

What's new in WebSphere Application Infrastructure?

Jonathan Marshall

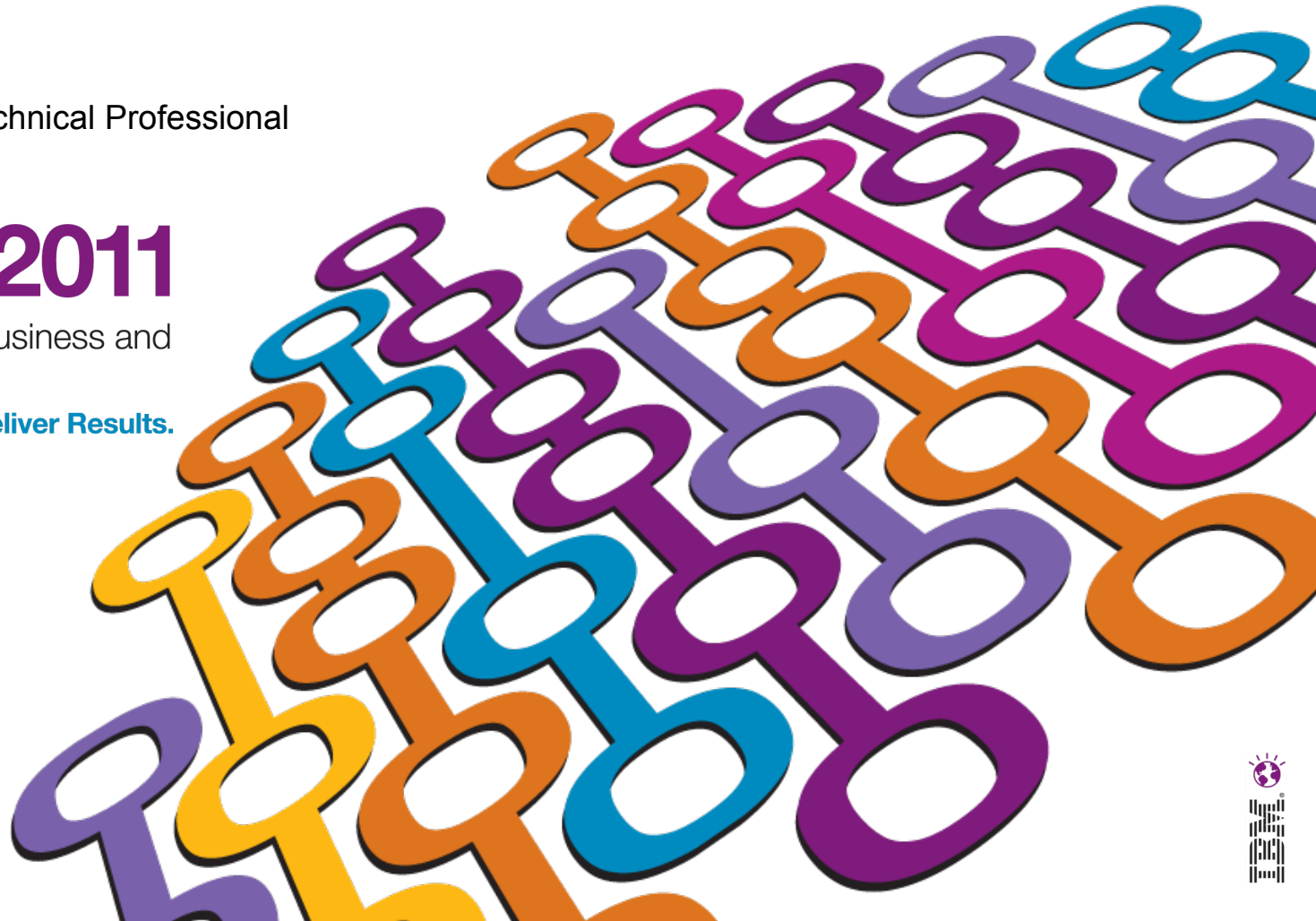
WebSphere Client Technical Professional

IBM Software

Impact2011

Changing the Way Business and
IT Leaders Work

Optimize for Growth. Deliver Results.





IT organizations must become agile while providing higher quality applications under resource constraints



Doing more with less

Reduce capital expenditures and operational expenses



Higher quality applications

Improve quality of applications and deliver new applications that help the business grow and reduce costs

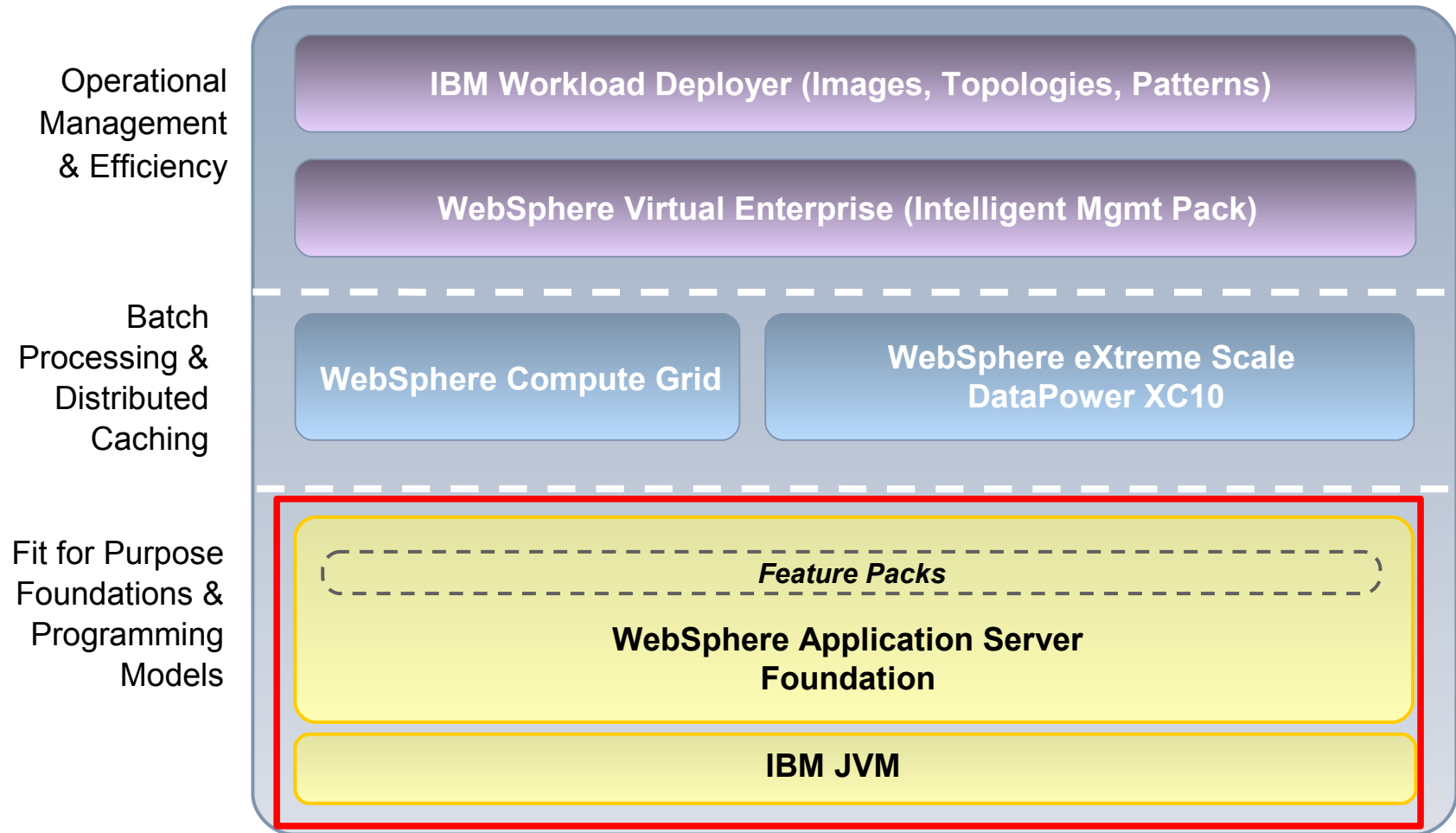


Breakthrough agility

Increase ability to quickly deliver new applications to capitalize on opportunities while containing costs and managing risk



WebSphere Application Infrastructure: The Big Picture





WebSphere Application Server Family

WebSphere Application Server for Developers

Enables efficient development of innovative applications that will eventually run on WAS in production

Also available as a no-charge edition for the developer desktop

WebSphere Application Server Hypervisor Edition

Optimized to instantly run in VMware and other server virtualization environments

WebSphere Application Server Network Deployment

Delivers near-continuous availability, with advanced performance and management capabilities, for mission-critical applications

WebSphere Application Server for z/OS

Takes full advantage of the z/OS Sysplex to deliver a highly secure, reliable, and resource efficient server experience

WebSphere Application Server

Provides secure, high performance transaction engine for moderately sized configurations with web tier clustering and failover across up to five application server profiles

WebSphere Application Server - Express

A lower-cost, ready-to-go solution to build dynamic Web sites and applications

WebSphere Application Server Community Edition

An open source-based, small footprint foundation with no up-front acquisition costs

Built on a common code base



WebSphere Application Server v8

eGA – June 17th



Speed Delivery of Applications & Services

- Open Source to Enterprise
- Free WAS for Developers
- Self Service Development Environments
- Faster Edit-Compile-Debug
- Programming Models
 - Java EE 6
 - Web 2.0 & Mobile
 - OSGi Applications
 - SCA
 - Java Batch
 - XML
 - SIP & CEA
 - Dynamic Scripting
- Integrated Tooling
- Application Adapters

Operational Efficiency & Reliability

- High Performance
- Transactional Strength
- Scalability & HA
- Install & Maintenance
- Problem Determination
- Platform & Environment Flexibility
- Flexible Pricing Models
- Feature Packs

Security & Control

- Administrative Productivity
- OSGi Application Agility
- Security
- Migration

Intelligently Manage Application Environments & Deliver Rich User Experiences Faster



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Java EE 6

Simplify standards-based enterprise Java development for dept. to core business apps

Enhanced developer productivity, user experiences, performance & integration:

- **Enterprise JavaBeans (EJB) 3.1:** Enhanced developer productivity through simplification including testing outside of the application server, new timer support & async enhancements
- **Contexts and Dependency Injection for Java (CDI) 1.0:** Faster time to value through tighter and simpler integration between Web & business logic tiers
- **Java Persistence API (JPA) 2.0:** Enhanced developer ease of use & app performance through improved locking, mapping support & dynamic query construction
- **Java Servlet 3.0:** Enhanced time to value through annotations and ease of integrating third party presentation frameworks
- **Java API for RESTful Web Services (JAX-RS) 1.1:** Deliver better user experiences faster through integrated Web 2.0 prog model support
- **JavaServer Faces (JSF) 2.0:** Enhanced developer productivity & end user experience through annotations & Facelets support
- **Bean Validation 1.0:** Improved developer productivity through declarative means for describing validation constraints for data
- **Java Architecture for XML Binding (JAXB) 2.2:** Improved performance via new default marshalling optimizations
- **Enterprise Web Services 1.3:** Improved integration and reuse support
- **Java API for XML-Based Web Services (JAX-WS) 2.2:** Developer productivity and security enhancements





Monitored Directory Support

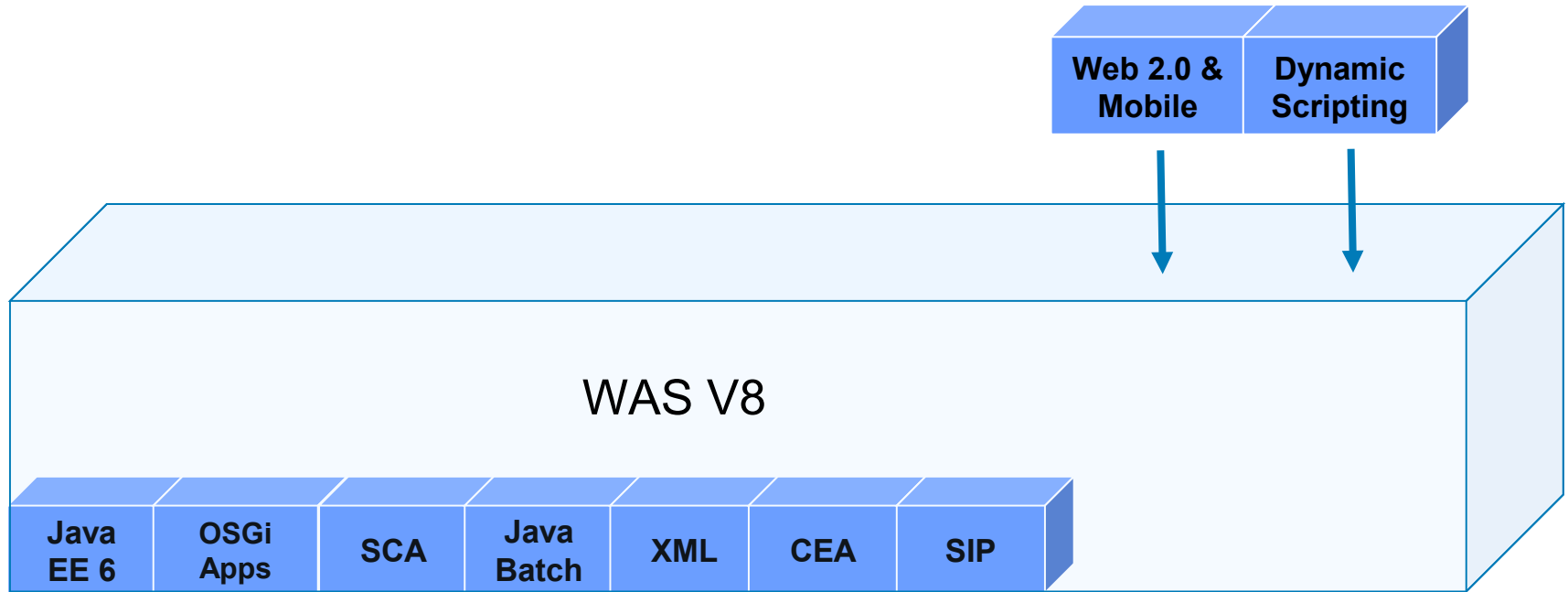
Accelerate edit-compile-debug tasks during the development lifecycle

- Enhanced developer productivity through new monitored directory-based application install, update and uninstall of Java EE applications
- Drag & drop and command line support
- Supported with WAS Express, Base, ND & z/OS
- Supported file types:
 - EAR (Enterprise Archive)
 - WAR (Web Application Archive)
 - JAR (Java Archive)
 - SAR (SIP Application Resource)





Broad Set of Integrated Standards-Based Programming Models





Bring the Power of WAS to Your Mobile Users



- Extend the reach of WAS applications from the Desktop to Mobile devices
- Satisfy end user demand for better “anytime, anywhere” access
- Speed time to value through cross device web browser support
- Access to device services
- Development tool support from Rational Application Developer



New!

**IBM WAS
Feature Pack for
Web 2.0 and
Mobile**



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High Performance

Enhanced!



Reduce TCO through higher performance application foundations

- **Java 6**
 - JVM runtime enhancements
 - JIT optimizations
- **Application Performance Improvements vs. WAS v7**
 - DayTrader: Up to 20%
 - OSGi Applications: Up to 26%
- **End-to-end performance improvements vs. WAS v7 including**
 - Up to 15% faster product installations
 - Up to 20% faster server startup time for developers
 - Up to 69% faster application server creation in a large topology
 - Up to 31% faster application server cluster creation in a large topology
 - Up to 22% faster application deployments in a large topology
 - Up to 11% better vertical scaling on larger multi-core systems
 - JPA 2.0 optimizations with DynaCache and JPA Level 2 cache



Performance data is based on WebSphere Application Server in a distributed environment

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput or performance that any user will experience will vary depending upon many factors, including considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve results similar to those stated here.

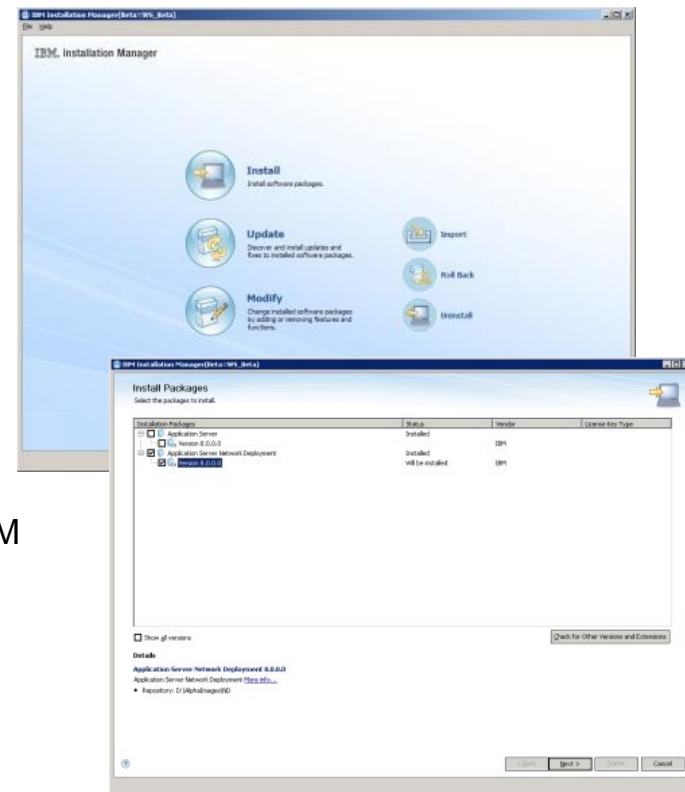
IBM Installation Manager

New!



Faster time to value & lower operational costs through new install & maintenance tech.

- Full local & centralized product lifecycle management:
 - Install/Uninstall
 - Update/Rollback (Fixpacks and iFixes)
 - Modify (Add/Remove features)
- Installs exactly the desired level of service in one pass
- GUI & response file modes of operation
 - Response files can be recorded from the GUI or created by specifying the appropriate xml
- Single user experience across WAS, WAS components & various IBM products
 - A single instance of IIM can manage the product lifecycle for any IM based products, from WebSphere, Rational, etc.
 - Support for WAS, IHS, WCT, etc.
- Centralized Installation Manager V8 is available from Job Manager & DM
 - Remotely install WebSphere Application Server, IBM HTTP Server, Application Clients, DMZ Security Proxy Server, and Web Server Plug-ins



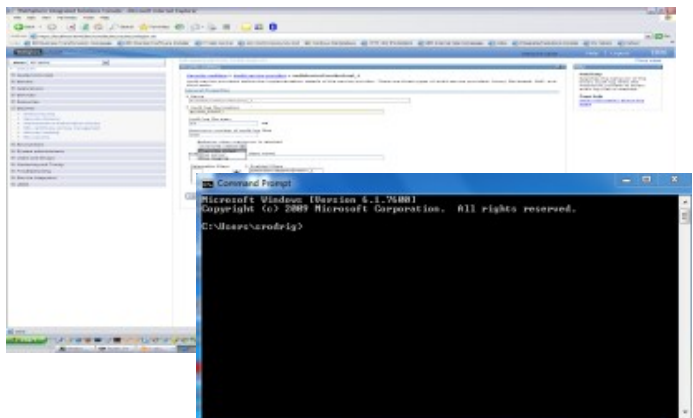


High Performance Extensible Logging (HPEL)

Improve performance & ease of use of log & trace to improve problem determination

Key Features:

- Speeds up logging and tracing
 - Log primitive over 6x faster than WAS v7
 - Trace primitive 3.8x faster than WAS v7
- Provides more flexible access to log and trace data
 - Command-line access to filter and format
 - Administrative console GUI to filter and format local or remote logs and trace, even when the remote server is down
 - Programmatic access to filter, format, and merge local or remote logs and trace
- Works with existing application log and trace instrumentation
- Provides a common solution for z/OS and distributed platforms



Examples:

View only warning and higher msgs for this one application:
`logViewer.sh -minLevel warning -includeLoggers "com.acme.app1.*"`

View msgs from 07/11/2010 onward beginning with SEC on thread 0x000000c:
`logViewer.sh -startDate 07/11/2010 -message "SEC*" -thread 0c`



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Administrator Productivity Enhancements

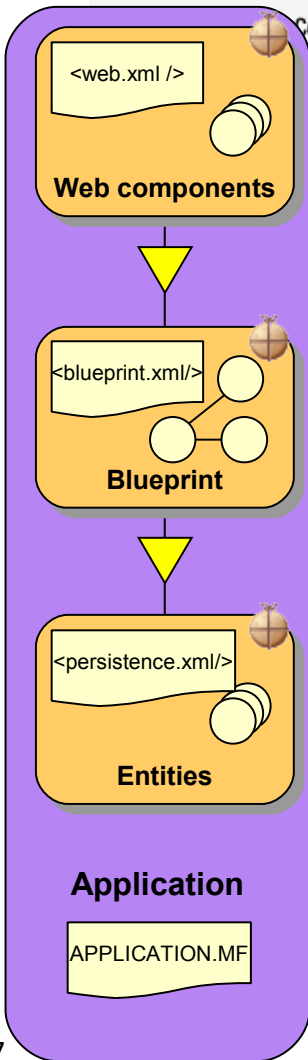
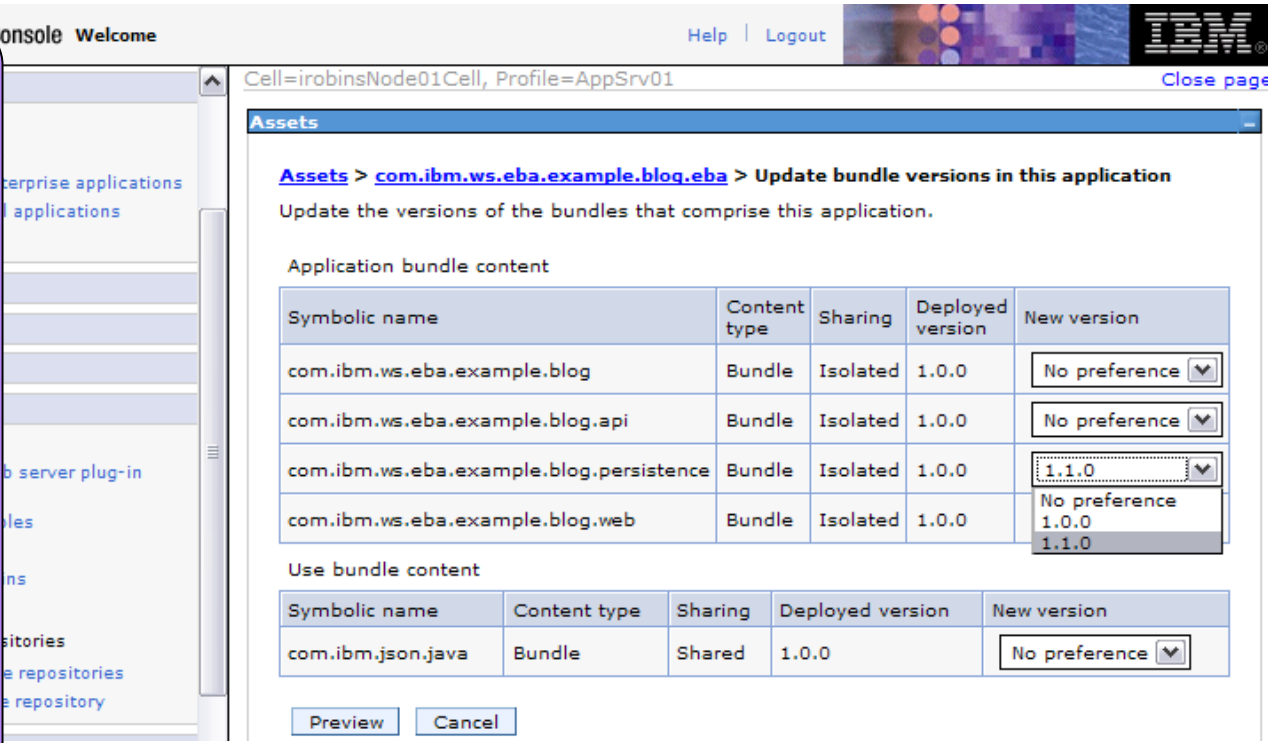
Improve administrator productivity and minimize down time

- Template-based cell creation and enhanced portability of Properties File Based Configuration to speed and standardize customizations across different cells
- Move and recover nodes to increase environment flexibility and resilience
- Job Manager enhancements to simplify the creation, augmenting and deletion of profiles on remote nodes
- Administrative option for all platforms to list all SDKs in use and select SDK to use amongst supported Java SDKs



Dynamic Application Update of OSGi Apps

Rapidly extend applications to meet new business requirements with reduced down time

The screenshot shows the IBM WebSphere console interface. The main content area is titled "Assets" and displays the path `Assets > com.ibm.ws.eba.example.blog.eba > Update bundle versions in this application`. Below this, there is a table for "Application bundle content" and a table for "Use bundle content".

Symbolic name	Content type	Sharing	Deployed version	New version
com.ibm.ws.eba.example.blog	Bundle	Isolated	1.0.0	No preference
com.ibm.ws.eba.example.blog.api	Bundle	Isolated	1.0.0	No preference
com.ibm.ws.eba.example.blog.persistence	Bundle	Isolated	1.0.0	1.1.0
com.ibm.ws.eba.example.blog.web	Bundle	Isolated	1.0.0	No preference

Symbolic name	Content type	Sharing	Deployed version	New version
com.ibm.json.java	Bundle	Shared	1.0.0	No preference

Buttons for "Preview" and "Cancel" are visible at the bottom of the update dialog.

- Administratively preview new bundles before making updates
- In-place bundle update enables application to remain continuously available throughout the update process





Security Enhancements

Utilize a more secure environment out of the box

- Security hardening
 - Require SSL communication for RMI/IIOP communication by default
 - Enable session security by default
 - Enable cookie protection via HttpOnly attribute to reduce cross-site vulnerabilities



- Multiple Security Domains supports the Federated Repository (VMM) to provide enhanced security control
- Fine-grained administrative security; Users can be defined with administrative roles on specific resources:
 - Cells, node groups, nodes, clusters, servers, and applications

Integrated Solutions Console Welcome ms:imfd

Application servers

Application servers

Use this page to view a list of the application servers in your environment page to change the status of a specific application server.

Preferences

You have Administrator authority with the following resources:

Select	Name	Node	Ver:
<input type="checkbox"/>	myserver	capehatterasNode01	ND
<input type="checkbox"/>	server1	capehatterasNode01	ND
<input type="checkbox"/>	serverdiunh	capehatterasNode01	ND

You have Monitor authority with the following resources:

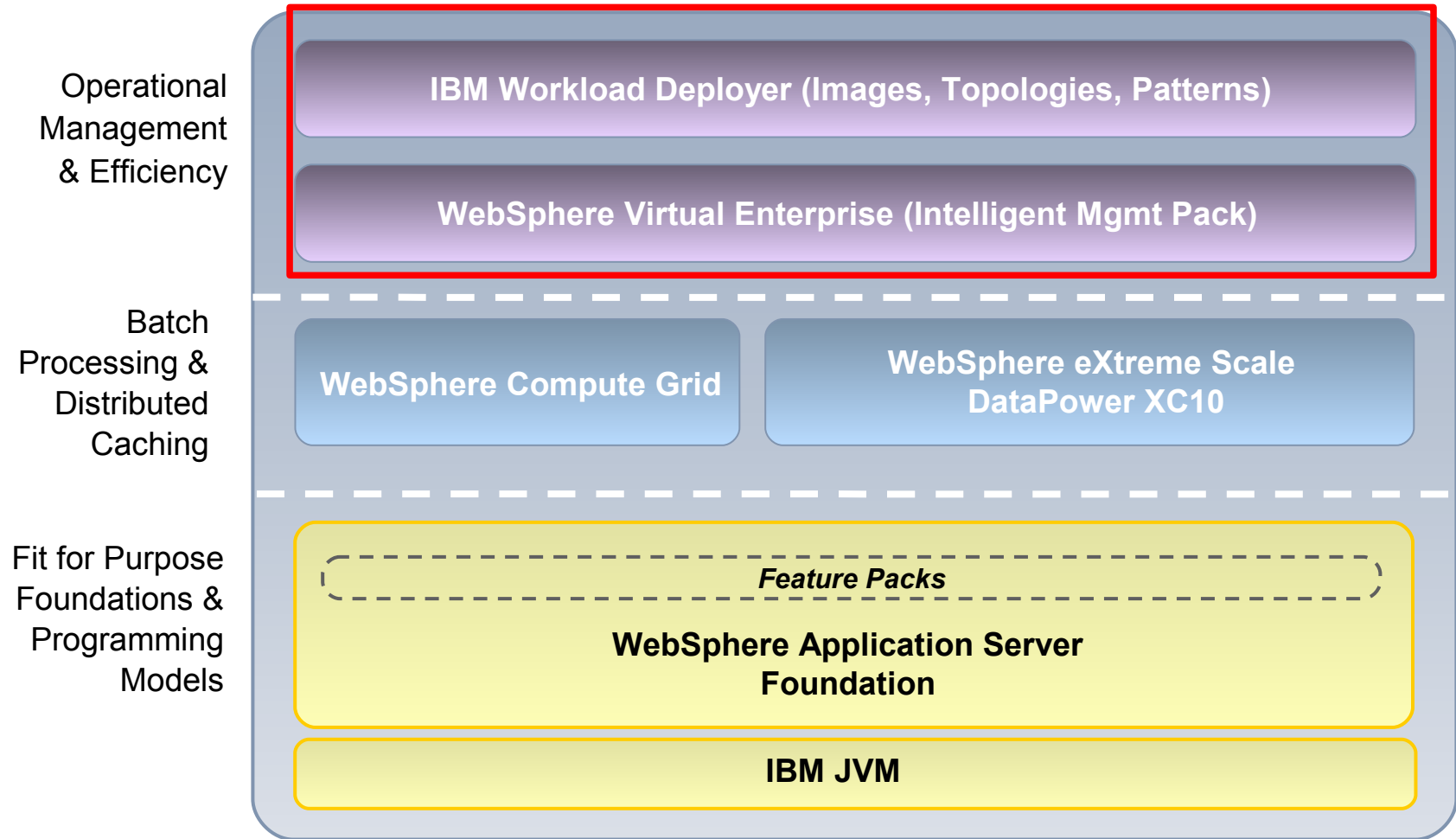
Templates...

Select	Name	Node	Ver:
<input type="checkbox"/>	servernfcinf	capehatterasNode01	ND

Total 4



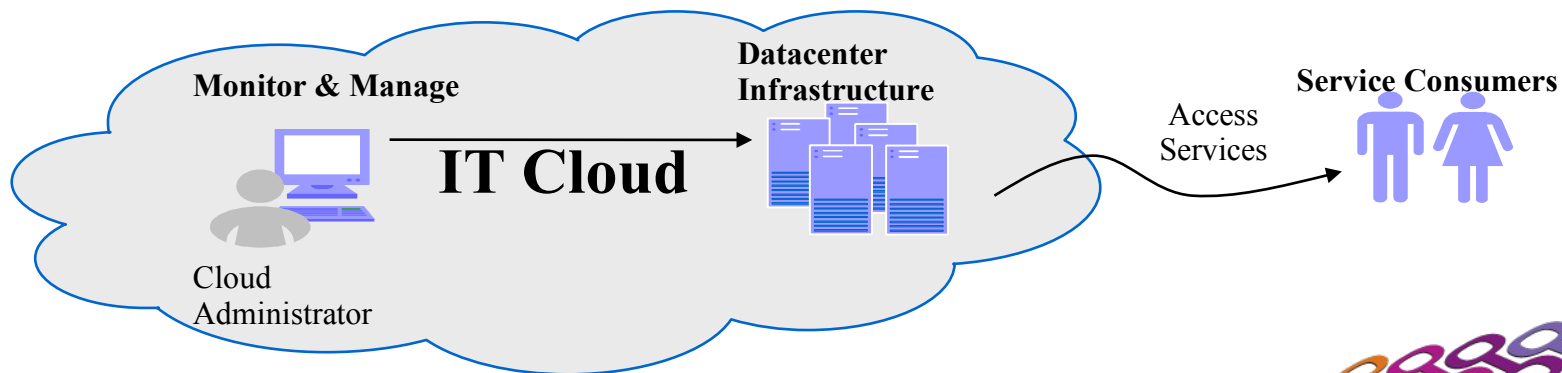
WebSphere Application Infrastructure: The Big Picture





Inefficiencies in today's middleware environments

- Takes too long to setup application environments
 - ~4-6 weeks
- Configuration drift is a major problem in application promotion
 - ~30% of bugs caused by changes in configuration
- Resources in the data center are significantly underutilized
 - ~85% idle in distributed data centres
- Spend more on maintenance than building new capability
 - ~70% of IT spend goes to keeping things running



IBM Workload Deployer

Next Generation Appliance
Replaces existing WebSphere
CloudBurst Appliance offering



Topology Patterns

Deployment of optimized product configurations (Hypervisor Edition products + base patterns) using IBM best practices.

Appliance form factor

Product Patterns

Hypervisor Edition Images

Workload Patterns

Workload Patterns

Deployment of workload patterns as integrated solutions delivered with integrated management and monitoring.



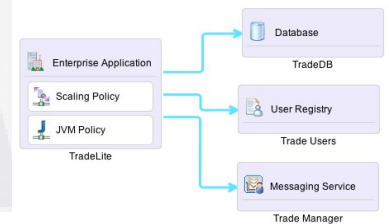
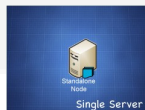
x86

System p

System z
(z/Linux)

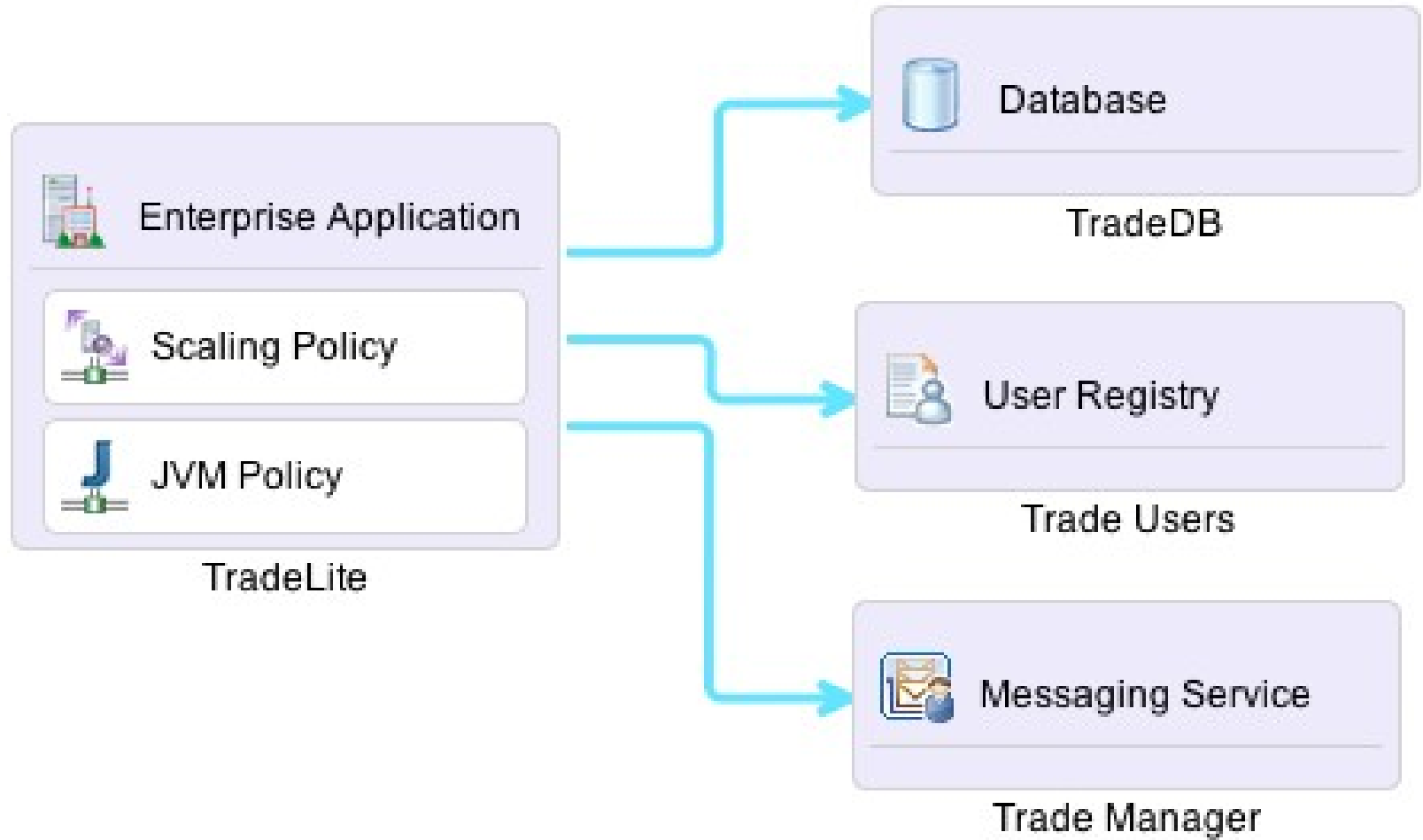
x86

Bring your own hardware





The Simplicity of Workload-Centric Cloud





Workload 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

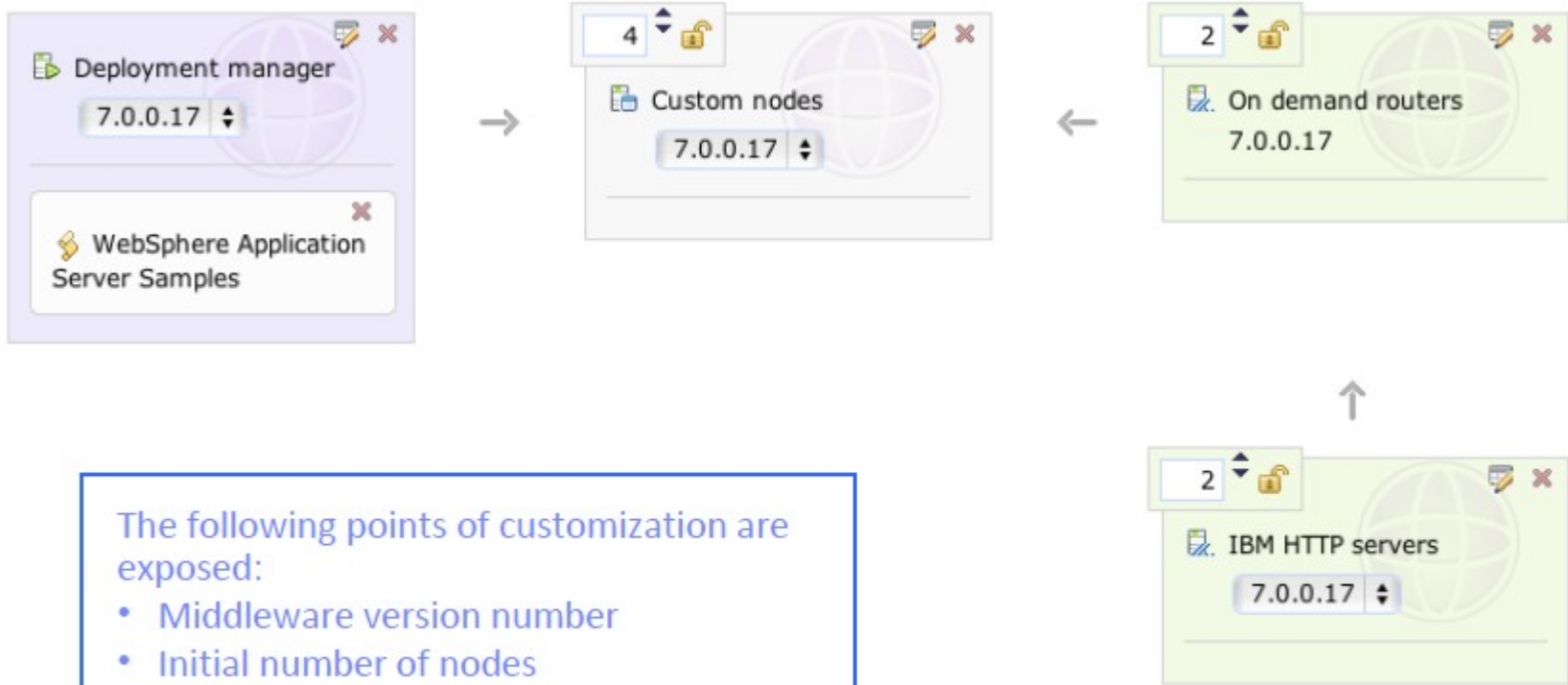
Monitoring

All components of workload pattern environments are monitored by IBM Workload Deployer





Topology Pattern-based Deployment



The following points of customization are exposed:

- Middleware version number
- Initial number of nodes
- Arbitrary script package execution

IBM Workload Deployer new capabilities include:

- VM mobility
- IP & Naming control
- Larger storage

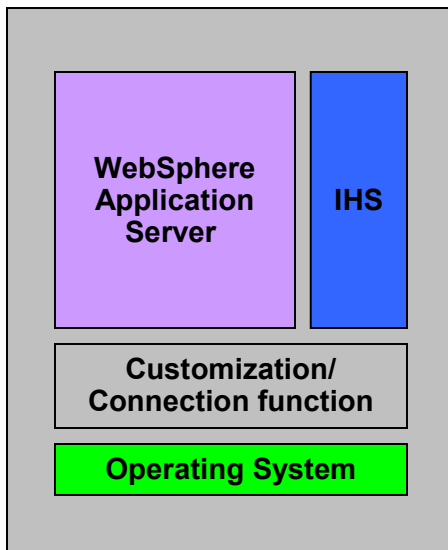




IBM Hypervisor Edition Products

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

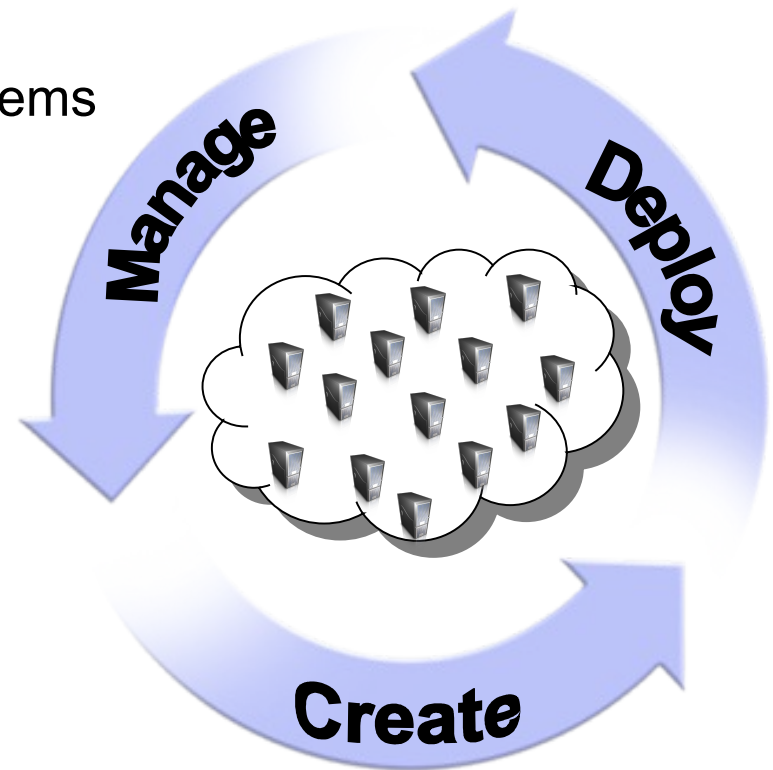
WebSphere Portal Hypervisor Edition

DB2 Enterprise Edition



Life cycle in the on-premise cloud

- Create WebSphere environments
 - Use or customise Hypervisor Images
 - Create WebSphere patterns
- Deploy WebSphere patterns as virtual systems
 - Provide custom deployment information
- Self-service life-cycle
 - Monitor resource usage
 - Start, stop, and remove virtual systems
 - Create snapshots of virtual systems
 - Apply fixes and service level upgrades
 - Manage software license use



Ubiquitous operational excellence

*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*



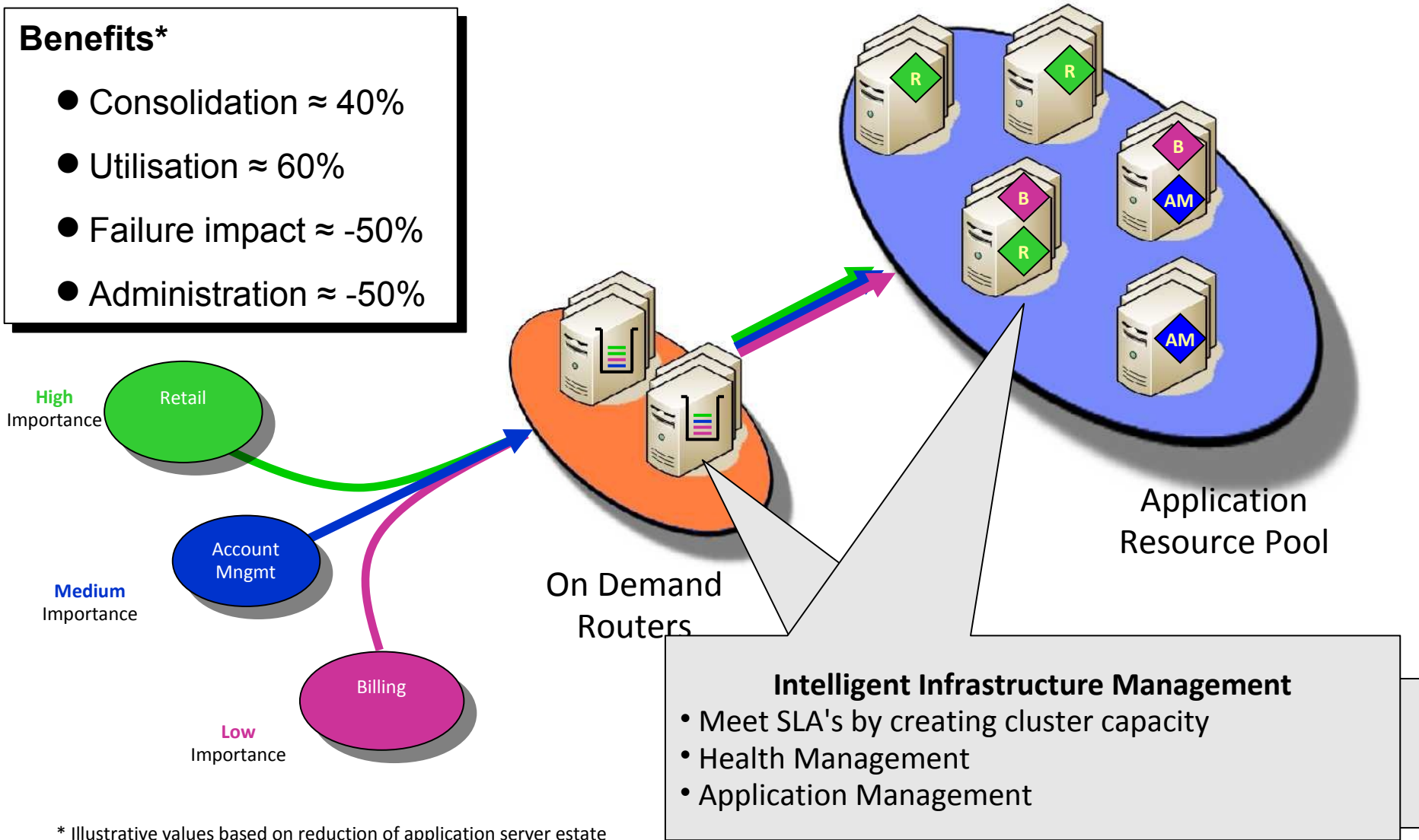


Application Virtualisation with Virtual Enterprise

Consolidating cell deployments

Benefits*

- Consolidation \approx 40%
- Utilisation \approx 60%
- Failure impact \approx -50%
- Administration \approx -50%



* Illustrative values based on reduction of application server estate





WebSphere Virtual Enterprise v7.0

■ Administrative Enhancements

- Fine-grained security support for WebSphere Console
- Historic Charting
- SNMP trap generation
- Centralized Logging

■ On Demand Router Enhancements

- Dynamic Clusters
- Maintenance Mode
- Traffic Routing
- Health Monitoring

■ Performance Management Enhancements

- Multi-cell Performance Management
- Service Policies without response time goals

■ Intelligent Management Pack Enhancements

- Virtual Machine Elasticity
- Integration with Hypervisor Metrics



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

1

Use the pattern editor to select the policy-based management options to include in your environment

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

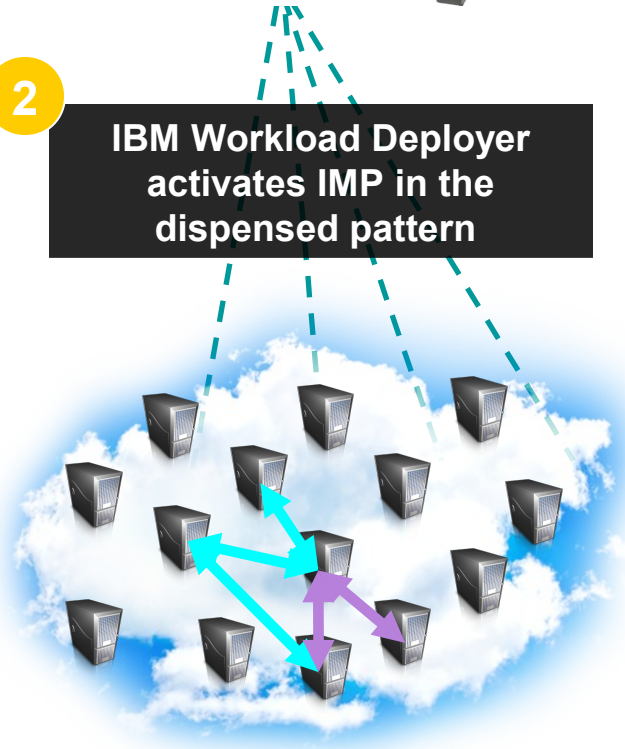


2

IBM Workload Deployer activates IMP in the dispensed pattern

3

Policy-based management self-optimizes your running private cloud environment



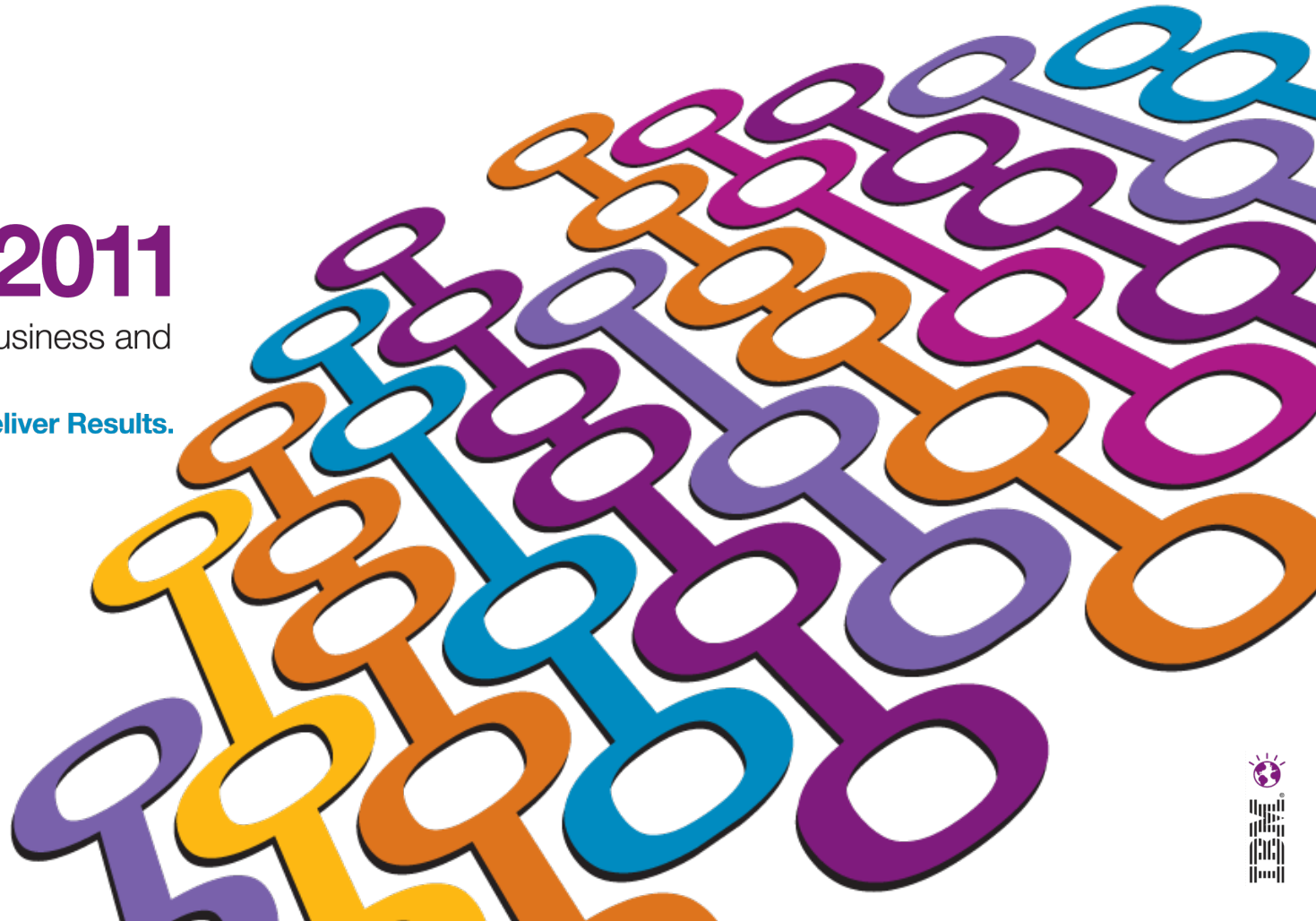
Summary

IBM Software

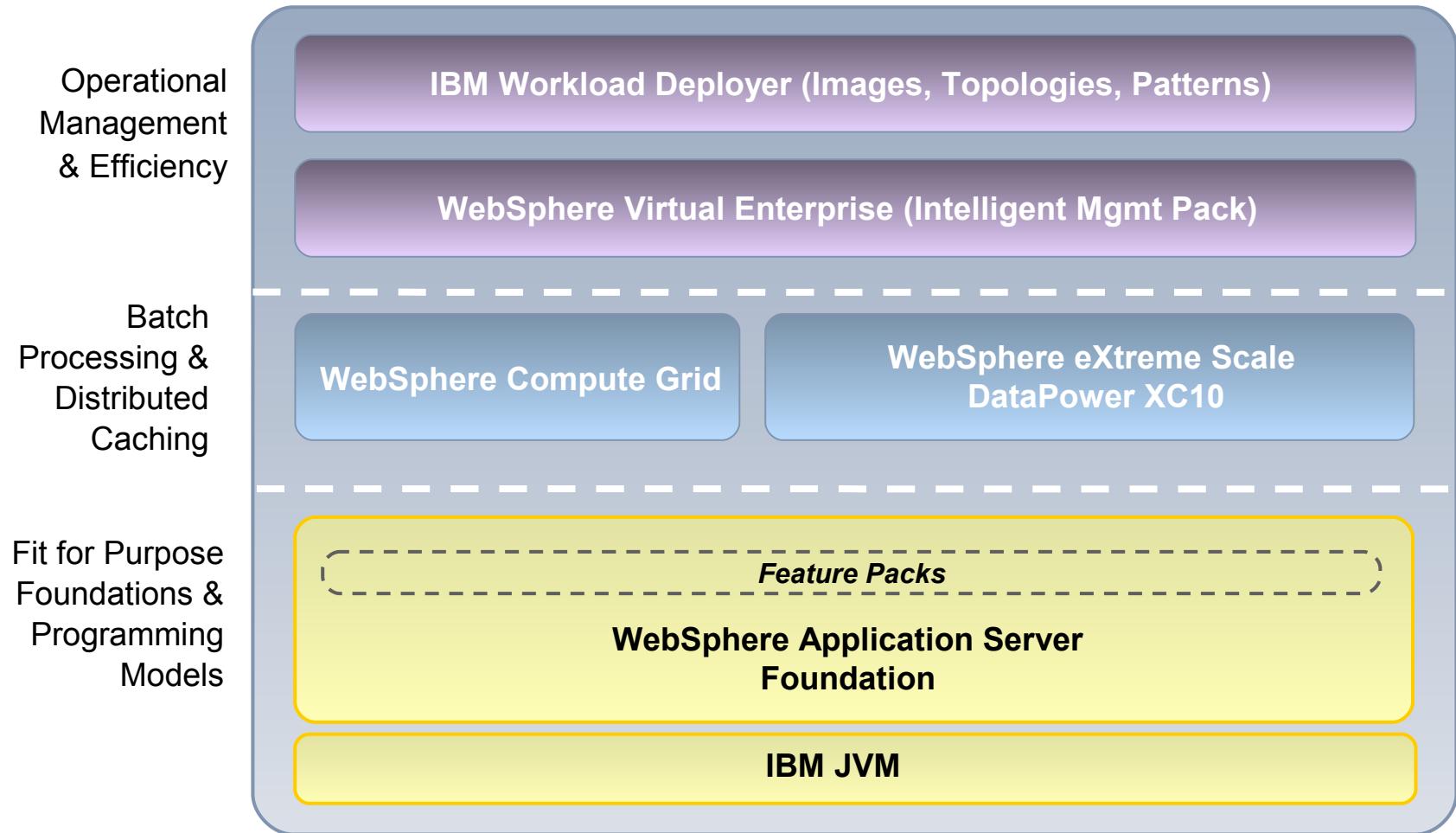
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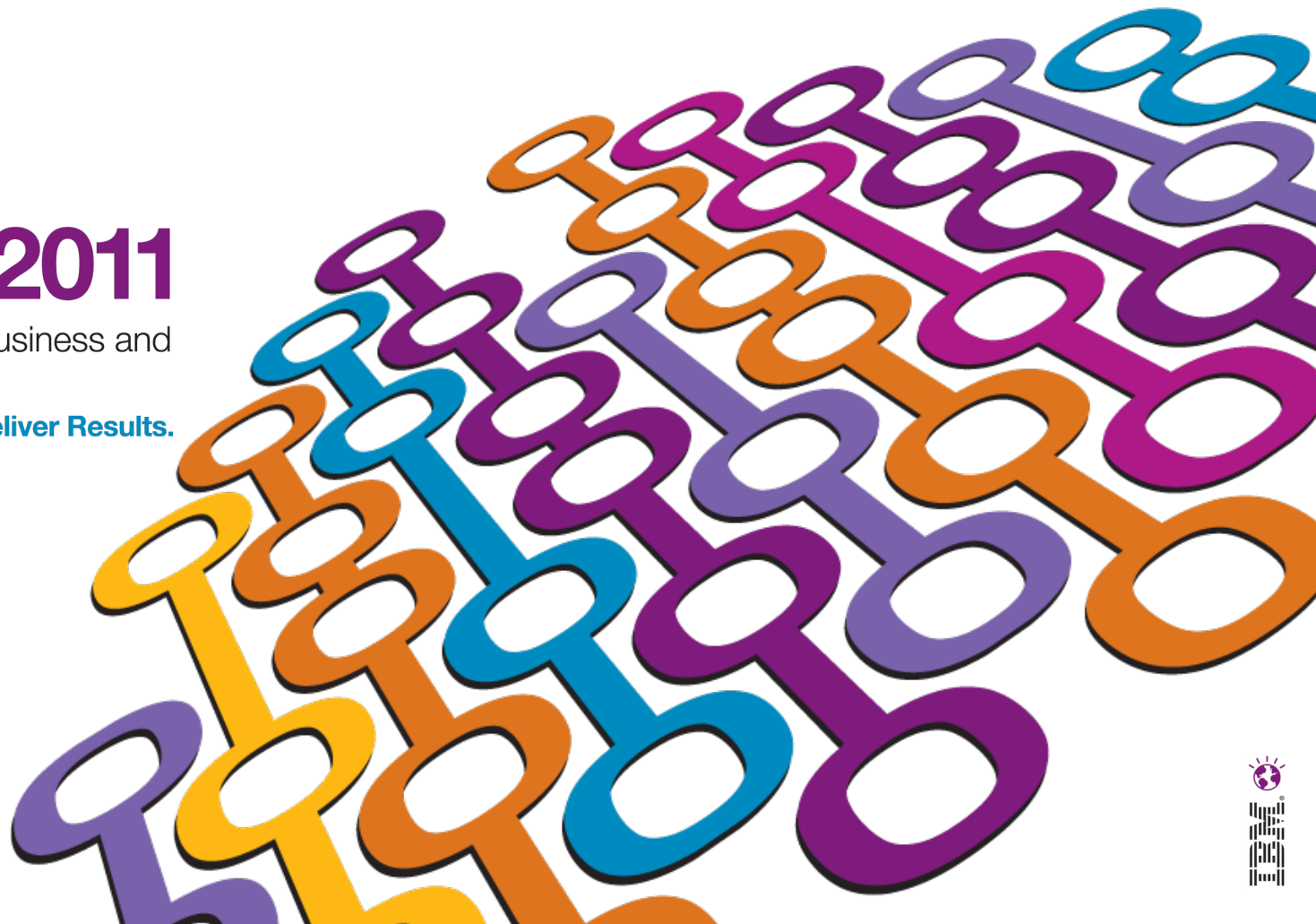
Backup

IBM Software

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Lowering Barriers to Developer Adoption

- No charge WebSphere Application Server for Developers
 - For use on developer desktop at no charge

Download at: <http://bit.ly/bq49yq>

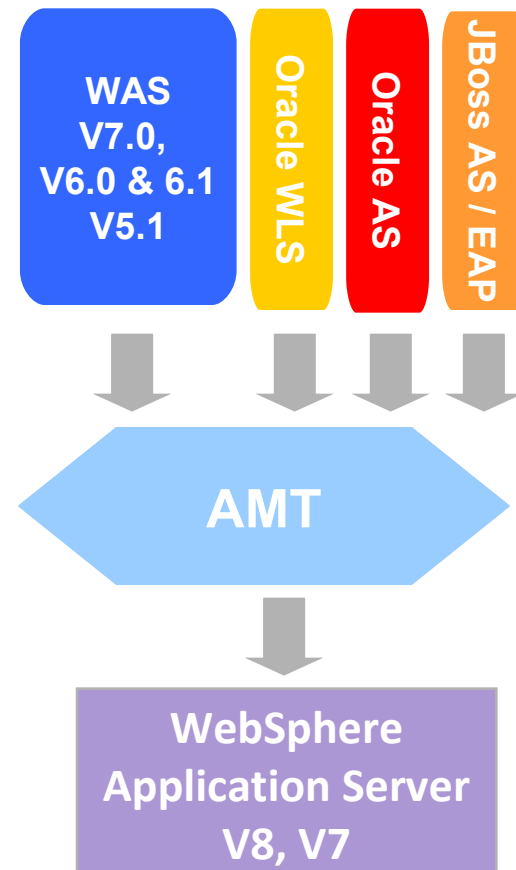
The screenshot shows the IBM developerWorks website. The top navigation bar includes the IBM logo, language selection (English), and a sign-in/register link. Below this is a secondary navigation bar with categories like 'Technical topics', 'Evaluation software', 'Community', and 'Events', along with a search box. The main content area features a breadcrumb trail: 'developerWorks > Evaluation software > WebSphere >'. The title of the page is 'Free: WebSphere Application Server for Developers'. The main text describes the product as a no-charge offering for development runtime. A sidebar on the left contains a 'WebSphere' menu with links to 'New to WebSphere', 'Products', 'Downloads', 'Technical library', 'Community & forums', and 'Events'. Below the sidebar are 'Related links' for software downloads and product finder. The main content area also includes a list of links: 'System requirements', 'Features and benefits', 'Product main page', 'WebSphere Application Server product demonstrations', 'Quick start guide', and 'Sample dictionary application'. On the right, there are promotional widgets for 'WebSphere software', 'Update My dW interests', and 'We're here to help' with a photo of a woman.



Application Migration Tooling

Migrate applications from WebSphere & other Java EE application servers to WebSphere faster with minimized risk

- Migrate applications from older releases to WAS V8 or V7
- Migrate from Oracle or JBoss faster and easier to WAS V8 or V7
 - Migrate applications up to 2x as fast
 - Migrate web services up to 3x as fast
- Application Migration Tool
 - Analyzes source code to find potential migration problems:
 - Removed features
 - Deprecated features
 - Behavior changes
 - JRE 5 & JRE 6 differences
 - Java EE specification changes or enforcements
 - Capable of making some application changes
 - Provides guidance on how to make required changes
 - Works with Eclipse or Rational Application Developer (RAD)



Get the Tool at No Charge: <http://ibm.co/hqfkdj>





Application & Server Virtualization



Application Infrastructure Virtualization

- Coordinate, schedule and manage workload across a pool of resources
- Schedulers, workload managers, etc.



Application Virtualization

- Running an application within a VM

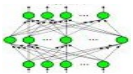


Server Virtualization

- Partitioning / Hypervisors

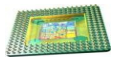


Virtual Memory



Network Virtualization

- Virtual LANs (VLANs)
- Virtual Private Networks (VPNs)



Microprocessor Virtualization

- Multi / Hyper Threading
- Hardware assisted virtualization (Intel, AMD)

Application
Virtualization

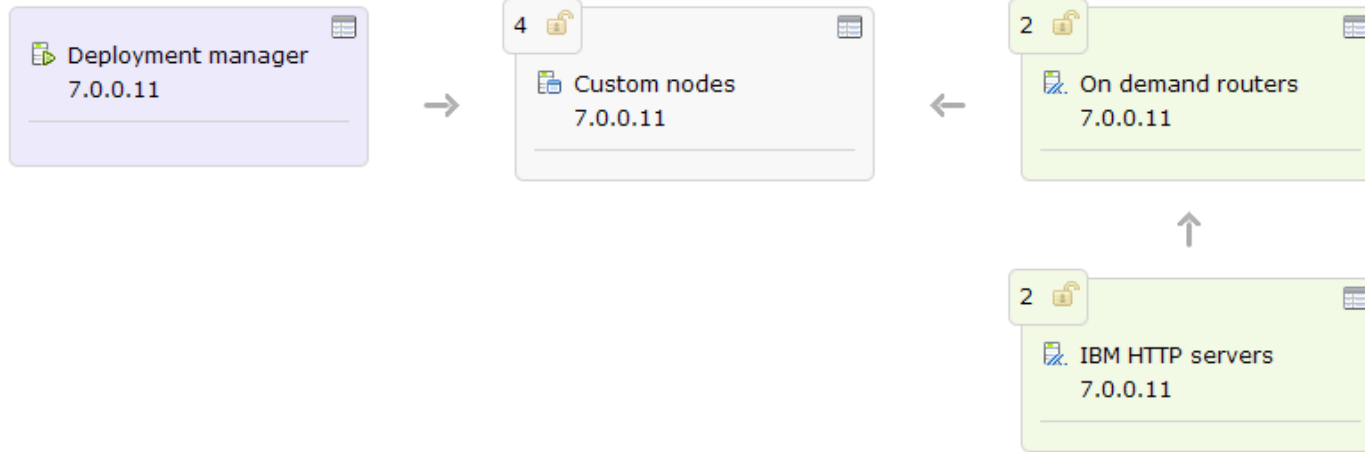
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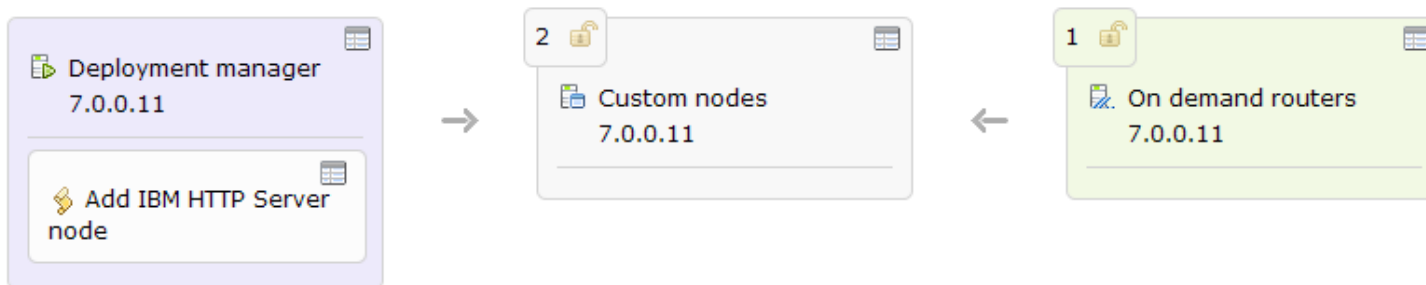


Pre-built topology patterns in IBM Workload Deployer

WebSphere advanced cluster



WebSphere advanced cluster (development)





Customized patterns with the Intelligent Management Pack

