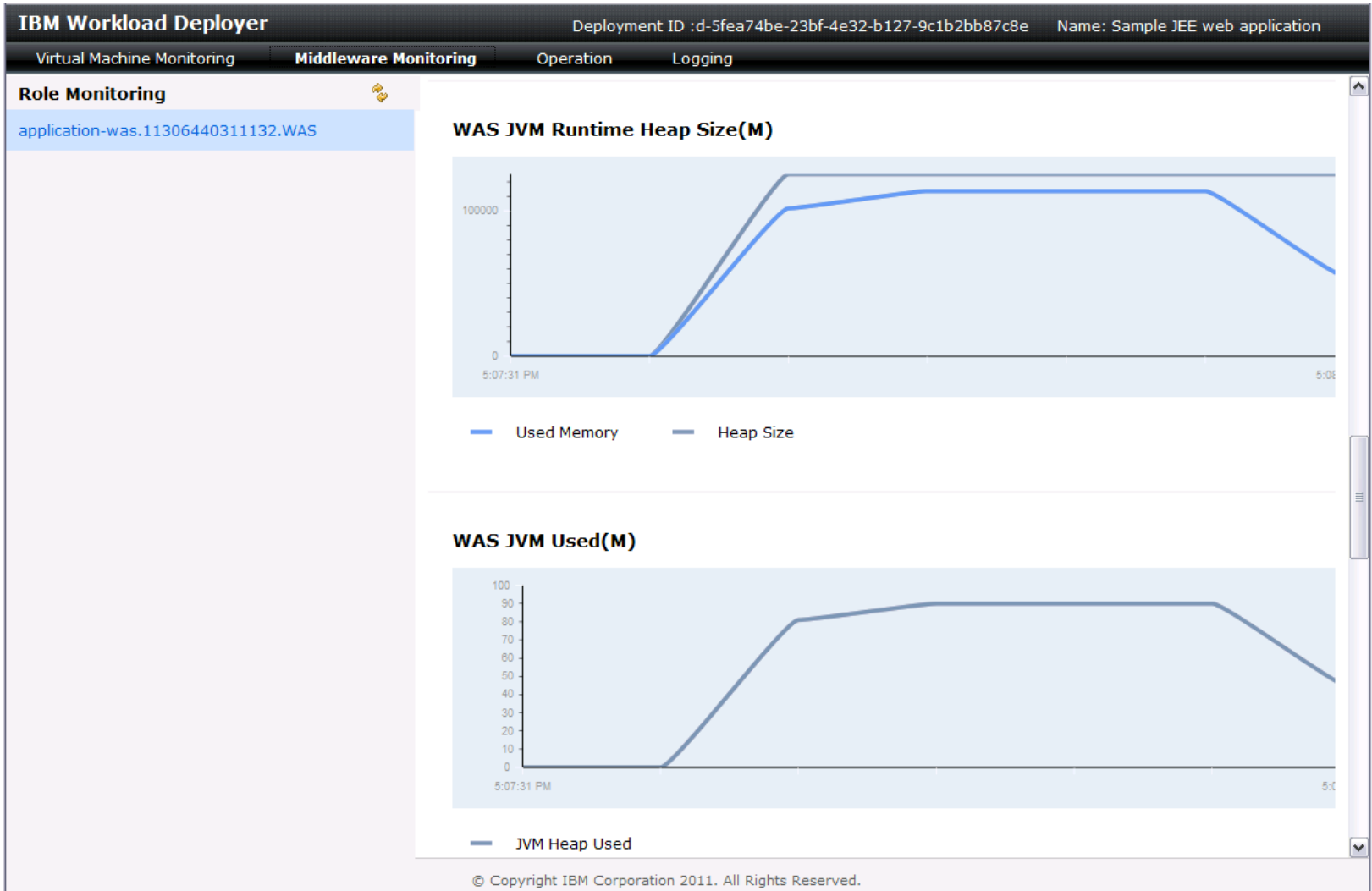
[-] Virtual machines of the virtual application : 2

Name	Public IP	VM Status	Started on	Role Status	Action
application-was. 11306440311132	172.16.39.1	Running <span style="color: green;">✔</span> <a href="#">Log</a>	May 26, 2011 4:05:27 PM	WAS <span style="color: green;">✔</span> <a href="#">Endpoint</a>	<a href="#">View</a>
database-db2. 11306440311142	172.16.39.0	Running <span style="color: green;">✔</span> <a href="#">Log</a>	May 26, 2011 4:05:27 PM	DB2 <span style="color: green;">✔</span> <a href="#">Endpoint</a>	<a href="#">View</a>

[+] History    The virtual system has been deployed and is ready to use

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3.0.0.0-32825 / 20110519-2145-820







**IBM Workload Deployer** Deployment ID : d-5fea74be-23bf-4e32-b127-9c1b2bb87c8e    Name: Sample JEE web application

Virtual Machine Monitoring    Middleware Monitoring    **Operation**    Logging

---

**Operations**

application-was.WAS	WAS	<input type="checkbox"/> Update configuration
database-db2.DB2	DB2	<input type="checkbox"/> Install WebSphere Application Server Updates
SSH	SSH	<input type="checkbox"/> Import WebSphere Application Server truststore certificate
		<input type="checkbox"/> Remove WebSphere Application Server truststore certificate
		<input type="checkbox"/> Renew WebSphere Application Server application SSL certificate
		<input type="checkbox"/> Export certificate
		<input type="checkbox"/> Create CA signer request
		<input type="checkbox"/> Upload CA signed certificate
		<input type="checkbox"/> Regenerate LTPA keys
		<input type="checkbox"/> Import LTPA keys

---

**Operation Execution Results**

Name	Status	Created Time	Result	Return Value
No operation results				

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**IBM Workload Deployer** Deployment ID : d-5fea74be-23bf-4e32-b127-9c1b2bb87c8e Name: Sample JEE web application

Virtual Machine Monitoring    Middleware Monitoring    Operation    **Logging**

Refresh  Auto-refresh

- application-was.1130644031
  - OS
  - WAS
    - .../logs/server1
      - native\_stdout.log
      - native\_stderr.log
      - SystemErr.log
      - SystemOut.log**
  - IWD Agent
    - .../logs/application-was.1130644031
    - .../application-was.1130644031
    - .../logs/install
    - .../logs/application-was.1130644031
    - /oconfig
  - database-db2.11306440311

```
***** Start Display Current Environment *****
WebSphere [ARIESJPA 1.0.0.3 cf031103.20][WXS 7.1.0.2 cf21113.63898]Platform 7.0.0.15 [BASE
7.0.0.15 cf151107.06] running with process name localhostNode01Cell\localhostNode01\server1 and
process id 20122
Host Operating System is Linux, version 2.6.18-238.9.1.el5
Java version = 1.6.0, Java Compiler = j9jit24, Java VM name = IBM J9 VM
was.install.root = /opt/IBM/WebSphere/AppServer
user.install.root = /opt/IBM/WebSphere/AppServer/profiles/AppSrv01
Java Home = /opt/IBM/WebSphere/AppServer/java/jre
ws.ext.dirs = /opt/IBM/WebSphere/AppServer/java/lib:/opt/IBM/WebSphere/AppServer/profiles/AppSrv01
/classes:/opt/IBM/WebSphere/AppServer/classes:/opt/IBM/WebSphere/AppServer/lib:/opt/IBM/WebSphere
/AppServer/installedChannels:/opt/IBM/WebSphere/AppServer/lib/ext:/opt/IBM/WebSphere/AppServer
/web/help:/opt/IBM/WebSphere/AppServer/deploytool/itp/plugins/com.ibm.etools.ejbdeploy/runtime
Classpath = /opt/IBM/WebSphere/AppServer/profiles/AppSrv01/properties:/opt/IBM/WebSphere/AppServer
/properties:/opt/IBM/WebSphere/AppServer/lib/startup.jar:/opt/IBM/WebSphere/AppServer
/lib/bootstrap.jar:/opt/IBM/WebSphere/AppServer/lib/jsf-nls.jar:/opt/IBM/WebSphere/AppServer
/lib/lmproxy.jar:/opt/IBM/WebSphere/AppServer/lib/urlprotocols.jar:/opt/IBM/WebSphere/AppServer
/deploytool/itp/batchboot.jar:/opt/IBM/WebSphere/AppServer/deploytool/itp/batch2.jar:/opt/IBM
/WebSphere/AppServer/java/lib/tools.jar
Java Library path = /opt/IBM/WebSphere/AppServer/java/jre/lib/i386:/opt/IBM/WebSphere/AppServer
/bin:/usr/lib
***** End Display Current Environment *****
[5/26/11 20:50:30:450 UTC] 00000000 ManagerAdmin I TRAS0017I: The startup trace state is **info.
[5/26/11 20:50:30:802 UTC] 00000000 ManagerAdmin I TRAS0111I: The message IDs that are in use
are deprecated
[5/26/11 20:50:30:919 UTC] 00000000 ModelMgr I WSVR0800I: Initializing core configuration
models
[5/26/11 20:50:32:322 UTC] 00000000 ComponentMeta I WSVR0179I: The runtime provisioning feature
is disabled. All components will be started.
[5/26/11 20:50:32:540 UTC] 00000000 ProviderTrack I com.ibm.ffdc.osgi.ProviderTracker
AddingService FFDC1007I: FFDC Provider Installed: com.ibm.ffdc.EmptyProvider(silent)
[5/26/11 20:50:32:589 UTC] 00000000 ProviderTrack I com.ibm.ffdc.osgi.ProviderTracker
AddingService FFDC1007I: FFDC Provider Installed: com.ibm.ws.ffdc.impl.FfdcProvider@6cc86cc8
[5/26/11 20:50:32:866 UTC] 00000000 AdminInitiali A ADMN0015I: The administration service is
initialized.
[5/26/11 20:50:34:060 UTC] 00000000 JMXConnectors I ADMC0056I: The JMX RMI connector has been
disabled.
```

## Summary of Virtual Application Pattern Features

### **Automated Scaling**

Managed environments scale up and down based on observed utilization of compute resources

### **Failover**

Failed virtual machines are replaced with new VMs which are configured with the old VM's identity

### **Load Balancing**

Requests coming into workload pattern environments are load balanced

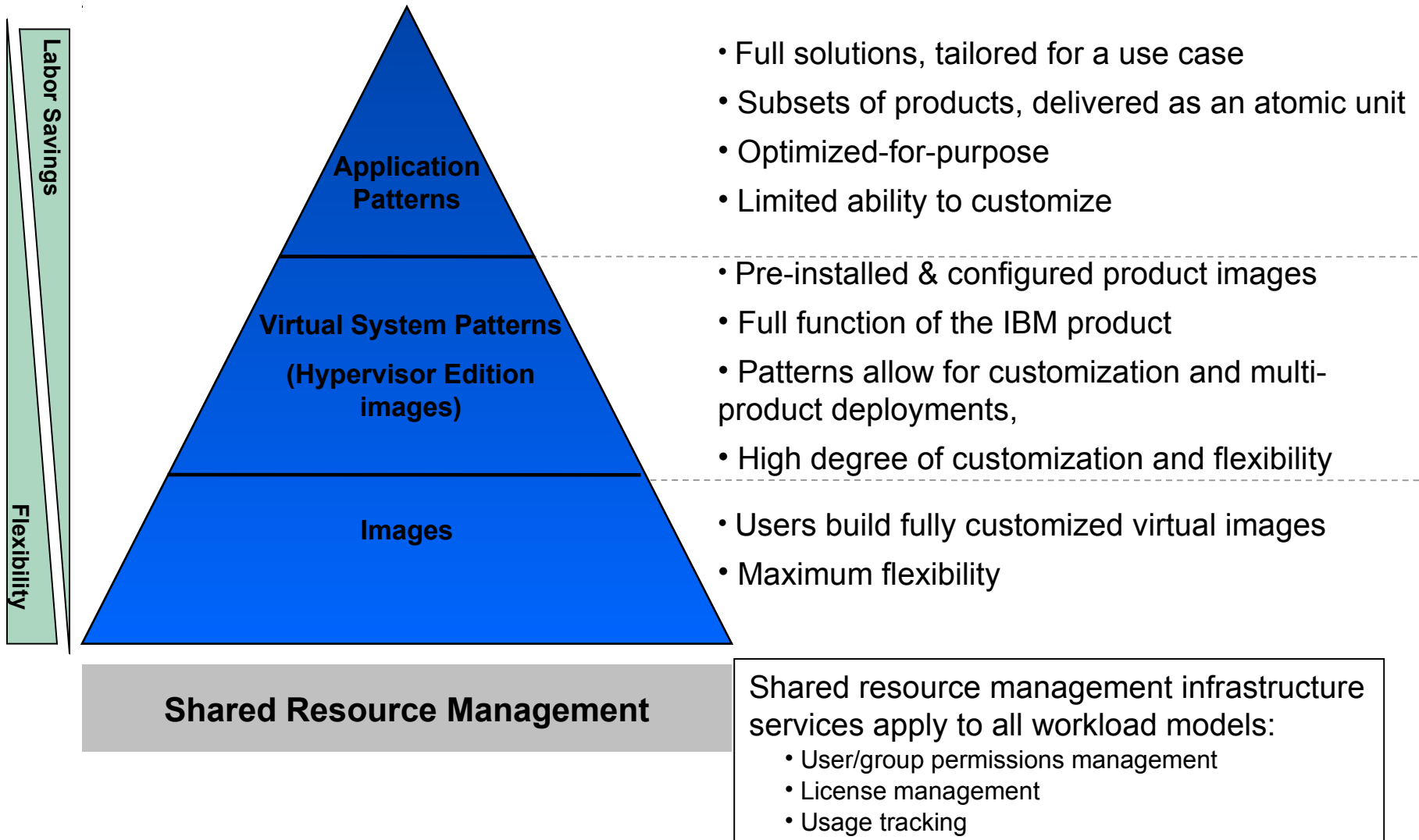
### **Security**

ACL's for application sharing and management access, LDAP integration for application security

### **Monitoring**

All components of workload pattern environments are monitored by IWD

## So what's the reality then?



## So what are the best practices? *Some thoughts...*

- Good application design. *No change there then!*
  - Cluster-aware (e.g. serializable sessions)
  - Stick to the Java EE specifications to give portability
  - Rely on Enterprise Java services (don't dip outside the container)
- Resist the urge to “go bespoke”
  - It is always *possible* to do customisation but focus on standardisation as that's where the cost and time benefits really are
  - Do we *really* need that level of control over the topology?
- Understand the organisational implications
  - Benefit from pre-provisioned hardware
  - Cloud crosses team, project and funding boundaries
  - Subtle changes in roles for middleware skills (pattern design)
  - Be prepared for implication of self-provisioning (suitable charge-back)

# Are we ready for public cloud?

- More cost-efficient for short-term usage
- Data sensitivity assurance

## Traditional

- WebSphere Application Server
- WebSphere Virtual Enterprise
- WebSphere eXtreme Scale
- Sub-capacity licensing



## Private clouds

- IBM Workload Deployer
  - WAS Hypervisor Editions
  - WebApp Workload Pattern
- Intelligent Management Pack
- Sub-capacity licensing



## Public Clouds

- WAS on IBM Public Cloud
- WAS Amazon Machine Image
- Pay per SW use or bring your SW
- Bring your license (on IBM Cloud)
- IBM Sandbox



# IBM Workload Deployer v3

Multiple Deployment Models

**Next Generation Appliance**  
 Replaces existing WebSphere CloudBurst Appliance offering

Supports direct migration from previous offering

## Virtual System Patterns

Deployment of optimized product configurations (Hypervisor Edition products + base patterns) using IBM best practices. Enables rapid assembly and deployment of custom solutions using pre-configured product patterns with intelligent placement and mobility.

## Virtual Application Patterns

Deployment of workload patterns as integrated solutions delivered with integrated management and monitoring. Deployments include full life-cycle management including failure recovery, intelligent placement and elasticity.

## Appliance form factor

Product Patterns

Hypervisor Edition Images

Workload Patterns



Bring your own hardware



x86

System p

System z  
(z/Linux)

x86



# Any Questions?

<http://www.youtube.com/user/WebSphereClouds>





- IBM Education Assistant (<http://publib.boulder.ibm.com/infocenter/ieduasst/v1r1m0/index.jsp?topic=/com.ibm.iea.iwd/iwd/IWD30.html>)
- IBM Information Center for Workload Deployer (<http://publib.boulder.ibm.com/infocenter/worlodep/v3r0m0/index.jsp?topic=%2Fcom.ibm.worlodep.doc%2Fwelcome.html>)
- Easy virtual app automation using Workload Deployer: A pattern approach to building cloud applications  
<https://www.ibm.com/developerworks/cloud/library/cl-workloaddeployer/>
- Harness the power of the cloud with IBM Workload Deployer V3  
[http://www.ibm.com/developerworks/websphere/techjournal/1106\\_amrhein/1106\\_amrhein.html](http://www.ibm.com/developerworks/websphere/techjournal/1106_amrhein/1106_amrhein.html)

## Customizing with WebSphere CloudBurst (series)

- Customizing with WebSphere CloudBurst, Part 1: Creating highly customized private clouds  
[http://www.ibm.com/developerworks/websphere/techjournal/0907\\_amrhein/0907\\_amrhein.html](http://www.ibm.com/developerworks/websphere/techjournal/0907_amrhein/0907_amrhein.html)
- Customizing with WebSphere CloudBurst, Part 2: Using WebSphere CloudBurst to customize a WebSphere middleware environment  
[http://www.ibm.com/developerworks/websphere/techjournal/0909\\_amrhein/0909\\_amrhein.html](http://www.ibm.com/developerworks/websphere/techjournal/0909_amrhein/0909_amrhein.html)
- Customizing with WebSphere CloudBurst, Part 3: Using script packages for customizing above and beyond patterns  
[http://www.ibm.com/developerworks/websphere/techjournal/0911\\_stelzer/0911\\_stelzer.html](http://www.ibm.com/developerworks/websphere/techjournal/0911_stelzer/0911_stelzer.html)
- Customizing with WebSphere CloudBurst, Part 4: Extending virtual images in WebSphere CloudBurst  
[http://www.ibm.com/developerworks/websphere/techjournal/0912\\_amrhein/0912\\_amrhein.html](http://www.ibm.com/developerworks/websphere/techjournal/0912_amrhein/0912_amrhein.html)
- Customizing with WebSphere CloudBurst, Part 5: Maintaining virtualized WebSphere Application Server environments  
[http://www.ibm.com/developerworks/websphere/techjournal/1001\\_amrhein/1001\\_amrhein.html](http://www.ibm.com/developerworks/websphere/techjournal/1001_amrhein/1001_amrhein.html)

## Cloud computing for the enterprise (series)

- Cloud computing for the enterprise: Part 1: Capturing the cloud

[http://www.ibm.com/developerworks/websphere/techjournal/0904\\_amrhein/0904\\_amrhein.html](http://www.ibm.com/developerworks/websphere/techjournal/0904_amrhein/0904_amrhein.html)

- Cloud computing for the enterprise: Part 2: WebSphere sMash and DB2 Express-C on the Amazon EC2 public cloud

[http://www.ibm.com/developerworks/websphere/techjournal/0905\\_amrhein/0905\\_amrhein.html](http://www.ibm.com/developerworks/websphere/techjournal/0905_amrhein/0905_amrhein.html)

- Cloud computing for the enterprise: Part 3 Using WebSphere CloudBurst to create private clouds

[http://www.ibm.com/developerworks/websphere/techjournal/0906\\_amrhein/0906\\_amrhein.html](http://www.ibm.com/developerworks/websphere/techjournal/0906_amrhein/0906_amrhein.html)

## WebSphere CloudBurst Cloud Management (series)

- Managing your private cloud, Part 1: Introducing the WebSphere CloudBurst Appliance command line interface

[http://www.ibm.com/developerworks/websphere/techjournal/0907\\_burr/0907\\_burr.html](http://www.ibm.com/developerworks/websphere/techjournal/0907_burr/0907_burr.html)

- Managing your private cloud, Part 2: Using the WebSphere CloudBurst REST API interface

[http://www.ibm.com/developerworks/websphere/techjournal/0911\\_amrhein/0911\\_amrhein.html](http://www.ibm.com/developerworks/websphere/techjournal/0911_amrhein/0911_amrhein.html)

## Additional WebSphere CloudBurst Articles:

- Innovations within reach: What's new in WebSphere CloudBurst V2.0  
[http://www.ibm.com/developerworks/websphere/techjournal/1007\\_inreach/1007\\_inreach.html](http://www.ibm.com/developerworks/websphere/techjournal/1007_inreach/1007_inreach.html)
- Comment lines by Ruth Willenborg: The "special sauce" inside the WebSphere CloudBurst Appliance  
[http://www.ibm.com/developerworks/websphere/techjournal/0909\\_col\\_willenborg/0909\\_col\\_willenborg.html](http://www.ibm.com/developerworks/websphere/techjournal/0909_col_willenborg/0909_col_willenborg.html)
- Automating the construction of applications and application environments: Exploring the integration of WebSphere CloudBurst and Rational Build Forge  
[http://www.ibm.com/developerworks/websphere/techjournal/0912\\_brauneis/0912\\_brauneis.html](http://www.ibm.com/developerworks/websphere/techjournal/0912_brauneis/0912_brauneis.html)
- Innovations within reach: It's fast, highly consumable, deeply knowledgeable, uses patterns - and it's purple  
[http://www.ibm.com/developerworks/websphere/techjournal/1001\\_inreach/1001\\_inreach.html](http://www.ibm.com/developerworks/websphere/techjournal/1001_inreach/1001_inreach.html)

## On-line Demonstrations and Webcasts

- IBM Workload Deployer Demonstrations  
[https://www14.software.ibm.com/webapp/iwm/web/signup.do?source=sw-app&S\\_PKG=cloudburst&S\\_TACT=109HE31W&S\\_CMP=web\\_ibm\\_ws\\_appinfra\\_hr\\_cloudblb](https://www14.software.ibm.com/webapp/iwm/web/signup.do?source=sw-app&S_PKG=cloudburst&S_TACT=109HE31W&S_CMP=web_ibm_ws_appinfra_hr_cloudblb)
- Webcasts:Deploy and Virtualize: Create high performing application environments  
[https://www14.software.ibm.com/webapp/iwm/web/signup.do?lang=en\\_US&source=sw-app&S\\_PKG=deploy\\_virtualize\\_ss&S\\_TACT=109KA11W&S\\_CMP=web\\_ibm\\_ws\\_appinfra\\_bd\\_wllb](https://www14.software.ibm.com/webapp/iwm/web/signup.do?lang=en_US&source=sw-app&S_PKG=deploy_virtualize_ss&S_TACT=109KA11W&S_CMP=web_ibm_ws_appinfra_bd_wllb)

## White Papers

- A Study on Reducing Labor Costs: Through the Use of IBM Workload Deployer

[https://www14.software.ibm.com/webapp/iwm/web/signup.do?source=sw-app&S\\_PKG=cloudblaborcosts&S\\_TACT=109HE38W&S\\_CMP=web\\_ibm\\_ws\\_appinfra\\_bd\\_wllb](https://www14.software.ibm.com/webapp/iwm/web/signup.do?source=sw-app&S_PKG=cloudblaborcosts&S_TACT=109HE38W&S_CMP=web_ibm_ws_appinfra_bd_wllb)

- IDC Analyst White paper: Leveraging Dynamic Application Infrastructure for Effective Private Cloud Computing

[https://www14.software.ibm.com/webapp/iwm/web/signup.do?source=sw-app&S\\_PKG=idcldaipcc&S\\_TACT=109HE51W&S\\_CMP=web\\_ibm\\_ws\\_appinfra\\_bd\\_wllb](https://www14.software.ibm.com/webapp/iwm/web/signup.do?source=sw-app&S_PKG=idcldaipcc&S_TACT=109HE51W&S_CMP=web_ibm_ws_appinfra_bd_wllb)

## Redbook

- Rapid WebSphere Application Server Provisioning with IBM Workload Deployer

[https://www14.software.ibm.com/webapp/iwm/web/signup.do?lang=en\\_US&source=sw-app&S\\_PKG=cloudburstred&S\\_TACT=109HE16W&S\\_CMP=web\\_ibm\\_ws\\_appinfra\\_bd\\_wllb](https://www14.software.ibm.com/webapp/iwm/web/signup.do?lang=en_US&source=sw-app&S_PKG=cloudburstred&S_TACT=109HE16W&S_CMP=web_ibm_ws_appinfra_bd_wllb)

## Blogs

- IBM Workload Deployer: Application-centric cloud platform (Part 1 of 3)

[https://www.ibm.com/developerworks/mydeveloperworks/blogs/CLLotusLive/entry/ibm\\_workload\\_deployer\\_application\\_centric\\_cloud\\_platform\\_part\\_1\\_of\\_320?lang=en](https://www.ibm.com/developerworks/mydeveloperworks/blogs/CLLotusLive/entry/ibm_workload_deployer_application_centric_cloud_platform_part_1_of_320?lang=en)

- IBM Workload Deployer: Application-centric cloud platform (Part 2 of 3)

[https://www.ibm.com/developerworks/mydeveloperworks/blogs/CLLotusLive/entry/ibm\\_workload\\_deployer\\_application\\_centric\\_cloud\\_platform\\_part\\_2\\_of\\_3?lang=en](https://www.ibm.com/developerworks/mydeveloperworks/blogs/CLLotusLive/entry/ibm_workload_deployer_application_centric_cloud_platform_part_2_of_3?lang=en)

## WebSphere Cloud's YouTube Channel

- WebSphereCloud's YouTube Demonstration videos

<http://www.youtube.com/user/WebSphereClouds>

## WebSphere CloudBurst Sample Gallery

- WebSphere CloudBurst Samples

[https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#/wiki/W6451b814902a\\_4a31\\_9589\\_81f21f330185/page/Samples%20Gallery%20for%20WebSphere%20CloudBurst](https://www.ibm.com/developerworks/mydeveloperworks/wikis/home?lang=en#/wiki/W6451b814902a_4a31_9589_81f21f330185/page/Samples%20Gallery%20for%20WebSphere%20CloudBurst)

## IBM Image Construction and Composition Tool

The IBM Image Construction and Composition Tool enables users to construct custom virtual images that they can provision with Tivoli Provisioning Manager and IBM WebSphere CloudBurst Appliance, or use in IBM Smart Business Development and Test on IBM Cloud.

- IBM Image and Construction and Composition Tool

<http://www.alphaworks.ibm.com/tech/iicct/download>

## IBM Workload Plugin Development Kit

The IBM Workload Plugin Development Kit allows you to build custom virtual application patterns, or extend existing patterns with custom components and capabilities, so that IBM Workload Deployer can deploy your custom virtual applications to your cloud.

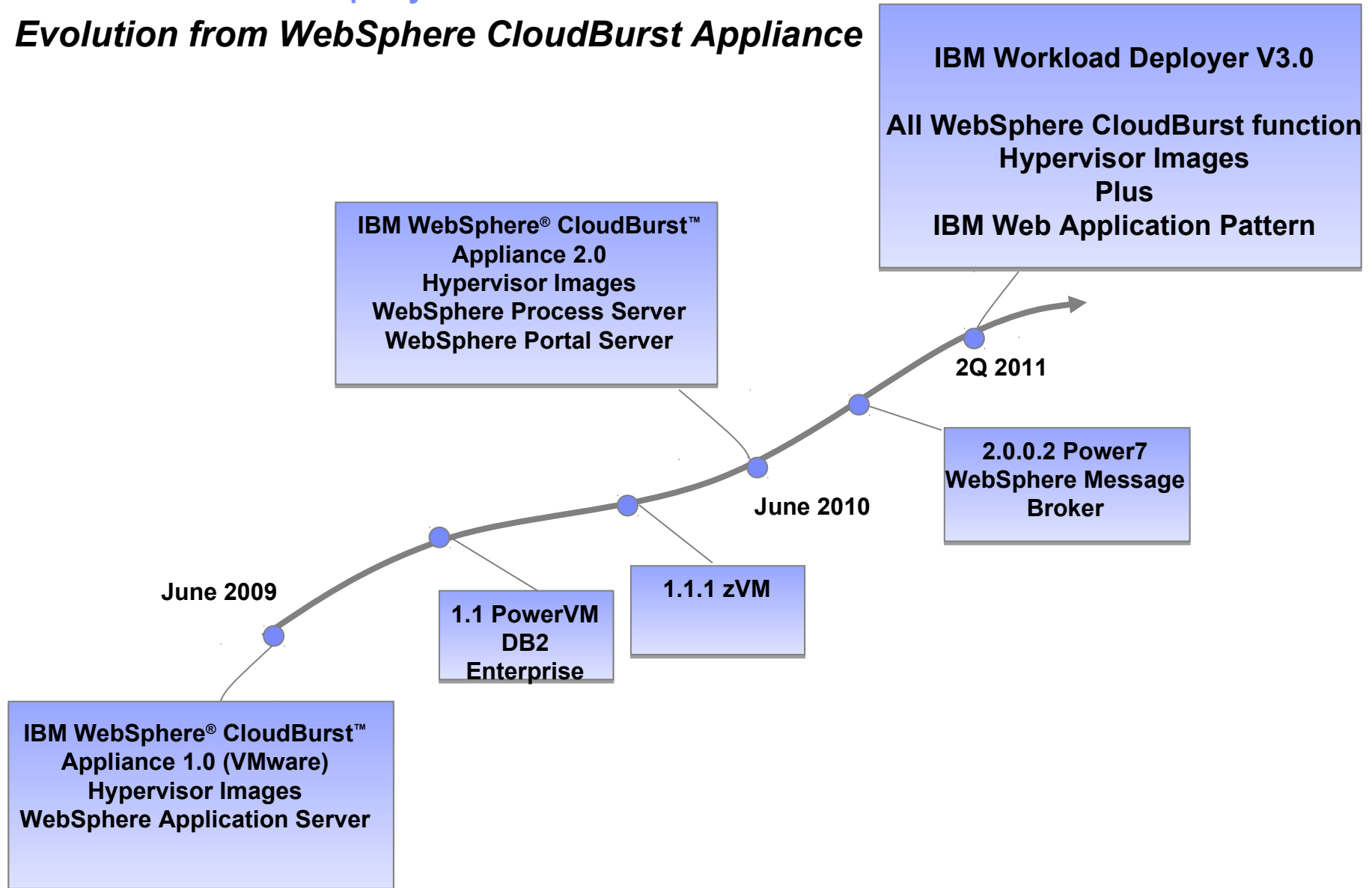
- IBM Workload Plugin Developer Kit

<https://www14.software.ibm.com/webapp/iwm/web/preLogin.do?source=swg-plugindekit>



# IBM Workload Deployer

## Evolution from WebSphere CloudBurst Appliance





## The Virtual Application Pattern Approach

- **Awareness and optimizations for specific workloads**
  - Integrated stacks of middleware optimized for particular workloads
  
- **Consolidating workloads under a simplified management system**
  - Expose radically simplified management model optimized for specific workloads
  - Pattern based deployments for most common workloads
  
- **Full lifecycle management**
  - Go beyond provisioning to full lifecycle (update, failure recovery, growth, problem determination)
  
- **Elastic, efficient, multi-tenant and automated management and execution of application workloads**
  - Integrated monitoring, metering, logging, security, caching, etc.
  - Automated policies for resource consumption and balancing
  - Optimized resource utilization of middleware in virtualized environments

## Web App and Database Patterns

- Designed to support common online web application and database workloads
  
- **Pattern for Web Applications** consists of application support based on
  - WebSphere Application Server,
  - Tivoli Directory
  - WebSphere eXtreme Scale
  - Connectors to remote systems
    - MQ, DB2, DB2/z, CICS, IMS, 3rd party DB (Oracle), Tivoli Directory
  
- **Pattern for Database** provides support for DB2 in a Database-as-a-Service model
  
- **Web and Database patterns can be used together**
  
- **All Patterns support**
  - Integrated monitoring and logging extensions
  - Failure recovery and HA/Auto-Scaling\*
  - Sold as an integrate offerings

	RedHat ESX	AIX PowerVM	SUSE zLinux zVM	RedHat zLinux zVM	SUSE Linux (64-bit) ESX	SUSE Linux (32-bit) ESX
<b>Portal</b>						
Portal/ WCM V6.5.1						X
Portal/ WCM V7.0	32-bit					X
<b>Database</b>						
DB2 V9.7		X			X	X
<b>BPM</b>						
WPS V6.2		X	X			X
WPS V7.0	32-bit	X	X			X
WPS V7.5						
Monitor V7.0						X
Monitor V7.5						
<b>I LOG</b>						
<b>Cognos</b>						
<b>Connectivity</b>						
Cast Iron						
WMQ v7.0.1	64-bit					
WMB v7.0	64-bit					
WSRR v7.5						
WTX v8.4						
<b>Application Infrastructure</b>						
WebSphere Application Server v6.1	32-bit	X				X
WebSphere Application Server v7.0	64, 32-bit	X	X	X	X	X
WebSphere Application Server v8.0						
IBM HTTP Server for WAS HV	64, 32-bit	X	X	X	X	X

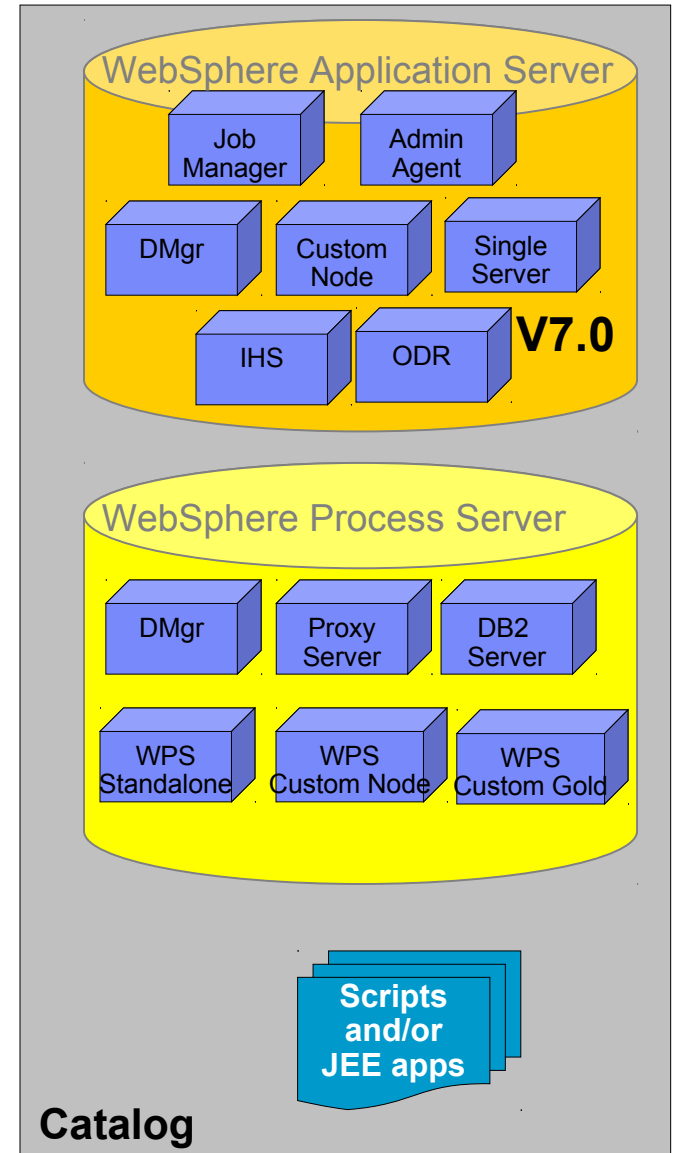
# Catalog

IBM provided Virtual Images

- WebSphere Application Server Hypervisor Edition (V6.1, V7.0)
- WebSphere Process Server
- WebSphere Message Broker
- And more

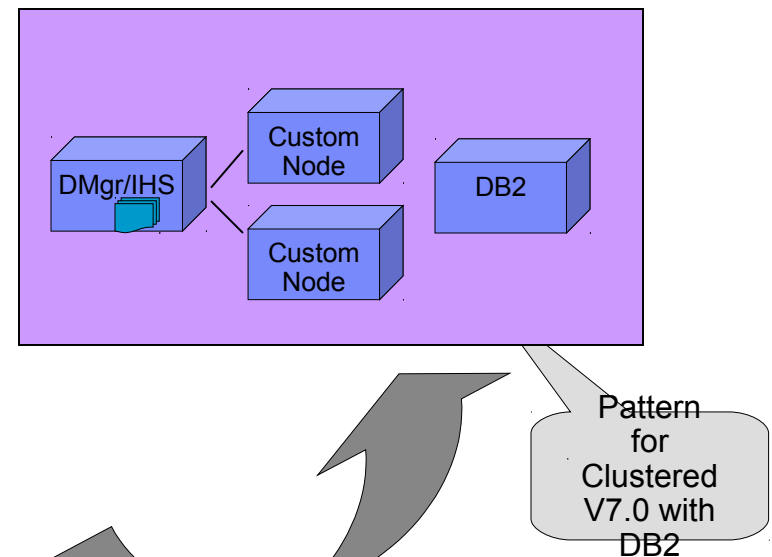
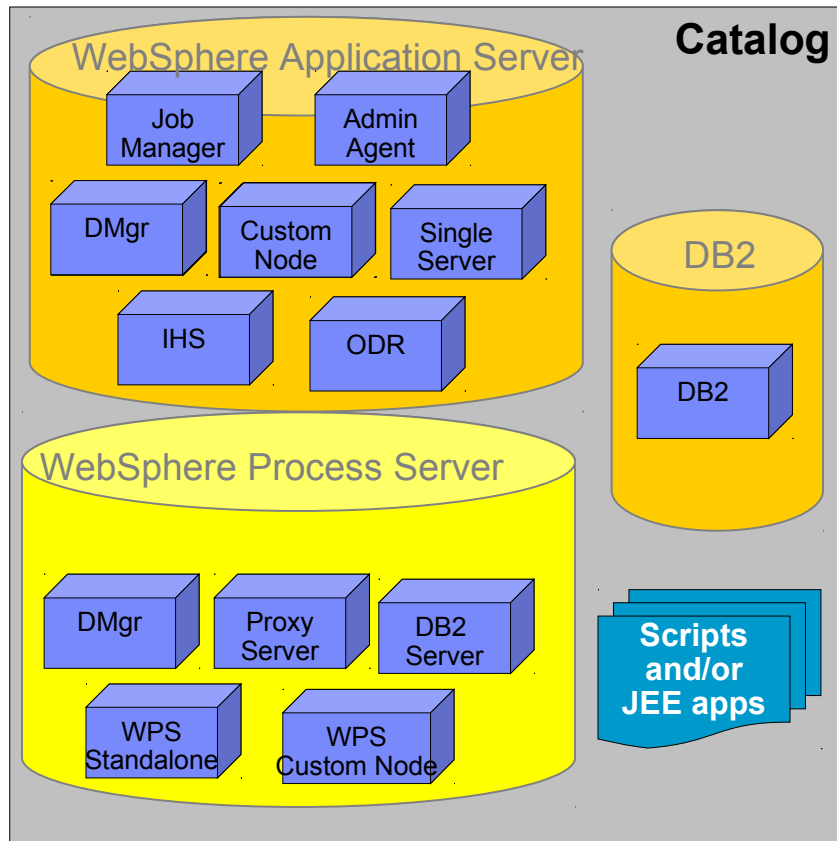
User supplied Script packages

- wsadmin or other scripts
- JEE applications



# Virtual System Patterns

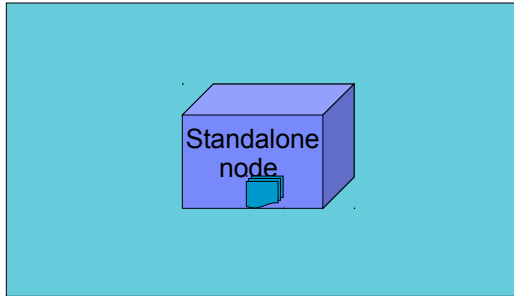
- Pattern is one or more virtual images and script packages from the catalog to satisfy a certain deployment topology
- Example: Creating pattern of WebSphere V7.0 Clustered topology with DB2



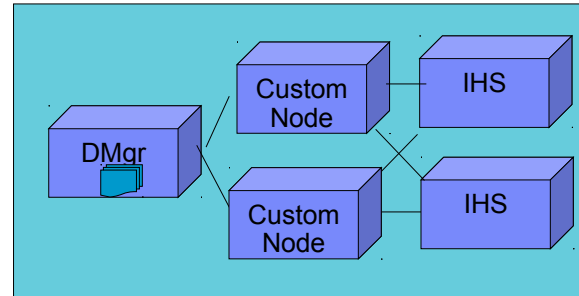
**Create Pattern from components available in Catalog**

## Example Preloaded Patterns

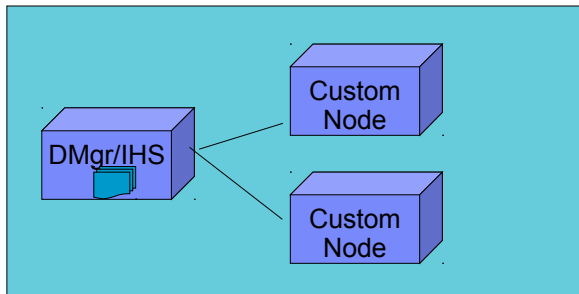
Single Server



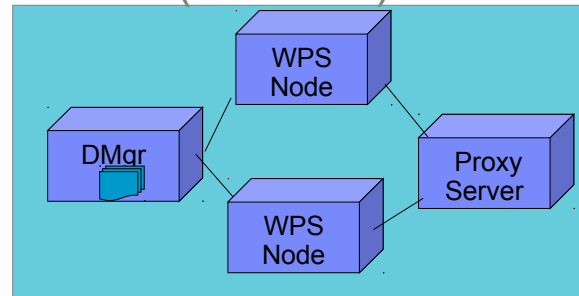
WebSphere cluster



WebSphere cluster (dev)



WebSphere Process Server (Scalable)



**Advanced Options for messaging, session persistence, and global security available**

# IBM Image Construction and Composition Tool

Now Available on alphaWorks!  
<http://bit.ly/ICONAlphaWorks>

## Image Builder



Define image (OS and bundles)

Operating system specialist



Create base OS

Software specialist



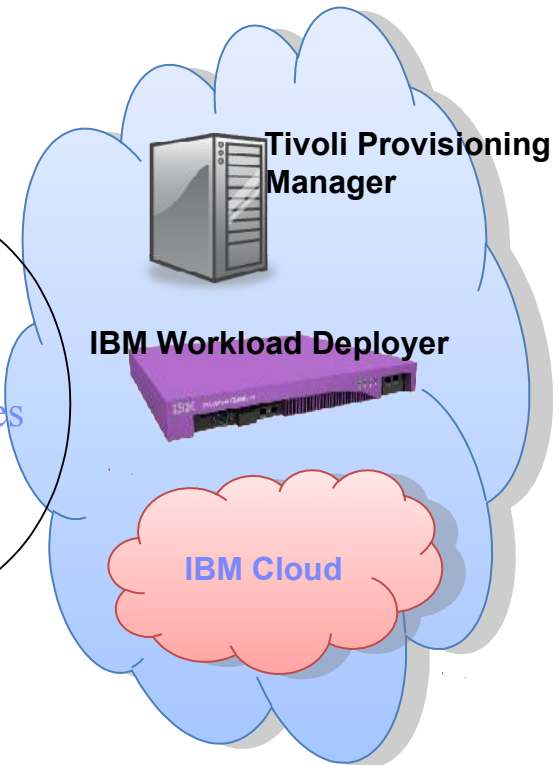
Create bundle

## Image Construction Tool



Bundle Repository

Build Images



# Datacenter Integration

