WebSphere software

IBM

WebSphere Migration Workshop

WebSphere 8.5 Overview

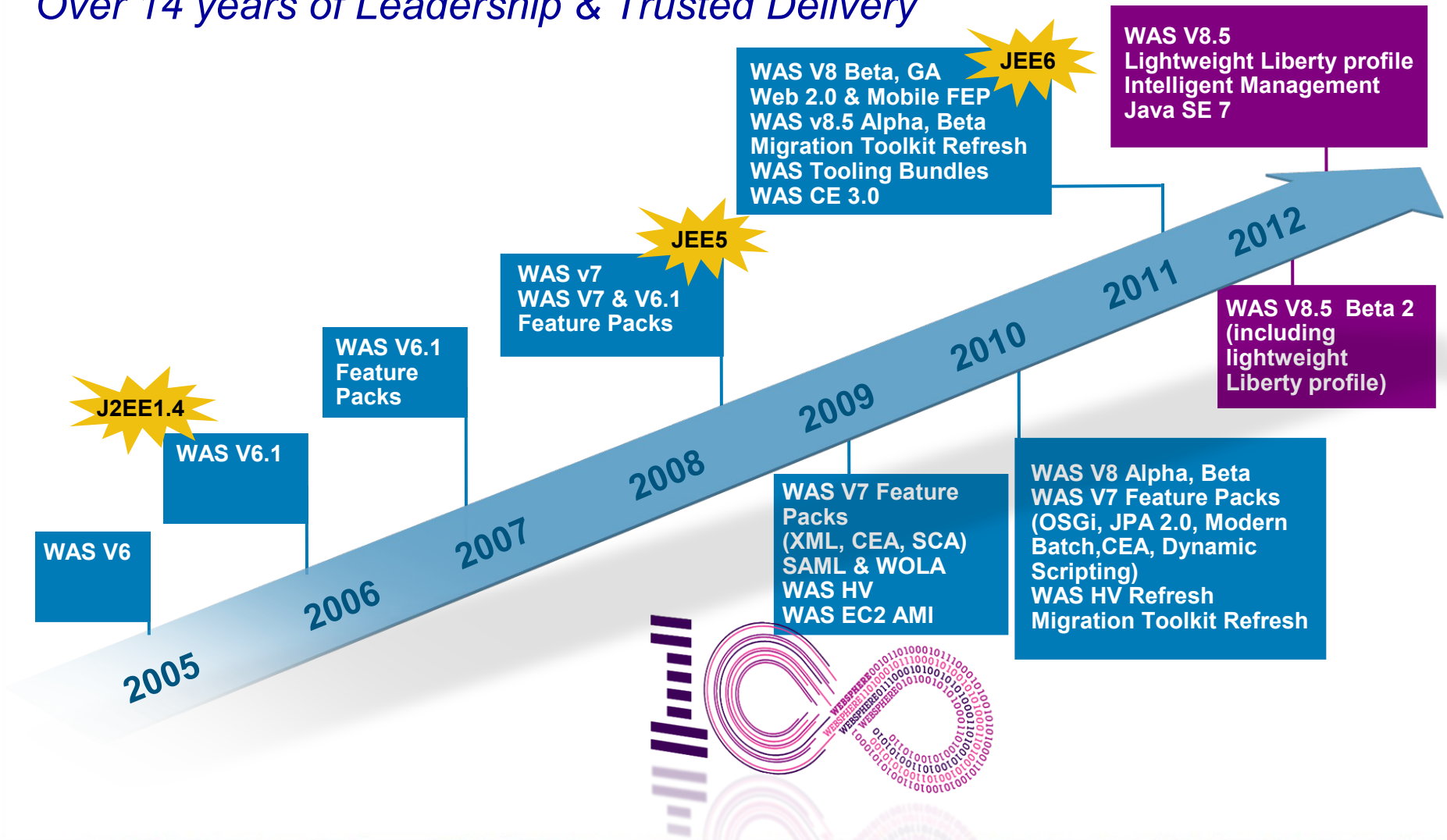
WW WebSphere Migration Team

Objectives

- **Explain** how WebSphere Application Server V8.5 offers a simplified developer experience, with the new lightweight Liberty Profile, updated tooling, and programming model updates
- **Understand** how WebSphere Application Server V8.5 improves application resiliency with Intelligent Management (WVE), messaging infrastructure resiliency, and memory leak detection
- **Recognize** key enhancements to WebSphere Application Server V8.5 for improved operations, security, control, and integration, including new embedded batch capabilities (WCG)

WebSphere Application Server (WAS):

Over 14 years of Leadership & Trusted Delivery

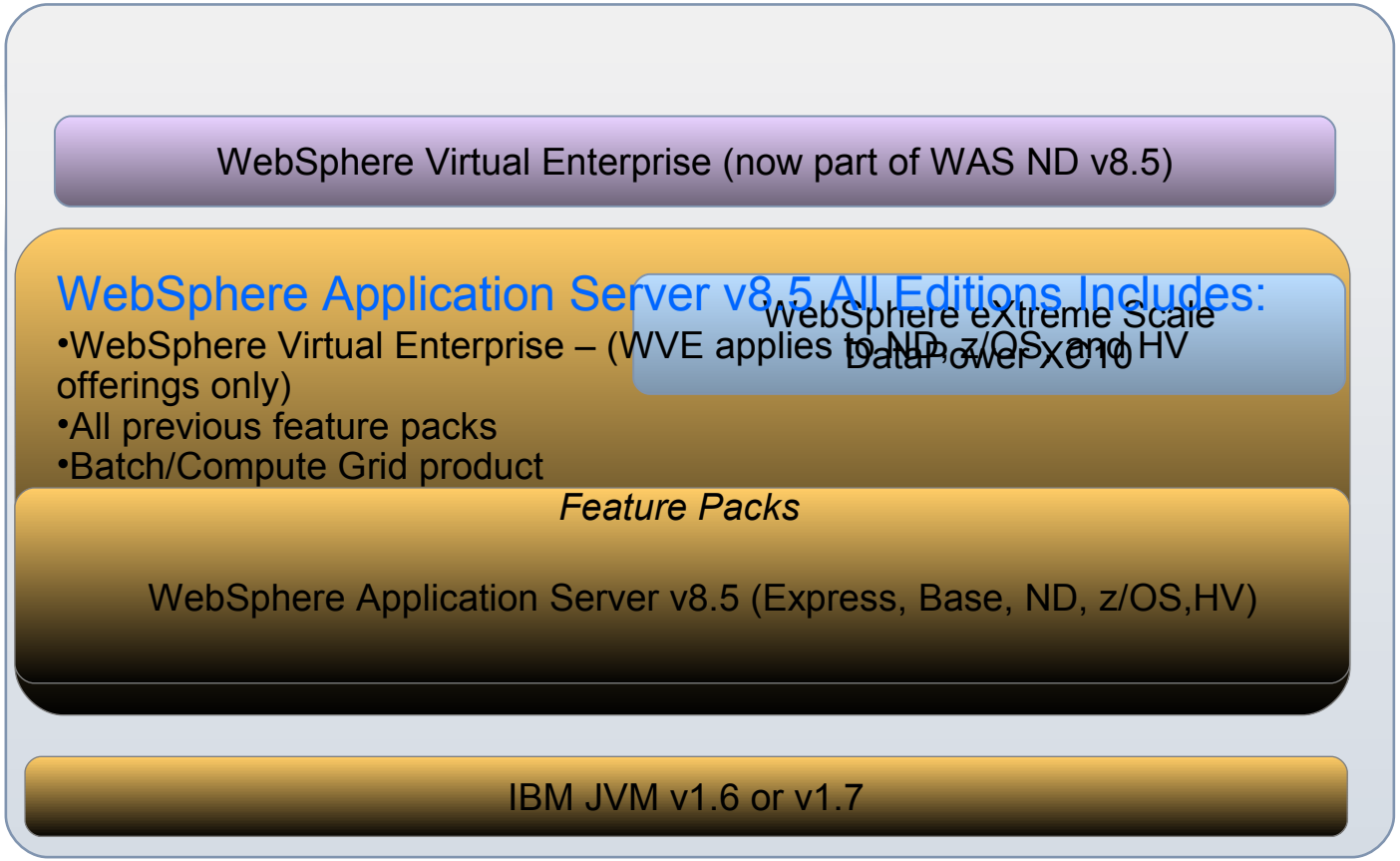


WebSphere Application Infrastructure

Operational Management & Efficiency

Batch Processing & Distributed Caching

Fit for Purpose Foundations & Programming Models



Rational Application Developer

WAS Dev Tools for Eclipse

Eclipse

WebSphere Application Server V8.5 Delivers

Unparalleled Application Development and Management Environment, Rich User Experiences…Faster

Developer Experience

Fast, flexible, and simplified application development

- New Liberty Profile

Application Resiliency

Intelligent Management & Enhanced Resiliency

- Enhanced WebSphere Application Server ND

Operations and Control

Improved Operations, Security, Control & Integration

- Improved Operations

WebSphere Application Server V8.5 Delivers

Unparalleled Application Development and Management Environment, Rich User Experiences…Faster

Developer Experience

Fast, flexible, and simplified application development

- Liberty Profile
- Expanded Tooling and WebSphere Application Server Tooling Bundles
- OSGI programming model enhancements
- EJB support in OSGi apps
- JDK7 Support
- Migration toolkit
- Web 2.0 & Mobile Toolkit; IBM Worklight Integration
- SCA OASIS programming model

Application Resiliency

Intelligent Management & Enhanced Resiliency

- Application Edition Management
- Application Server Health Management
- Dynamic Clustering
- New Intelligent Routing capabilities
- Messaging infrastructure resiliency
- Memory leak detection & protection in WAS

Operations and Control

Improved Operations, Security, Control & Integration

- Selectable JDK
- WebSphere Batch enhancements
- Admin Security Audit
- OSGi Blueprint security improvements
- Cross Component Trace (XCT)
- Enhanced IBM Support Assistant
- Better log and trace filtering

WebSphere Application Server v8.5 portfolio:

WAS for Developers

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

Available as a no-charge edition for the developer desktop and includes Eclipse adapters

WAS Hypervisor Edition

Optimized to instantly run in VMware and other server virtualization environments

WAS ND

Delivers near-continuous availability, with advanced performance and mgmt capabilities, for mission-critical apps

WAS for z/OS

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

WAS

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

WAS Express

A lower-cost, ready-to-go solution to build dynamic Web sites & apps

WAS CE

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

Built on a common code base

Built on built upon the open source Apache Geronimo

WebSphere Application Server V8.5 Delivers

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- SCA OASIS programming model

Terminology

WebSphere Application Server Liberty Profile:

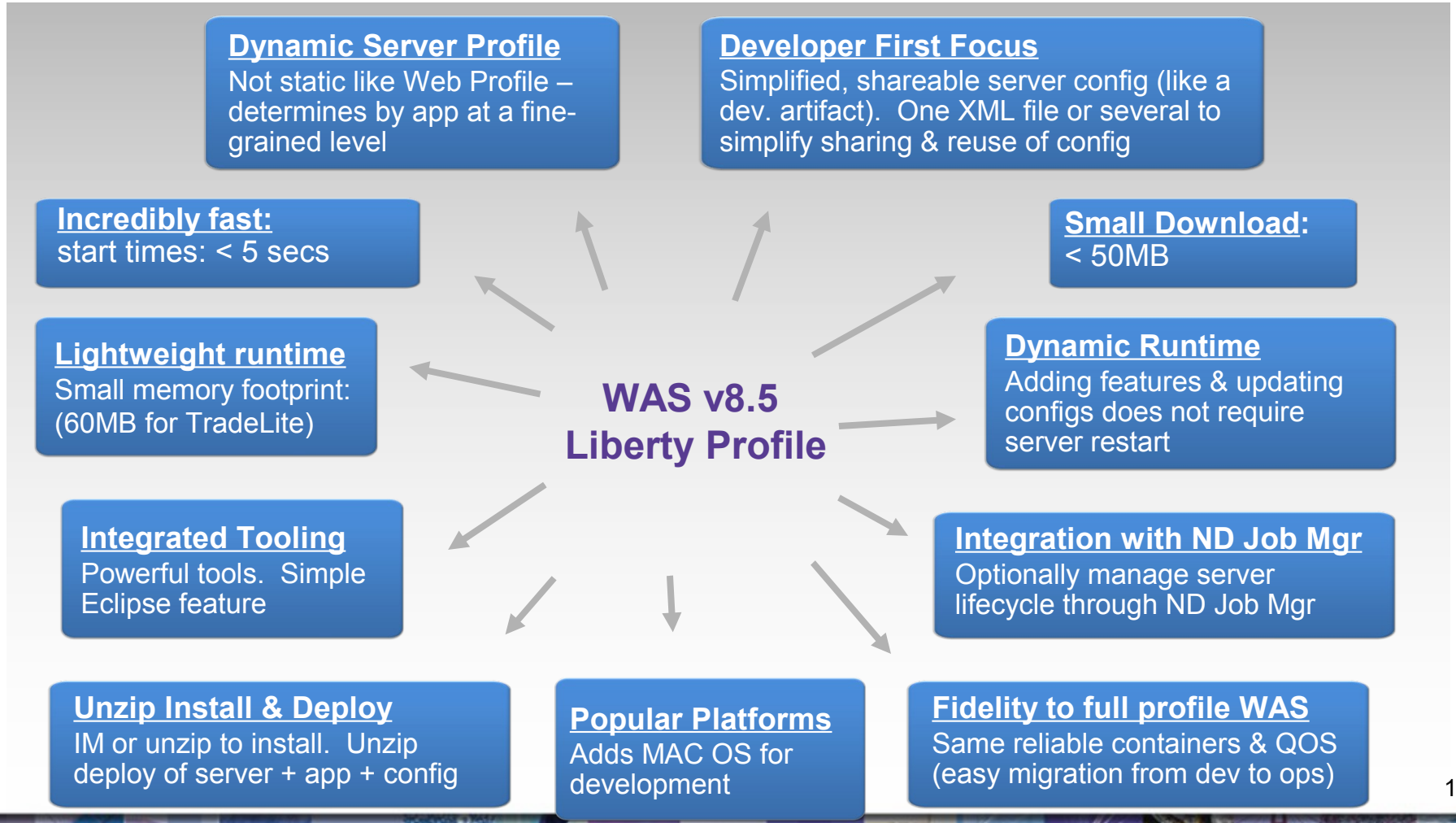
- WebSphere Application Server Liberty profile is a highly composable and dynamic runtime environment.
- Extremely fast startup – under 5 seconds
- Server install is about 50 MB.
- Consumes 50 MB of memory out of the box.

WebSphere Application Server Full Profile:

New terminology created in WAS V85 to distinguish the liberty profile VS the existing profile (aka full profile)

WebSphere Application Server v8.5: Introduces the Lightweight "Liberty" Profile – For Web, OSGi and Mobile Apps

A highly composable, dynamic Server profile



Software development is hard, the rapid pace of change makes it difficult to keep up

Developer and team productivity

- Adjusting to rapidly changing requirements and shorter project cycles
- Complexity in adopting new technology
- Developers work as individuals - skills are not leveraged across the team

Application quality

- Hard to diagnose problems that show up late
- Shorter project cycles puts quality at risk
- Need to infuse quality from the beginning

Product integration

- Need an end to end environment that is not brittle to changes of individual components

Cloud computing

- Migrating our application to the cloud is not so simple
- IDEs are expensive to manage, and too much downtime for developers

Standards and platforms

- Assurances that our investment is here to stay and has a healthy future.

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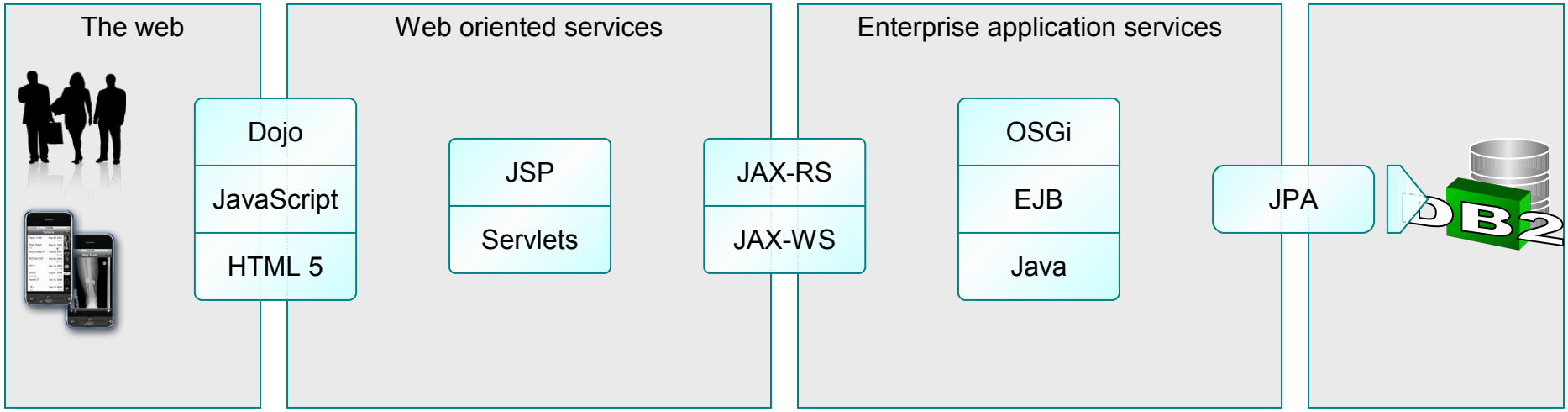
Unleash innovation with WDT 8.5

A cost effective IDE focused on web application and modern service development

Create & edit → Validate → Refine & refactor → Publish → Test → Debug

Design web, Java EE and OSGi applications with persistence



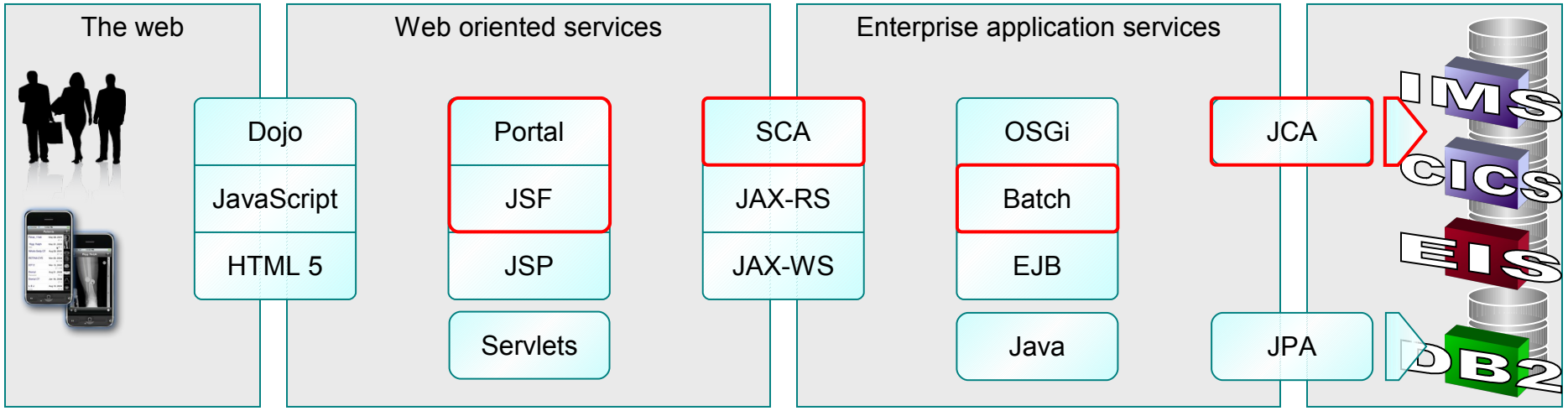
Made for the WebSphere Application Server Full and Liberty profiles
Available from the Eclipse Marketplace

Enterprise Application Development with RAD

Optimize team development of robust, high quality, enterprise integrated applications

Create & edit → Visualize → Validate → Refine & refactor → Analyze → Publish → Test → Debug → Profile

Integrate the enterprise to the social web using state of the art technology



Collaborate with agility, exploiting modern infrastructure and the Cloud

Introducing the WAS Tools Edition Bundles

Team

Individual

WAS ND – Tools Edition

- Like “WAS – Tools Edition” but for WAS ND production use

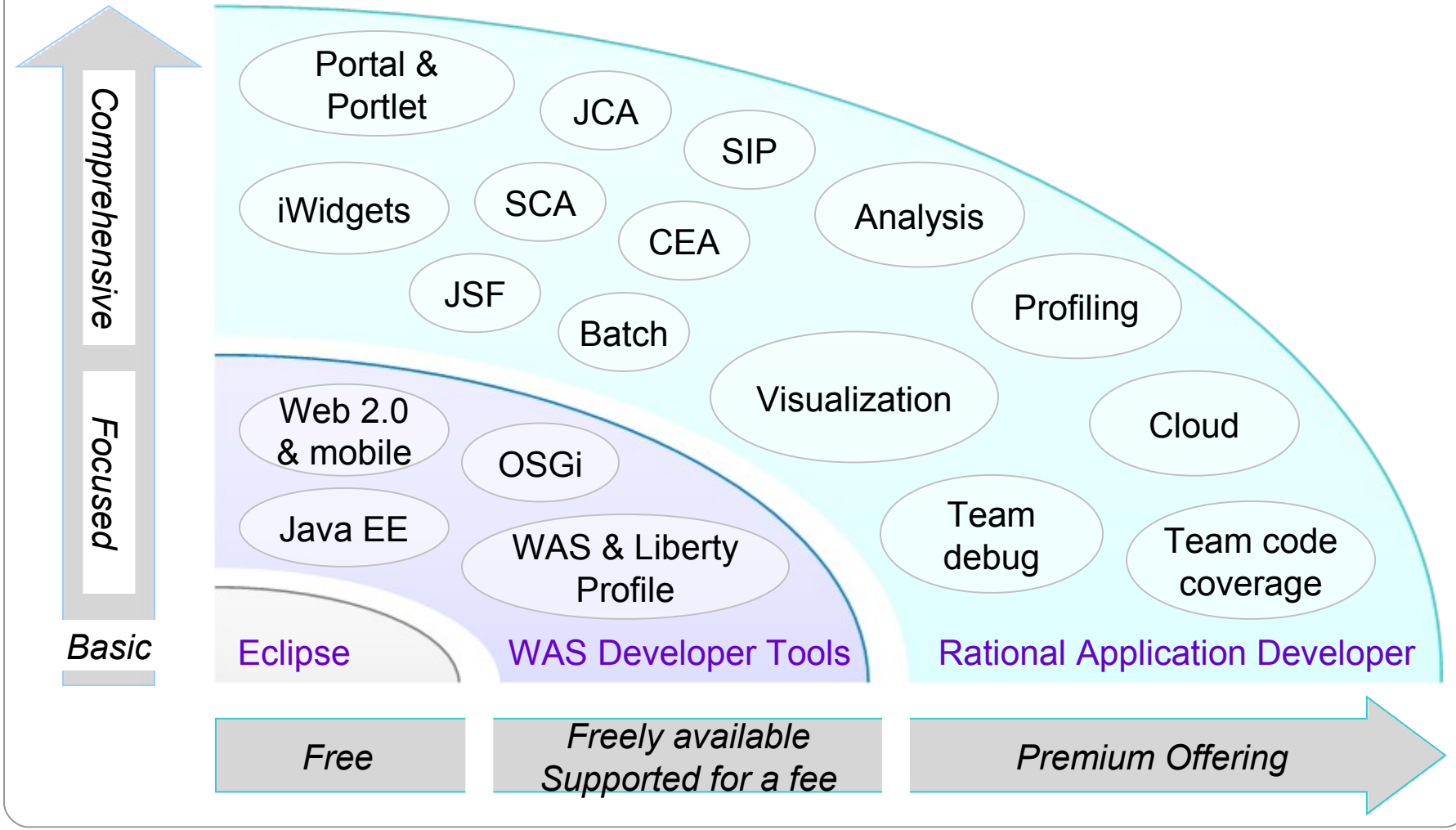
WAS – Tools Edition

- Solution: Production WAS + unlimited tools (RAD or WAS Developer Tools)
- Terms (runtime): Production use
- Terms (tools): Unlimited use of tools for developing applications to be deployed on WAS included with this bundle.

WAS for Developers – Tools Edition for Eclipse

- Solution: WAS for Developers + WAS Developer Tools
- Terms: Single user. Development use only
- Freely available, supported for a fee
- Easily obtained for rapid development to WAS v7, v8, v8.5 and Liberty

Rational Application Developer and the new WAS Developer Tools



WAS v8.5 with the Liberty Profile and Tooling now looks like:

WAS for Developers

Tools Edition | +Liberty Profile

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+Liberty Profile

A lower-cost, ready-to-go solution to build dynamic Web sites & apps

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

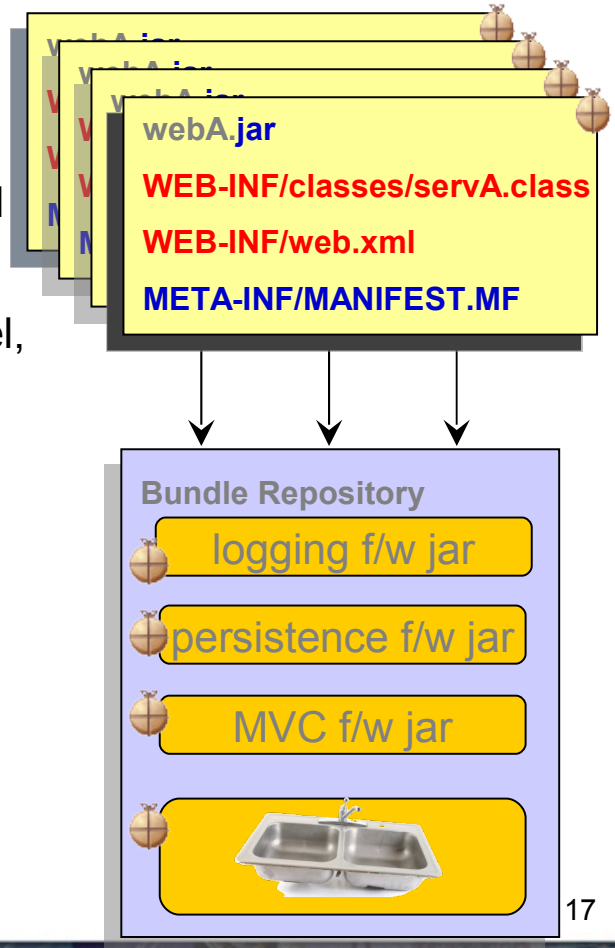
Built on a common code base

OSGi Applications

Speed development, increase ease of use and reuse through the modularity, dynamism, and versioning capabilities of OSGi applied to web & enterprise applications

Key Features:

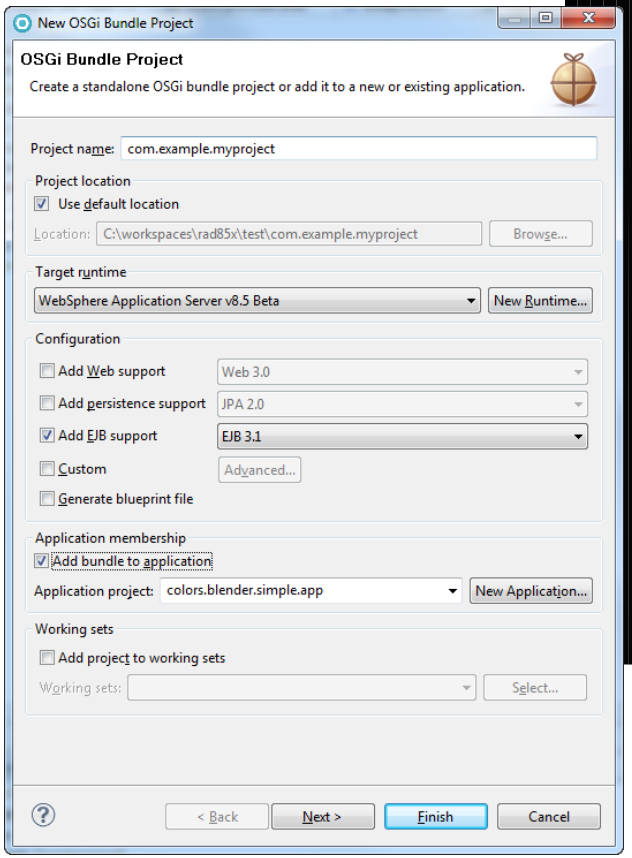
- **Modular deployment and management:** Separate common libraries from application archives; manage them centrally and across many versions, concurrently
- **Standards Based DI Framework:** POJO development model, with a container that manages injection of configuration, and controls activation & deactivation, integrated with the server
- **In-place update:** Update applications modules without restarting the application
- **Java Standards Layering:** Java standards such as transaction, security, & persistence can be mixed into the componentized apps as services

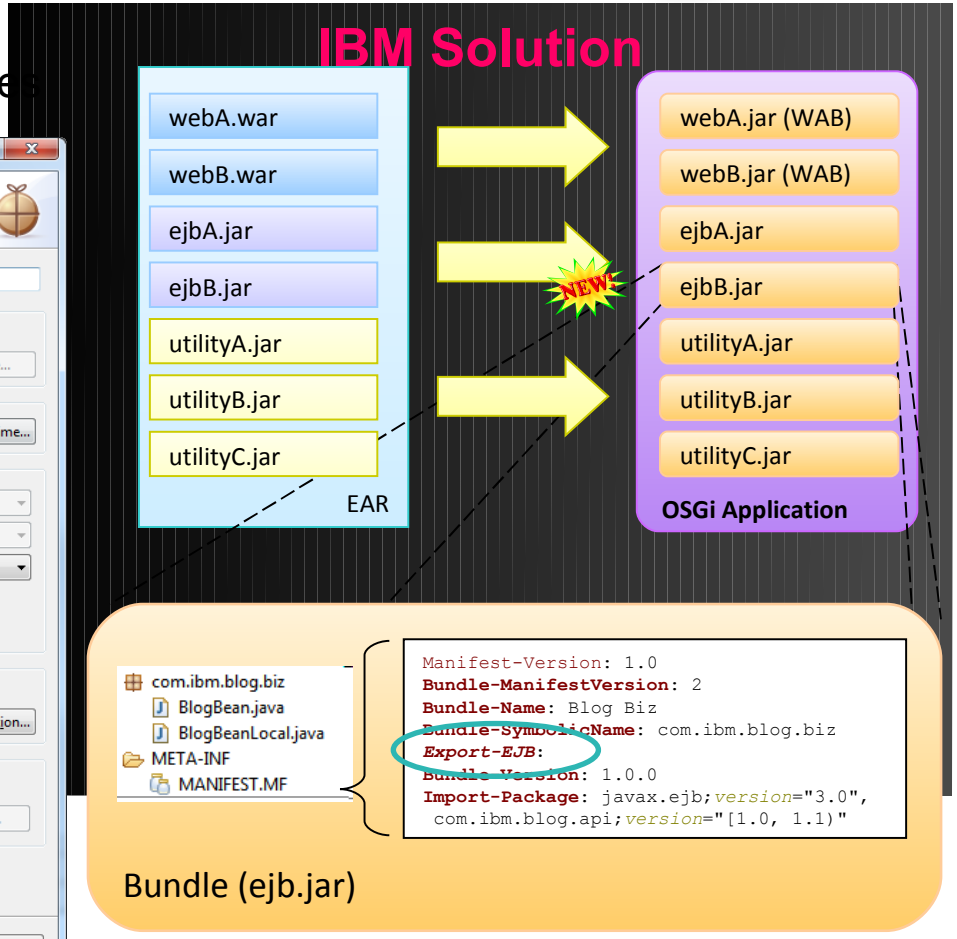


OSGi Applications – New in V85

Enhanced!

Support added for EJB Bundles, including metadata-driven publication of OSGi Services





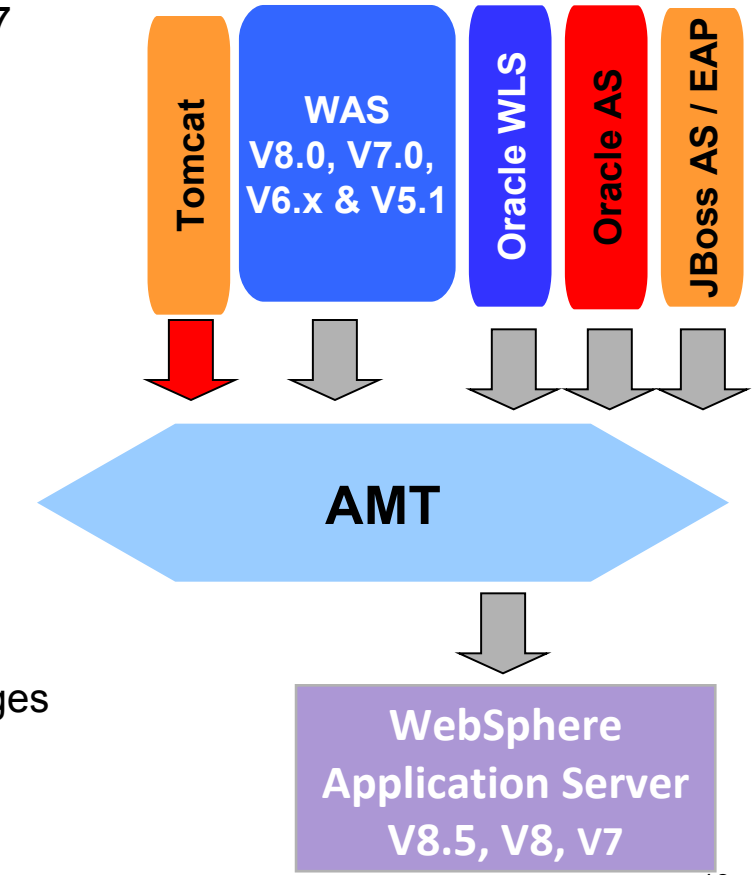
WAB = Web Application Bundle

Application Migration Tooling v3.5

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

Enhanced!

- Migrate apps from older versions to WAS V8.5, V8, V7
- Migrate from Oracle, TomCat, JBoss faster & easier
  - 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 & deprecated features
    - Behavior changes
    - JRE 5 & JRE 6 differences
    - Java EE spec changes or enforcements
  - Capable of making some application changes
  - Provides guidance on how to make required changes
  - Works with Eclipse or RAD (RAD)



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

Mobile Application Development

New!

Worklight takes WAS mobile web applications to the next level

WAS	WAS + Web 2.0 and Mobile Toolkit	Worklight
Enterprise Web Applications • Java EE programming • Build, deploy and manage Enterprise applications and services • Server-side & Client-side development	**Mobile Web App development based on standard web technologies:** • Run application in mobile browser • Based on HTML5, CSS3, JavaScript • Native look and feel • Advanced mobile UI components **Feature Pack for WAS v6.1/7/8** **Toolkit in WAS v8.5**	**Application delivery in a variety of forms:** • Hybrid application • Native • Install through App Store • Access to native services
Desktop Web Applications	**Mobile Web Applications**	**Mobile Applications**

WAS V85 Pluggable JDK support

Allow development and production environments to select the most appropriate JDK for the situation (JDK 6 or 7)

- WAS v8.5 introduces “selectable” JDK:
  - Some of the environment can use Java 7 while the rest continues to use Java 6
  - Use Java 7 in a small subset of your topology & keep the rest on Java 6
  - Switch back and forth between Java 7 and Java 6 as necessary
- Install as feature extension to new or existing WAS v8.5 installation
  - Use with either full WAS profile or Liberty profile
- Create WAS admin profiles for developer use
  - Use managesdk to set WAS new profile and command defaults to Java 7
  - Create admin profile and start server
- Build and test Java 7 applications
  - Use ant or maven to build Java 7 applications
    - See PlantsByWebSphere sample docs for information
  - Use RAD to develop, deploy, and test Java 7 applications

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WebSphere Application Server V8.5 Delivers

Unparalleled Application Development and Management Environment, Rich User Experiences…Faster

Application Resiliency

Intelligent Management & Enhanced Resiliency

- Application Edition Management
- Application Server Health Management
- Dynamic Clustering
- New Intelligent Routing capabilities
- Messaging infrastructure resiliency
- Memory leak detection & protection in WAS

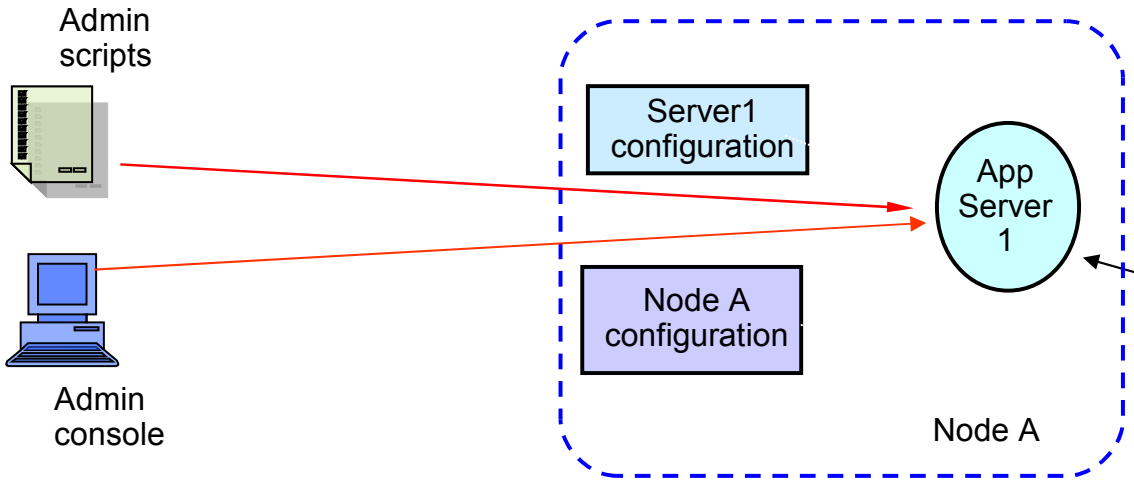
Intelligent Management

Intelligently manage your environment with a simplified infrastructure, flexible and effective application control and runtime efficiency

Pre-V7 Standalone Application Servers

V6.1

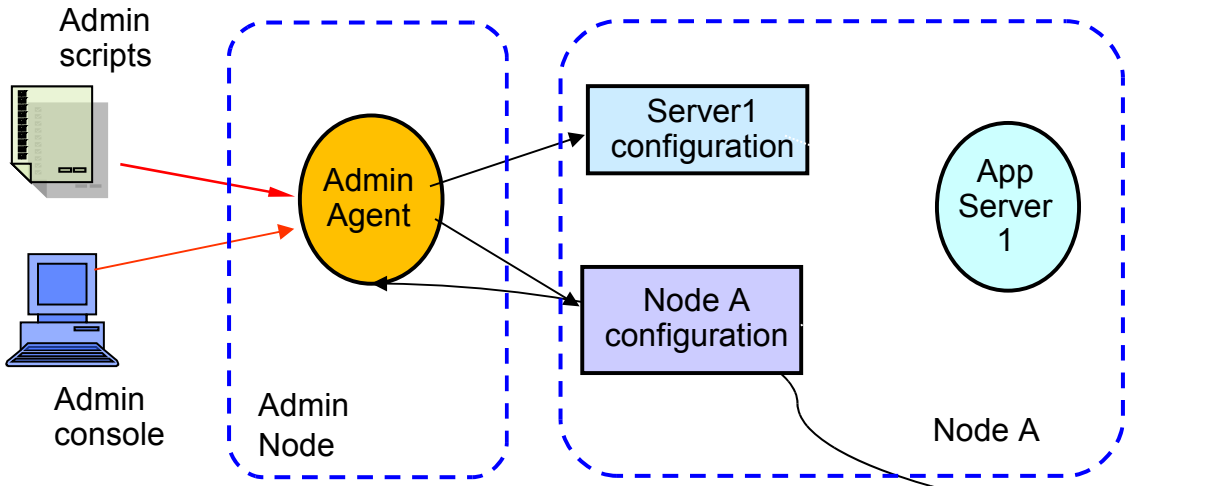
WebSphere Application Server Single Server Edition



Administrative logic hosted in same JVM as the application server and customer applications.

Flexible Management Option – WAS V7 and above with Administrative Agent

Improves control and eases administration



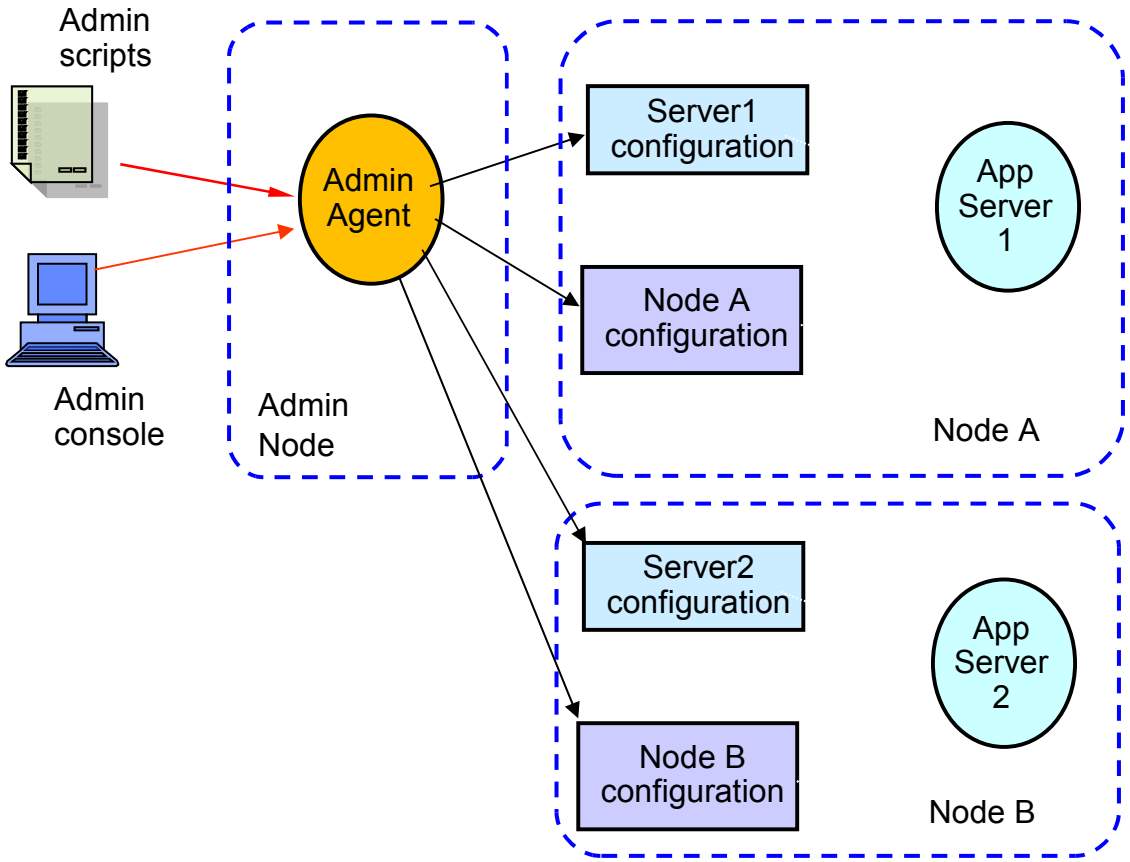
Administrative logic hosted in separate JVM from application server

Optional Administrative Agent included in
WebSphere Application Server & WebSphere Application Server – Express

Flexible Management Option – Administrative Agent

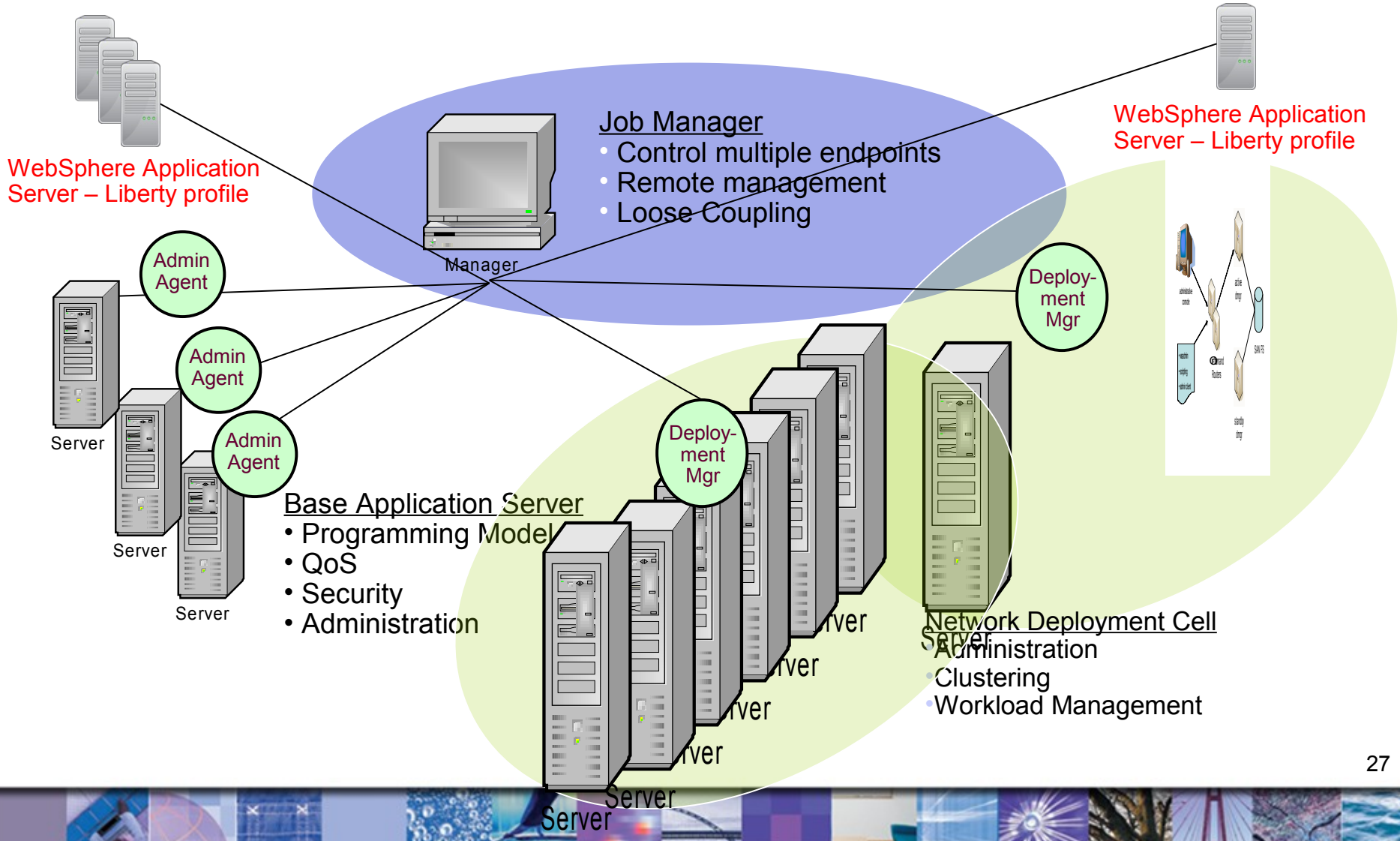
Improves control and eases administration

WebSphere Application Server Single Server Edition -- V7 (and above)



- Administrative agent can manage multiple servers on a local machine
- Central administration of local nodes
- Alternative to Deployment Manager's cell model

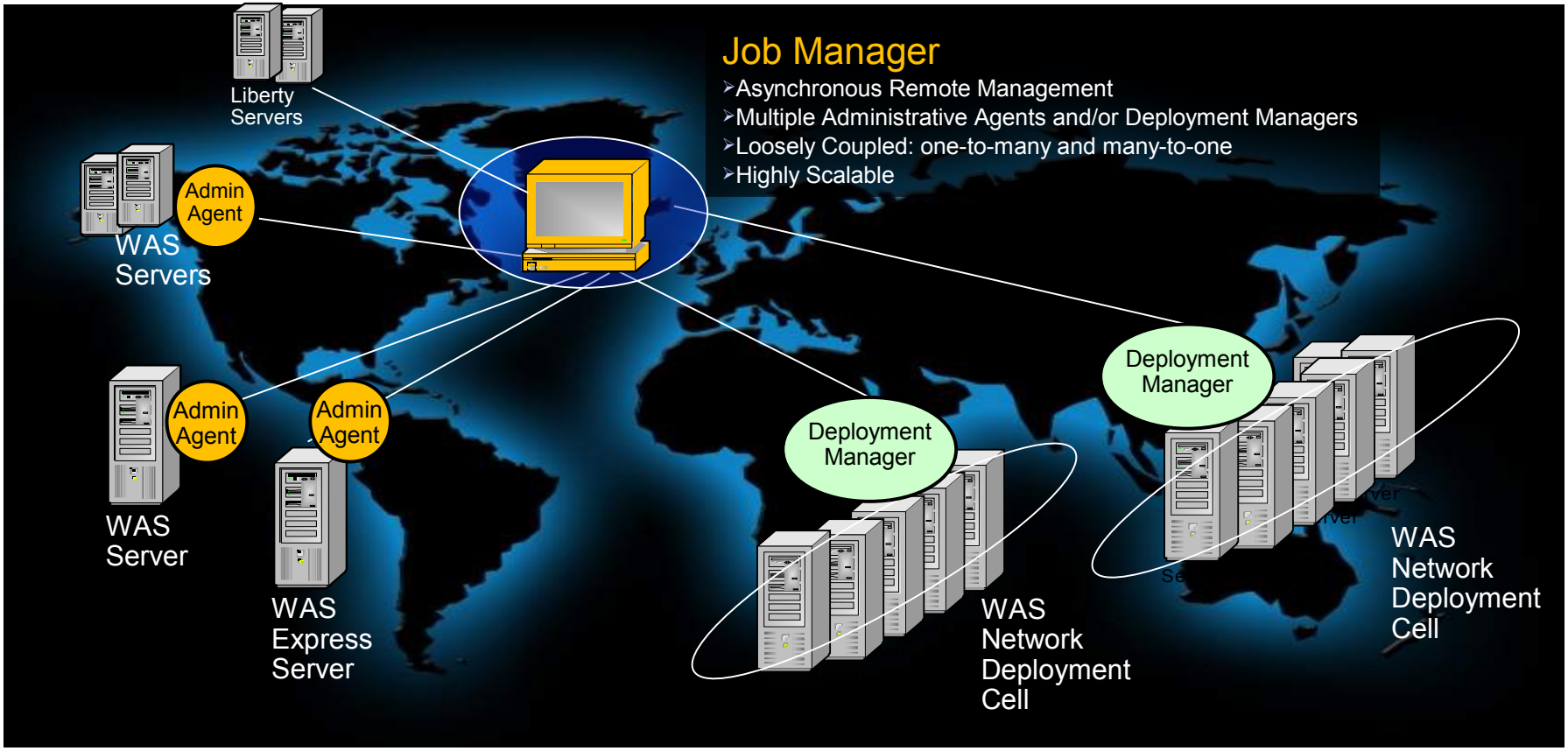
Centralized Management through Job Manager



Flexible Management Option – Job Manager

For cost effective worldwide growth

Flexible, scalable and asynchronous administrative topology



Flexible Management Option – Job Manager

Administrative Jobs

- List of job types depends on registered nodes
  - Collect inventory data and node status
  - Distribute/collect/remove files
  - Install/uninstall/update/start/stop applications
  - Create/delete/start/stop application servers and proxy servers
  - Create/delete/start/stop clusters
  - Create/delete cluster members
  - Configure properties
  - Execute wsadmin scripts
- Submit asynchronous administrative jobs that:
  - Take effect specified time
  - Expire after a specified time
  - Recur at a specified time interval
  - Notify administrator when at a job completes via e-mail or JMX

Flexible Management Option – Job Manager

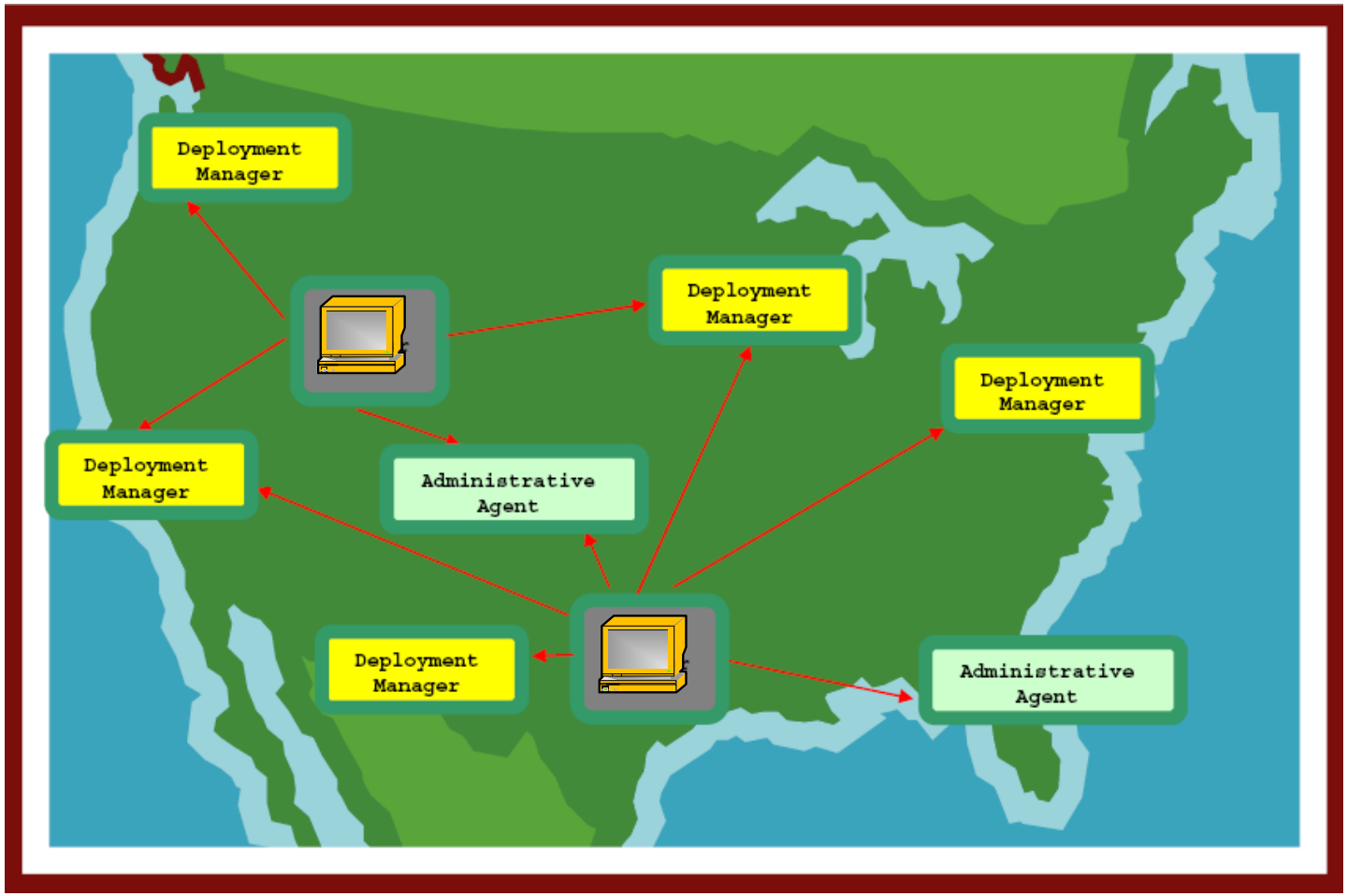
One-to-Many and Many-to-One

- Not meant to replace the existing deployment manager or base servers
- Offers administrators new management options not available before. For example:
  - Manage multiple stand-alone servers, such as in server farms
  - Coordinate management actions across multiple deployment managers
  - Manage servers that are geographically dispersed (such as branch servers) and reachable only through a low bandwidth, high latency network
  - Submit asynchronous administrative jobs that:
    - Take effect at a specified time
    - Expire after a specified time
    - Recur at a specified time interval
    - Notify the administrator when job completes via e-mail or JMX notification
  - View status of submitted jobs with a graphical representation summarizing the status of the job on each of its targets

Flexible Management Option – Job Manager

V7

One-to-Many and Many-to-One



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Application Edition Management

Applications can be upgraded without incurring outages

- Upgrade Applications without interruption to end users
- Concurrently run multiple editions of an applications
  - Automatically route users to a specific application
- Multiple editions can be activated for extended periods of time
- Rollout policies to switch from one edition to another without service loss
- Easily update WebSphere without incurring down time
- Easy-to-use edition control center in admin console, plus full scripting support

Validation Mode

Rollout Policies

Concurrent Activation

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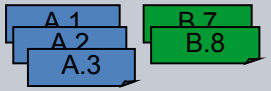
Resiliency features now included in WAS ND V8.5 (previously purchased separately)

WebSphere Virtual Enterprise

Application Edition Management



- Enables interruption free application rollout

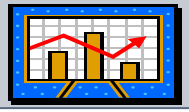
Up to 45% less hardware

Health Management

- Monitors the status of your applications with the ability to sense and respond to problem areas

Up to 90% fewer outages

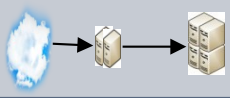
Dynamic Clustering



- Dynamically provision and start/stop new instances of app server based on workload demands

Up to 45% less software

Intelligent Routing



- Ensures priority is given to business critical applications via administrator defined rules

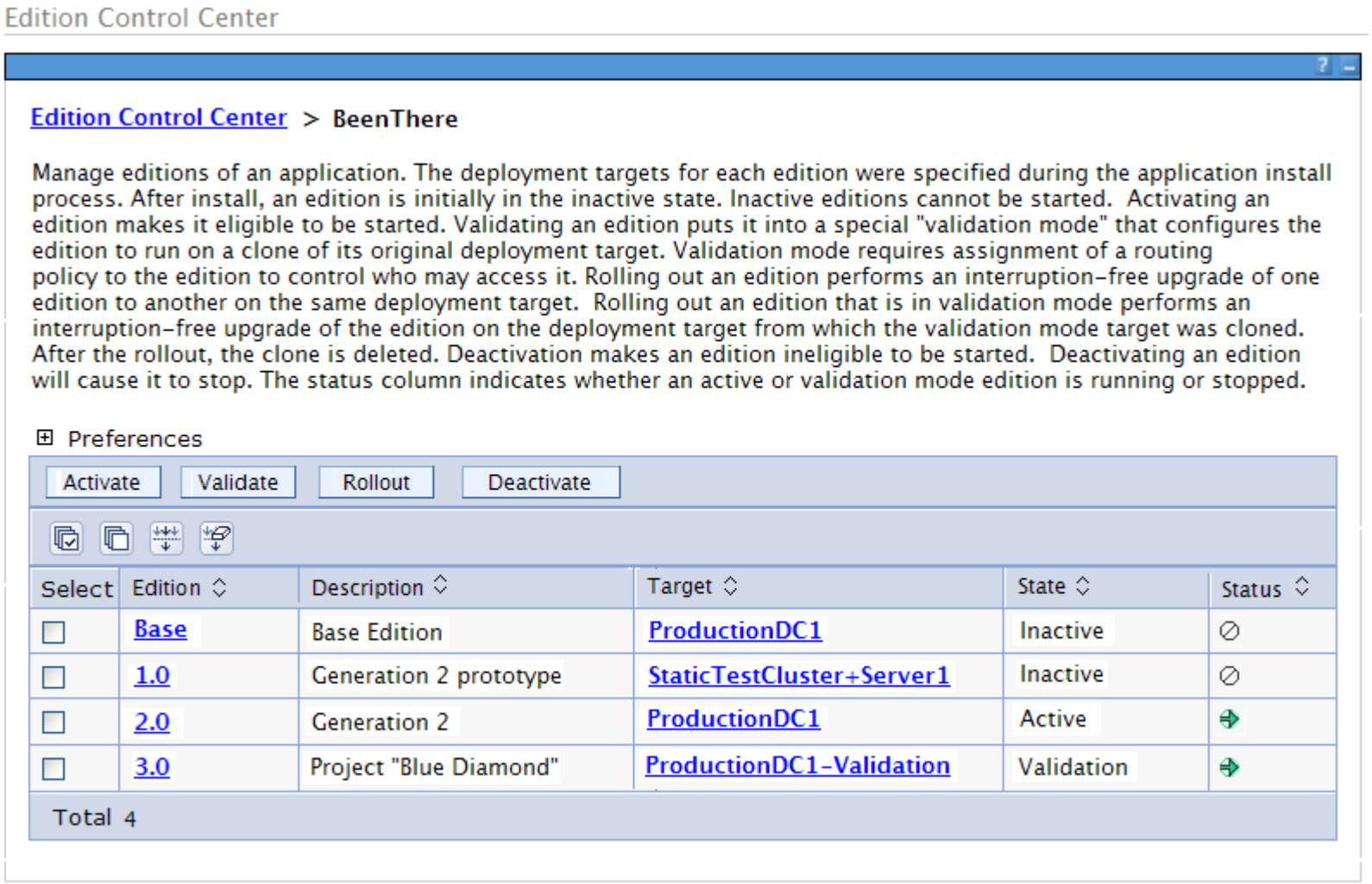
Up to 60% less administration

WebSphere Batch

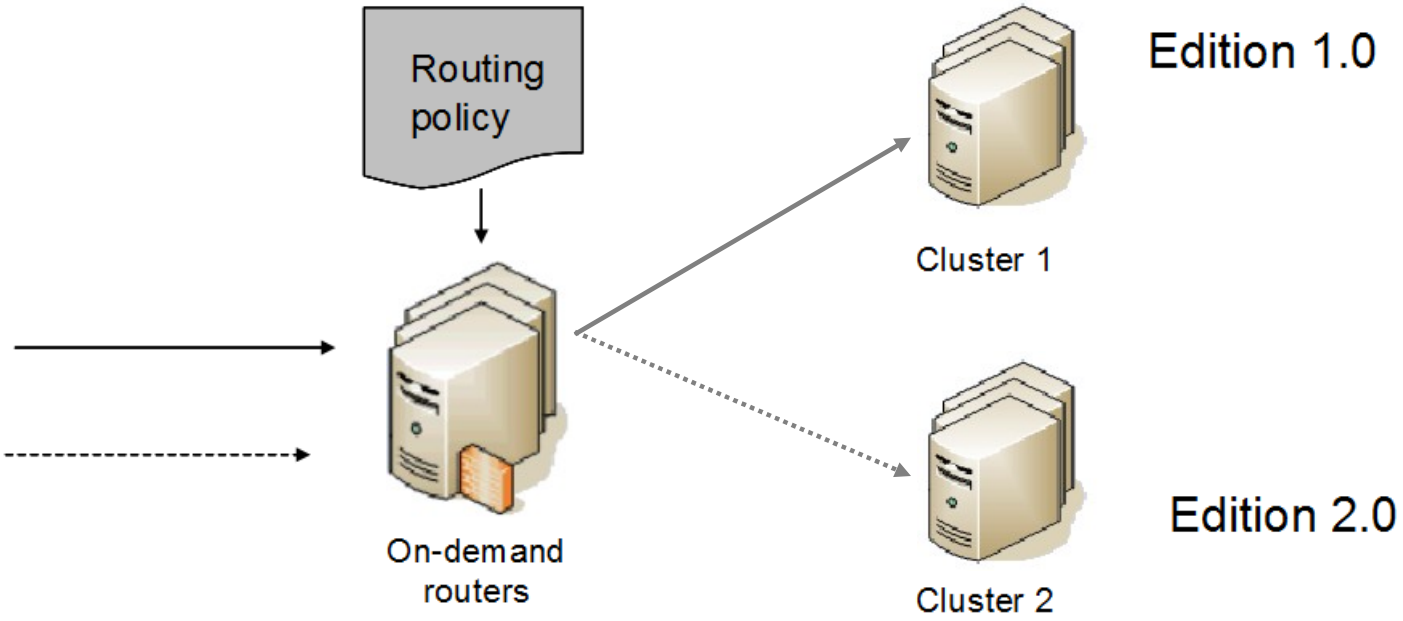
Batch processing

- Support that leverages your existing Java online transaction processing (OLTP) infrastructure to support new Java batch workloads

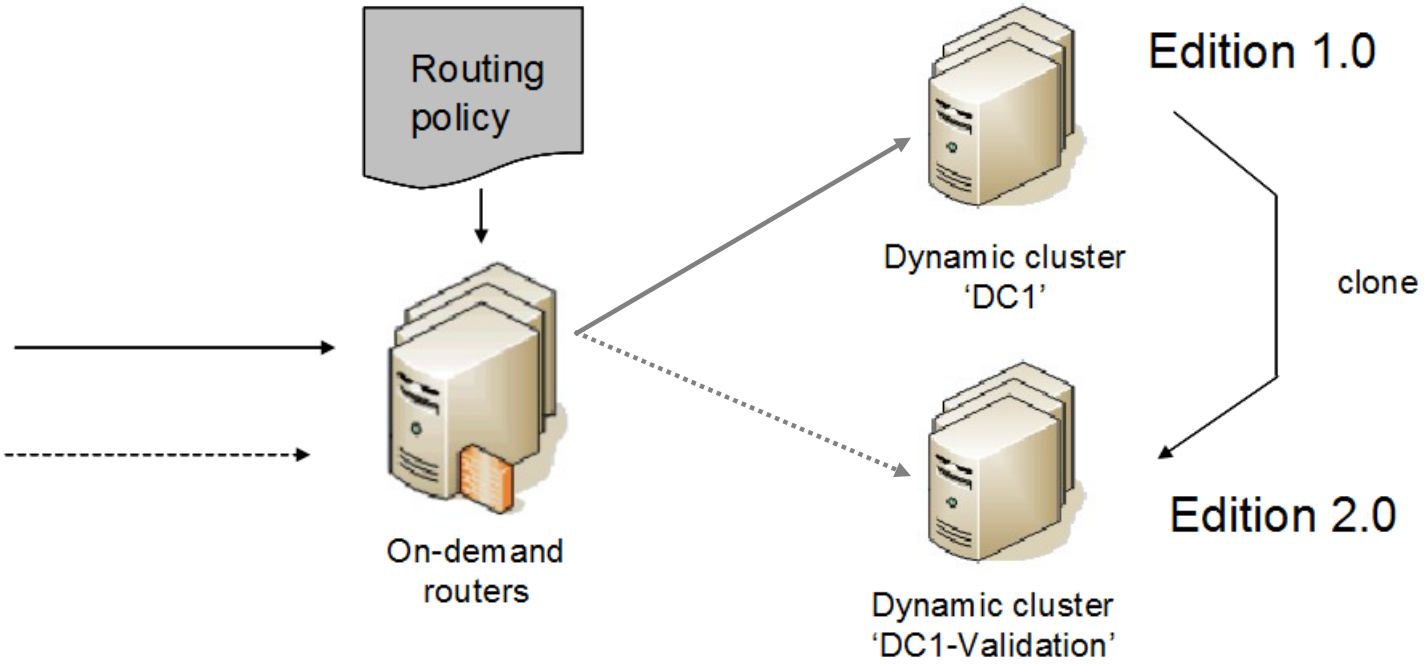
Application Edition Management
Administrative Console - Edition Control Center



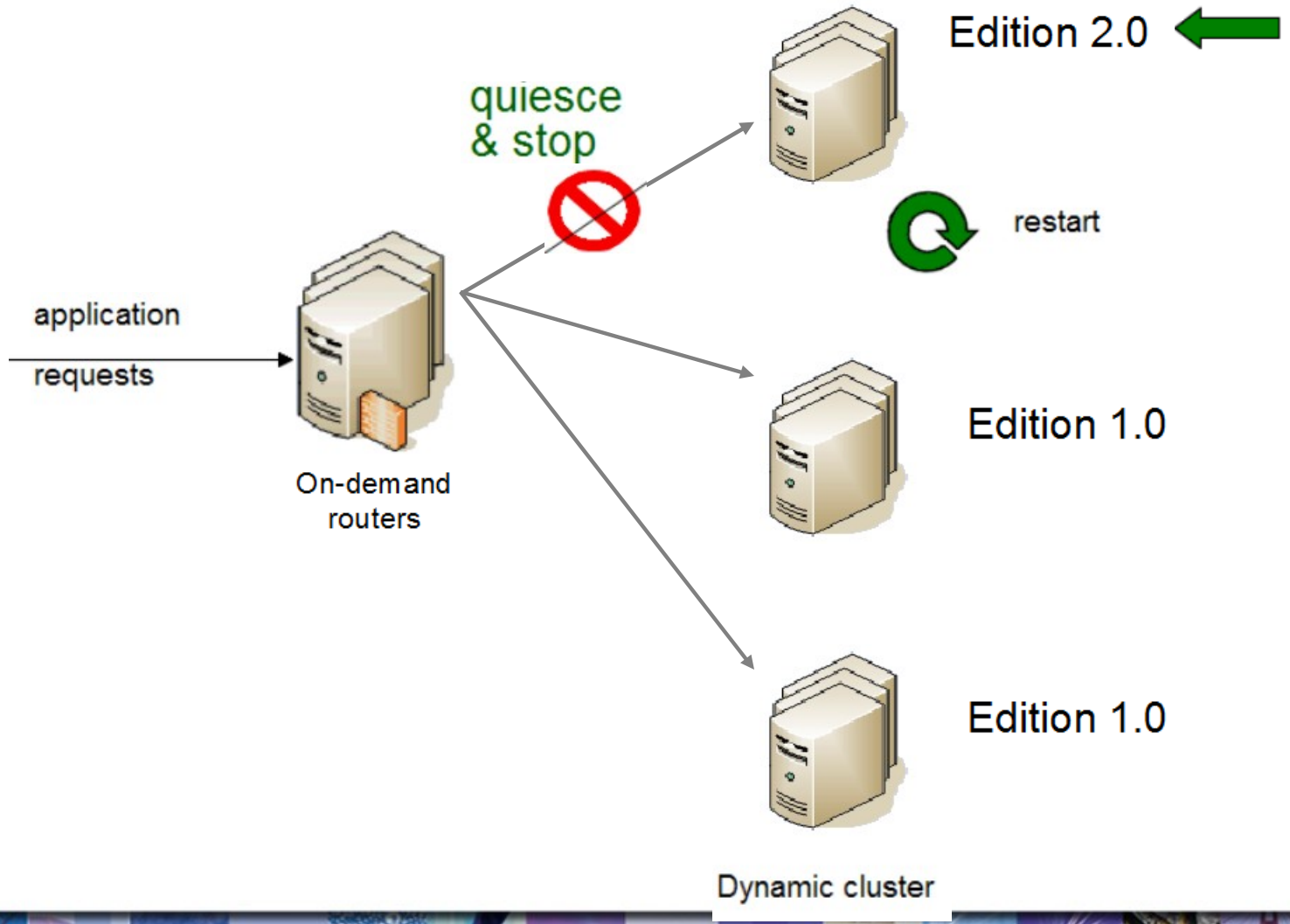
Application Edition Management Operational Scenario – Concurrent Activation



Application Edition Management - Validation Mode



Application Edition Management - Rollout Mode



Application Edition Management

Eliminate down-time for managed applications

Before Application Edition Management

1. Stop application servers
2. Uninstall old version of application
3. Install new version of application
4. Replicate application changes to all nodes
5. Start application servers

- Application is unavailable from step 1 through 5
- To revert to old version of application, repeat all steps, reversing “old” and “new” ... thus another long outage

With Application Edition Management

1. Install new edition of application
2. Replicate application changes to all nodes
3. Roll out new edition of application

- Application remains available to end users throughout the update process
- To revert to old version of application, simply rollback the old edition

Health Management

Sense and respond to problems before end users suffer an outage

- Automatically detect and handle application health problems
  - Without requiring administrator time, expertise, or intervention
- Intelligently handle health issues in a way that will maintain continuous availability
- Each health policy consists of a condition, one or more actions, and a target set of processes
- Includes health policies for common application problems
- Customizable health conditions and health actions

Comprehensive Health Policies

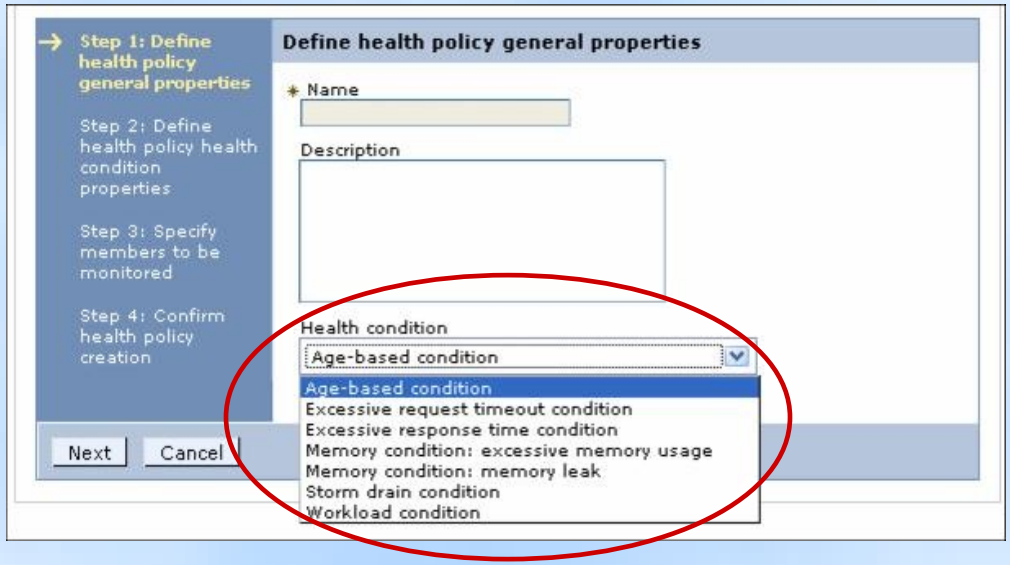
Customizable Health Conditions

Customizable Health Actions

Health Management – Health Policies

Helps mitigate common health problems before outages occur

- Health policies can be defined for common server health conditions
- When a health policy's condition is true, corrective action execute automatically or require approval
  - Notify administrator (send email or SNMP trap)
  - Capture diagnostics (generate heap dump, java core)
  - Restart server
- Excessive response time means you are monitoring what matters most: your customer's experience!
- Application server restarts are done in a way that prevent outages and service policy violations
- Each health policy can be in supervise or automatic mode. Supervise mode is like training wheels to allow you to verify that a health policy does what you want before making it automatic.



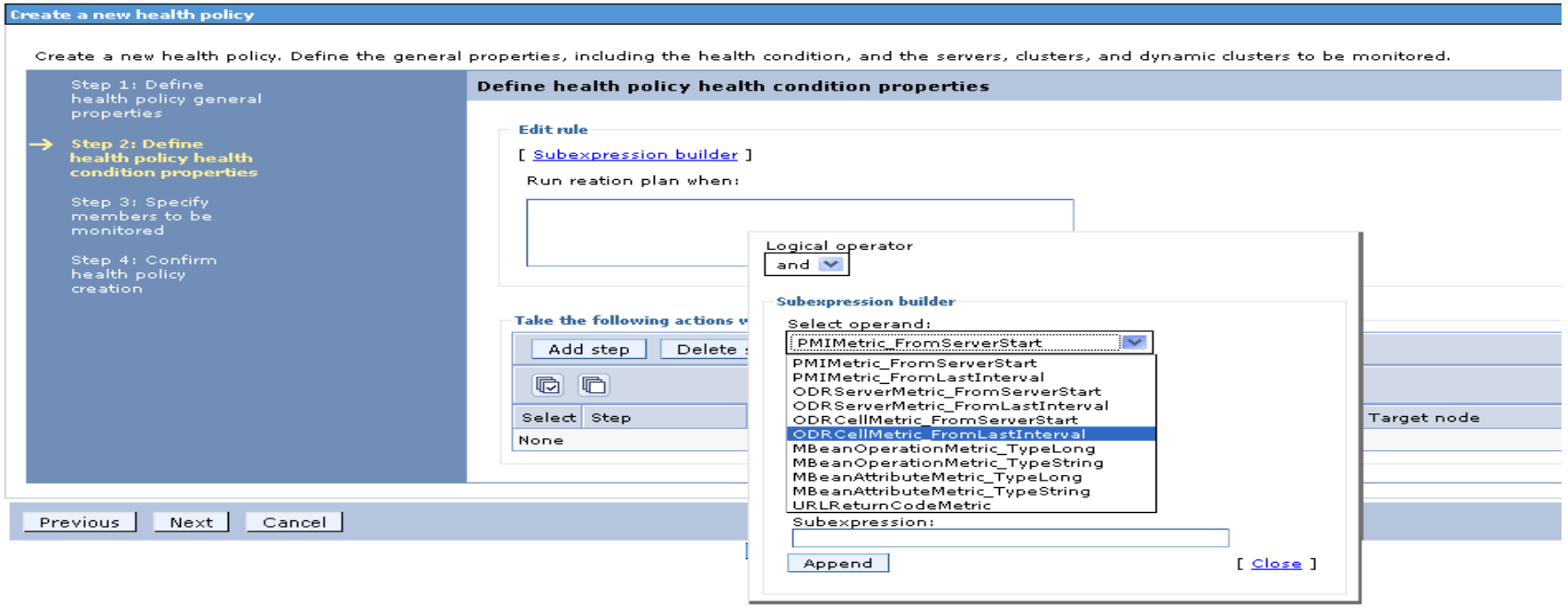
Health Conditions

- **Excessive request timeouts:** *% of timed out requests*
- **Excessive response time:** *average response time*
- **Excessive garbage collection:** *% of time spent in GCs*
- **Excessive memory:** *% of maximum JVM heap size*
- **Age-based:** *amount of time server has been running*
- **Memory leak:** *JVM heap size after garbage collection*
- **Storm drain:** *significant drop in response time*
- **Workload:** *total number of requests*

Health Management – Custom Health Conditions

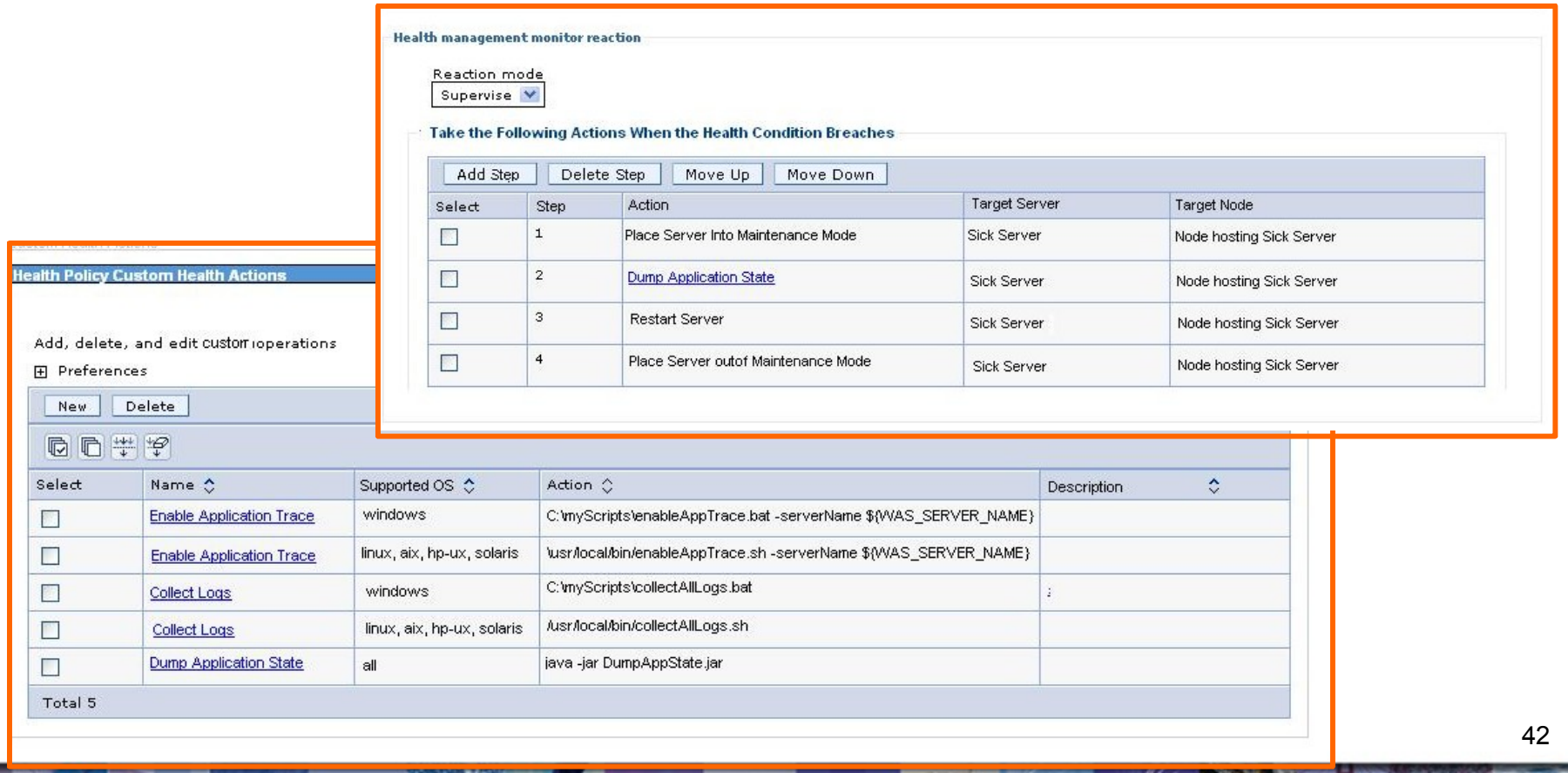
Flexibility to determine what an "unhealthy" condition is…

- Custom expressions can be built which use metrics from:
  - The On Demand Router, URI return codes
  - PMI metrics, MBean operations and attributes
  - Examples: hung thread detection, DB connection pool exhaustion or slow down
- Complex boolean expressions using a mix of operands is supported (AND, OR, NOT)



Health Management – Custom Health Actions

Provides flexibility by allowing the definition of custom actions allowing administrators to define an action plan to be carried out when the unhealthy situation detected.



Health management monitor reaction

Reaction mode: Supervise

Take the Following Actions When the Health Condition Breaches

Add Step | Delete Step | Move Up | Move Down

Select	Step	Action	Target Server	Target Node
☐	1	Place Server Into Maintenance Mode	Sick Server	Node hosting Sick Server
☐	2	Dump Application State	Sick Server	Node hosting Sick Server
☐	3	Restart Server	Sick Server	Node hosting Sick Server
☐	4	Place Server outof Maintenance Mode	Sick Server	Node hosting Sick Server

Health Policy Custom Health Actions

Add, delete, and edit custom operations

Preferences

New | Delete

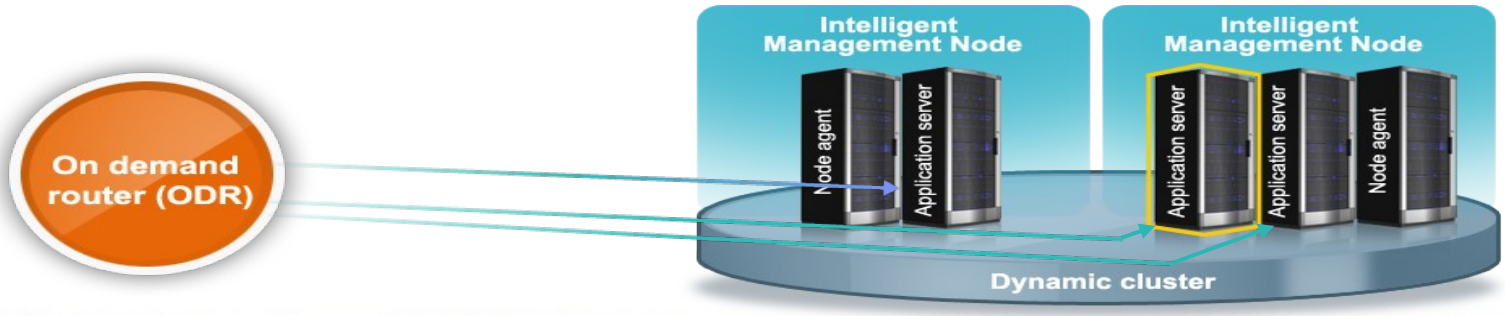
Select	Name	Supported OS	Action	Description
☐	Enable Application Trace	windows	C:\myScripts\enableAppTrace.bat -serverName ${WAS_SERVER_NAME}	
☐	Enable Application Trace	linux, aix, hp-ux, solaris	\usr\local\bin\enableAppTrace.sh -serverName ${WAS_SERVER_NAME}	
☐	Collect Logs	windows	C:\myScripts\collectAllLogs.bat	
☐	Collect Logs	linux, aix, hp-ux, solaris	/usr/local/bin/collectAllLogs.sh	
☐	Dump Application State	all	java -jar DumpAppState.jar	

Total 5

Dynamic Clustering

Proactively provision and start or stop application servers based on workload demands to meet Service Level Agreements

- Associate service policies with your applications
  - Let WebSphere manage to the service goals
- Programmatically respond to spikes in demand
  - Add or reduce application server instances as appropriate
- Automatically recover from infrastructure problems
- Includes automatic start and stop of cluster members based on load for MQ-driven applications
- Decrease administrative overhead required to monitor and diagnose performance issues



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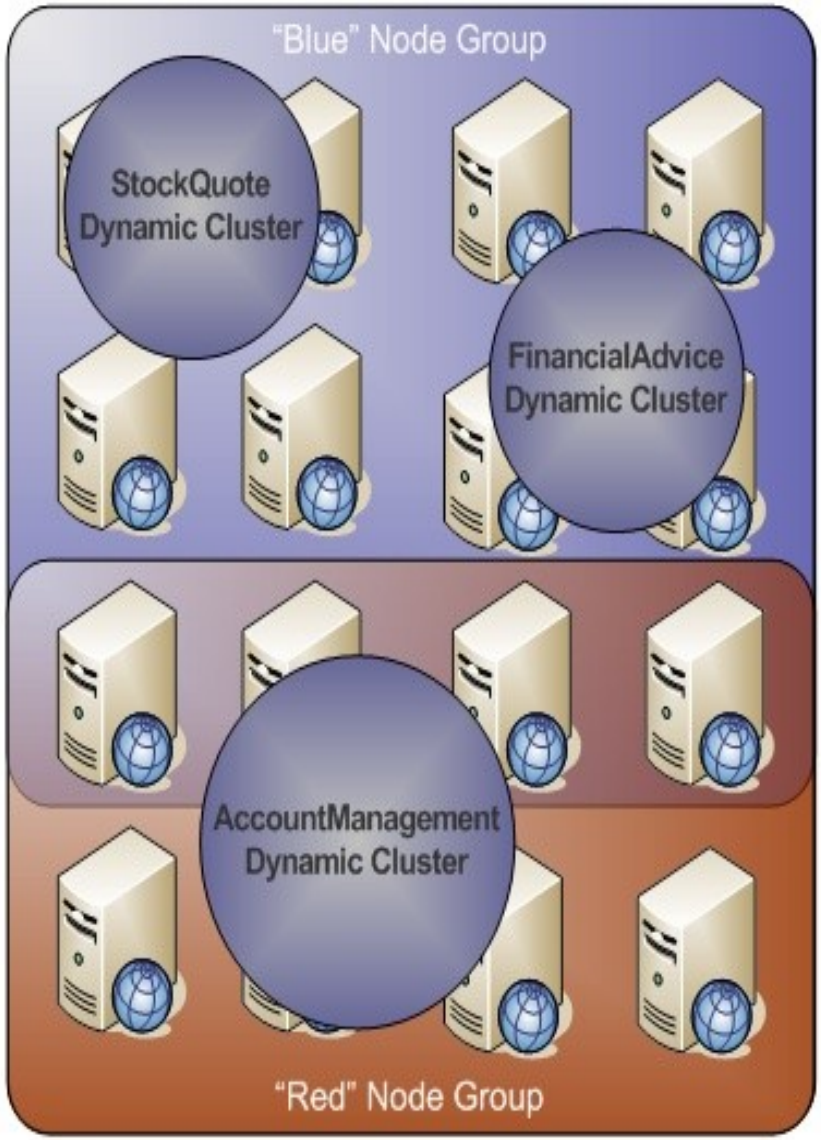
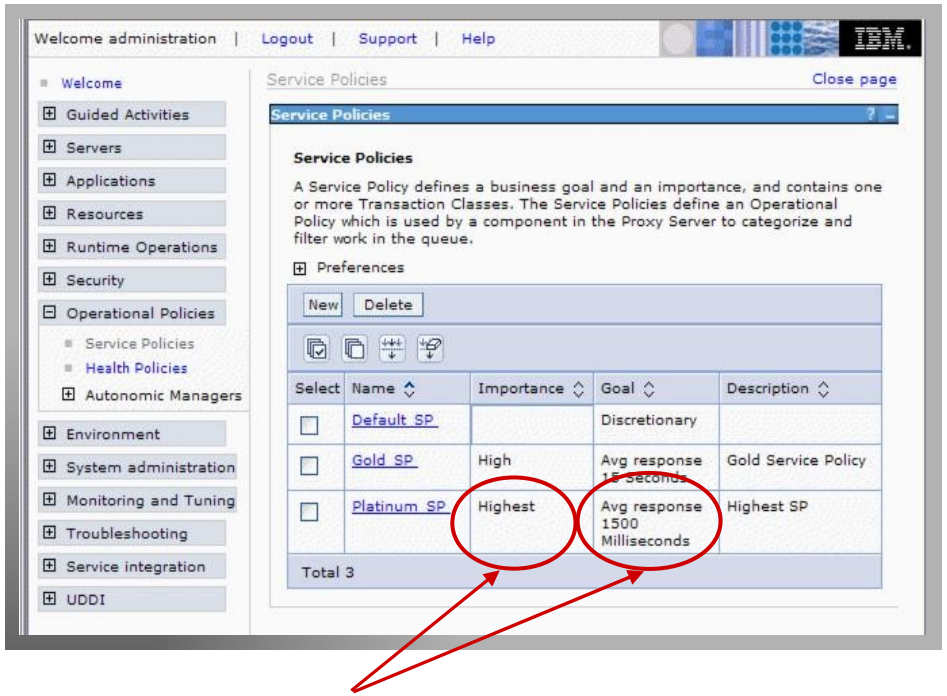
Dynamic Clustering

- A Dynamic Cluster is a virtual cluster of servers (JVMs) hosting the application that lives on group of nodes
- What is dynamic about a dynamic cluster?
  - App server definitions are dynamically created or deleted based upon the node membership policy (e.g. Servers are created/deleted if a node is added to /removed from a node group)
  - App server definitions are automatically updated when the server template associated with the dynamic cluster is updated
  - App servers are started / stopped based upon current application demand & service policies



What is a Service Policy?

- Easily allows an administrator to specify the relative importance of applications and optionally a response time goal. WebSphere then manages your applications according to this policy.
  - Service policies are used to define application service level goals
  - Allow workloads to be classified, prioritized and intelligently routed
  - Enables application performance monitoring
  - Resource adjustments are made if needed to consistently achieve service policies



Service Policies define the relative importance and response time goals of application services; defined in terms the end user result the customer wishes to achieve

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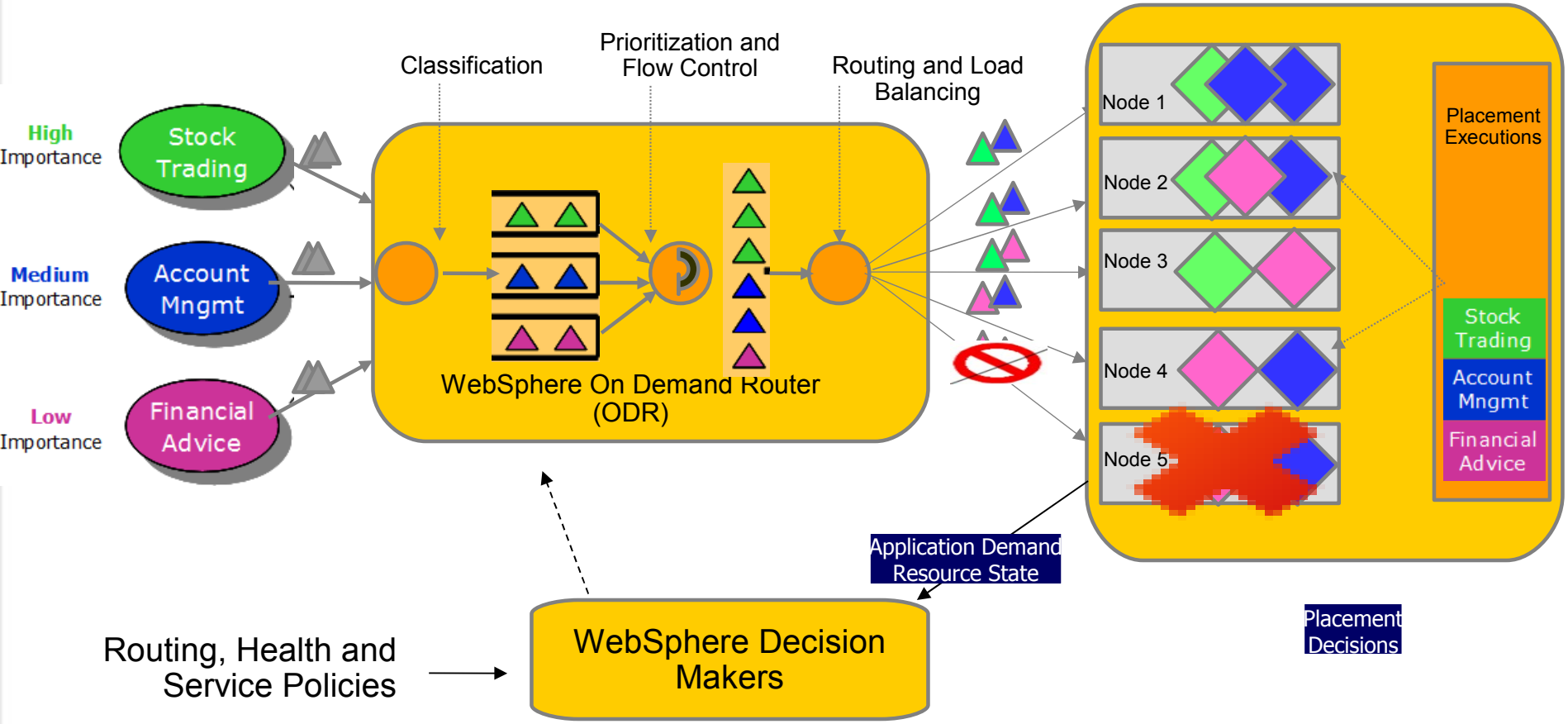
Intelligent Management Scenario

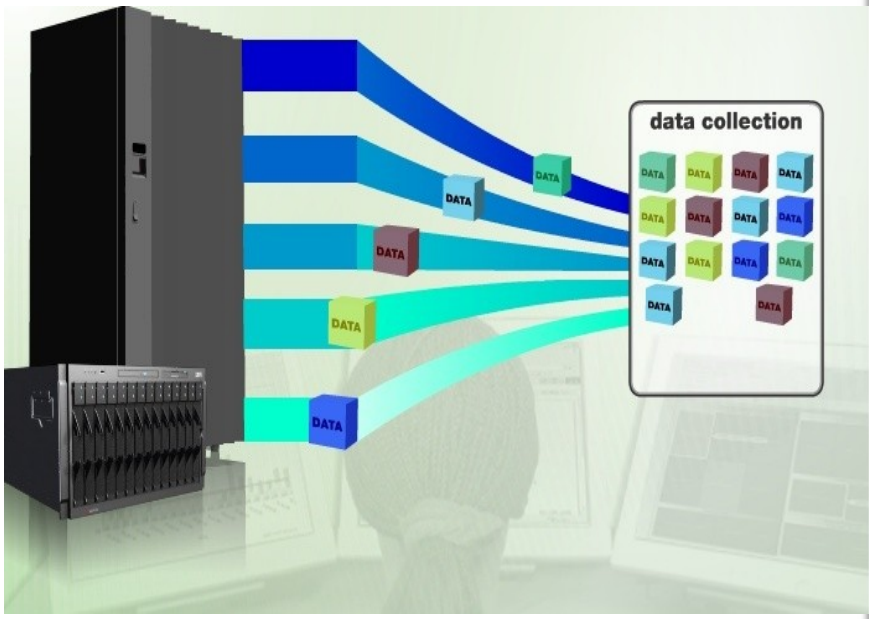
The On Demand Router applies sophisticated classification and flow control algorithms to intelligently manage workload



Intelligent Management Data Logging

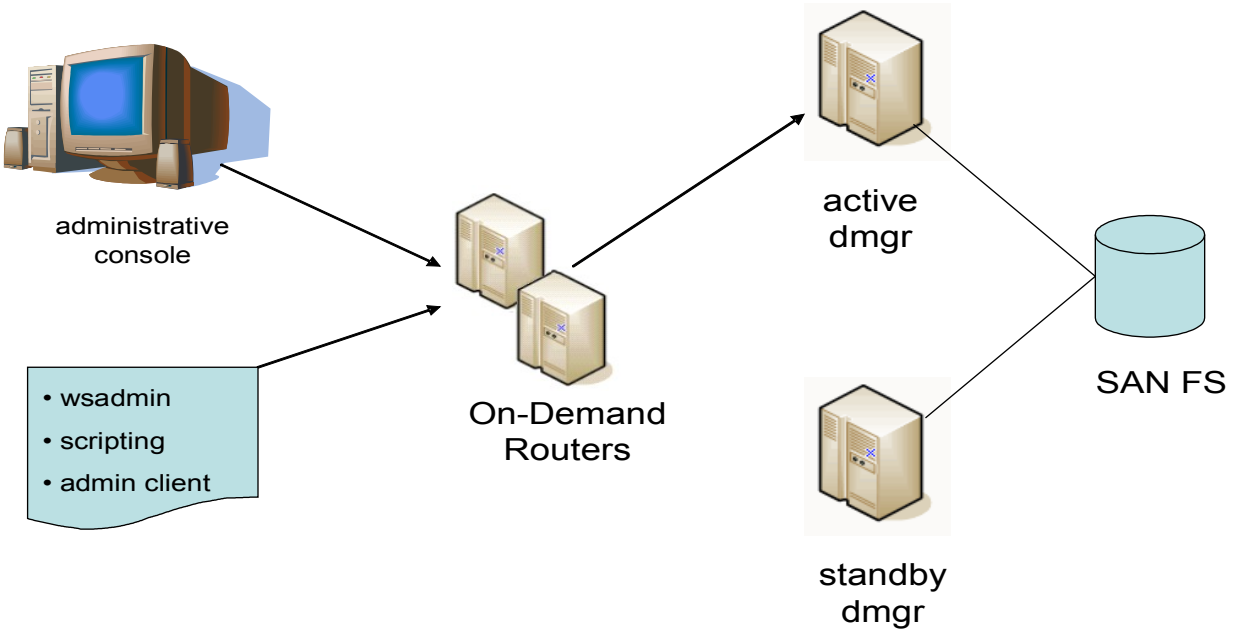
- WebSphere Application Server ND contains comprehensive data logging of applications, users and resources; content in logs is configurable and aggregated for easily hooking into accounting and charge-back products

  - Comprehensive logging of application, resource and workload information across autonomic systems
  - Historical trend analysis using either pre-packaged or customized reports with innovative visualization techniques
  - Easily hookup to accounting and chargeback systems such as Tivoli Usage and Accounting Manager



Highly Available Deployment Manager

- *Hot-standby deployment manager (dmgr)*
- *ODR routes to currently active dmgr*
- *SOAP connector is supported for scripting*
- *Shared file system with fast lock recovery is used to:*
  - *share configuration and work space*
  - *failover when shared file system lock is released*



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WAS v8.5 with the Liberty Profile and Intelligent Mgmt. now looks like:

WAS for Developers

Tools Edition | +Liberty Profile

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

Available as a no-charge edition for the developer desktop and includes Eclipse adapters

WAS Hypervisor Edition

+Liberty Profile | +Intelligent Mgmt

Optimized to instantly run in VMware and other server virtualization environments

WAS ND

Tools Edition | +Liberty Profile | +Intelligent Mgmt

Delivers near-continuous availability, with advanced performance and mgmt capabilities, for mission-critical apps

WAS for z/OS

+Liberty Profile | +Intelligent Mgmt

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

WAS

Tools Edition | +Liberty Profile

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

WAS Express

+Liberty Profile

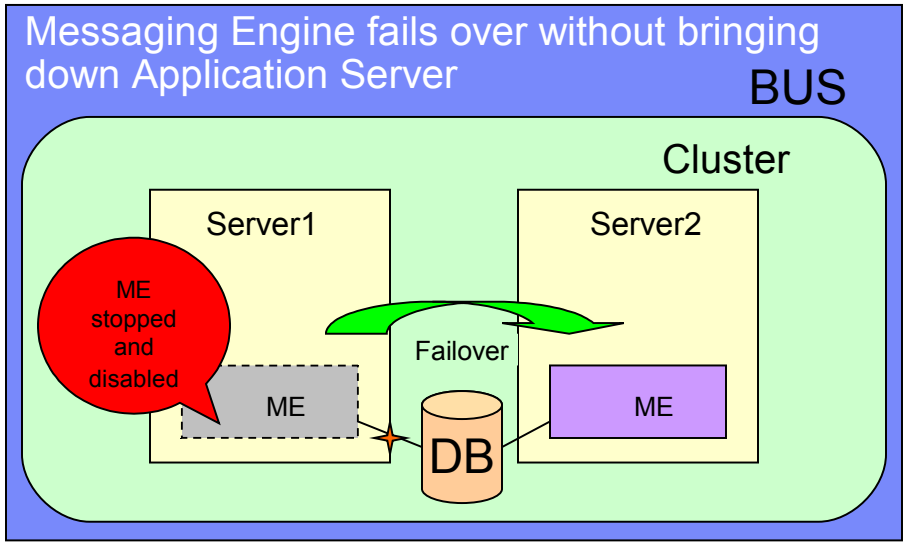
A lower-cost, ready-to-go solution to build dynamic Web sites & apps

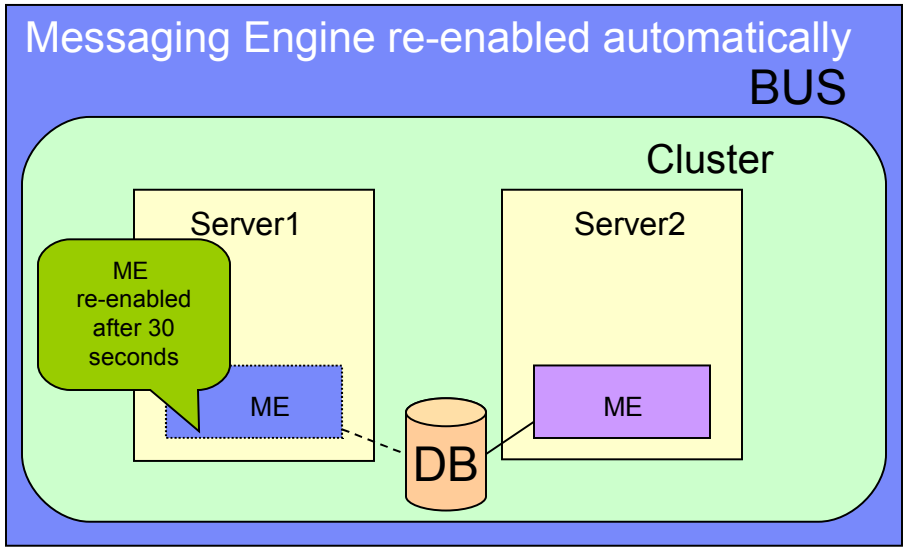
WAS CE

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

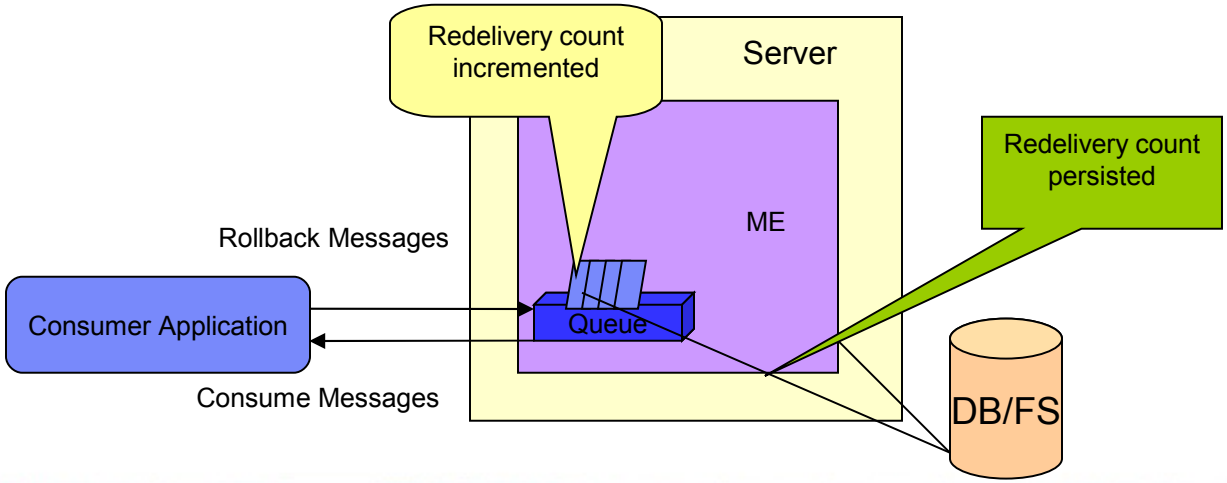
Built on a common code base

Resiliency of messaging infrastructure





Re-delivery count persisted



Memory leak detection & Protection in WAS

Reduce possibilities of memory leak in your applications

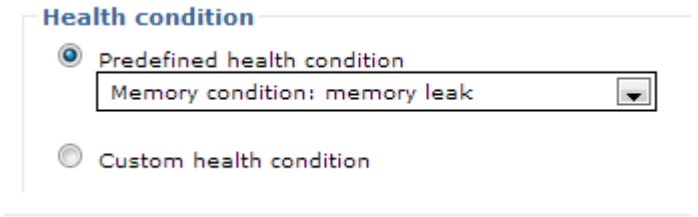
Get enough info. if leak is detected to help fix my app

List stopped apps that have memory leaks

WebSphere Application Server V8.5:

- Ability to mitigate memory leak when stopping apps
- Ability to prevent leaks, receive leak warnings and get heap/system dumps
- MBean to list stopped apps that have memory leaks

Operational Policies >> Health Policies >> New >> Health condition - “Memory condition: memory leak”



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WebSphere Application Server V8.5 Delivers

Unparalleled Application Development and Management Environment, Rich User Experiences…Faster

Operations and Control

Improved Operations, Security, Control & Integration

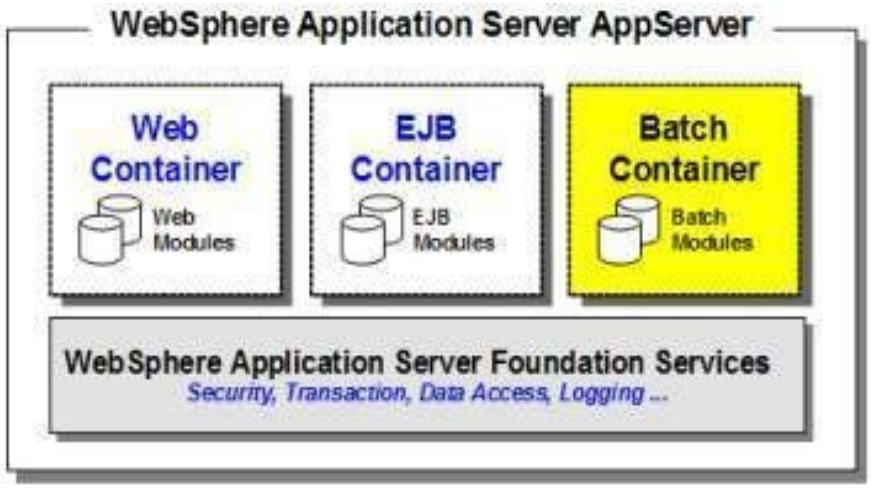
- Selectable JDK
- WebSphere Batch enhancements
- Admin Security Audit
- OSGi Blueprint security improvements
- Cross Component Trace (XCT)
- Enhanced IBM Support Assistant
- Better log and trace filtering

WebSphere Batch

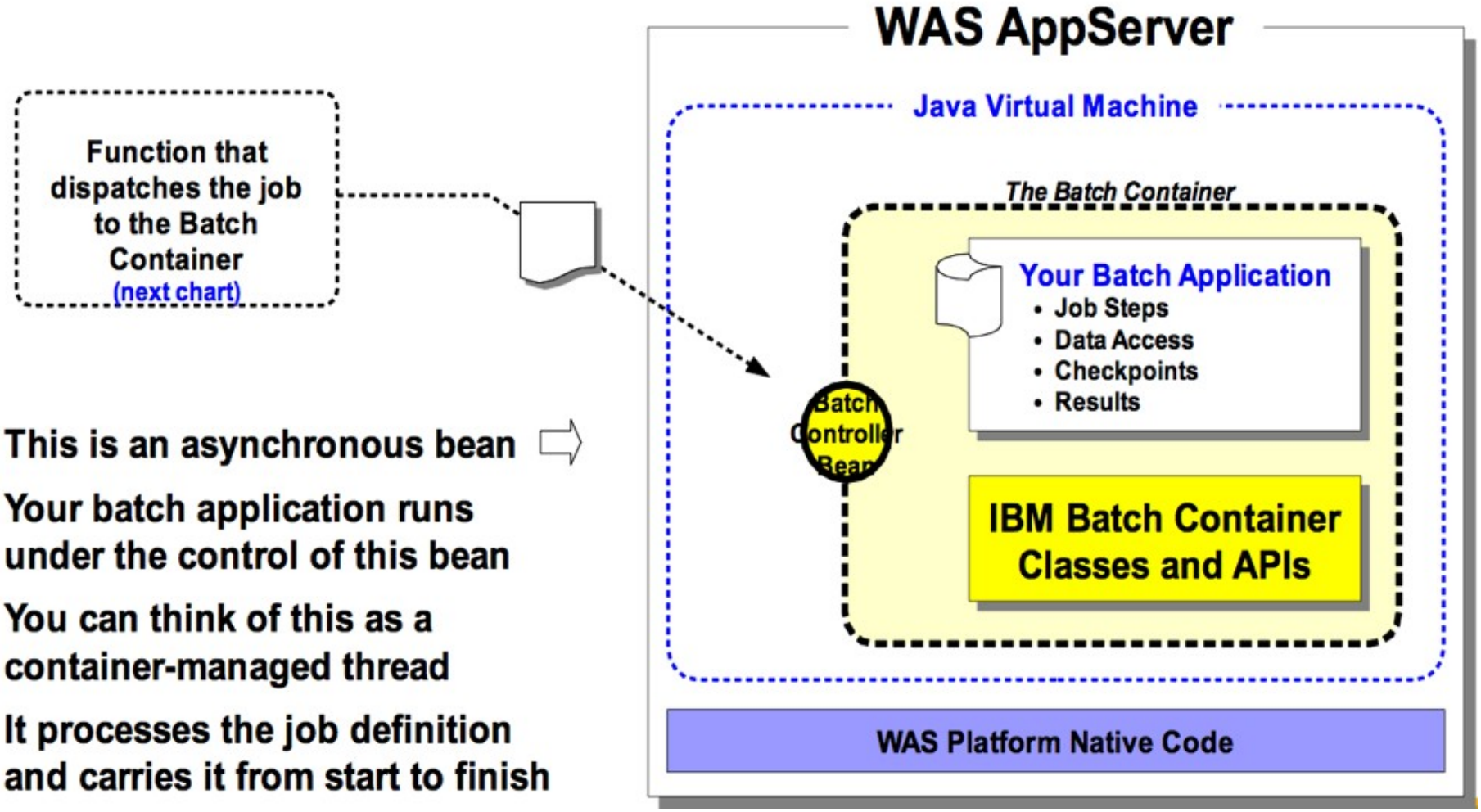
Quickly develop and deploy batch applications and dramatically reduce infrastructure and operational costs

- **Lower TCO:** Concurrent execution of batch & online transaction processing (OLTP) workloads using shared business logic on a shared infrastructure; Higher throughput and lower resource consumption on z/OS when collocated with data subsystems
- **Enhanced Developer Productivity:** Pre-integrated application framework, Java batch programming model and tools

- **Automation & Admin:** Container managed services for checkpoint and restart capabilities. Integrated administration of OLTP applications and batch jobs
- **Packaging utility:** Utility to package batch application that can be deployed using JEE runtime



The WebSphere Batch Container



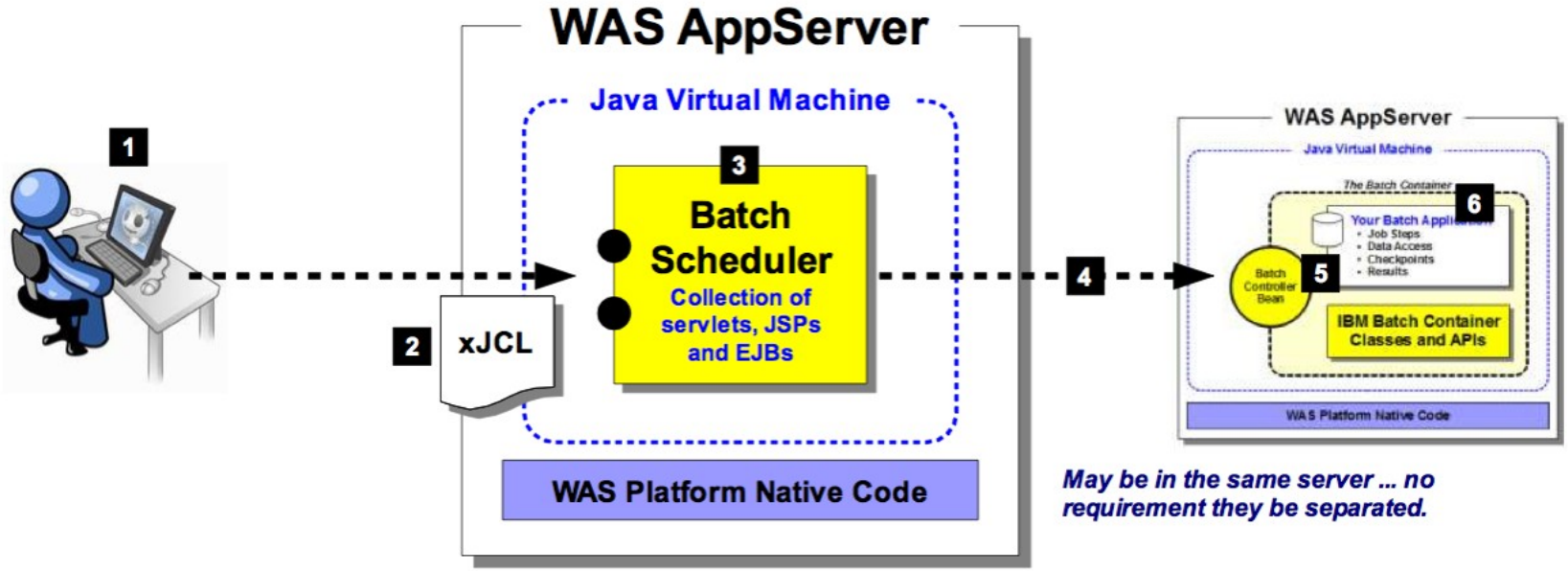
This is an asynchronous bean

Your batch application runs under the control of this bean

You can think of this as a container-managed thread

It processes the job definition and carries it from start to finish

The WebSphere Batch Workflow



1. A user requests a job be submitted

2. The job control definition is specified

3. The scheduler analyzes the request

4. The job is dispatched to a capable endpoint

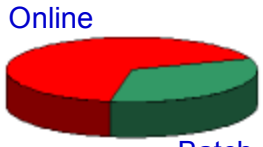
5. Batch endpoint begins execution with the invocation of the async controller bean

6. **Your batch application is invoked**

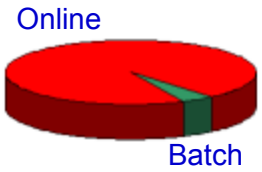
Concept of "Dedicated Batch" Window Going Away

Windows of time which used to be dedicated to batch processing are shrinking. The demands of online processing require more and more ...

In the past ...



Today ...



24 x 7 x 365 Access

Users of your online systems expect availability at all hours

Users from other parts of the world means availability is expected around the clock

Mobile Users

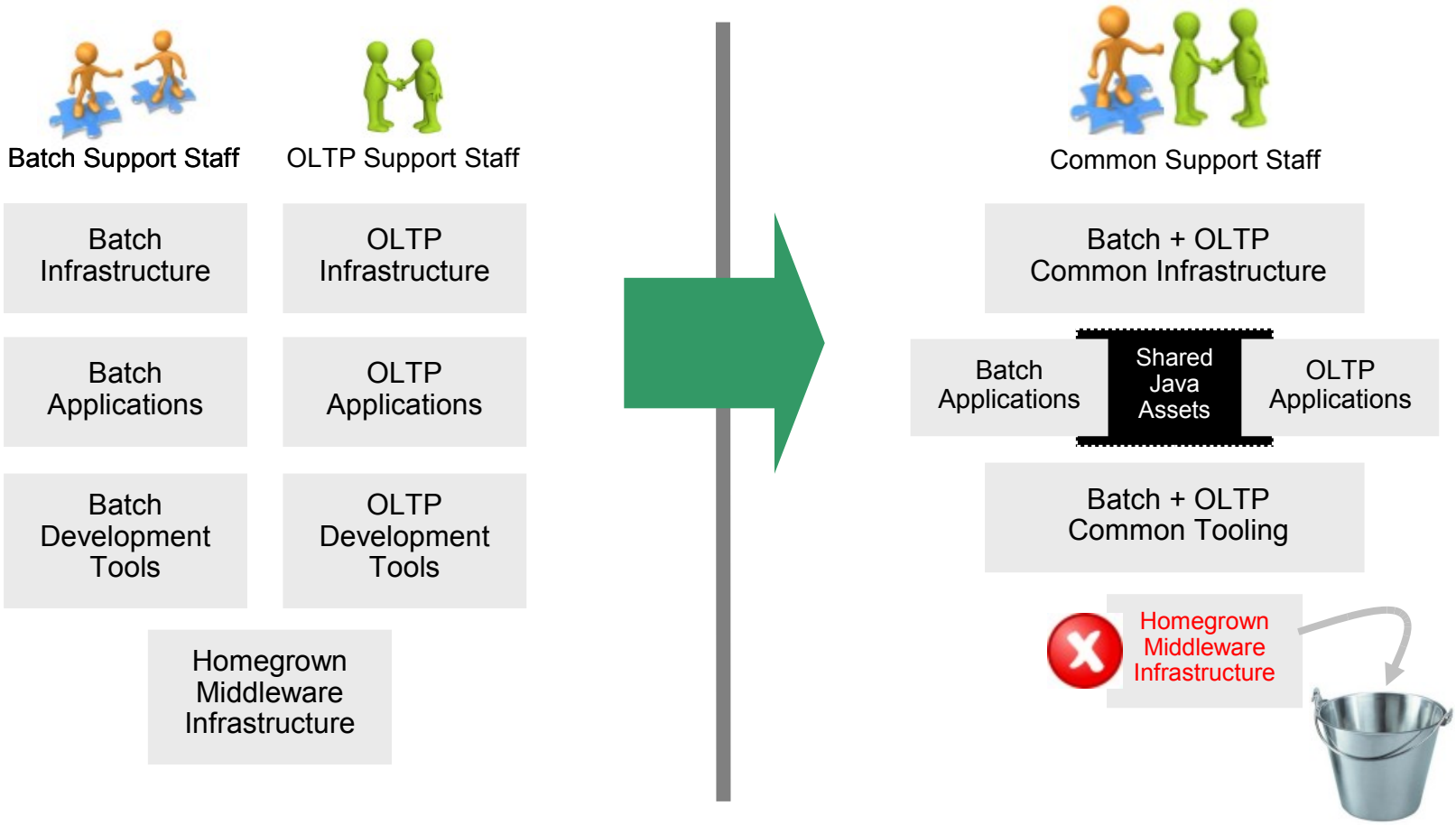
Users are no longer tied to a desk and a computer. Today users have access to mobile computing devices that are with the user wherever they may be. Day or night, home or office.

The need to process batch work has *not* gone away.

The need to perform the work concurrent with OLTP has emerged.

The Value of Shared Services

It's not *just* that the window is shrinking ... it's also the cost pressures on maintaining the batch and OLTP environments:



Efficiencies through consolidation around common assets

Index

Java for Batch Processing?

Yes ... for many very good reasons:

Availability of Skills

Java is a programming language with wide adoption in the industry. Skills for Java programming are common and affordable.

Tooling Support

Development tooling for Java has advanced to the point where some tools (IBM Rational Application Developer) are very powerful and sophisticated.

This also provides an opportunity to consolidate to a common tooling environment for both OLTP and batch development.

z/OS Specialty Engines

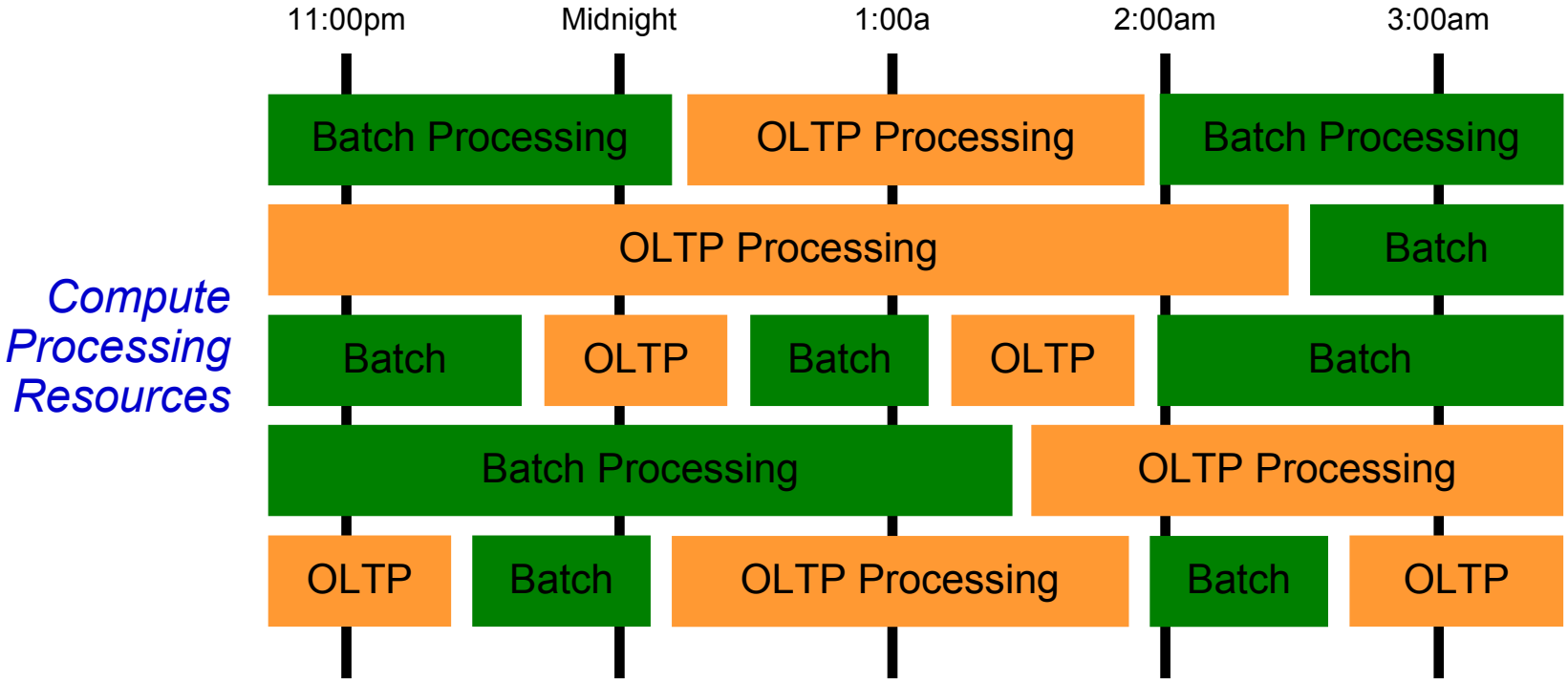
Pressures on cost containment often dictate greater use of z/OS specialty engines. Java offloads to zAAP. Java batch does as well.

Processing in OLTP Runtime

Running Java batch in the same execution runtime as Java OLTP provides an opportunity to mix and manage the two processing types together under the same management model.

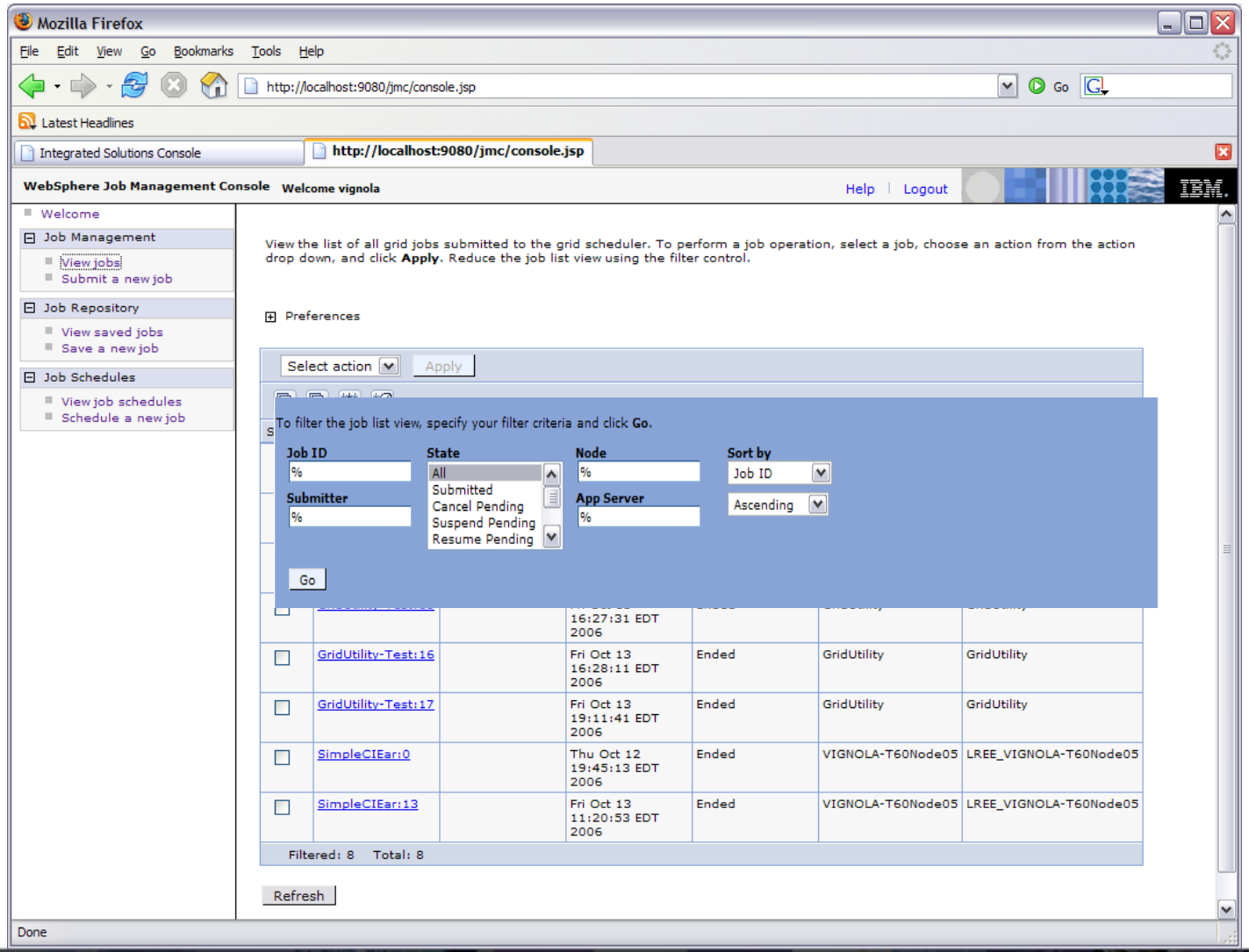
The Objective -- OLTP and Batch Mixed and Managed:

OLTP and Batch do not need to be "either / or" ... it can be "both":



With IBM WebSphere Batch this is possible. OLTP and Batch processing within a common execution runtime (WebSphere Application Server) allows the WAS platform to mix and manage the two workload types.

Job Management Console …



Security Enhancements

Ensure app server environment complies with OSGi security improvements and improve the ability to audit and track changes

- OSGi Blueprint security improvements:
  - Configure bean security in the Blueprint xml file
  - Configure bean-level security in OSGI apps
  - Configure method level security in OSGI apps
- Checkpoint Repository:
  - Audit and track any changes anybody makes to the WebSphere application Server configuration

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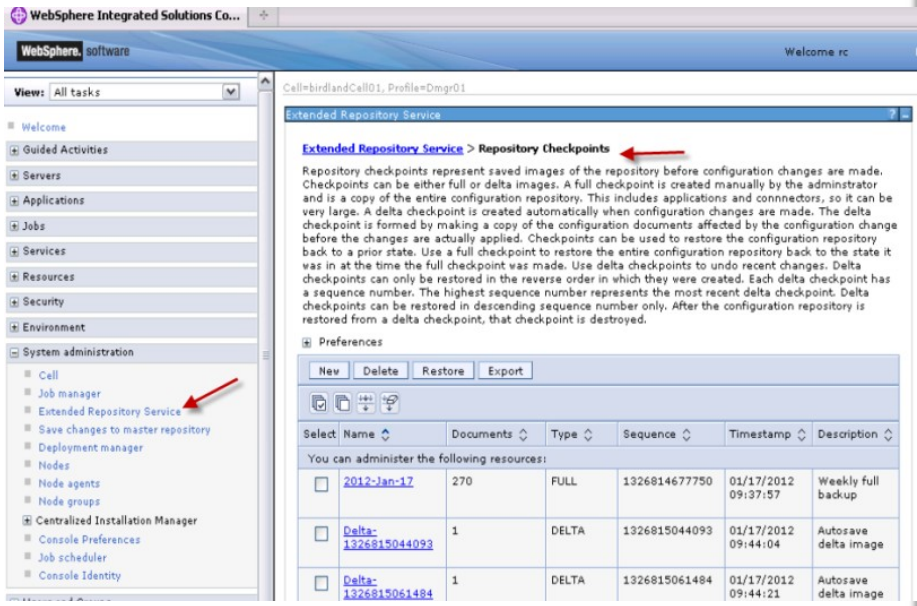
Repository Checkpoint and Admin Audit

Simplify restoration of earlier configuration checkpoints and record all configuration updates is security audit log.

- The Repository Service is consolidated from WVE.
- Provides “full” and “delta” checkpoints of the master configuration repository.
- Simplifies restoration to a previous configuration state.
- Full checkpoint created manually
- Delta checkpoints, when enabled, are created automatically in checkpoint repository on every configuration-save
- New Security Audit event - ADMIN_REPOSITORY_SAVED refers to corresponding delta checkpoint records.
  - The delta checkpoint can be exported to review configuration changes when needed



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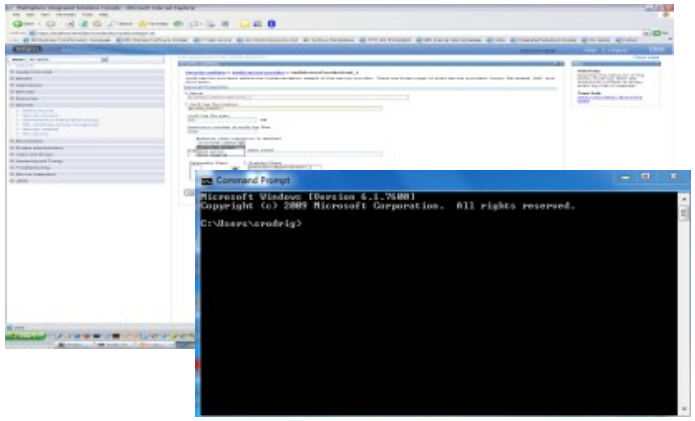
High Performance Extensible Logging (HPEL)

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



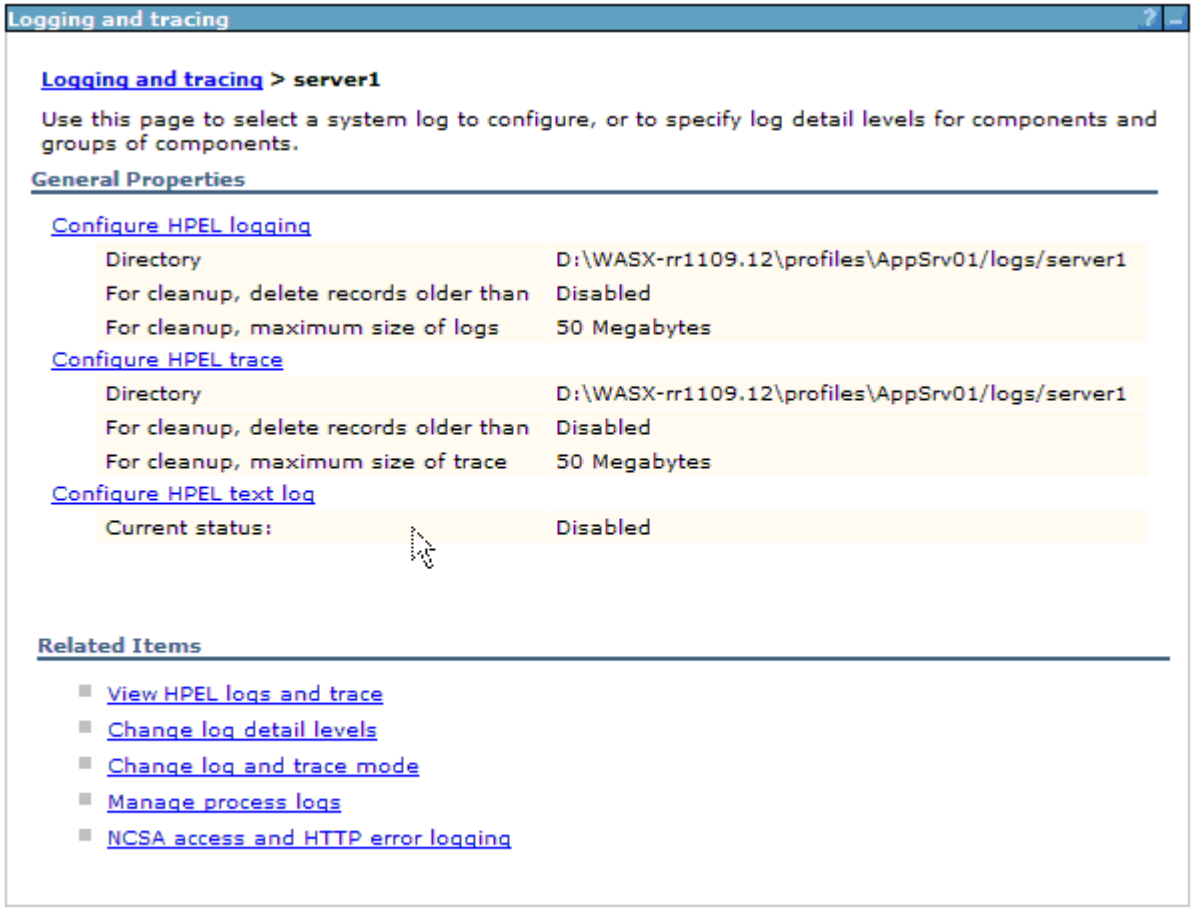
Examples:

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 0x0000000c:
logViewer.sh -startDate 07/11/2010 -message "SEC*" -thread 0c

High Performance Extensible Logging (HPEL)

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



Cross-Component Trace (XCT) for Problem Determination

Improve your ability to diagnose & debug SW problems in order to minimize and eliminate application downtime

- XCT log viewer - available for the IBM Support Assistant, can render log and trace content from multiple log / trace files grouped by request
  - View that detailed information on HTTP and JMS requests and responses to easily debug complicated application problems.
- High Performance Extensible Logging (HPEL) now has log / trace entry extensions
  - Filter entries by application name, by request ID or by other custom fields

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High Performance Extensible Logging (HPEL)
Log / trace entry extensions

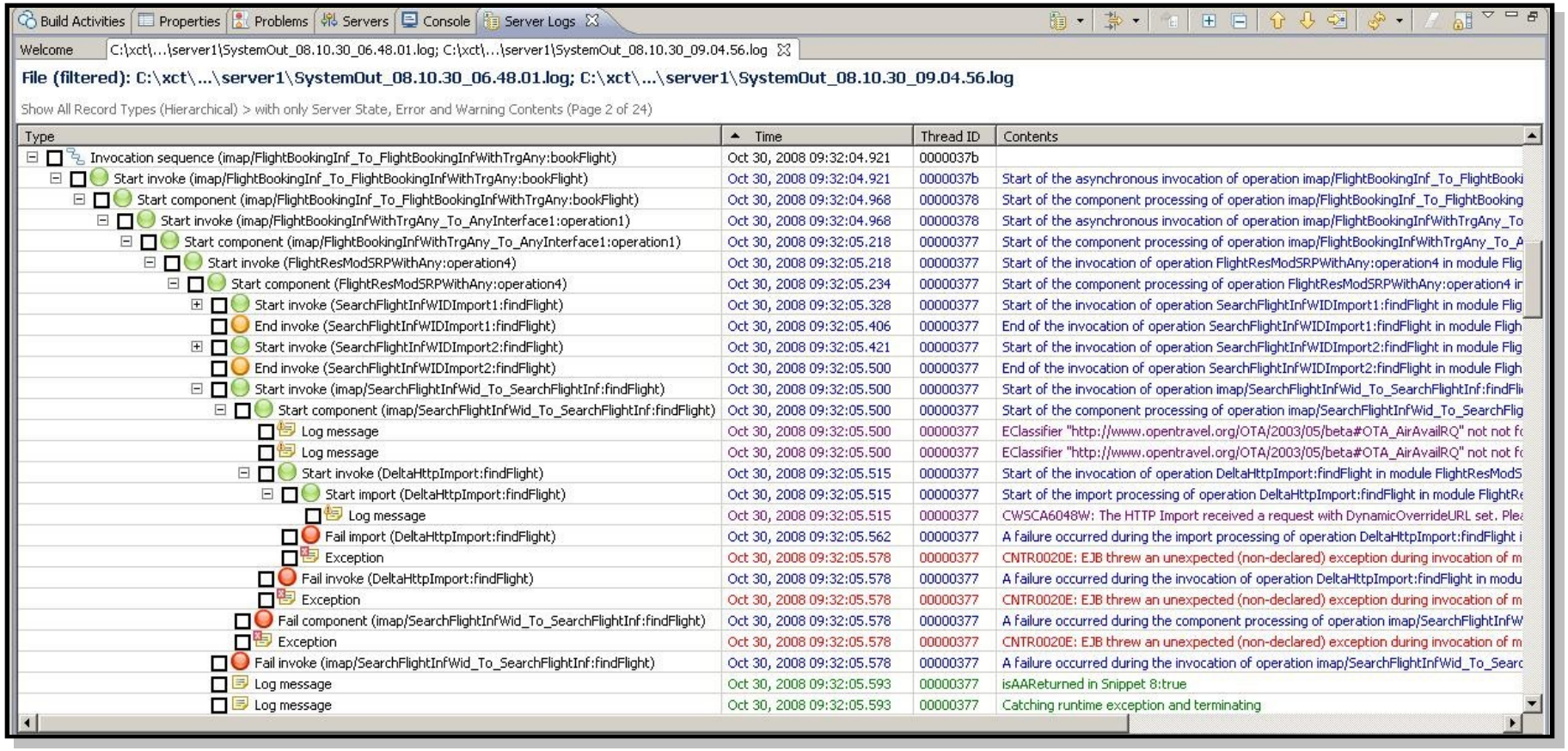
- HPEL log / trace entries can now be extended with name value pair 'extensions'
  - JEE application name has been added as an extension (called 'appName') to all log / trace entries created on threads associated with an application
  - XCT requestID has been added as an extension (called 'requestID') to all log/trace entries known to be created on threads associated with a request
- When viewing HPEL log / trace, entries can be filtered by appName, requestID, or any other extension via the HPEL logViewer command

```
logViewer.sh -includeExtensions appName=ACMEShovels -format advanced

…

[12/10/11 10:52:01:500 EST] 000001c6  1 UOW= source=com.acme.SomeLogger thread=[WebContainer :
   6] org= prod= component= appName=[ACMEShovels]

          This is a trace entry from the MyShovels application

…
```

- Developers can add their own extensions to HPEL log / trace entries via the new **LogRecordContext** API

Cross-Component Trace (XCT)

- XCT log viewer, available for the IBM Support Assistant, can render log and trace content from multiple log / trace files grouped by request



Cross-Component Trace (XCT)

- XCT enables correlation of log and trace entries created by multiple threads and/or processes on behalf of the same request
  - XCT can augment log / trace entries with a requestID which you can view and filter using HPEL

```
[3/18/11 14:50:17:391 EDT] 00000018  W UOW= source=com.ibm.somelogger.QuickLogTest org= prod= component=
thread=[WebContainer : 1] requestID=AAP+k9s6JZ9-AAAAAAAAAAA
      hello world
```

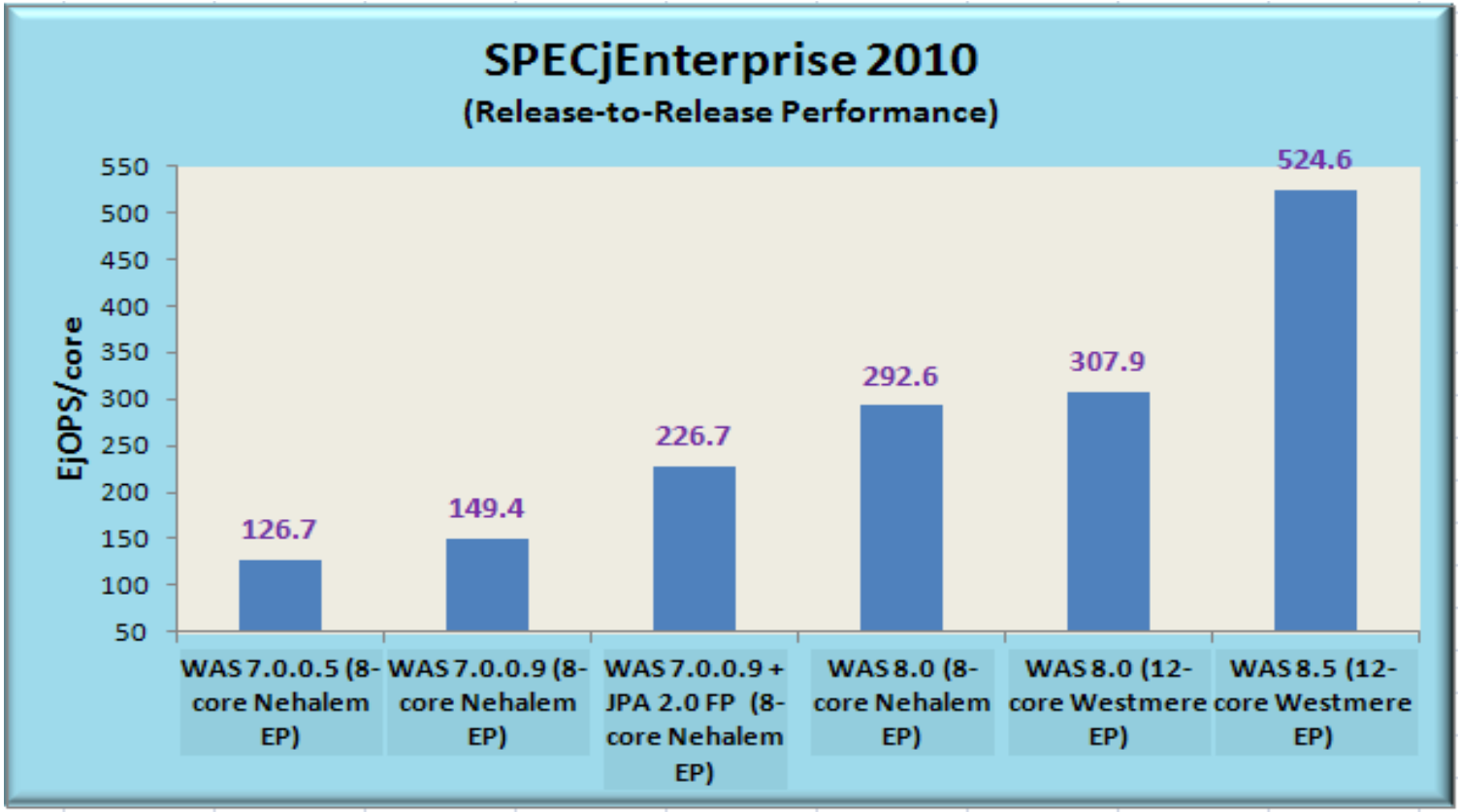
  - XCT can add records to your log / trace files so you can see how work related to each request branched between all involved threads / processes.

```
[3/23/12 14:01:40:615 CDT] 00000032 XCT           I   BEGIN AAP+k9s6JZ9-AAAAAAAAAAA 00000000000-ccccccccccc2
HTTPCF(InboundRequest /HelloWorld/ RequestContext(828937987))
[3/23/12 14:01:40:678 CDT] 00000032 XCT           I   END   AAP+k9s6JZ9-AAAAAAAAAAA 00000000000-ccccccccccc2
HTTPCF(InboundRequest RC=200 RequestContext(828937987))
[3/23/12 14:01:50:381 CDT] 00000032 XCT           I   BEGIN AAP+k9s6JZ9-AAAAAAAAAAB 00000000000-ccccccccccc2
HTTPCF(InboundRequest /HelloWorld/ RequestContext(435283455))
[3/23/12 14:01:50:443 CDT] 00000032 XCT           I   END   AAP+k9s6JZ9-AAAAAAAAAAB 00000000000-ccccccccccc2
HTTPCF(InboundRequest RC=200 RequestContext(435283455))
```

  - XCT can store data snapshots, for example the complete text of a JMS/HTTP request, to facilitate in-depth problem determination

```
[1/17/12 16:58:46:765 EST] 0000001c XCT           I   BEGIN AAP+k9s6JZ9-AAAAAAAAAAB 00000000000-ccccccccccc2
MyAnnotation(Attachment(MyRequest.txt))
```

WebSphere Release-to-Release Performance



Consistent Performance gains across WAS Releases

As per SPEC Published Data as of 4/26/2012
http://www.spec.org/jEnterprise2010/results/jEnterprise2010.html

WebSphere outperforms Oracle WebLogic

IBM is the world leader in middleware performance

- IBM 14% better than Oracle on same HW
- Improve performance and efficiency leveraging current HW investments
- Improve transaction availability of your SOA infrastructure by getting more out of your Hardware
- IBM #1 even if Oracle uses latest HW
- IBM middleware makes the best use of all HW Platforms – Intel, Power and/or z
- Get the best bang for your buck – run the most transactions at the lowest cost

http://ibm.co/Xkocdn

	IBM	Oracle	IBM advantage
# of app server cores (Intel Xeon E5-2690)	16	16	na
# of db server cores (Intel Xeon E5-2690)	16	16	na
Total JOPS	9,696.43	8,310.19	14.30%
JOPS per core	606.03	519.39	**14.30%**
3 year $ per JOPS hw+sw (non-clustered)	$87.79	$175.50	99.91%
3 year $ per JOPS hw+sw (clustered)	$111.06	$251.40	**126.36%**

1) SPEC and SPECjEnterprise 2010 are registered trademarks of the Standard Performance Evaluation Corporation.
Results from www.spec.org as of 04/29/2012 Oracle SUN Blade Server X6270 M2 452.285 EjOPS/core SPECjEnterprise2010, Oracle Sun Fire X4170 M3 – 519.386 SPECjEnterprise2010 EjOPS (Oracle's best SPECjEnterprise2010 EjOPS/core result so far). IBM HS 22 Blade 524.621 EjOPS/core (World Record SPECjEnterprise2010 EJOPS/core result)

WebSphere Application Server V8.5 Delivers

Unparalleled Application Development and Management Environment, Rich User Experiences…Faster

Developer Experience

Fast, flexible, and simplified application development

- Liberty Profile
- Expanded Tooling and WebSphere Application Server Tooling Bundles
- OSGI programming model enhancements
- EJB support in OSGi apps
- JDK7 Support
- Migration toolkit
- Web 2.0 & Mobile Toolkit; IBM Worklight Integration
- SCA OASIS programming model

Application Resiliency

Intelligent Management & Enhanced Resiliency

- Application Edition Management
- Application Server Health Management
- Dynamic Clustering
- New Intelligent Routing capabilities
- Messaging infrastructure resiliency
- Memory leak detection & protection in WAS

Operations and Control

Improved Operations, Security, Control & Integration

- Selectable JDK
- WebSphere Batch enhancements
- Admin Security Audit
- OSGi Blueprint security improvements
- Cross Component Trace (XCT)
- Enhanced IBM Support Assistant
- Better log and trace filtering

References

- Overview of new Administrative Features and Enhancements:
  - http://www.ibm.com/developerworks/websphere/techjournal/1206_cheng/1206_cheng.html
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  - http://www.ibm.com/developerworks/websphere/techjournal/1208_bourne/1208_bourne.html
- Pluggable SDK:
  - http://www.ibm.com/developerworks/websphere/techjournal/1209_hall/1209_hall.html
- Application Edition Manager Concepts
  - http://pic.dhe.ibm.com/infocenter/wasinfo/v8r5/topic/com.ibm.websphere.wve.doc/ae/twve_appedtop.html
- OSGI Applications
  - http://pic.dhe.ibm.com/infocenter/wasinfo/v8r5/topic/com.ibm.websphere.osgi.iseries.doc/ae/ca_about.html