WebSphere CloudBurst Appliance

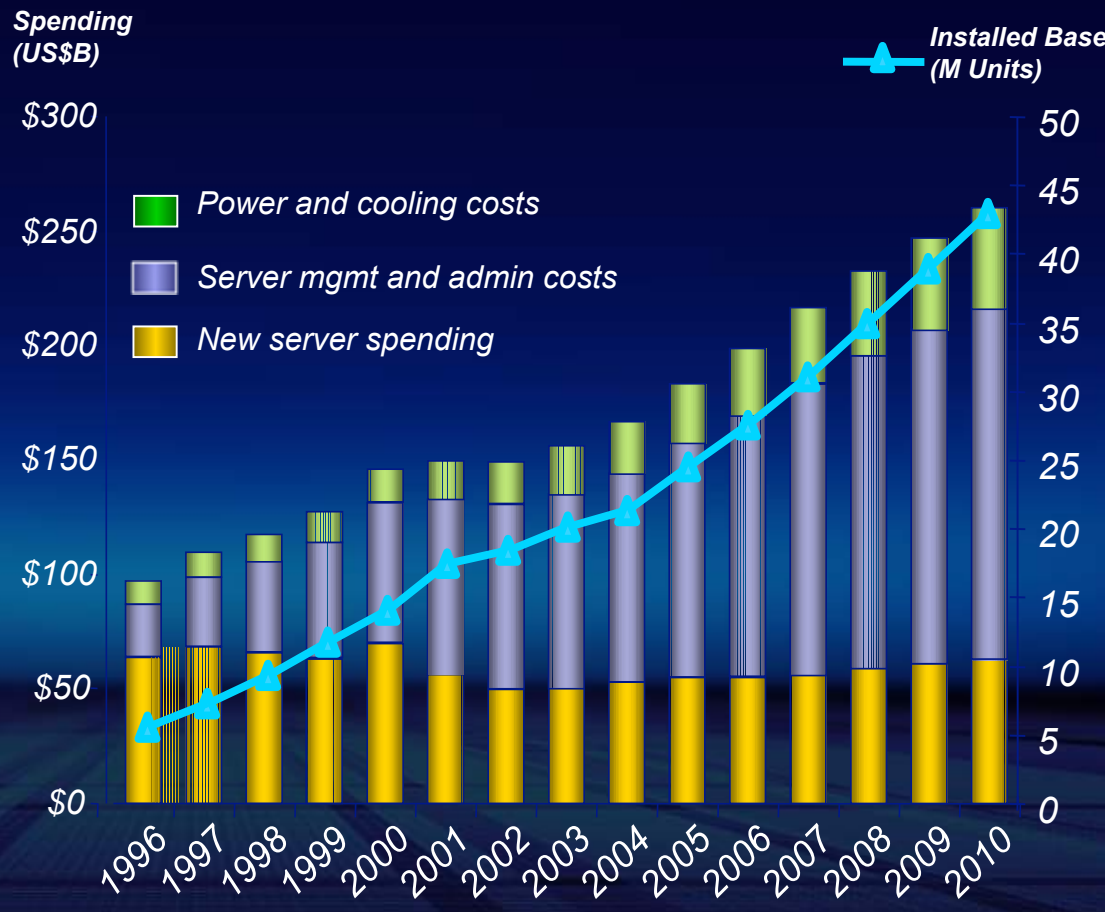
Better, Faster, Cheaper!

The Application Infrastructure Portfolio

Solution Sets		*IBM Offerings*
Application Foundation		WebSphere Application Server Family WebSphere sMash CICS Transaction Server
Intelligent Management		WebSphere CloudBurst Appliance WebSphere Virtual Enterprise
Extreme Transaction Processing		WebSphere eXtreme Scale WebSphere Compute Grid WebSphere RealTime

IT costs are increasing

- Costs to manage systems has doubled since 2000
- Costs to power and cool systems has doubled since 2000
- Devices accessing data over networks doubling every 2.5 years
- Bandwidth consumed doubling every 1.5 years
- Data Doubling every 18 months[1]
- Server processing capacity doubling every 3 years[2]
- 10G Ethernet ports tripling over the next 5 years



Source: IDC, 2008

[1]WW TB Capacity Shipped on Enterprise Disk Storage Systems

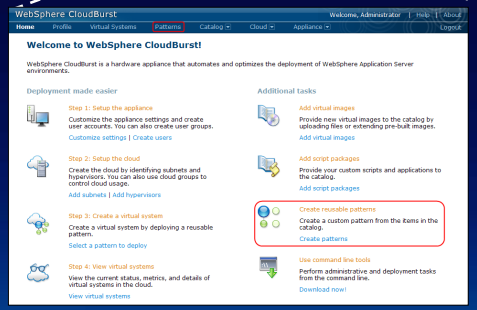
[2]Server processing consumption doubles every 3 years

What admin & management efficiencies can be made?

- The average lead time to get a new application environment up and running is 4-6 weeks
  - Approvals, procurement, shipment, HW installation, license procurement, OS installation, application installation, configuration
- 30% of bugs are introduced by inconsistent configurations
  - These bugs are often of the most difficult variety to detect
  - They often emerge when moving between dev/test, QA, production
- Because it's so expensive to set up an environment, there is an incentive to hold onto them even when no longer needed "just in case."
  - Future environments = new hardware, instead of recycling returned hardware, and this takes time and money

WebSphere Clouds: 2 products

1) WebSphere CloudBurst Appliance (hardware)

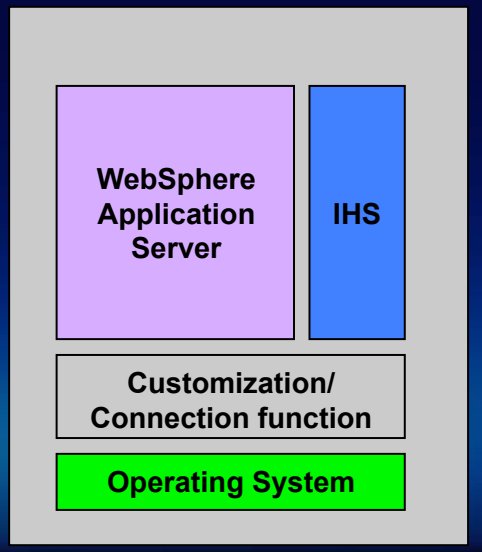


2) CloudBurst dispenses WebSphere Application Server Hypervisor Edition Servers into a set of other machines

1) User requests WebSphere Application Server Hypervisor Edition Environment to be dispensed

3) User can access WebSphere Application Server Hypervisor Edition Servers (Virtual Image)

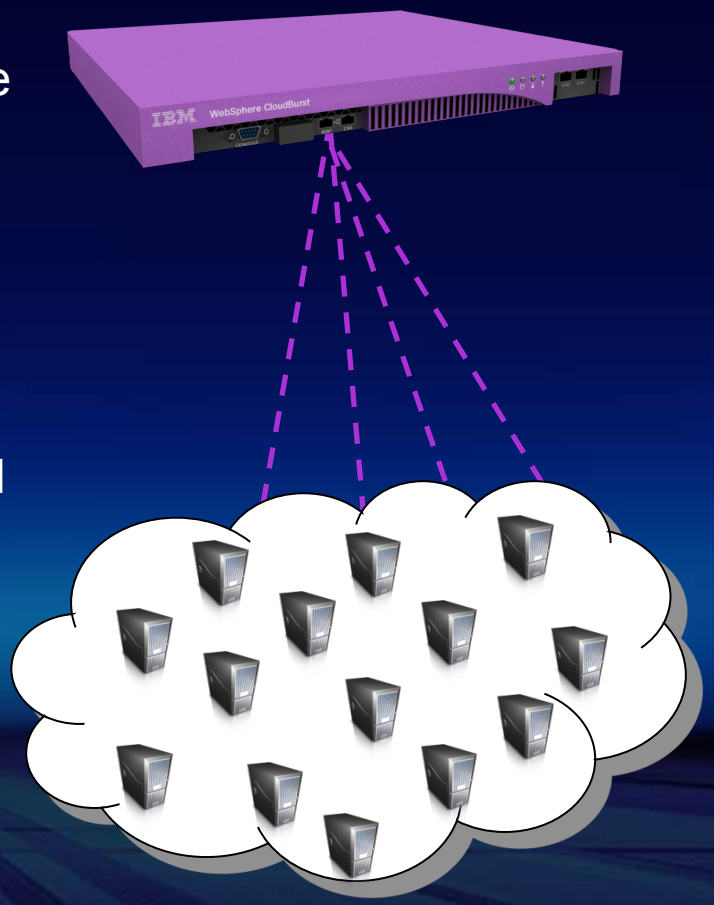
2) WAS HV (Virtual Image-software)



The WebSphere CloudBurst appliance dispenses these virtual images into a private cloud

WebSphere CloudBurst Appliance

- Secure, self-service cloud management hardware appliance
- Unmatched WAS management (apply maintenance, federate cells, etc. - not black box)
- Dispenses hardened WAS patterns into a pool/ cloud of virtualized hardware running a supported hypervisor e.g. VMware ESX or PowerVM.
- Enables consistent & repeatable deployment of application environments based on patterns
- Integrates with existing infrastructure through programmable REST APIs

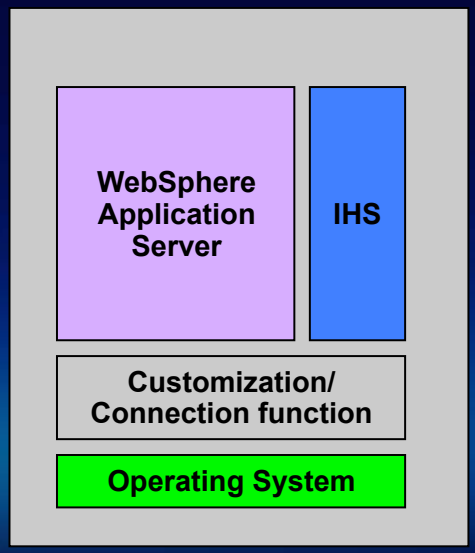


What's new in WebSphere CloudBurst in 4Q09?

- **PowerVM supported as a deployment target**
  - Same patterns can be used on X86 and PowerVM by simply selecting the appropriate virtual image
  - Test on X86, go live on PowerVM, use WebSphere CloudBurst to manage it all!
- **Export/Import virtual images and patterns**
  - Enables artifacts to be created/configured once, and then shared amongst multiple WebSphere CloudBurst Appliances throughout the enterprise/globe
- **DB2 trial image preloaded on appliance**
- **Integration w/ Tivoli Service Automation Manager (TSAM) & IBM CloudBurst**
  - WebSphere CloudBurst can be managed and controlled by TSAM.
  - Customers who utilize TSAM for general purpose provisioning can integrate WebSphere CloudBurst into their existing framework for consistency

WAS HyperVisor Edition (WAS HV)

- WAS shipped ready to run on a hypervisor
- No installation required (just run and choose a profile)
- Single virtual image capable of supporting single servers or clusters
- WAS v6.1 and v7 available at GA
- Full support for WAS Feature Packs
- Maintenance, support, and fixes through IBM for both WAS and Operating System
- Based on OVF standard



Functional roadmap

- The following features are on our desired list of function, and will be included in future releases as priority deems appropriate:
  - Multi-product patterns
  - Red Hat support
  - Support for additional products managed by WebSphere CloudBurst (both IBM and non-IBM)
  - Appliance clustering
  - Expanded storage capacity
  - Elasticity of dispensed environments
  - System Z support (z/VM)
  - License management (ability to limit usage)

IBM CloudBurst and WebSphere CloudBurst

provide cloud management capabilities with different approaches

	WebSphere CloudBurst Appliance	IBM CloudBurst
Offering type	Physical appliance	Services engagement + Bladecenter + set of provisioning and management software
Applicable Scope	Application middleware environments	General purpose cloud provisioning/ management
Hardware for cloud	Bring your own (leverage underutilized assets in your datacenter)	Included in the offering (bladecenter w/ 3 blades in it)
Items managed in cloud	GA virtual images from IBM (Hypervisor Edition products) for select products	User-built images (whichever products customer chooses to build)
Launched	May 2009 @ IMPACT in Las Vegas	June 2009 in press release

IBM CloudBurst and WebSphere CloudBurst

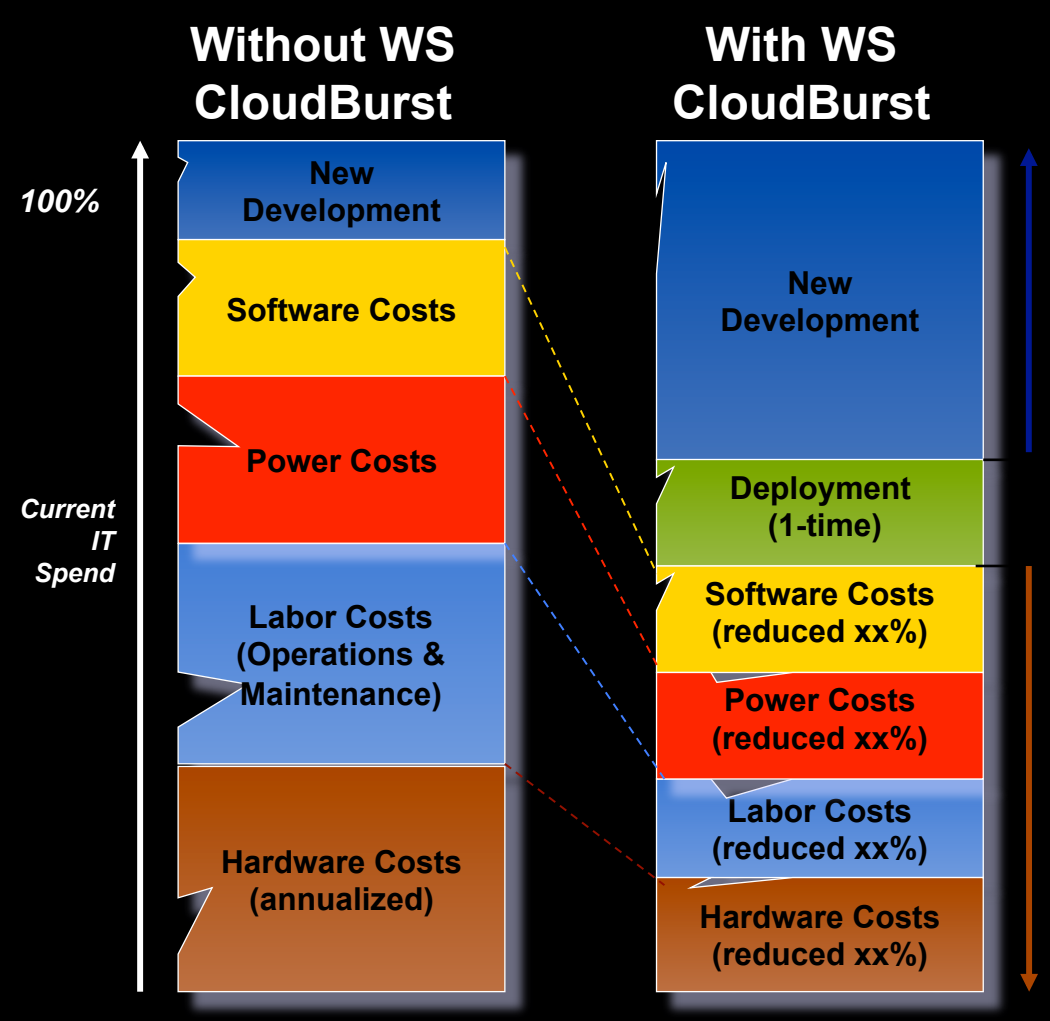
combine to deliver depth and breadth in cloud management!

- **WebSphere CloudBurst Appliance delivers very deep, purposed value in managing WebSphere environments.**

- **IBM CloudBurst delivers very broad, general-purpose value in managing just about anything, and includes hardware for the cloud**

- **For scenarios which benefit from both, the two products interact.**
  - IBM CloudBurst can serve as the entry point through which WebSphere CloudBurst artifacts may be accessed.
  - A consistent portal is used for all of your infrastructure

TCO Analysis
Quantifies WS CloudBurst Benefits



Enabled by

Virtualization

Optimization

Rapid provisioning

Benefits

Reduced Capital Expenditures

Reduced Operating Expenditures

Additional Benefits

Reduced risk, less idle time, more efficient use of energy, acceleration of innovative projects, enhanced customer service

Business Case Results

Annual Savings: $MM (xx%)

Breakeven: xx days
Net Present Value (NPV): $MM
Internal Rate of Return (IRR): xx%
Return on Investment (ROI): xx%

Insurance Company Improves fix management

Using Smart SOA Infrastructure: WebSphere CloudBurst

Industry Pains

- Deployment of maintenance takes approx. 30 minutes
- Deployment of maintenance is a manual process, often executed in the middle of the night

Smarter Business Outcomes

- Deployment took 4 minutes!
- Deployment was automated
- Deployment was able to be scheduled, so no one had to wait up to kick off the process

IBM Lab Increases Productivity and Agility

Using Smart SOA Infrastructure: WebSphere CloudBurst

Industry Pains

- OS security compliance issues due to virtualization
- Low rates of hardware utilization
- Agile development requires high quality and broader testing

Smarter Business Outcomes

- No OS security compliance violations in 4 months
- Increased server utilization up to 90%
- Reduced standardized topology deployment from over 2 hours down to 18 minutes
- Leveraged existing hardware and software assets

Why Smart SOA Infrastructure?

"The ability to provide compliant patterns and images in our public lab while leveraging the speed and rapid deployment of virtualization is significant for our efforts to consolidate hardware, and reduce costs while at the same time providing onDemand access to development and test environments necessary for Agile development". **Frank Varone, Test and Quality Manager for WebSphere Application Server**

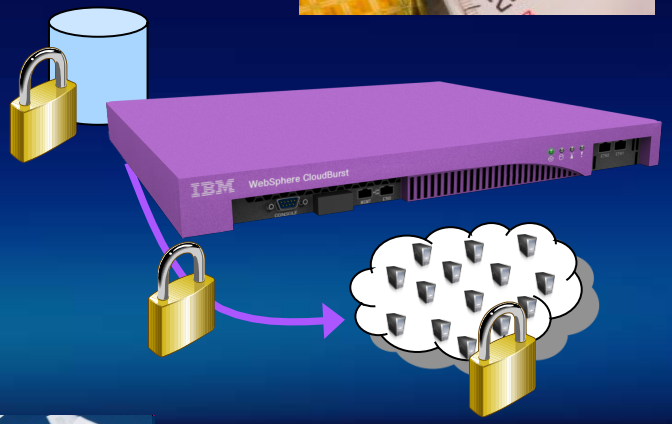
How does this compare to competition?

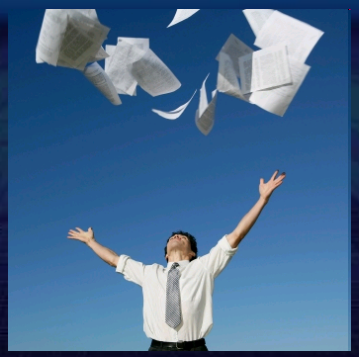
We deliver unique value that others cannot deliver:

- We offer a more integrated solution for a particular set of problems (IBM Software-related problems)
- We understand and control the software we dispense, and as a result, can remove more of the expensive, repetitive, and error-prone manual tasks that.
  - Other products can lay down black box images for each node in a WAS cell, but don't know how to:
    - **federate nodes into a cell**
    - **build clusters**
    - **apply maintenance**
- Appliance form factor delivers optimal security, simplicity, performance, and time-to-value
- IBM support – if the need arises, we put people on airplanes, and our clients WILL be successful

Summary: What does WS CloudBurst do for me?

- Reduce risk/errors by codifying infrastructure
- Security throughout entire virtual image lifecycle
- Drastically reduce set up and configuration time
- Simplify maintenance and management





Pricing and Packaging

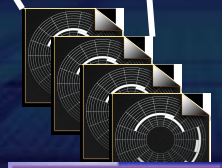
- The following sequence of charts contain the pricing model, for WebSphere CloudBurst Appliance and WAS HV

CloudBurst v1.0 solution components

1. CloudBurst Appliance

2. Set of X86 servers running ESX hypervisor

3. Cloud Capacity Entitlement (for size of cloud, in PVUs)



4. WAS HV Licenses (for size of cloud, in PVUs)

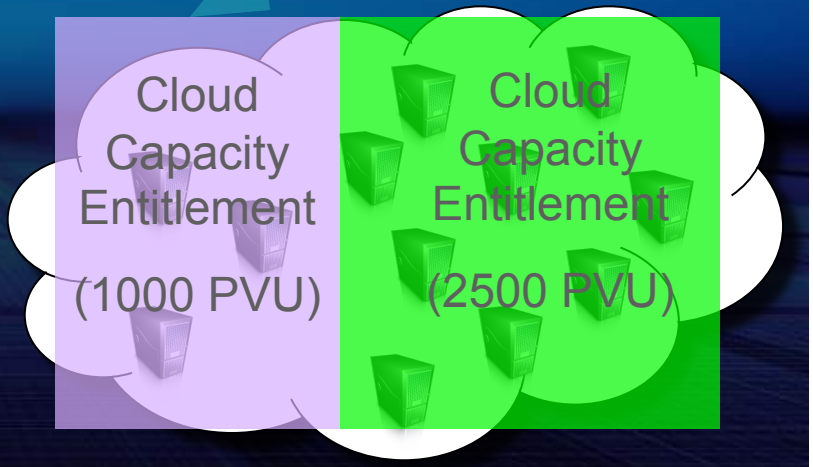
CloudBurst v1.0 Solution Structure

- **CloudBurst Appliance consists of two Priced Components:**
  - **Hardware appliance** – includes some cloud capacity entitlement (1000 PVUs)
    - 9235-72X MTM in AAS
  - Cloud Capacity entitlement (in PVUs)
    - 9231-200 MTM in AAS
- **WebSphere Application Server Hypervisor Edition**
  - Sold through PPA
  - Brand new WAS HV licenses OR
  - Trade-ups from existing WAS ND, Base, Express licenses
- **Hardware including supported hypervisor**
  - Prerequisite
- **Scenario**
  - **CloudBurst appliance** managing **WAS HV** in an X86 **cloud** that is **3500 PVU** in size. Assume 3500 PVU of **WAS ND** licenses being traded up.
  - What must you already have?
    - X86 servers running ESX hypervisor, totaling 3500 PVU
  - What do you buy?
    - **Appliance with 1000 PVU Cloud Cap. Ent.** (9235-72X)**: $45K**
    - **2500 PVU Cloud Cap. Entitlement** (9231-200)**: $37.5K**
    - ***3500 PVU WAS ND -> HV trade-up** (5724-H88): **$136.5K**
  - ***NOTE:** Customer may choose to purchase new WAS Hypervisor Edition licenses or trade-ups from existing licenses

CloudBurst Appliance + 1000 PVU cloud capacity entitlement – $45K per appliance

Additional Cloud Capacity Entitlement - $15 per PVU

WAS HV (3500 PVU)



WebSphere CloudBurst Appliance support options

- **Support options**
  - Platinum - **$3,500/year**
    - 24x7 phone support for firmware
    - 24x7 phone support for hardware
    - 4 hour replacement for hardware problems
  - Gold - **$1,050/year**
    - 24x7 phone support for firmware
    - 9x5 phone support for hardware
    - Next business day replacement for hardware problems
- **1 year "Gold" support included w/ purchase**
  - May be upgraded to "Platinum" support for this year for **$2,450**

Resources

- WebSphere CloudBurst
  - http://ibm.com/cloudburst
- WebSphere Application Server Hypervisor Edition
  - **http://www.ibm.com/software/webservers/appserv/hypervisor**
- Video with audio narration on business value at Education Assistant Site:
  - http://publib.boulder.ibm.com/infocenter/ieduasst/v1r1m0/index.jsp (scroll down and click on WebSphere CloudBurst Appliance)
- WebSphere Cloud Computing Community
  - **http://www.ibm.com/developerworks/spaces/websphereclouds**
- WebSphere CloudBurst demos
  - **http://www.youtube.com/websphereclouds**
- WebSphere CloudBurst articles
  - **Cloud computing for the enterprise, Part 2: Using WebSphere CloudBurst to create private clouds**
  - **Customizing with WebSphere CloudBurst, Part 1: Creating highly customized private clouds**
  - **Managing your private cloud: Introducing the WebSphere CloudBurst Appliance command line interface**

Usage introduction

- The following charts provide an overview as to how a user interacts with WebSphere CloudBurst Appliance.
- This section of the overview may be omitted, based on audience preference.
- Also, you may view a demo at one of these locations:
  - http://www.ibm.com/cloudburst
  - http://cattail.boulder.ibm.com/cattail/download/C75C46F0FE983DD8A09A04157F000001/2/deep_dive.zip

Using WebSphere CloudBurst: Key steps

1. Set up the cloud

2. Work with virtual images

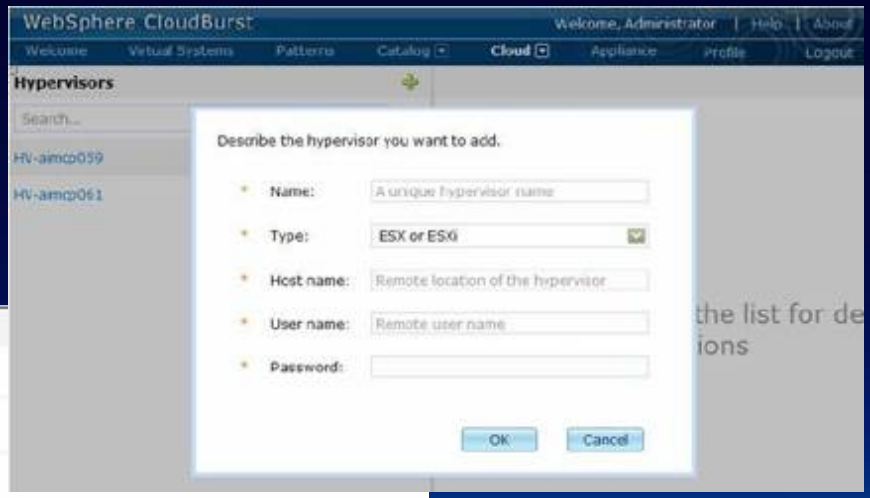
3. Add script packages

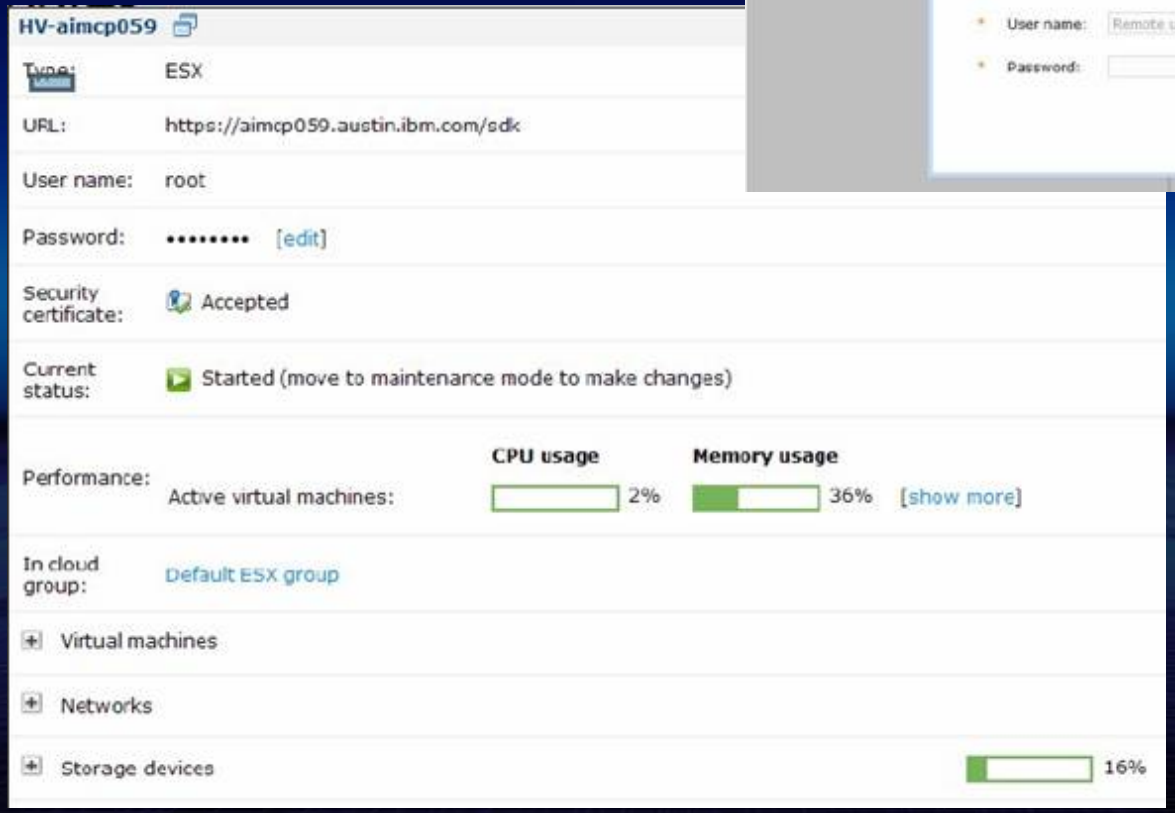
4. Customize deployment patterns

5. Deploy virtual systems

Set up the cloud – Identify hypervisors

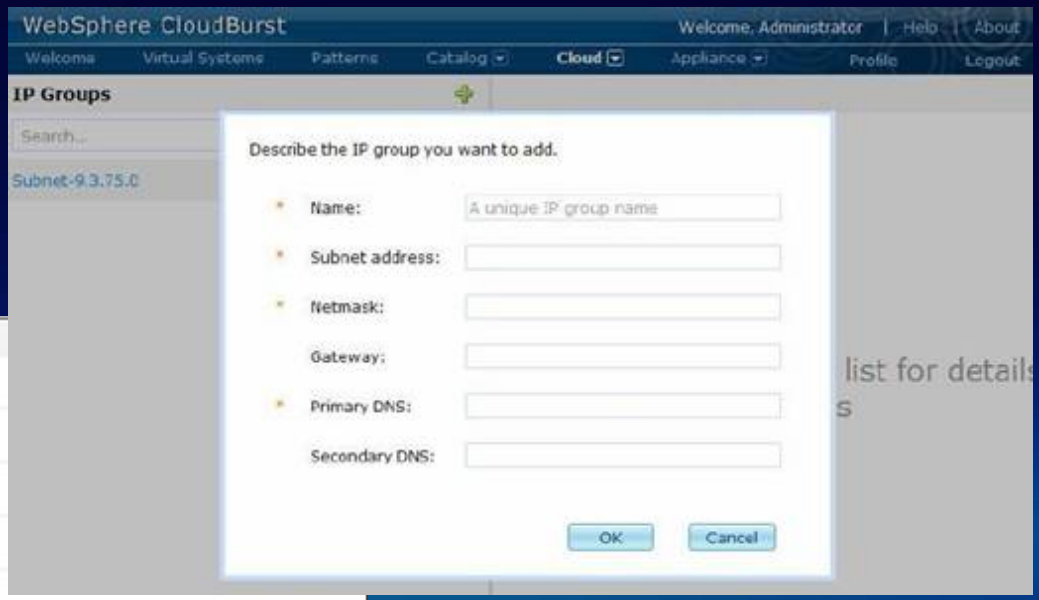
- Identify eligible hypervisors in the cloud
- Hypervisors must be installed & running in the cloud before identification in CloudBurst

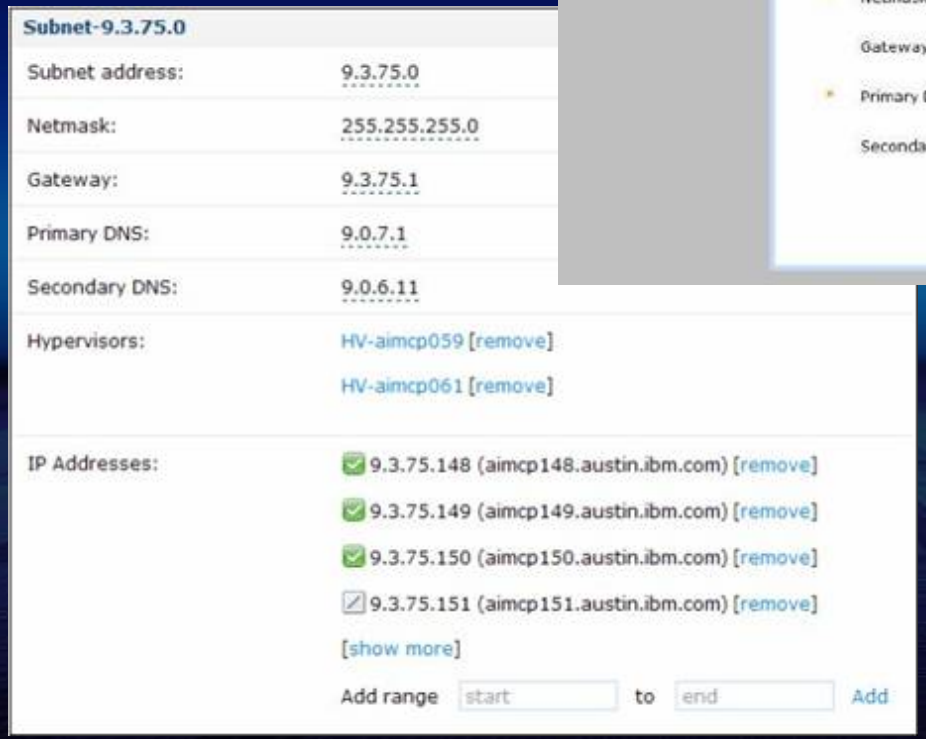




Set up the cloud – IP Addresses for Virtual Systems

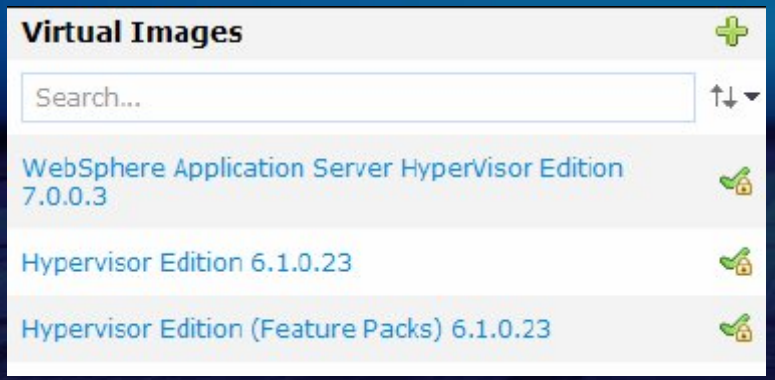
- Describe pool of IP addresses to be used for deployments
- View / Add / Remove IPs later

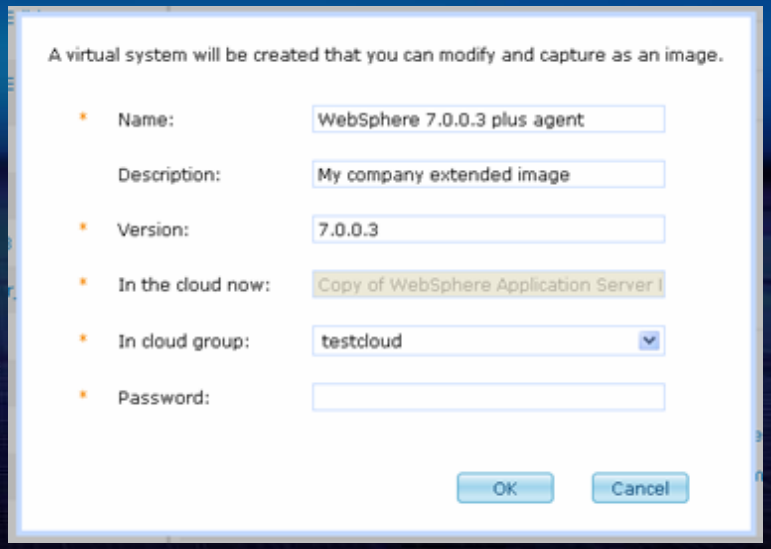




Work with Virtual images – Preloaded images

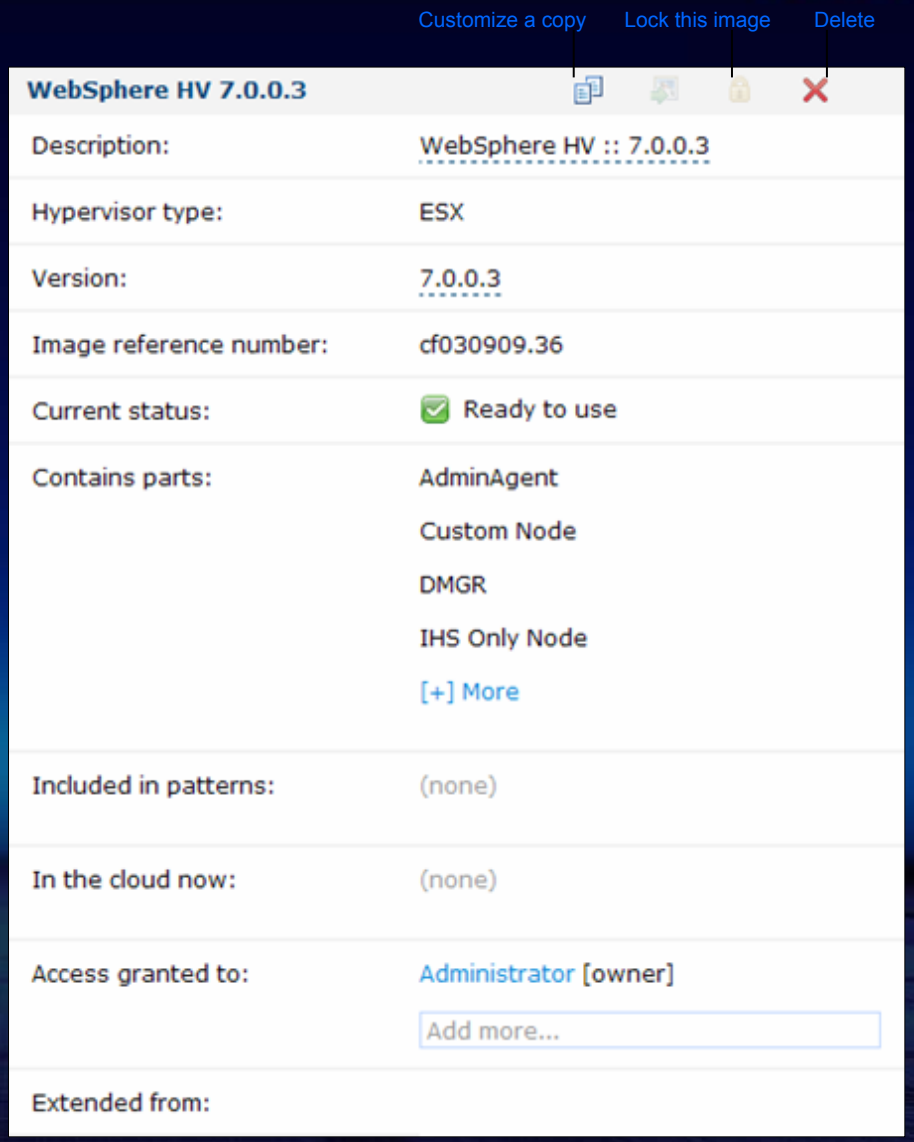
- CloudBurst comes preloaded with two virtual images
  - WAS HV 6.1.0.23
  - WAS HV 7.0.0.3
- By default these images are owned by the administrator
  - Administrator needs to grant permission to all required users of these virtual images
- These images can be customized to meet environment needs
  - Eg, add monitoring/corporate governance agents





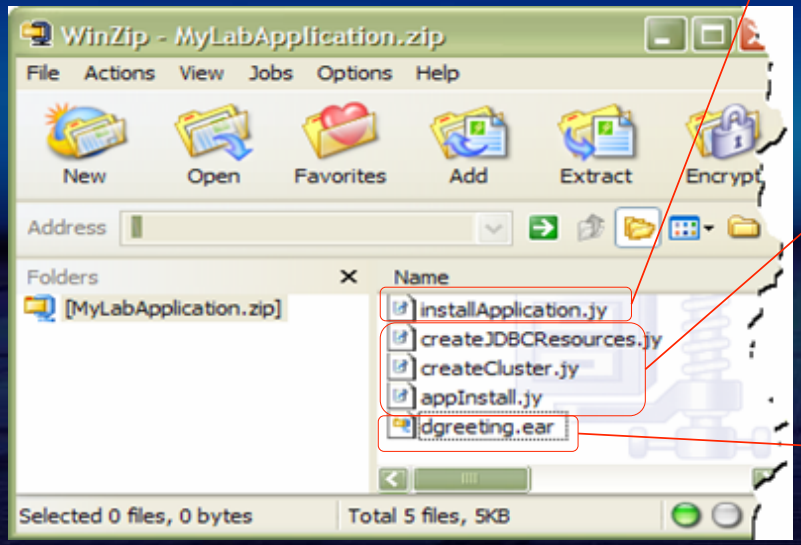
Work with Virtual images – Attributes

- Contains information specific to this virtual image such as
  - Which parts make up with virtual image
  - Which patterns and/or virtual systems are using parts from this virtual image
  - Who has been granted access to this pattern
- Extend and capture a virtual image

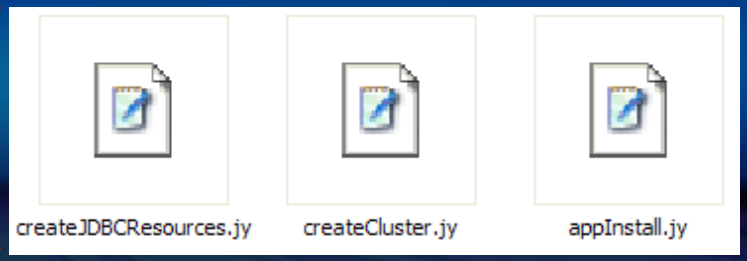


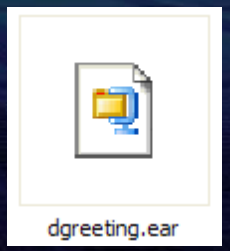
Adding a script package – Package format

- Script packages represent setup and configuration logic to be completed once the virtual system has been deployed – create JDBC resources, deploy app
- Zipped into a single binary
- Example contents of a script package:



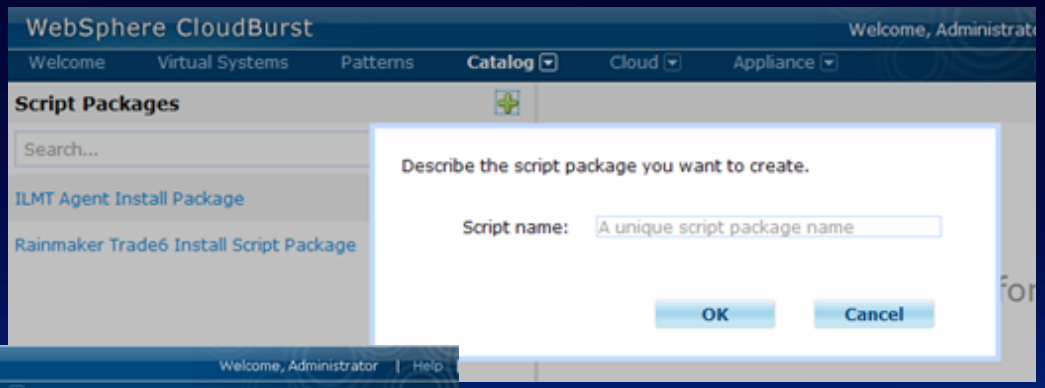

```
AdminTask.createApplicationServer('MyLabNode1', '[-name server1 -
templateName default -genUniquePorts true ]')

AdminApp.install('dgreeting.ear', '[ -cell MyLabCell -node MyLabNode1 -
server server1 -nopreCompileJSPs -distributeApp -
nouseMetaDataFromBinary -nodeployejb -appname greeting -
createMBeansForResources -noreloadEnabled -nodeployws -validateinstall
warn -noprocessEmbeddedConfig -filepermission
.*\.dll=755#.*\.so=755#.*\.a=755#.*\.sl=755 -
noallowDispatchRemoteInclude -noallowServiceRemoteInclude -
asyncRequestDispatchType DISABLED -nouseAutoLink]' )

AdminConfig.save()
```

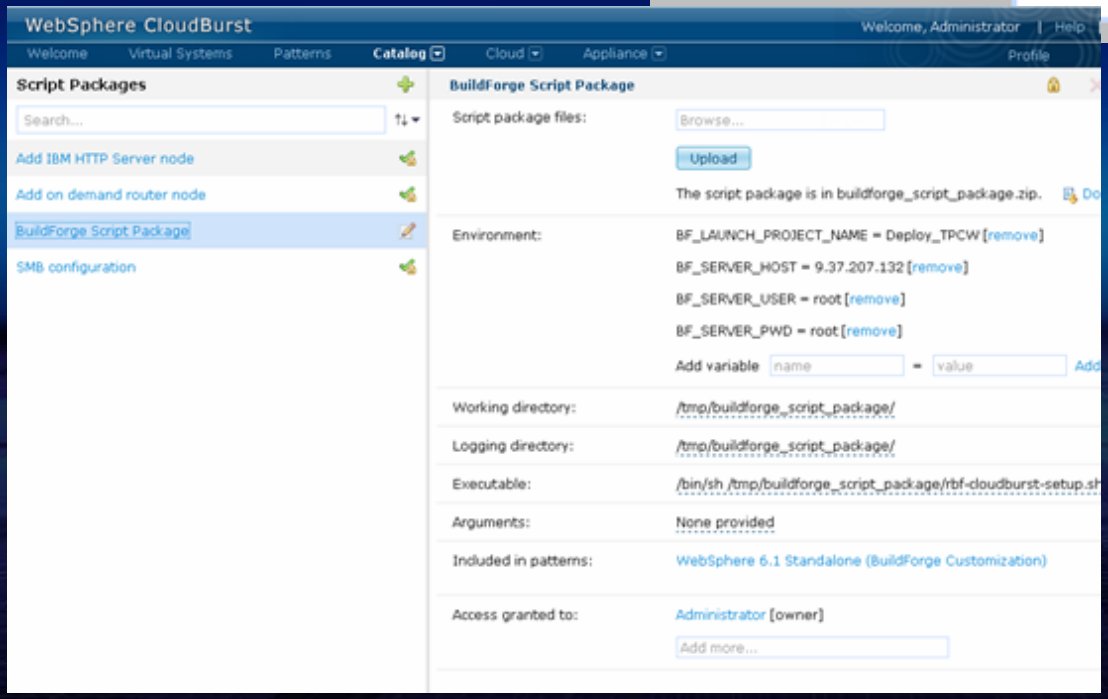




Adding a script package – Uploading the package

- Upload script package
- Create environment variables
- Specify an executable
- Supply arguments to the executable





Deployment patterns – Preloaded patterns

CloudBurst comes preloaded with a set of “best practices” patterns
- Can be used as is, or as the starting point for creating custom patterns

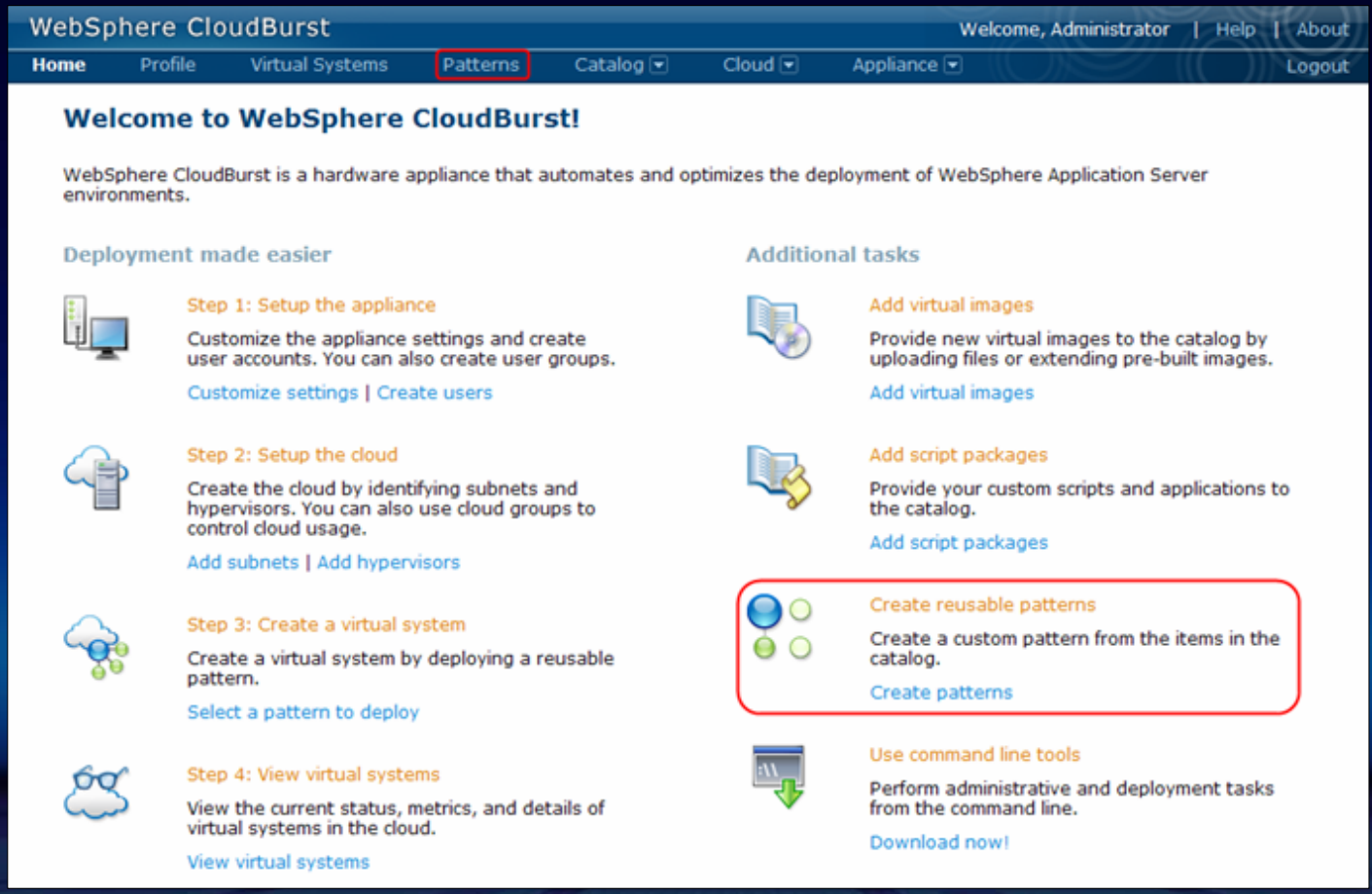
Sample preloaded patterns

WebSphere single server
- 1 Standalone server
- Total of 1 virtual machine

WebSphere cluster (development)
- 1 Deployment manager / IHS
- 2 Custom nodes
- Total of 3 virtual machines

WebSphere cluster (large topology)
- 1 Deployment manager
- 10 Custom nodes
- 4 IBM HTTP servers
- Total of 15 virtual machines

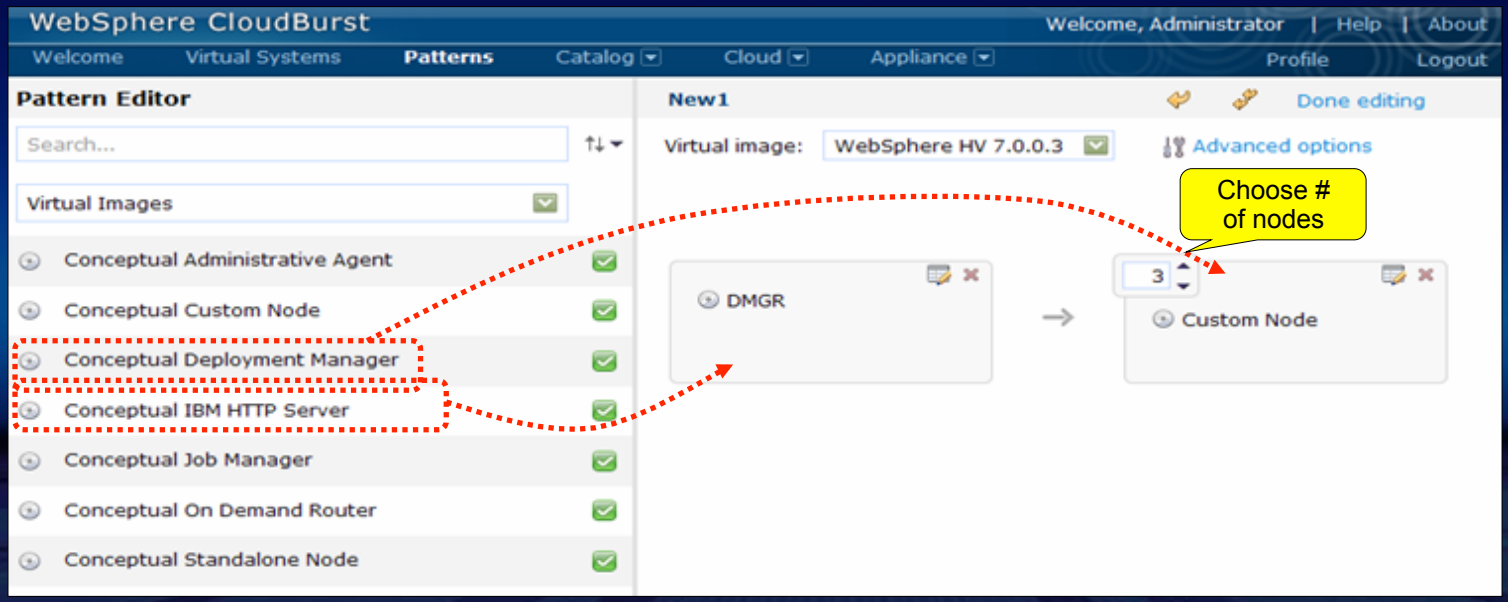
Deployment patterns – Create new pattern



- Patterns can be created from scratch, or by extending an existing pattern

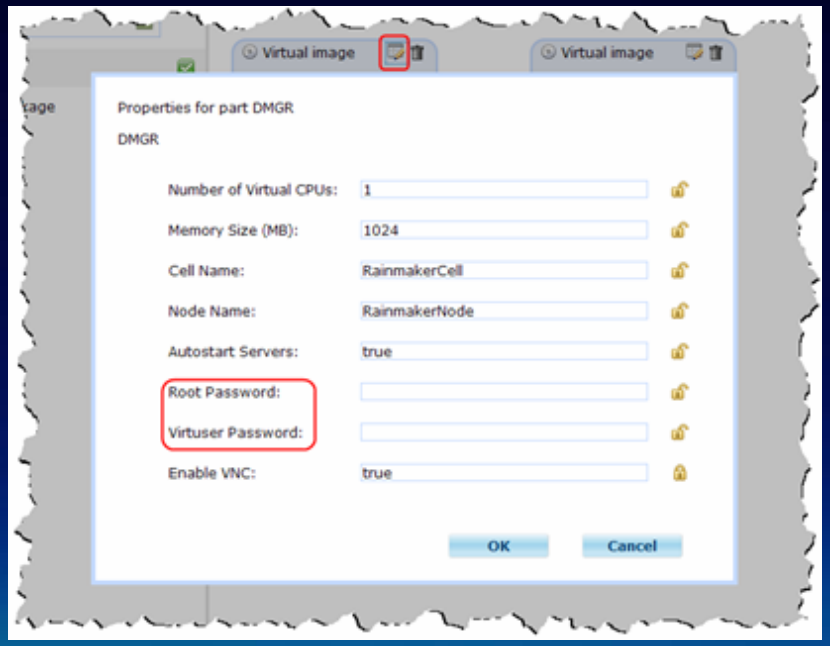
Deployment patterns – Editing topology

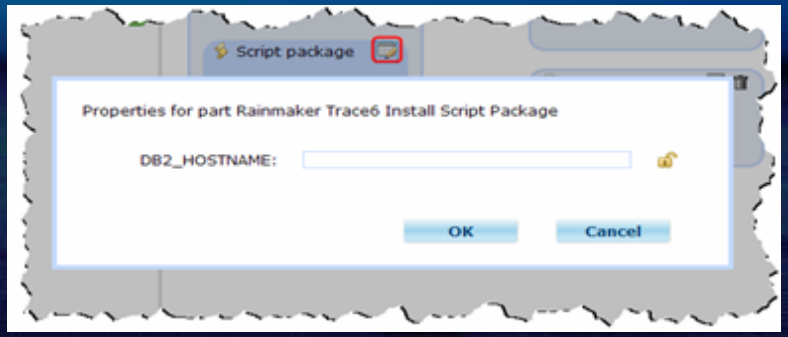
- Assemble patterns by dragging virtual image parts and script packages from the palette on the left and dropping them on to the canvas on the right



Deployment patterns -- Customizing pattern parts

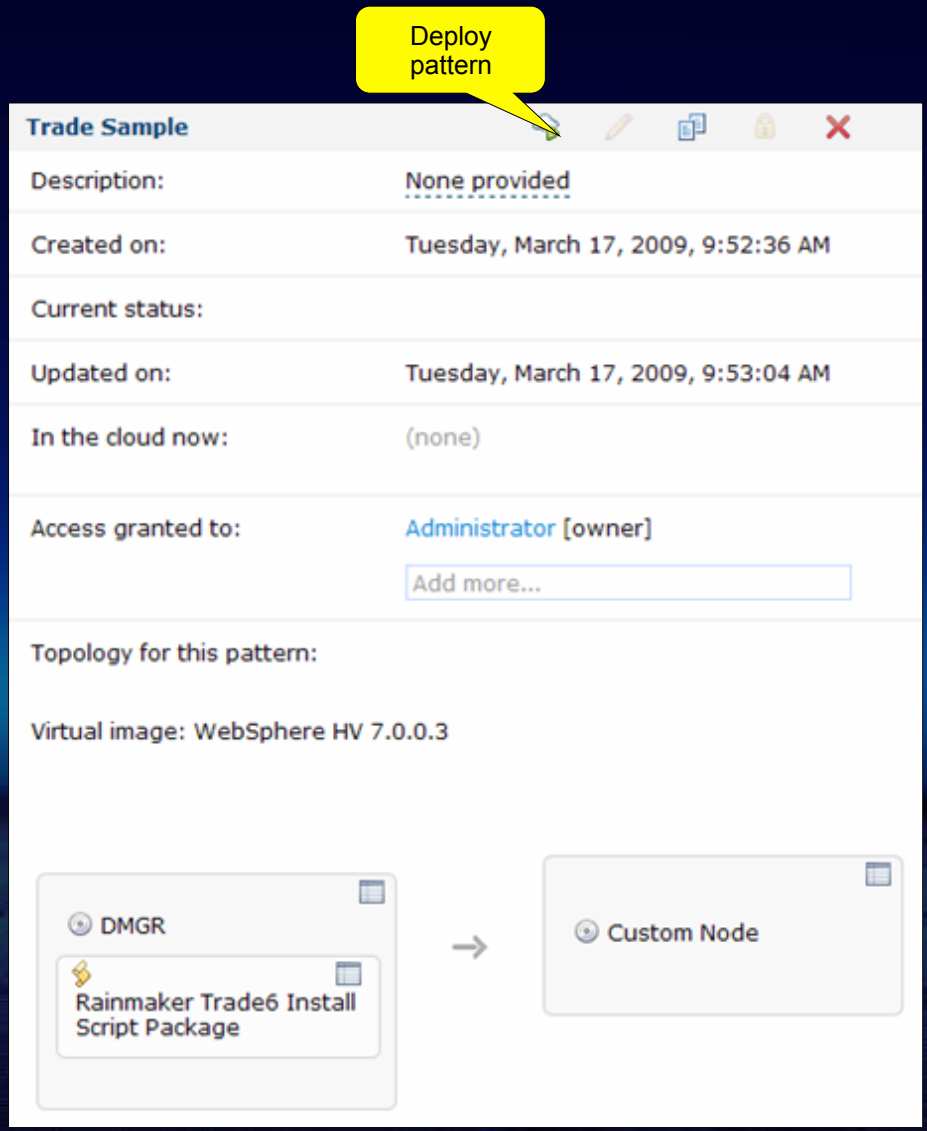
- Customize each server in the topology to suit environment
- Only two attributes are required
  - Root Password
  - Virtuser Password
- Customize script package environment variables
- Customize now or during deployment





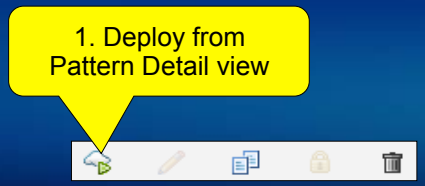
Deployment patterns – Attributes and options

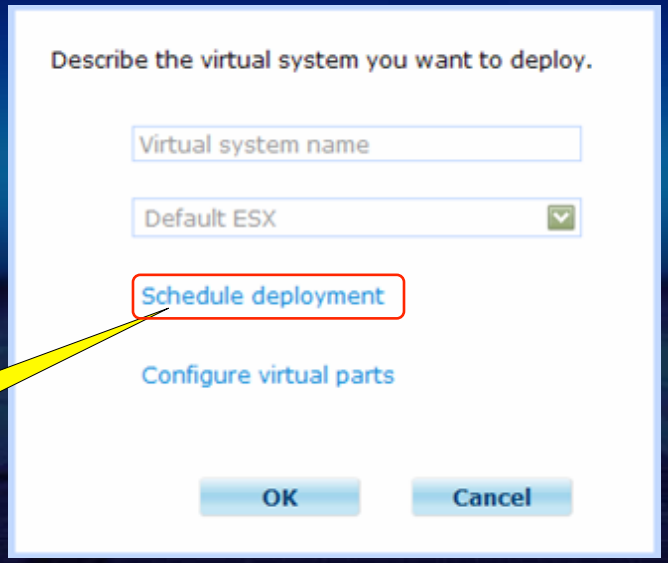
- Deploy, edit, clone, lock and delete your pattern
- View pattern topology
- View the virtual systems
- Permissions

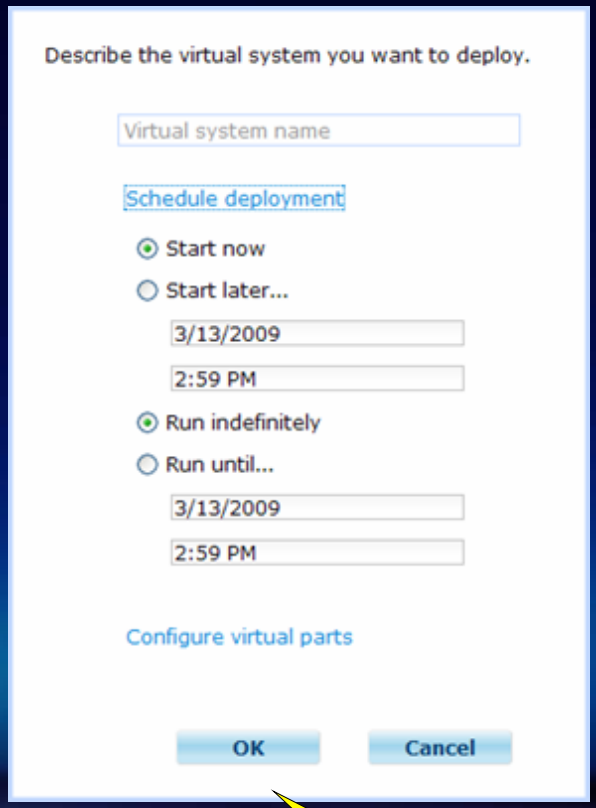


Deploy virtual systems – Now or later

- Deploy immediately
- Deploy at some later date and time
- Run forever or until some later date and time



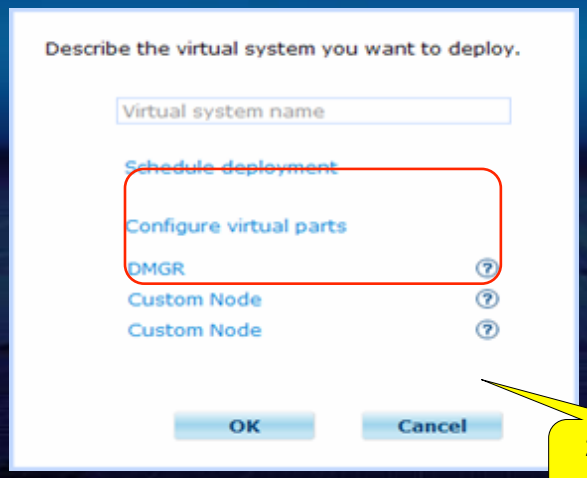




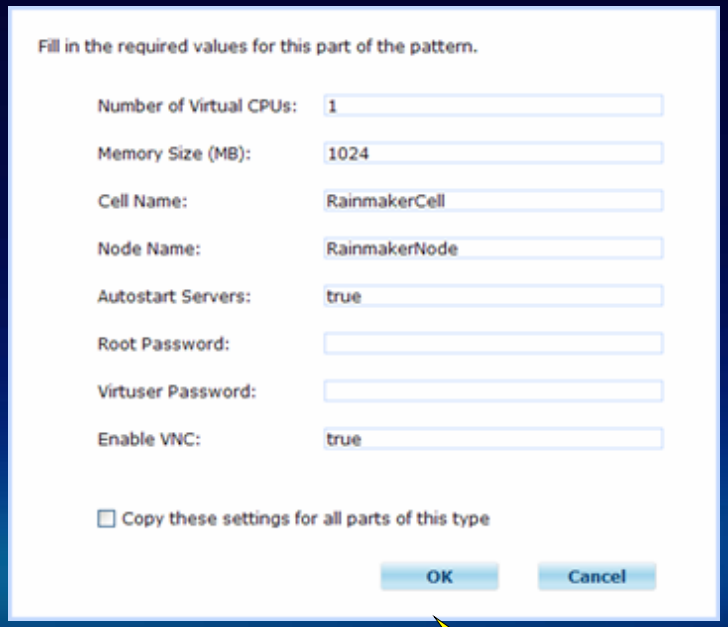
Deploy virtual systems – Optional configurations at deployment

- Configuration updates are specific to this deployment (virtual system)
- Root and Virtuser passwords are required for each deployment

1. Deploy from Pattern Detail view



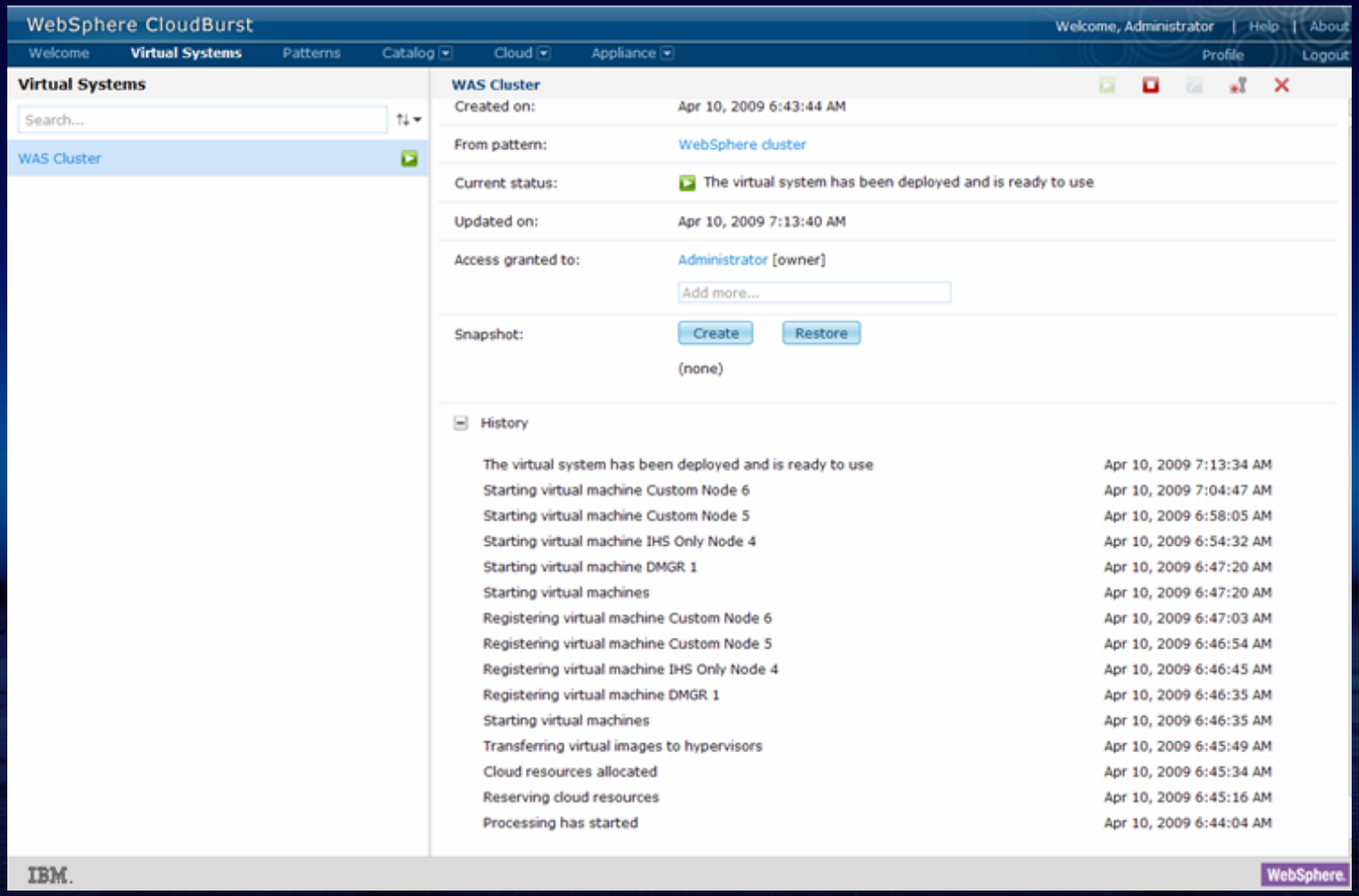
2. Click on part to configure



3. Configurable options

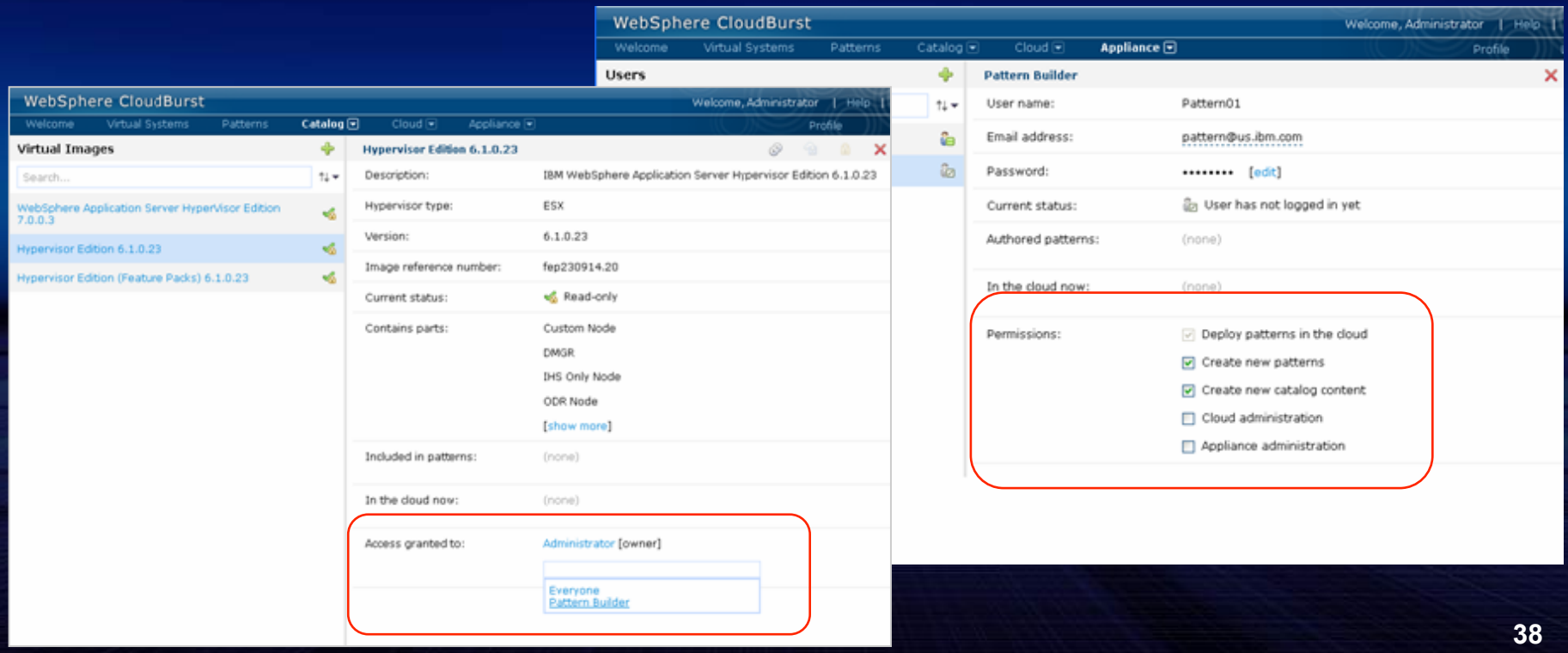
Drastically reduce setup & configuration time

- From clicking “deploy” to having a running system
  - Eg, 4 node cluster: 30 minutes



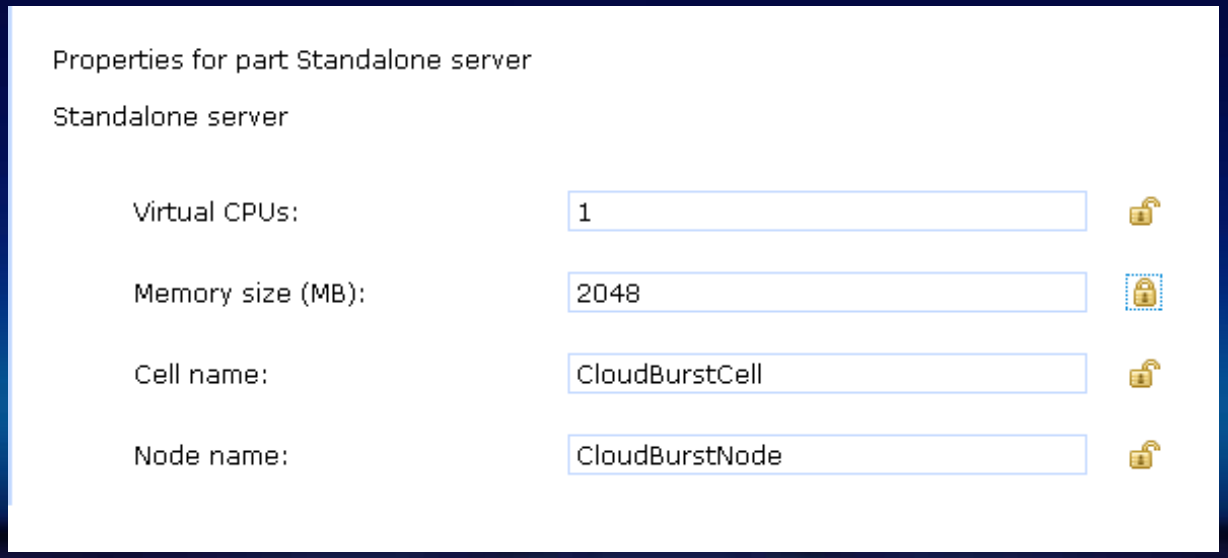
Security through the entire lifecycle

- SSH keys are stored in the appliance's secure vault
  - Protect images on disk in the appliance, on the wire while they're being dispensed, and in the cloud while they're running.
- Specify users and permissions at all levels:
  - Access to CloudBurst
  - View and edit rights of specific images and patterns
  - Passwords for dispensed virtual images



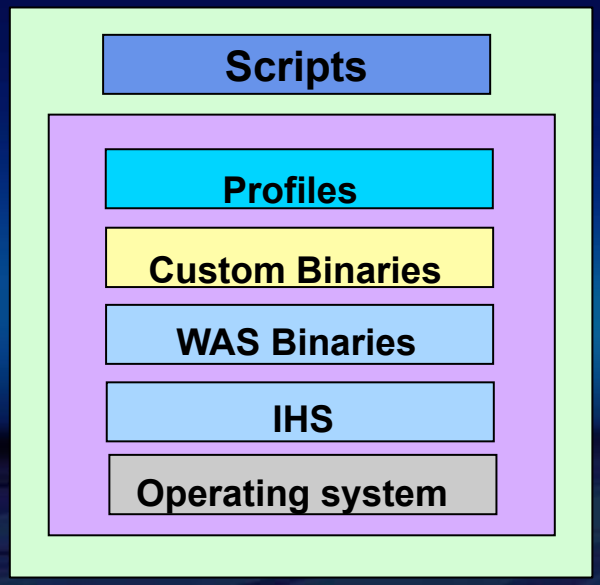
Reduce risk by codifying infrastructure

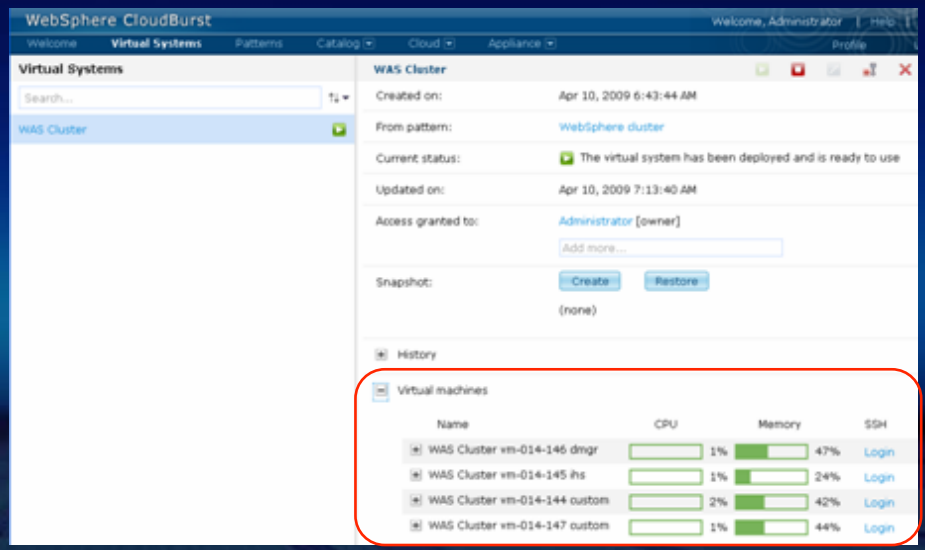
- "Lock" parameters, images, and patterns
- Freeze-dry best practices for repeated, consistent deployments



Simplify maintenance and management

- Flexibly manage, change, and update the components of your patterns
- Monitor Virtual System health from the CloudBurst console



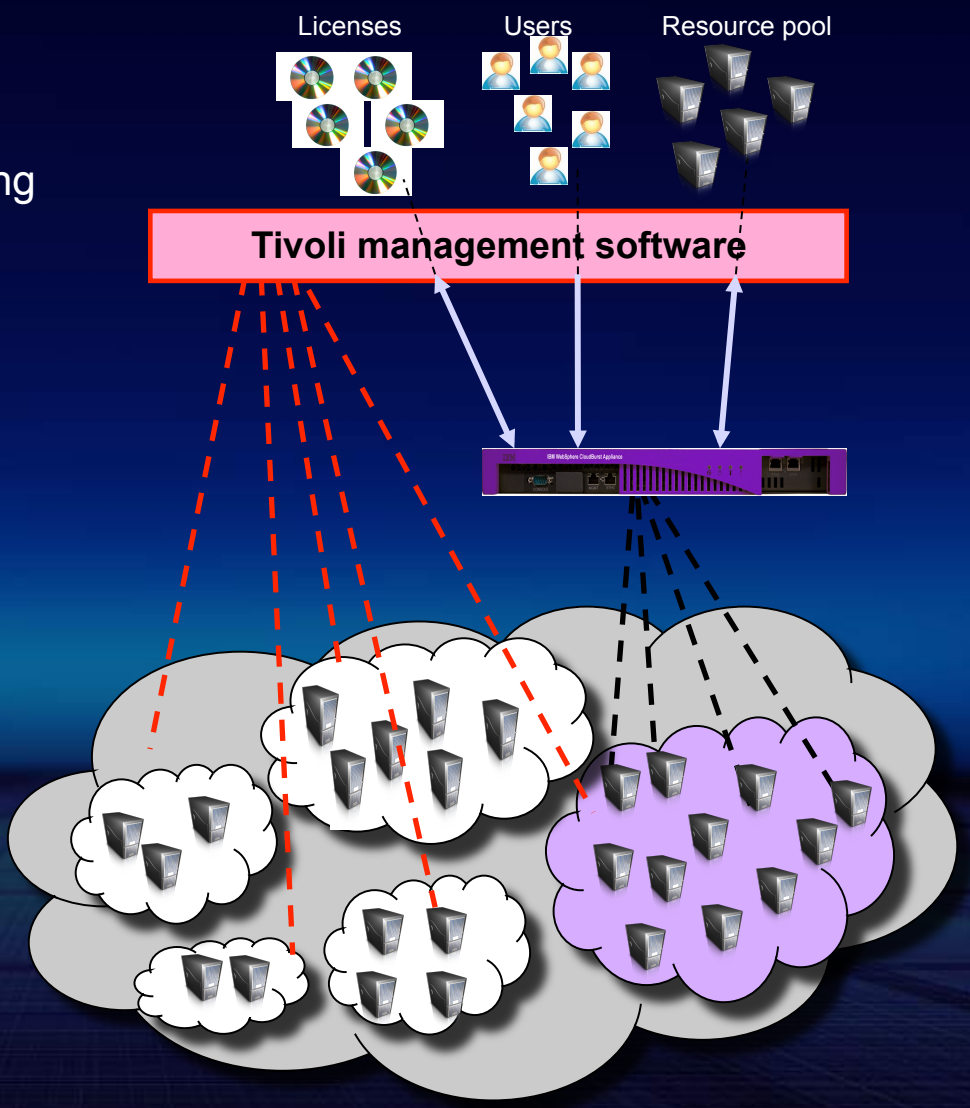


DataCenter Integration

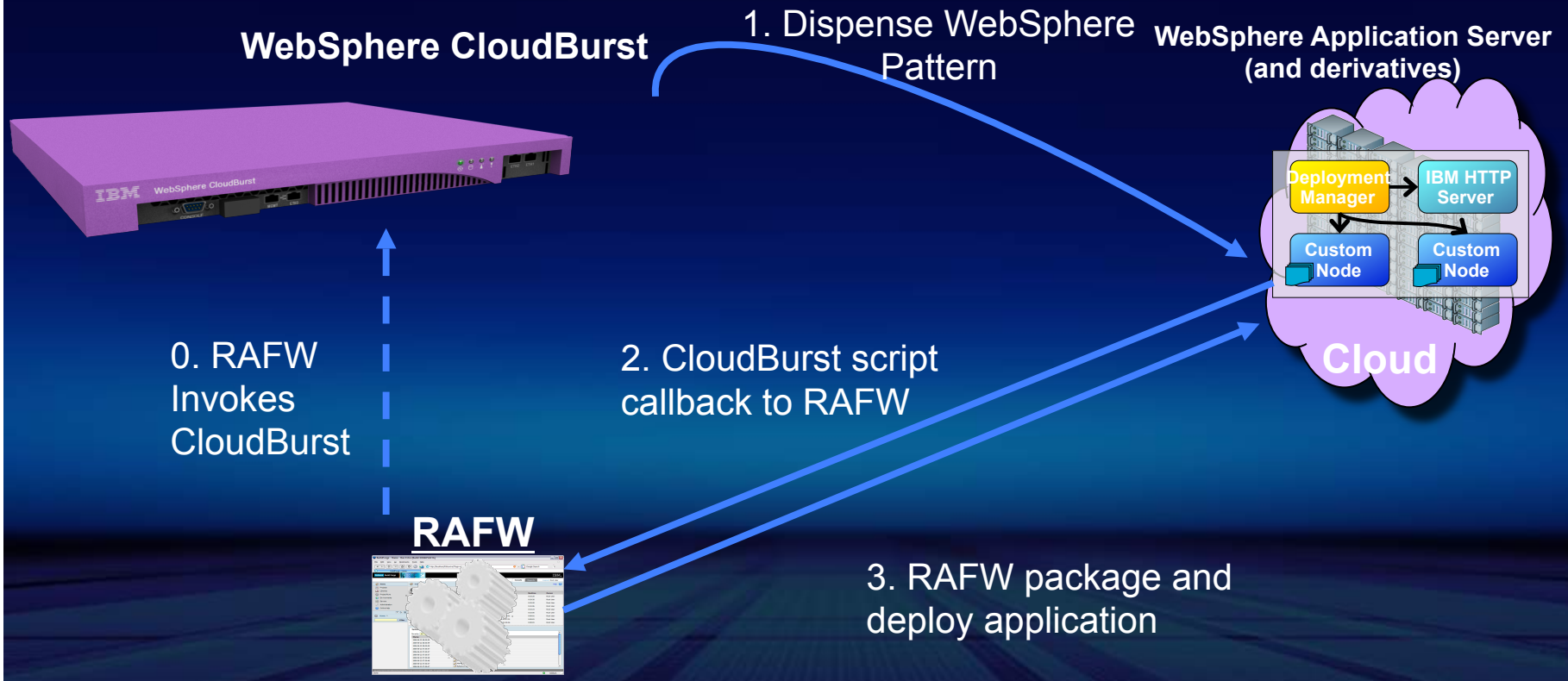
- The following charts provide an overview as to how WebSphere CloudBurst Appliance integrates with other IBM products.

Datacenter integration

- Automation / resource provisioning
- Monitoring
- User management
- License management



Rational Automation Framework for WebSphere and WebSphere CloudBurst



Note: This scenario can be extended to include additional Rational components including Rational Asset Manager, Rational AppScan, and Rational Software Architect

Backup

Server Virtualization Perspectives …

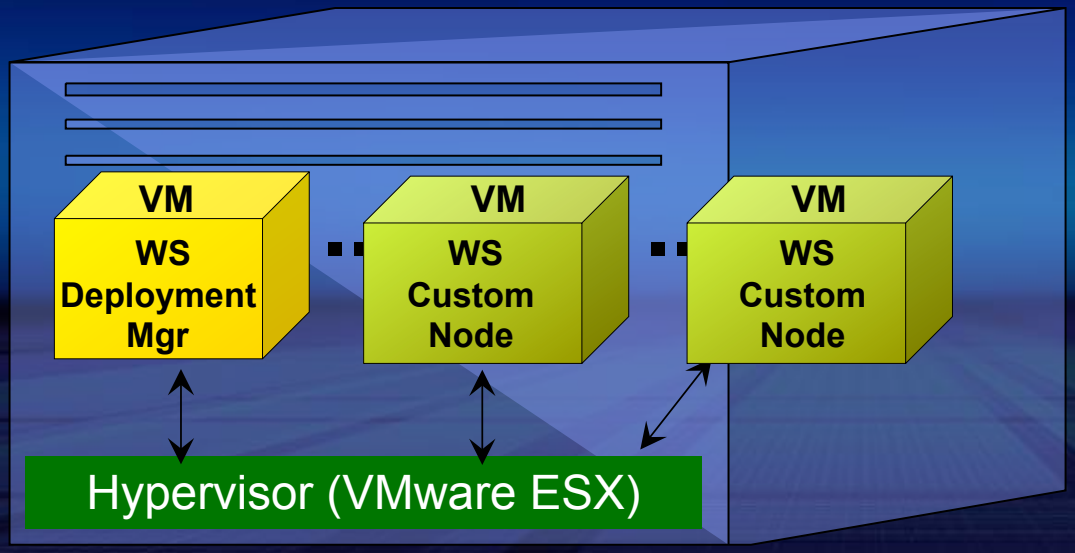
WebSphere CloudBurst Appliance and WebSphere Application Server Hypervisor Edition both leverage the benefits of server virtualization (specifically a type 1 Hypervisor - VMware ESX in first release)

Both offerings extend the benefits received beyond what you get if you just use a hypervisor like ESX alone

High Level Summary of Benefits of Server Virtualization

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**

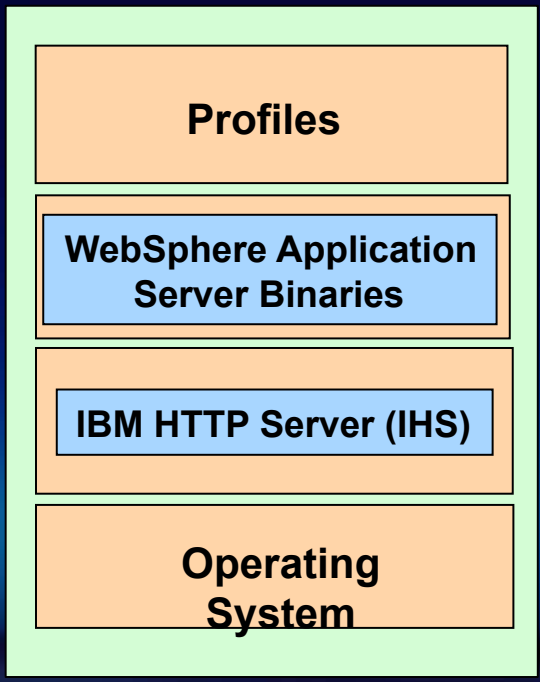


Both type 1 and type 2 hypervisors offer the server virtualization benefits above. Type 2 runs on top of the operating system and type1 is more efficient since it replaces the operating system while still providing multiple self-contained logical systems with their own operating sytsem to users.

WebSphere Application Server Hypervisor Edition Offers Customers Benefits beyond Server Virtualization

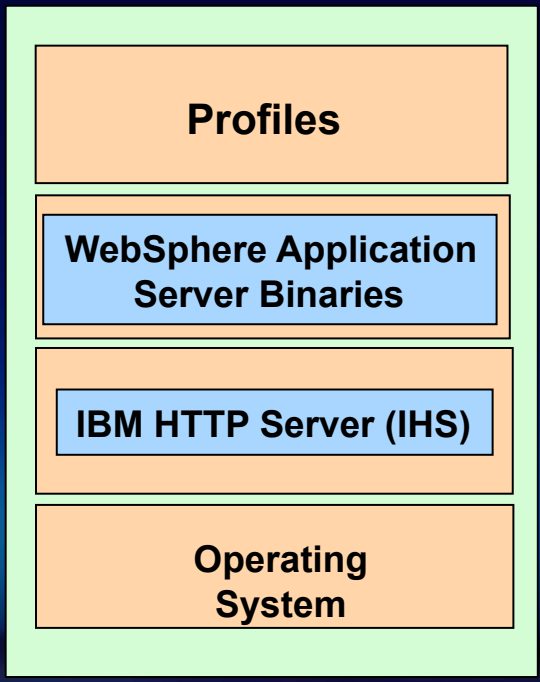
Offers the world-class clustering and high availability that WebSphere Application Server (WAS) offers and all the benefits of server virtualization plus

- Dramatically reduces time to install/config multiple images and keep them updated:
  - The operating system, the web server (HTTP Server), and WebSphere Application Server are already installed for you in a virtual image
  - WAS component profiles already created
  - Auto configs/tunes operating system and WAS following best practices.
  - Ability to create multiple virtual machines from the same virtual image saves on time to transfer images to/from disk, and the number of times an administrator needs to apply fixes/ modifications!



WebSphere Application Server Hypervisor Edition Offers Customers Benefits beyond Server Virtualization (*cont.*)

- Follows Open Virtualization Format (OVF) standards providing these benefits:
  - The image is compressed for rapid deployment over a network.
  - Platform independent (for release 1, SUSE 10.2 is the operating system or IBM services can assist with modifying for Red Hat. Additional platforms supported in the next release coming soon.)
  - Industry standard content verification and integrity checking, and provides a basic scheme for the management of software licensing. However, if you do not purchase WebSphere CloudBurst Appliance, you would have to write the code to perform the above



WebSphere CloudBurst Appliance Offers Everything that Server Virtualization and WAS Hypervisor Edition Offer plus:

- WebSphere Application Server systems can be deployed and ready to use in minutes vs days/weeks
- Time/cost saving examples:
  - Several common/best practice WebSphere system configurations ready to deploy out-of-box
  - Drag and drop components and/or scripts to quickly create new system configurations (“patterns”)
  - Move, deploy, config/tune a virtual system in a few clicks/seconds of effort
  - Allows management via the web (Web 2.0), Command Line, or REST APIs
  - Avoids repetitive application of fixes and other changes desired in multiple systems
- User/group security for image management functions
- Appliance form factor provides additional consumability, performance, and security

WebSphere CloudBurst Appliance Offers Everything that Server Virtualization and WAS Hypervisor Edition Offer plus: (*cont*.)

- Automatically makes smart decisions on where to deploy images based on CPU, memory, and disk available on the servers in the cloud of resources available Cloud resource utilization monitoring and reporting
- Data on user usage of virtual systems and cloud resources for charge back
- Integration with IBM License Metric Tool for sub-capacity license tracking
- Backup/restore (of images, scripts, patterns, user security permissions,…)

There is integration with Tivoli and RAFW