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WebSphere Application Server V8.5 Innovative
Applications & Interactive Experiences

Disclaimer



- All Performance data presented in this presentation is gathered in a controlled environment. Your own test results may vary based on hardware, software or infrastructure differences
- All data is meant to be used as a guide



Agenda



- What's New in WebSphere Application Server V8.5
- What's New in Performance for WAS V8.5



Application Infrastructure Trends



Rapid application development and delivery driving simplified, integrated and automated development and operations lifecycles

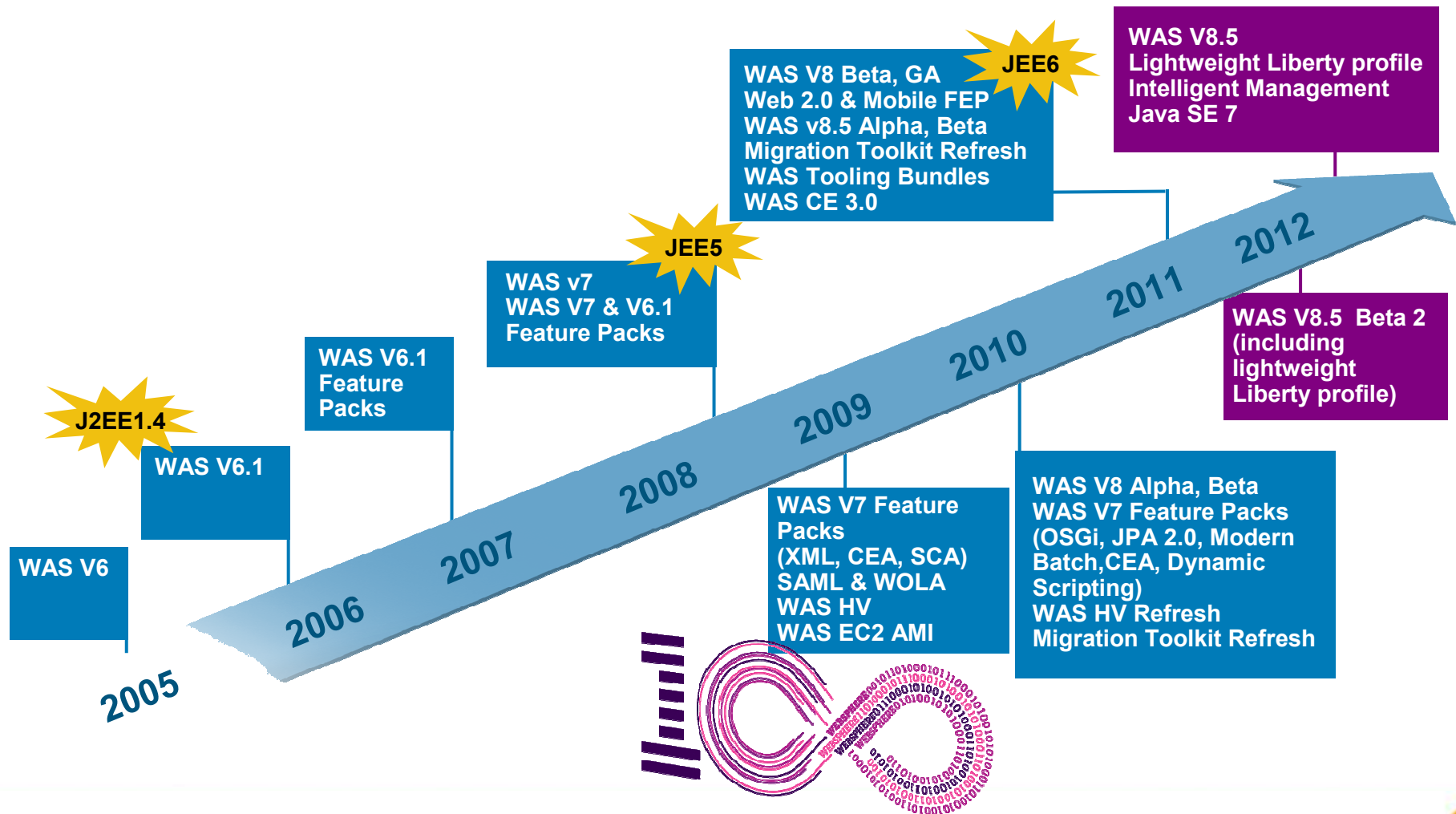
Explosion of mobile, social and cloud applications driving new demands on middleware infrastructures

The combination of huge transaction volumes against massive amounts of data with little tolerance for delays is driving the need for *elastic caching* technologies

Use of *cloud delivery models* to provide elasticity, scale, multi-tenancy and context across different form factors and access methods



WebSphere Application Server: *Over 14 years of Leadership & Trusted Delivery*





We've been listening

Users and Analysts have given us lots of feedback about the need for WAS improvements:

- Improved developer productivity
- Simpler “low-end” app environments
- Platform fidelity between “low-end” and “high-end” WAS environments
- Higher levels of resiliency for mission critical applications
- Improved operational control
- Constant improvements in end user satisfaction
- Lowered costs of application environments



WebSphere Application Server V8.5

Addressing the needs of today's agile enterprises and their developers



- For the **enterprise**

- The broadest range in choice of application server solutions in the industry
 - and the best fidelity across editions
- A new lightweight, powerful yet simple application server
- Increased scalability, resiliency and security for critical applications
- Flexibility to deploy new offerings quickly and efficiently

- For the **developer**

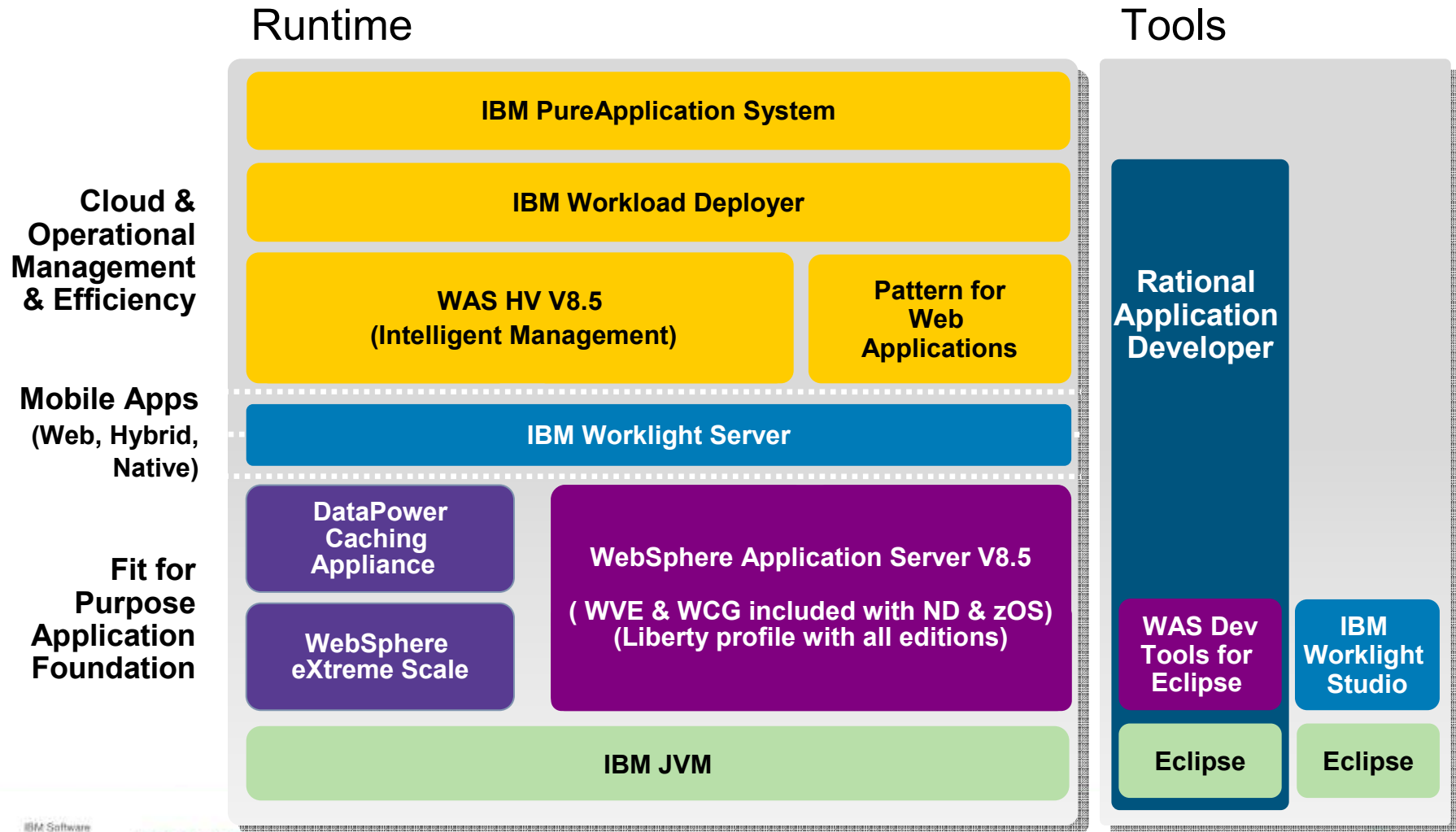
- ▶ Liberty profile with improved developer experience
- ▶ No charge, frictionless download
- ▶ Server start up in less than five seconds
- ▶ Simplified server configuration that can be versioned and maintained in source control along with the applications





WebSphere Application Infrastructure

What's Changed



WAS 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 WAS ND

Operations and Control



Improved Operations, Security, Control & Integration

- Improved Operations



WAS 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 WAS 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



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**Fast, flexible,
and simplified
application
development**

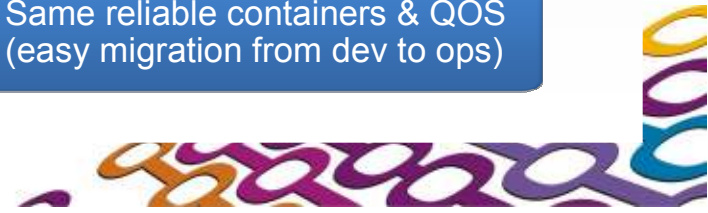
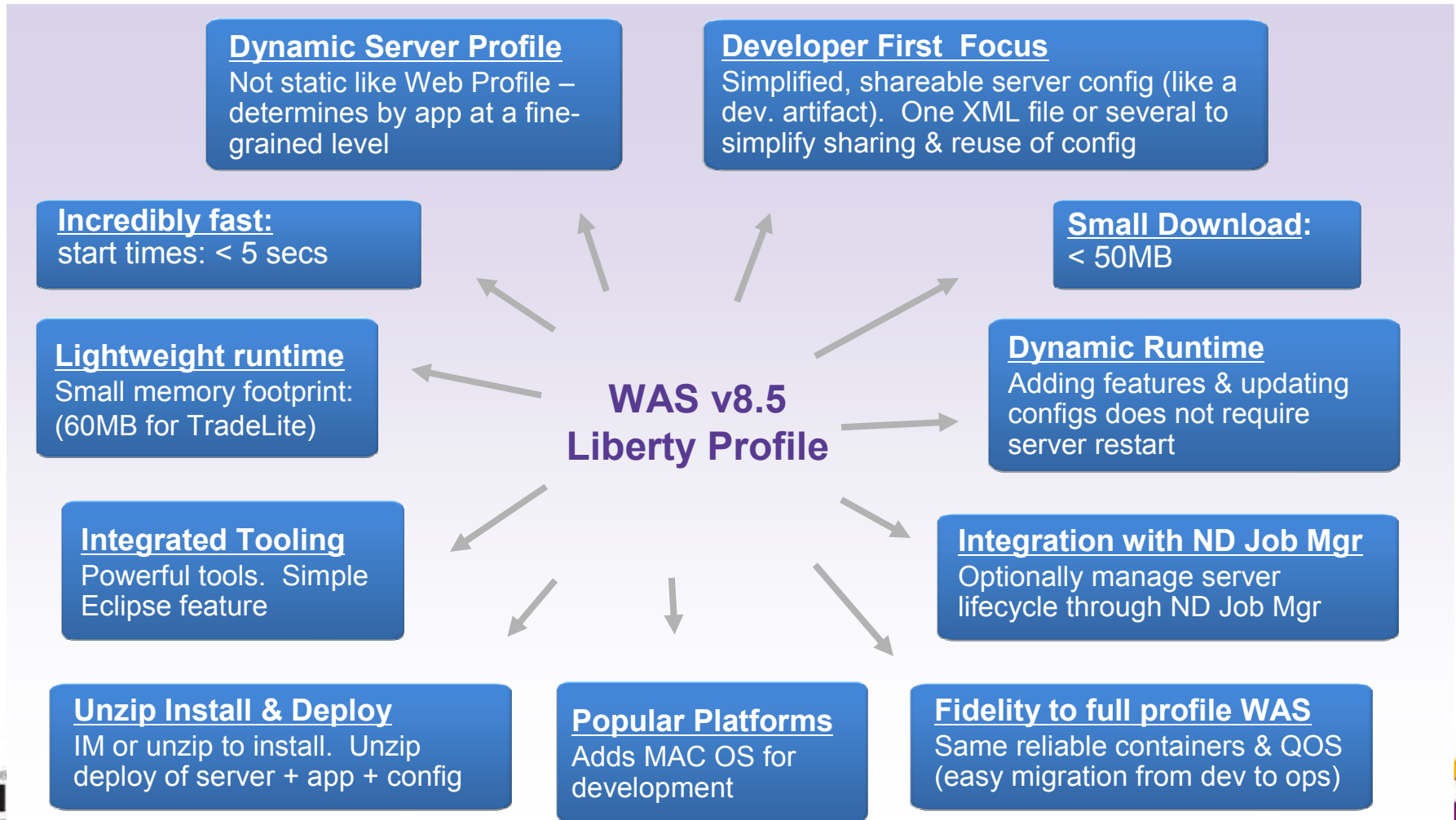
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WAS v8.5: Introduces the Lightweight “Liberty” Profile – For Web, OSGi and Mobile Apps



A highly composable, dynamic Server profile





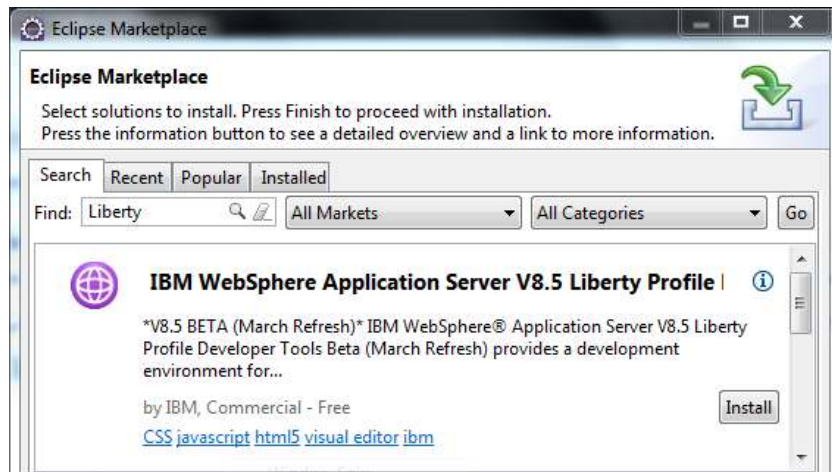
No Hurdles to Install



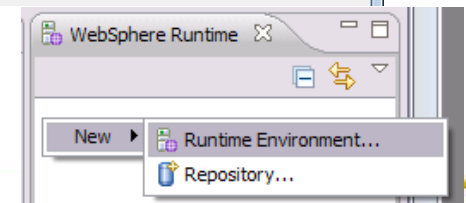
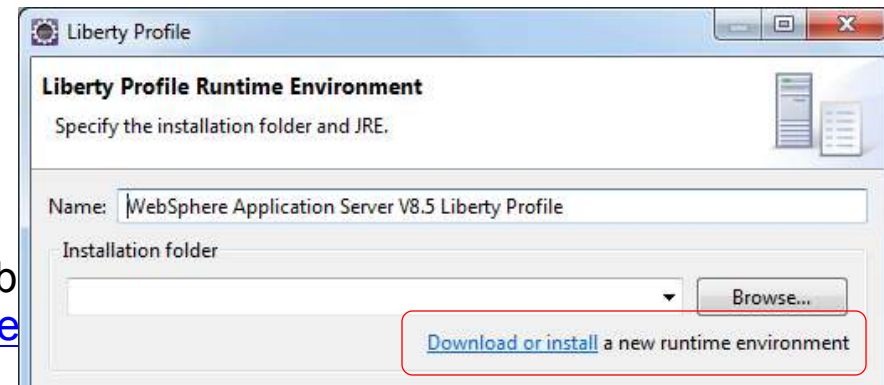
- Tools and runtime are **free** for development. No time limit
- Eclipse feature install for tools; 40MB zip download for server profile.
 - Installation Manager also supported → same installed result.

Two minutes from “Nothing” to “Done”:

1. Install WAS Developer Tools for Eclipse Feature



Lib
.ne



What This Means For Developers



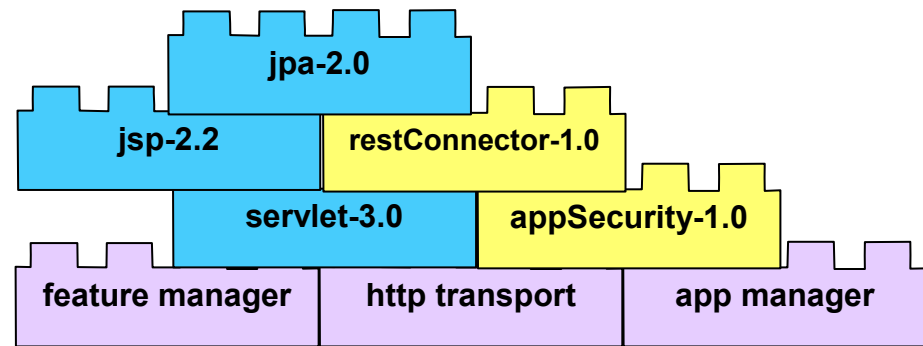
- Support for Liberty Profile in Rational Application Developer
 - Enterprise development - advanced programming, cloud, collaboration, and quality tools
 - Available standalone or bundled in WAS - Tools Edition and WAS ND - Tools Edition
- Support for Liberty Profile in WAS Developer Tools for Eclipse (WDT)
 - Subset of RAD focused on core programming models
 - Simple Eclipse feature update for WTP 3.6 (Helios) and 3.7 (Indigo)
 - Available unsupported at no charge, or supported for a fee through WAS for Developers – Tools Edition for Eclipse
- Lightweight WAS Liberty profile runtime for dev/test
 - Focused on the development and operations experience
 - Small footprint test server runtime
 - Simplified, shareable config
 - Fastest possible server start-up
 - Fidelity with full-profile WAS editions
 - Free for developer ! No Expiration
 - Initially focused on web apps (including JPA, transactions, security...)
- Accelerate development time to value
 - Develop/test with RAD or WDT and WAS v8.5 Liberty server type
 - Deploy applications unchanged to full profile WAS for production



Highly composable runtime based on 'features'



Full WAS Profile



WAS v8.5
Liberty Profile



And ... What Does it Mean for Production



- An “Embedded Server” profile is a production instance of the configured Liberty server type
 - Think of zipping up the application, configuration and server type you just tested on
 - Application centric – the server is pre-configured for a specific application(s)
- **Deployment options:**
 - Unmanaged unzip install
 - Managed ND Job Manager creates “Liberty deployments” by distributing and unzipping the embedded server package
 - “Light-touch” ND management: start and stop server
 - Server configuration remains via the same simplified XML config created in the development environment



Introducing the WAS Tools Edition Bundles



Team



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

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Individual

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



<h3>WAS for Developers</h3> <p>Tools Edition +Liberty Profile</p> <p>Enables efficient development of innovative apps that will run on WAS in production</p> <p>Available as a no-charge edition for the developer desktop and includes Eclipse adapters</p>	<h3>WAS Hypervisor Edition</h3> <p>+Liberty Profile</p> <p>Optimized to instantly run in VMware and other server virtualization environments</p>	<h3>WAS ND</h3> <p>Tools Edition +Liberty Profile</p> <p>Delivers near-continuous availability, with advanced performance and mgmt capabilities, for mission-critical apps</p>	<h3>WAS for z/OS</h3> <p>+Liberty Profile</p> <p>Takes full advantage of the z/OS Sysplex to deliver a highly secure, reliable, and resource efficient server experience</p>
<h3>WAS</h3> <p>Tools Edition +Liberty Profile</p> <p>Provides secure, high performance transaction engine for moderately sized configurations with web tier clustering and failover across up to five application server profiles</p>			
<h3>WAS Express</h3> <p>+Liberty Profile</p> <p>A lower-cost, ready-to-go solution to build dynamic Web sites & apps</p>		<h3>WAS CE</h3> <p>An open source-based, small footprint foundation with no up-front acquisition costs</p>	

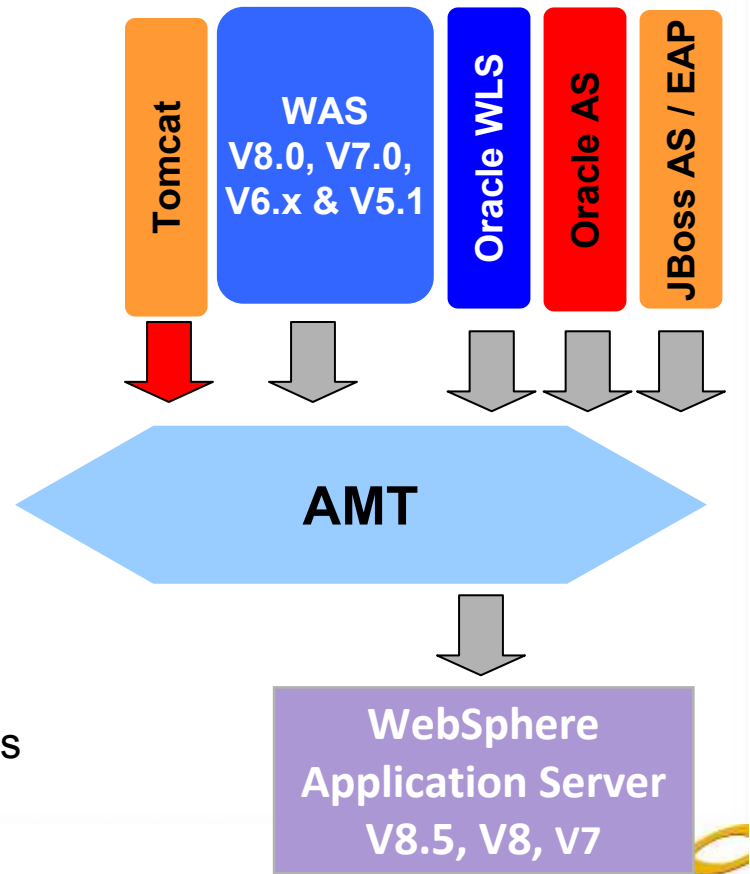


Application Migration Toolkit v3.0



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

- Migrate apps from older vers 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)





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Application Resiliency

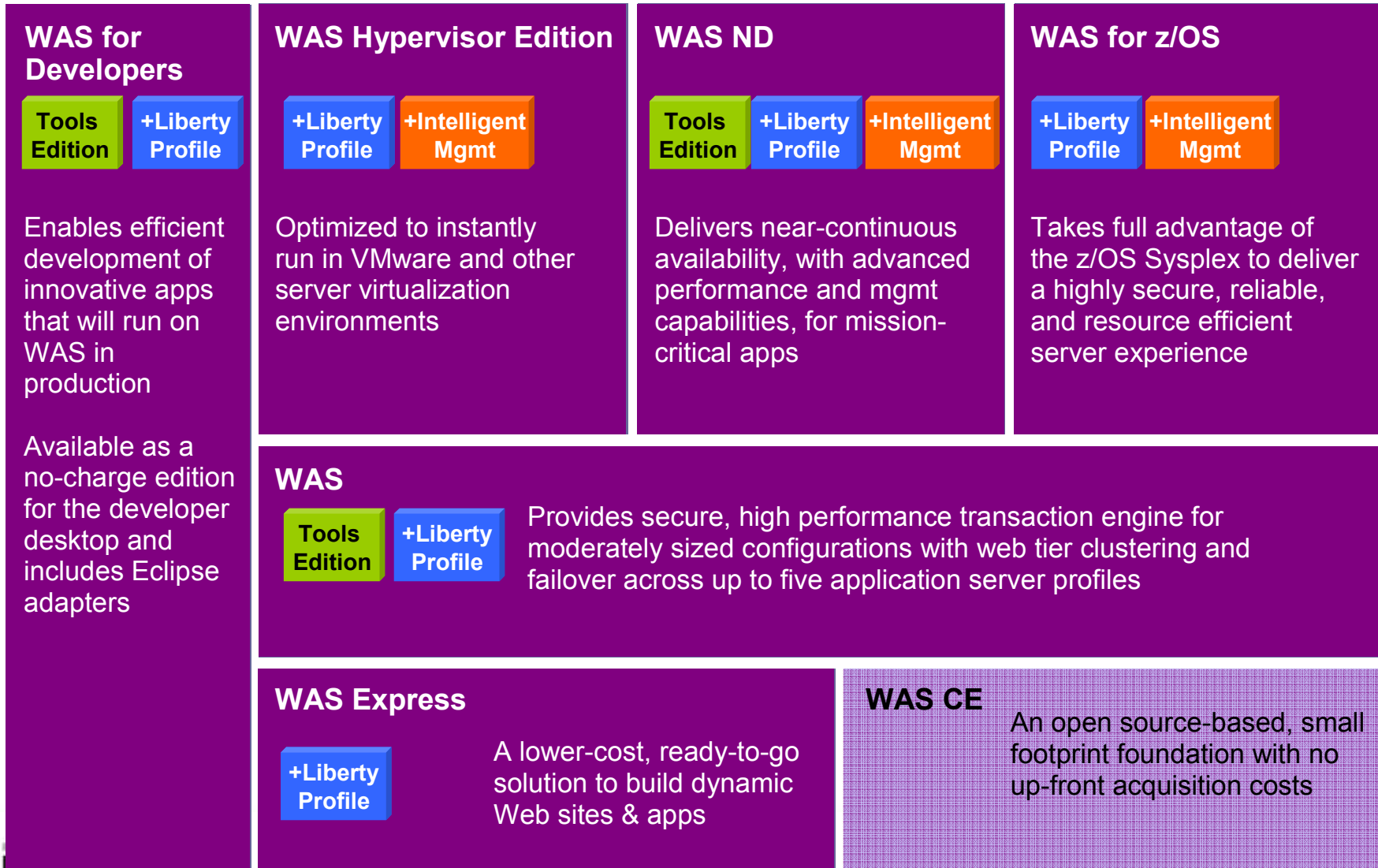


Intelligent Management & Enhanced Resiliency

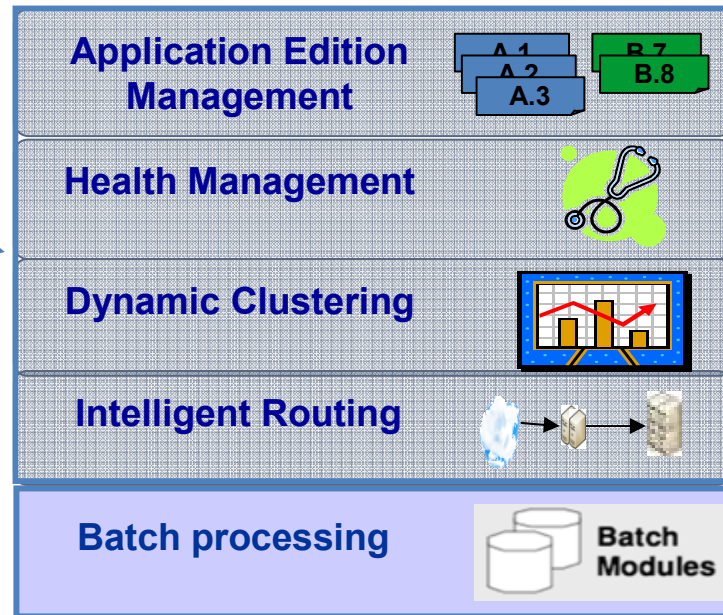
- Application Edition Management
- Application Server Health Management
- Dynamic Clustering
- New Intelligent Routing capabilities
- Messaging infrastructure resiliency
- Memory leak detection & protection in WAS



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



WAS ND V8.5: Resiliency enhancements – WebSphere Virtual Enterprise & WebSphere Batch



- Install WebSphere Virtual Enterprise
- Install WebSphere Compute Grid
- Install WAS V8 or earlier



Install WAS ND V8.5

After

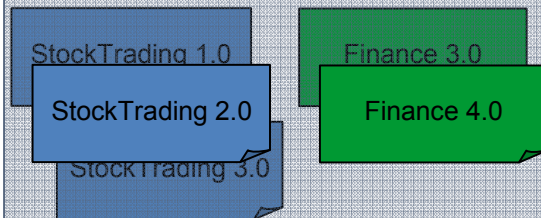


Intelligent Management

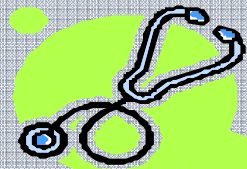


Extending QoS through autonomic computing

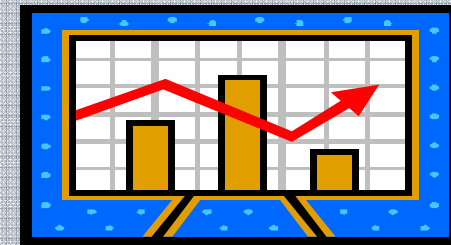
**Application
Edition
Management**
Self-Managing



**Health
Management**
*Self-Protecting
Self-Healing*



**Dynamic
Clustering**
Self-Optimizing



Intelligent Routing



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 OS or WebSphere without incurring down time
- Easy-to-use edition control center in admin console, plus full scripting support

**Validation
Mode**



**Rollout
Policies**



**Concurrent
Activation**



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**

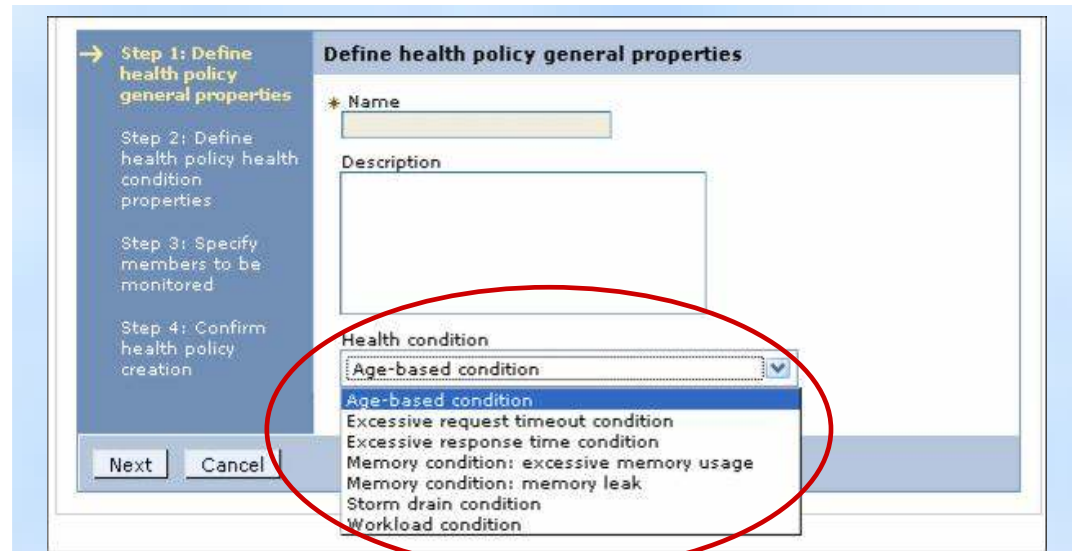


Health Management – Health Policies



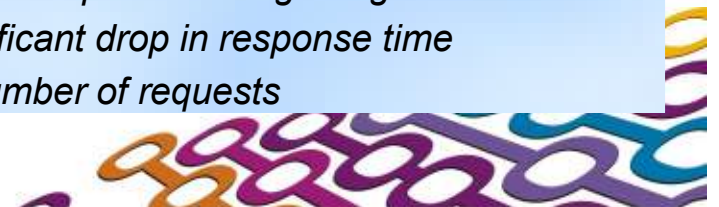
Helps mitigate common health problems before outages occur

- 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.

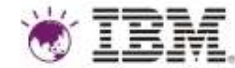


Health Conditions

- 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)

Create a new health policy

Create a new health policy. Define the general properties, including the health condition, and the servers, clusters, and dynamic clusters to be monitored.

Step 1: Define health policy general properties

→ Step 2: Define health policy health condition properties

Step 3: Specify members to be monitored

Step 4: Confirm health policy creation

Define health policy health condition properties

Edit rule

[Subexpression builder]

Run reaction plan when:

Take the following actions with

Add step Delete

Select Step

None

Logical operator: and

Subexpression builder

Select operand:

- PMIMetric_FromServerStart
- PMIMetric_FromLastInterval
- ODRServerMetric_FromServerStart
- ODRServerMetric_FromLastInterval
- ODRCellMetric_FromServerStart
- ODRCellMetric_FromLastInterval
- MBeanOperationMetric_TypeLong
- MBeanOperationMetric_TypeString
- MBeanAttributeMetric_TypeLong
- MBeanAttributeMetric_TypeString
- URLReturnCodeMetric

Subexpression:

Append [Close]

Target node

Previous Next Cancel

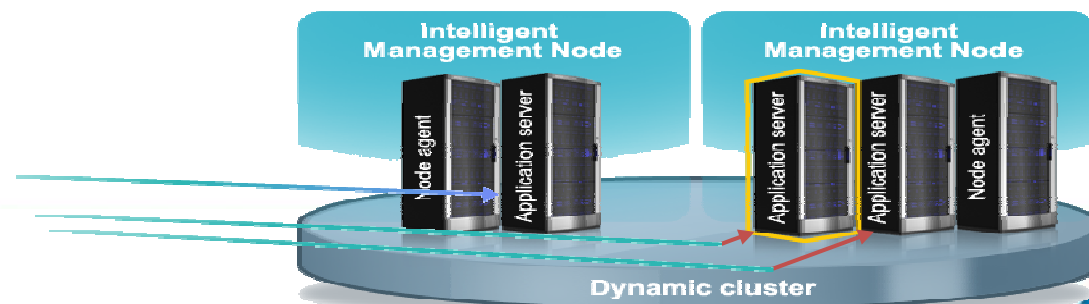


Dynamic Clustering



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



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

Select	Name	Importance	Goal	Description
<input type="checkbox"/>	Default SP		Discretionary	
<input type="checkbox"/>	Gold SP	High	Avg response 15 seconds	Gold Service Policy
<input type="checkbox"/>	Platinum SP	Highest	Avg response 1500 Milliseconds	Highest SP

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

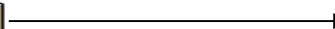
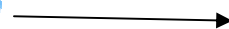


Intelligent Routing



Improves business results by ensuring priority is given to business critical applications

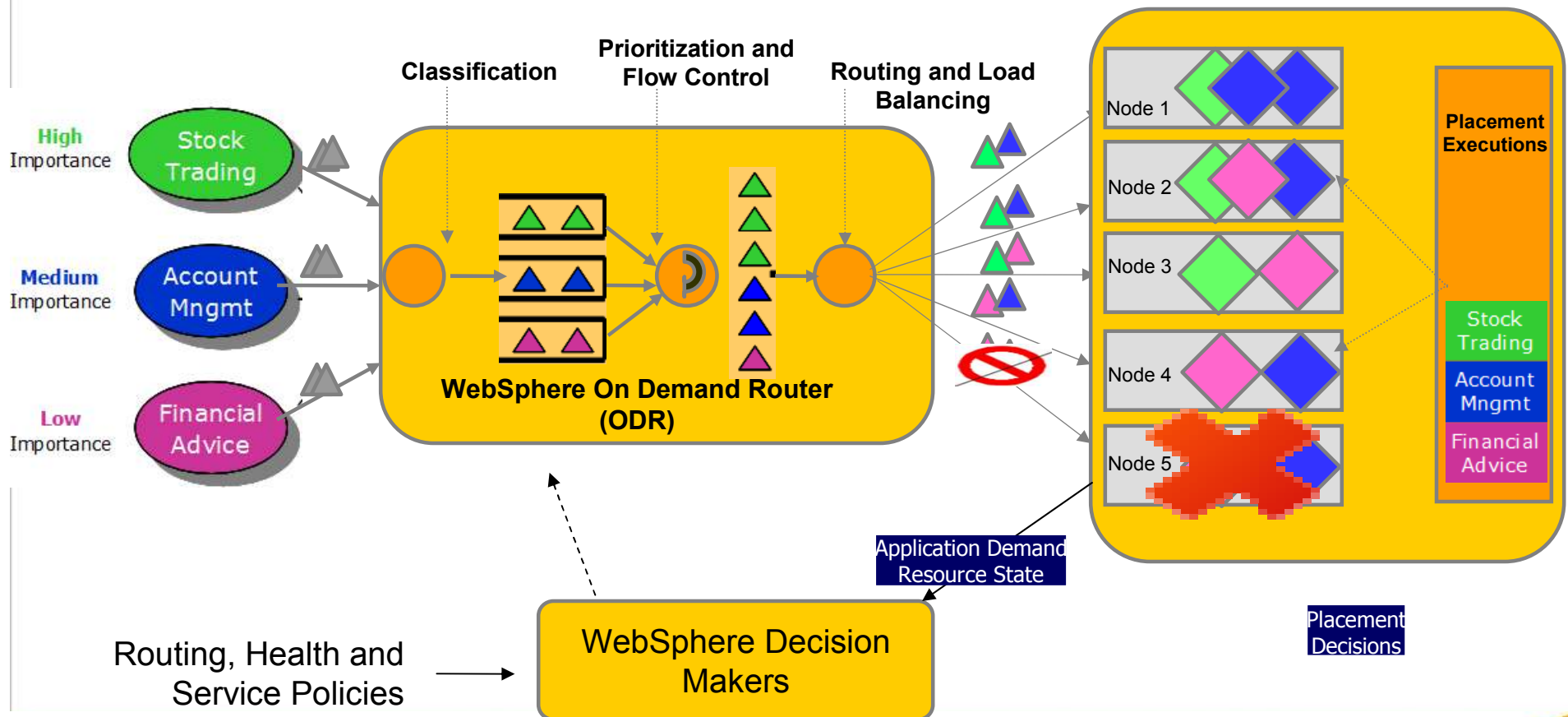
- Requests are prioritized and routed based upon administrator defined rules
 - Flexible policy-based routing and control
- On Demand Router (ODR) is the focal point for Intelligent Routing
- A routing tier that's aware of what's happening on the application server tier
 - Application server utilization, request performance, etc...
- Route work to the application server that can do it best
- Provide preference for higher priority requests
- Integrates with Health Management and Dynamic Clustering



Intelligent Management Scenario



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





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Improved Operations, Security, Control & Integration

- Selectable JDK
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Selectable JDK



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

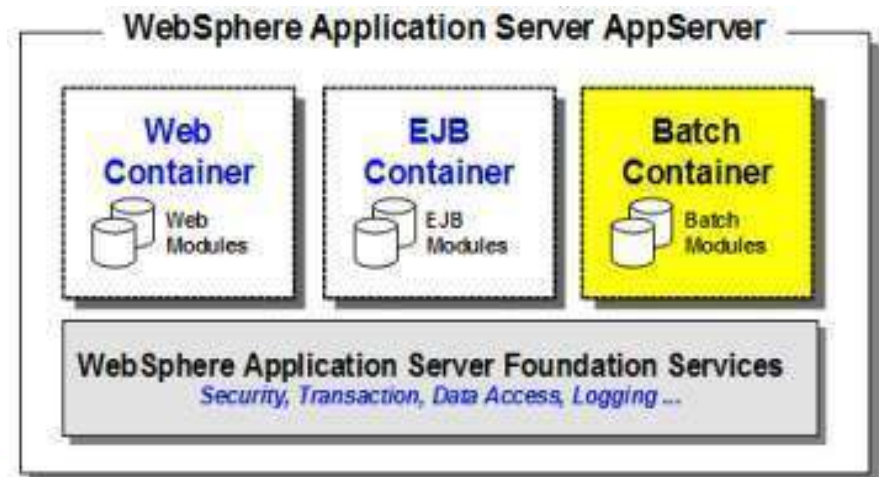


WebSphere Batch



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



WebSphere Batch Components



- **Batch Container**
 - Provides the batch execution environment, including services such as checkpoint/restart and job-logging.
- **Batch Scheduler**
 - Job management control point for determining when/where jobs run.
 - Supports operational commands and provides a visual job console.
- **Batch Toolkit**
 - Provides tooling for the creating, packaging, and testing batch jobs.
- **Parallel Job Manager**
 - Controls parallel job execution including splitting and merging of jobs.
- **Enterprise Connectors**
 - Enables integration to external products for scheduling (i.e. Tivoli Workload Scheduler) and monitoring (i.e. ITCAM) batch workloads.
- **Advanced Operations Pack**
 - Provides enhanced operations support, including integration for goal-oriented SLA management, job classes, and usage accounting (including SMF on z/OS).



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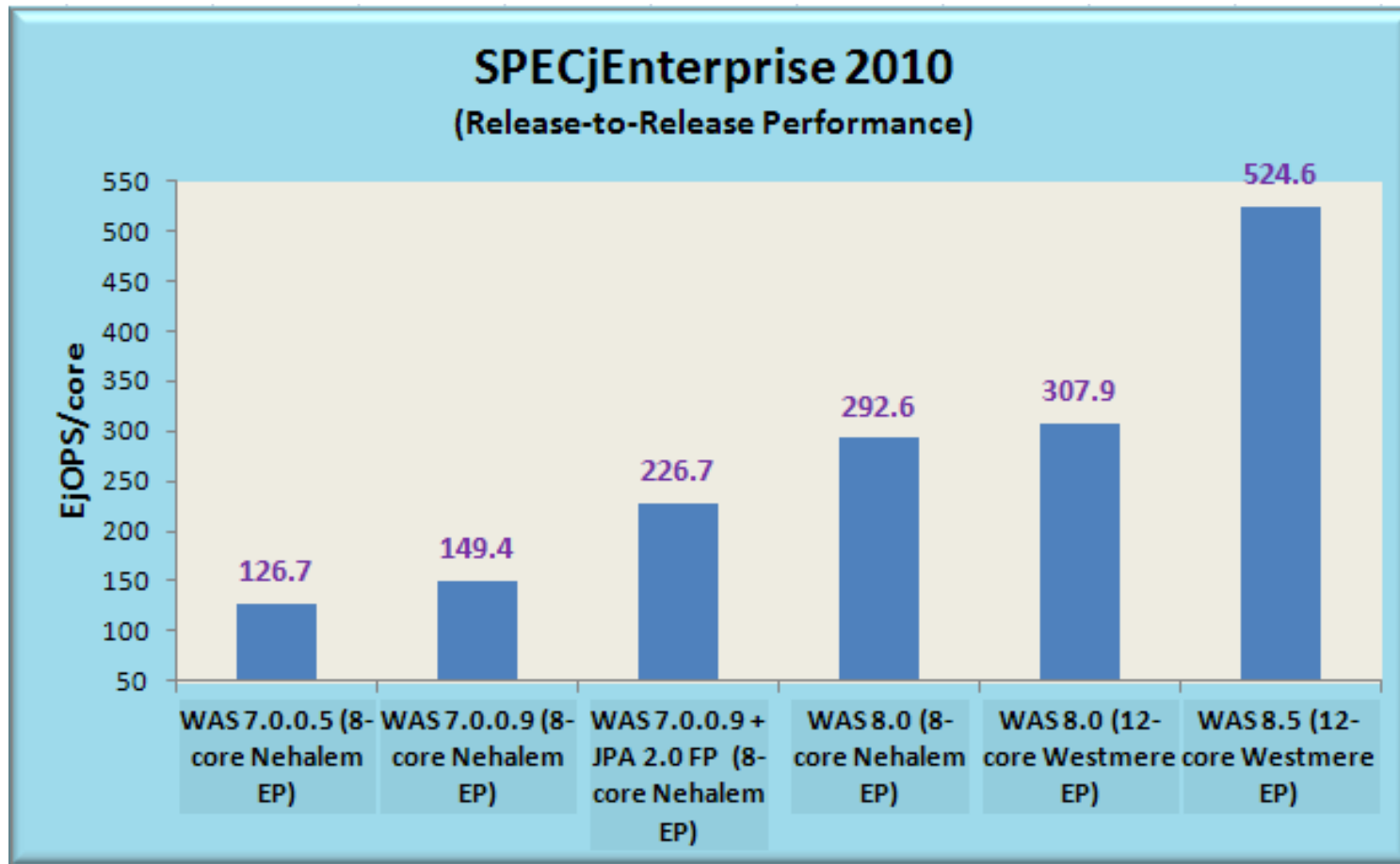
- Selectable JDK
- WebSphere Batch enhancements
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- Enhanced IBM Support Assistant
- Better log and trace filtering



And - - One more Thing - -



WebSphere Release-to-Release Performance



Consistent Performance gains across WAS Releases

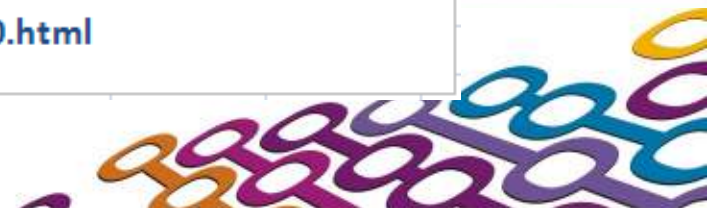
As per SPEC Published Data as of 4/26/2012

<http://www.spec.org/jEnterprise2010/results/jEnterprise2010.html>

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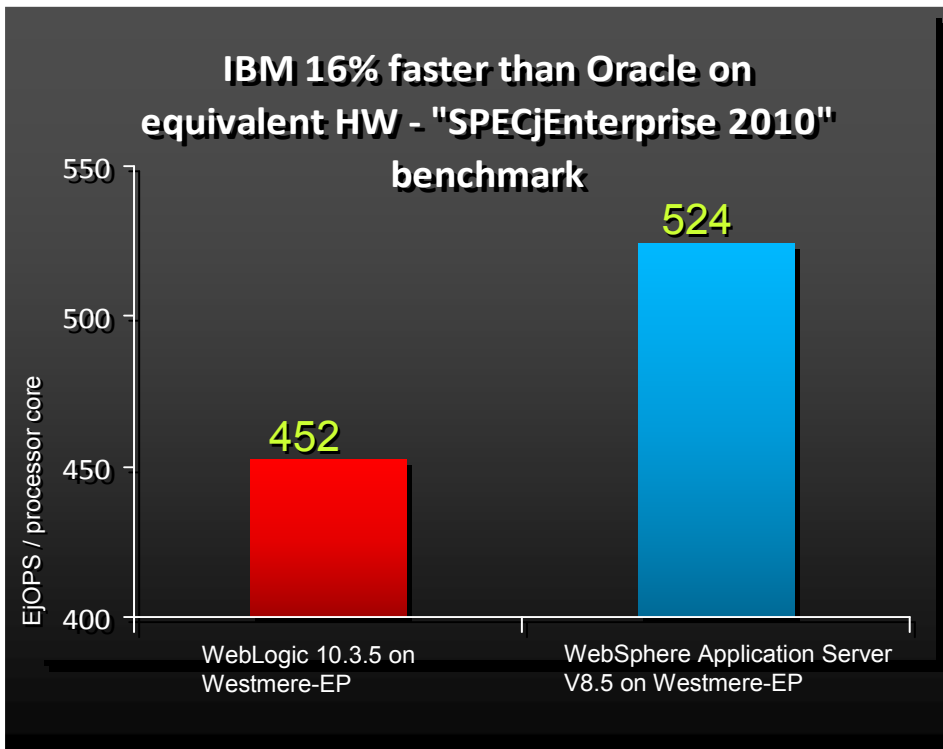
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WebSphere outperforms Oracle WebLogic

IBM is the world leader in middleware performance



- IBM **16% 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**

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)

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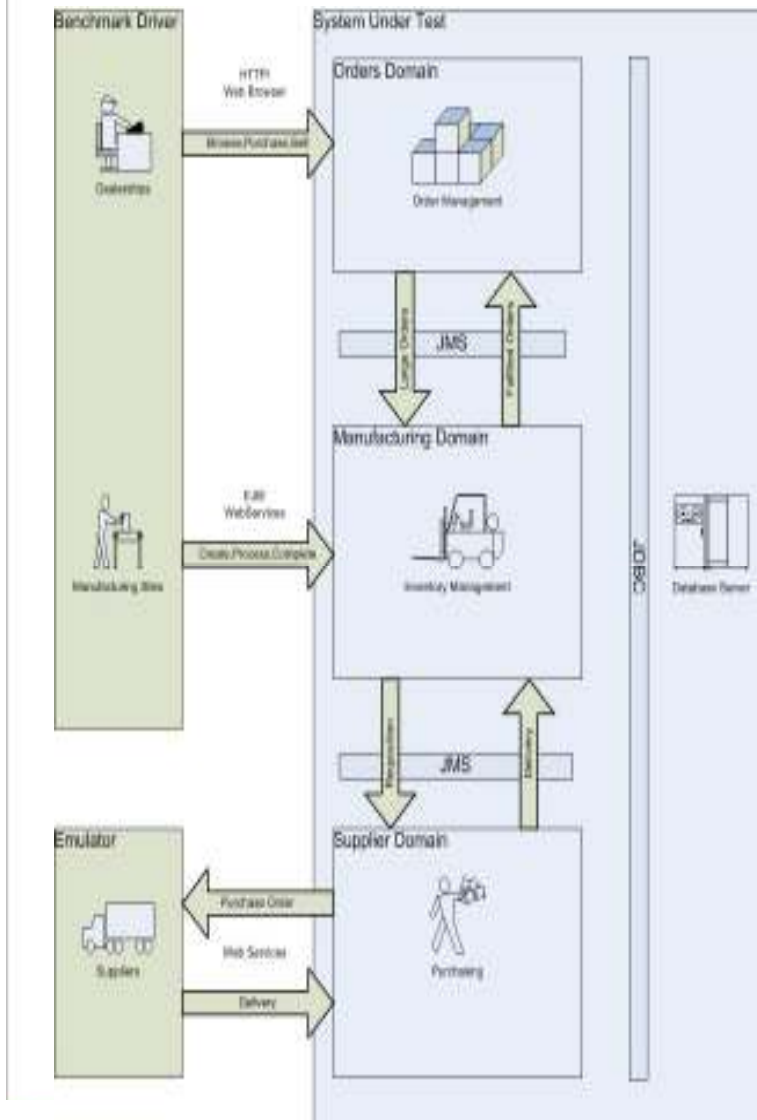


Performance Analysis and Improvement Approach

- We focus on a blend of complete system benchmarks and micro benchmarks to isolate specific customer scenarios
- Test on a blend of hardware platforms and OS levels
 - We cover all current hardware platforms to ensure performance
 - Drive to answer architectural issues and performance impacts of specific OS
- We study the important aspects of performance to your business
 - New programmatic APIs ability to deliver on promise
 - Throughput and response time of the server under different loads
 - Resource utilization (CPU, memory, disk, network, etc)
 - Effect of adding processor (SMP/Vertical scaling)
 - Effect of adding nodes to a cluster (Horizontal scaling)
- But we can't cover everything
 - Over 1000 different hardware and OS combinations are supported by WebSphere Application Server



SPECjEnterprise 2010 Benchmark



Architecture

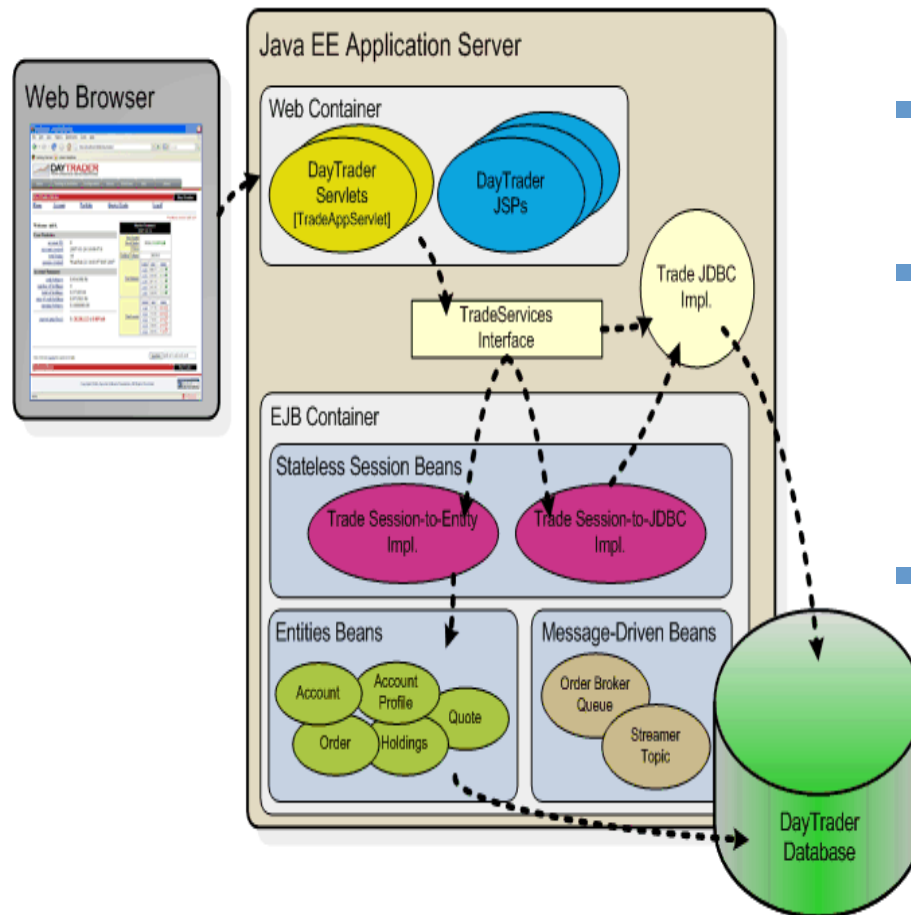
- Based on JEE 5.0 specifications
- Includes broad programming model coverage
- EJB 3
 - JPA managed CMPs
 - JMS and Message Driven Beans
 - Stateful and Stateless Session
 - Web container, Servlets and JSPs
- Web Services
 - Currently replace 50% of RMI interactions
 - WS Wrapped EJB as well as servlet based WS
 - Simple inline calls as well as complex binary inline and MTOM messaging
- Transaction management
- Database connectivity
- Example of development best practices
 - Efficient and highly analyzed design, based on MVC (Model / View / Controller) architecture.

Pedigree

- Jointly designed by the world's leading application server development teams
 - All code was designed, developed and reviewed by IBM, Oracle, SAP, RedHat, and others



DayTrader Benchmark

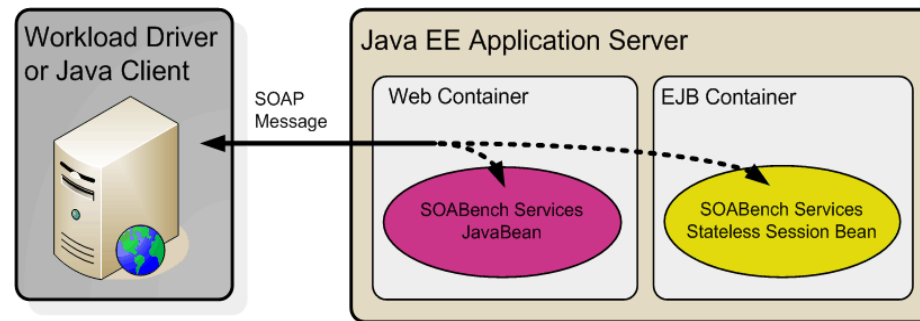


- Simulates an online stock trading application.
- Matches Java EE 5 specifications using JPA Entities and EJB 3.0 Session Beans
- Focuses on core Java EE technologies including Servlets, JSPs, JDBC, JMS, and EJBs (Stateless Session, CMP Entities, and MDBs)
- Run primarily in two modes:
 - JDBC Direct – Servlets make JDBC calls directly to the Database.
 - Full EJB – Servlets drive load to Session Beans and Entities to the Database.
- Serves as the basis for other performance scenarios including security, scalability, etc...



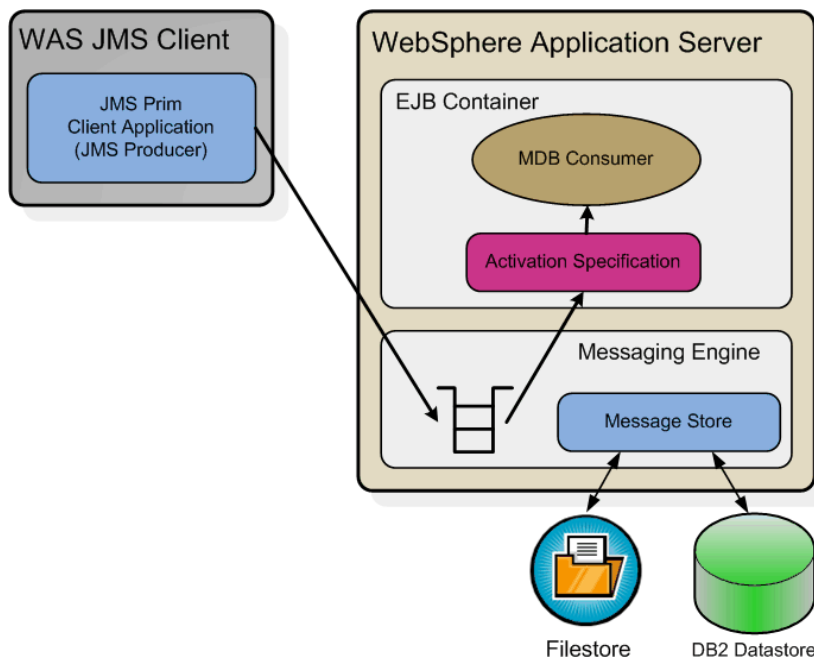
SOABench Benchmark

- An end-to-end cross-product benchmark for SOA foundation products. This report focuses on the facet stressing Web services performance.
- Models an auto insurance claim handling application.
- Payloads based on customer representative data containing a mix of all schema types
- Uses JAX-WS web services adhering to the Java EE5 spec.
- Qualities of Service such as Addressing and Reliable Messaging are used.



Messaging Overview and Benchmark for JMS

- JMSPrimitives application suite used to measure the performance of J2EE based messaging scenarios
- Designed to stress the messaging component of WebSphere Application Server



- Report covers the performance of the default messaging provider, focusing on JMS and Message Driven Beans.
- Messages consumed by an MDB bound against queue/topic
- Provides ability to measure peak message throughput for various messaging configurations:
 - Filestore & datastore
 - Persistence & Non-persistence
 - Point-to-Point (PtP) and Publish Subscribe (PubSub)





 **IBM WEBSPHERE V8.5 PERFORMANCE UPDATE**
WHAT'S NEW FOR PERFORMANCE IN WAS V8.5





What's New for WAS Performance – V8.5

- Significant Improvements in Runtime performance
- New lightweight Liberty Profile
- WebSphere Virtual Enterprise (WVE) product integration
- Faster product installation



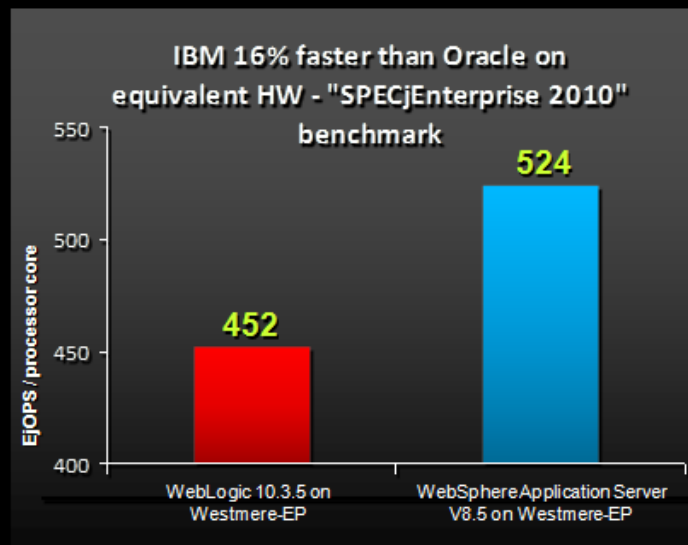
IBM World Leader In Middleware Performance



Smarter choices for improved IT economics



WebSphere outperforms Oracle WebLogic IBM is the world leader in middleware performance



- IBM **16% 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**

(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)

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IBM Software

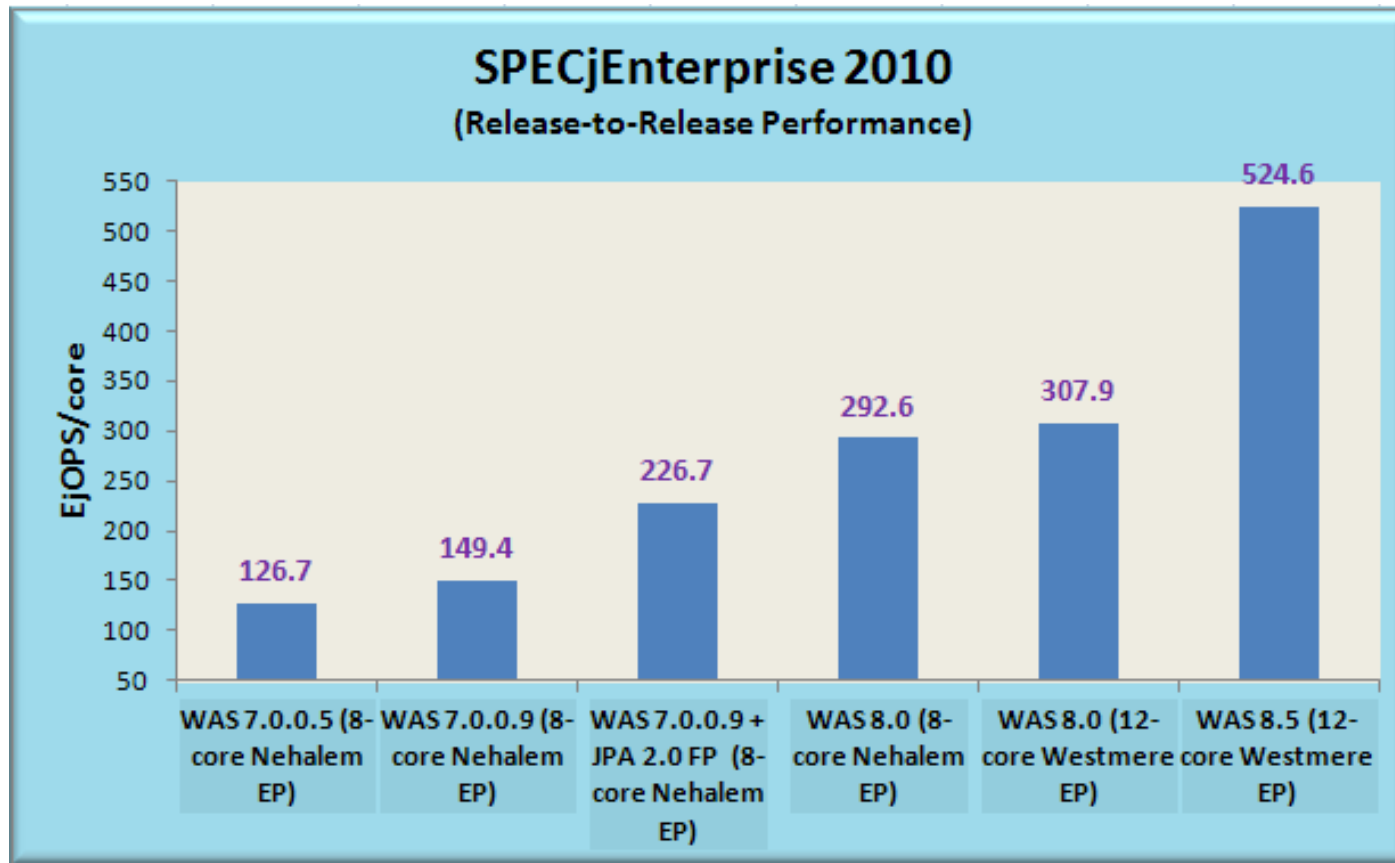
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WebSphere Release-to-Release Performance



Consistent Performance gains across WAS Releases

As per SPEC Published Data as of 4/26/2012

<http://www.spec.org/jEnterprise2010/results/jEnterprise2010.html>

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WebSphere 8.5 Performance Engineering



- Significant Performance Improvements across many components through Engineering Efforts
- Performance Improvements can be seen in
 - JDK 7.0
 - JPA 2.0 Persistence Layer
 - WebContainer
 - JSP Engine
 - EJBContainer
 - J2C/RRA and Connection Management
 - Messaging Optimizations



WebSphere 8.5 Performance Engineering



- Java Persistent Layer Optimizations
 - Compiler driven optimizations to finders/loaders/named queries
 - Ability to reuse database connections without state reset
 - Delayed collections to avoid loading data not needed
 - Optimizations to read only L2 caching
- Java 7.0 Optimizations
 - Optimizations to allow JIT'ed code to leverage large pages
 - Optimizations to BigDecimal formatting
 - Inlining optimizations
- WebContainer Optimizations
 - Avoid buffers and converters needed only in general cases
 - Efficient Pre/Post Invoke operations



WebSphere 8.5 Performance Engineering



- JSP Engine Optimizations
 - More Efficient handling of static content
 - More Efficient JSP Compiler
- EJBContainer Optimizations
 - Efficient Entity Manager Pool Handling
 - More Efficient Pre/Post Invoke Operations



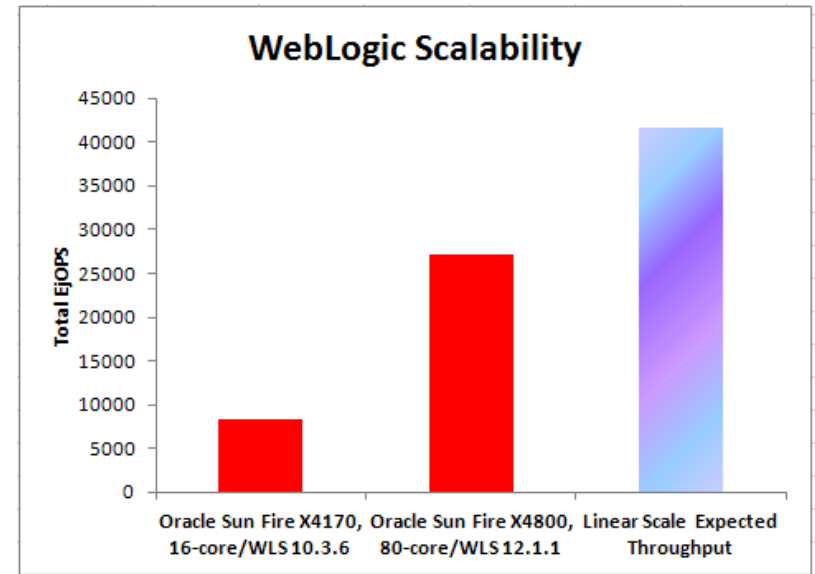
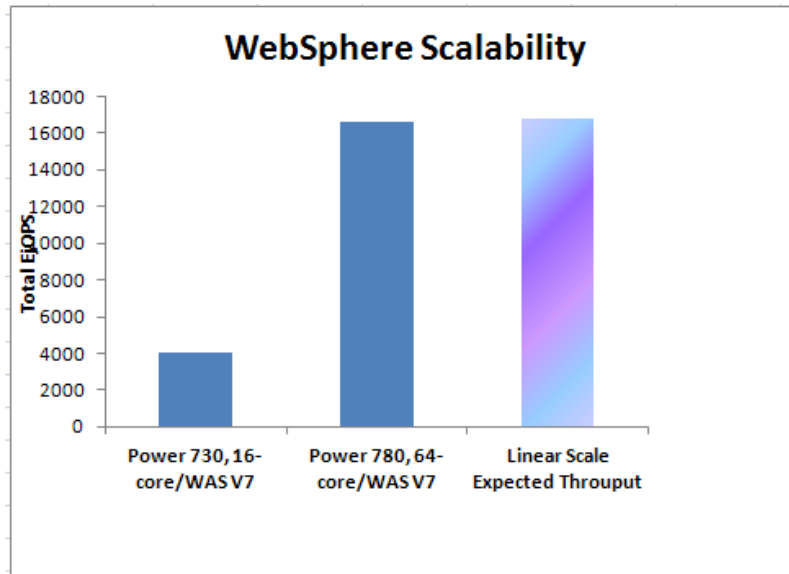
WebSphere 8.5 Performance Tuning



- JPA Tuning
 - `<property name="openjpa.ConnectionRetainMode" value="always"/>`
 - `<property name="wsjpa.FastPath" value="true"/>`
 - `<property name="openjpa.RestoreState" value="false"/>`
 - `<property name="openjpa.OptimizeIdCopy" value="true"/>`
 - `<property name="openjpa.ProxyManager" value="delayCollectionLoading=true"/>`
- JDK 7.0 Tuning
 - `-Xaggressive`



IBM Leads In Middleware Scalability



As per SPEC Published Data as of 4/26/2012

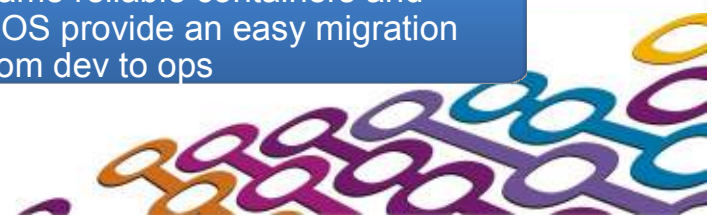
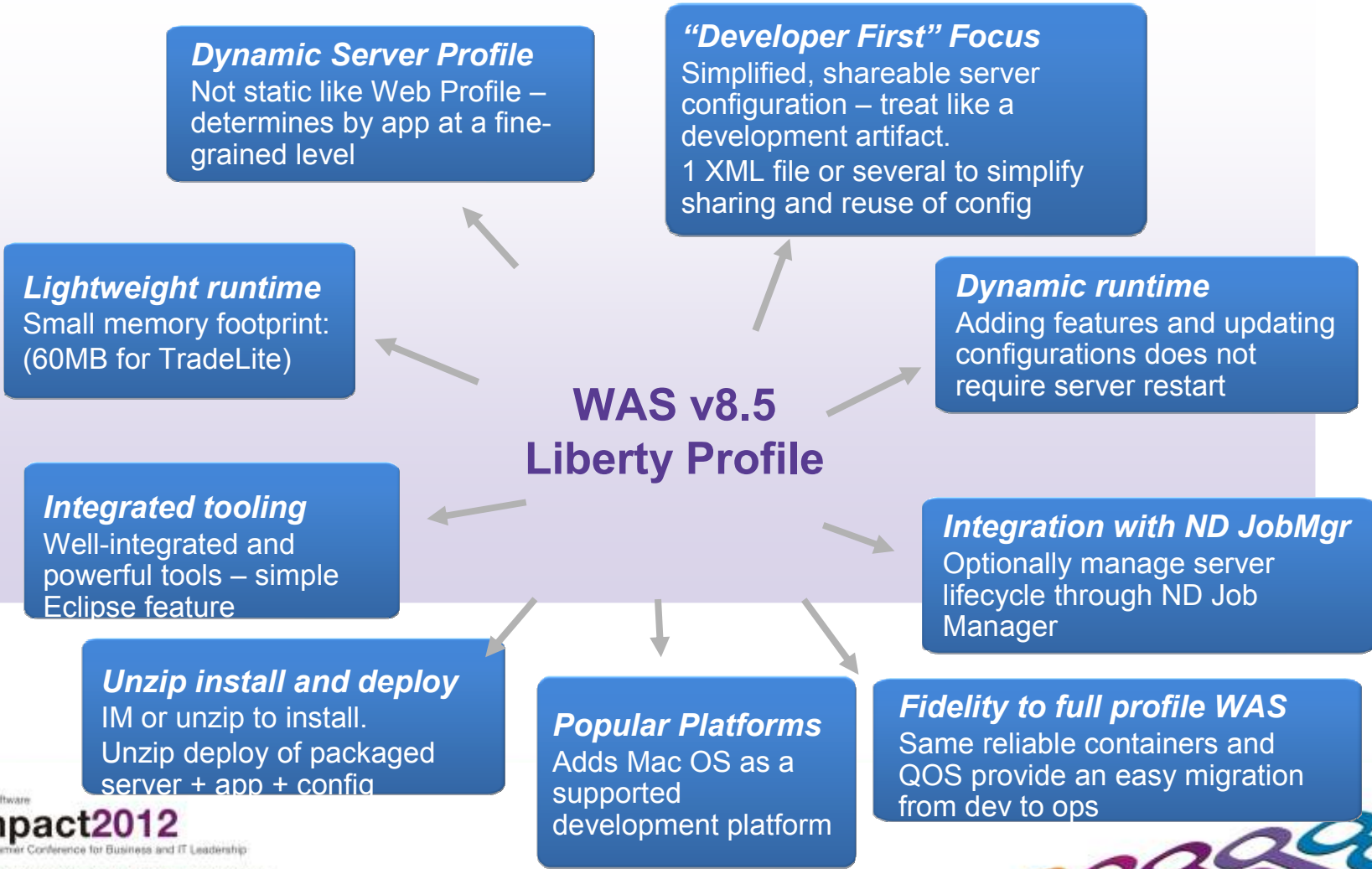
<http://www.spec.org/jEnterprise2010/results/jEnterprise2010.html>

- IBM Middleware is not only world leader in performance, it also has the best scalability
- Perfect Linear scaling for WebSphere going from 16-cores to 64-cores on Power 7 IBM Servers with expected scaling of 95%



WAS v8.5: Introduces the Lightweight WAS “Liberty” Profile

A highly composable, dynamic Server profile





No Hurdles to Install



Tools and runtime are **free** for development. No time limit

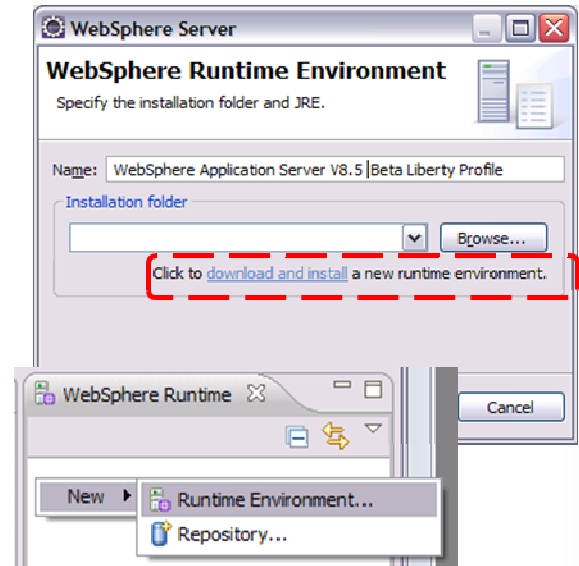
- Eclipse feature install for tools; 40MB zip download for server profile.
 - Installation Manager also supported → same installed result.

2 minutes from “Nothing” to “Done”:

1. Install WAS Developer Tools for Eclipse Feature



2. Use the Tools to download the WAS Liberty Profile or download 40MB zip from WASdev.net





Liberty Profile – Startup & Footprint

- **The problem of a lightweight development environment in WebSphere has been solved!**
 - Liberty Profile startup & footprint are on par with Tomcat.
 - Liberty Profile starts up in less than half the time of JBoss Web profile.

System Info:

Lenovo T60p - 2 x 2.16 GHz Intel Core Duo T2600
2GB RAM, Windows XP 32-bit

Apache Tomcat 7.0.12

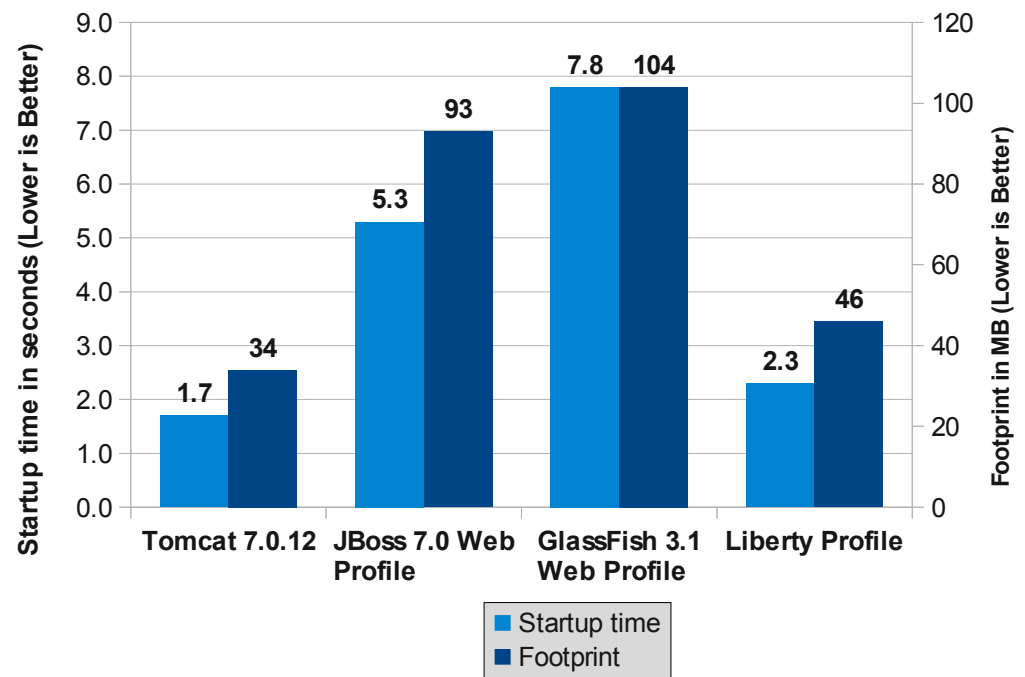
JBoss Community Edition 7.0 Web Profile server

GlassFish Server 3.1 Open Source Edition Web Profile

WAS V8.Next Liberty Profile

(All servers had the TradeLite benchmark application installed)

**Startup & Footprint Comparison
of various lightweight servers**



Note: Tomcat , JBoss, and GlassFish were measured with the HotSpot JDK, while Liberty was measured with the IBM JDK.





Liberty Profile – Throughput

- **A lightweight server that can service requests with the speed of a full production server!**
 - Liberty Profile provides up to 20% better runtime performance than JBoss and 25% better than Tomcat.

System Info:

IBM x3550 – 4 x 1.86 GHz Intel Xeon E5320, 8 GB RAM
RedHat Linux 5.3 32-bit

Apache Tomcat 7.0.12

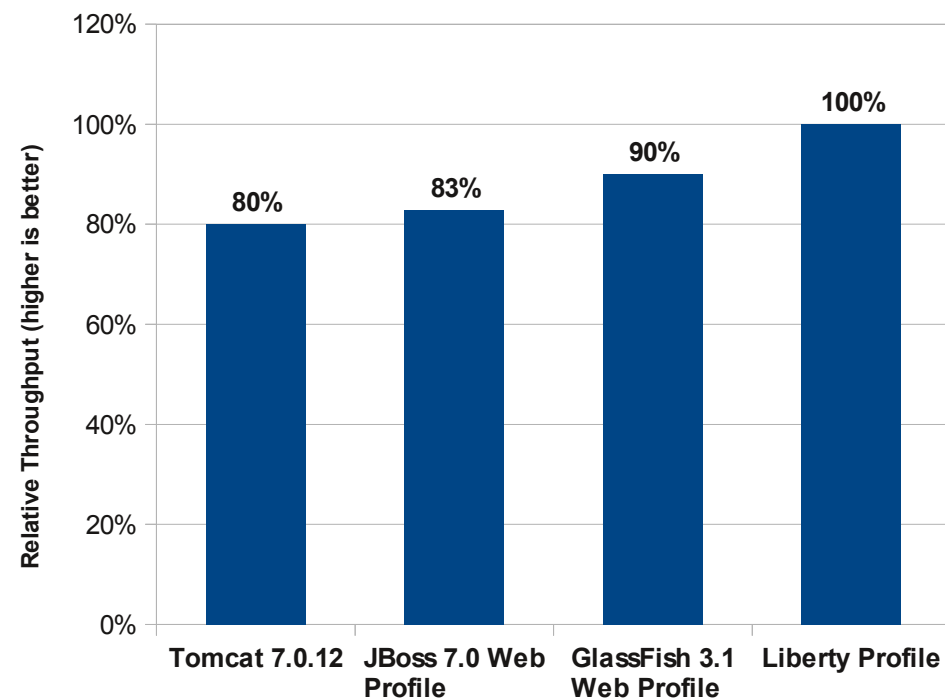
JBoss Community Edition 7.0 Web Profile server

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WAS V8.Next Liberty Profile

(All servers had the TradeLite benchmark application installed)

Throughput Comparison of various lightweight servers



Note: Tomcat , JBoss, and GlassFish were measured with the HotSpot JDK, while Liberty was measured with the IBM JDK.



WebSphere Virtual Enterprise (WVE)



- WVE Integrated into WAS V8.Next
- Installed by default, no special options needed.
- Performance Features:
 - Dynamic Clusters – can grow / shrink as workload demands.
 - Dynamic workload management – dynamically adjust weights to even out response times or CPU usage
 - Service policies – request prioritization to meet goals of response times, CPU usage, etc...
 - Overload Protection – protecting against CPU and heap overload
 - Many more!
- Sessions to consider:
 - TAP-1765 - IBM WebSphere Virtual Enterprise Best Practices
 - TAP-1766 - IBM WebSphere Virtual Enterprise Deep Dive

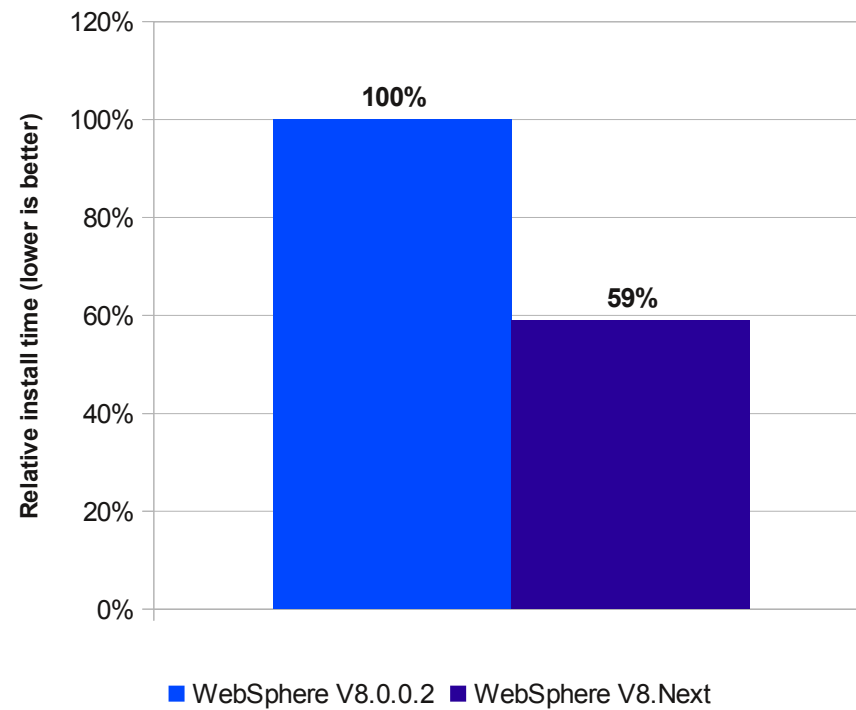




Product Installation time

- **Traditional WAS install time through Installation Manager has improved by 41%**
 - Major improvements to disk I/O operations.
 - Includes additional feature set of WVE being installed as well.

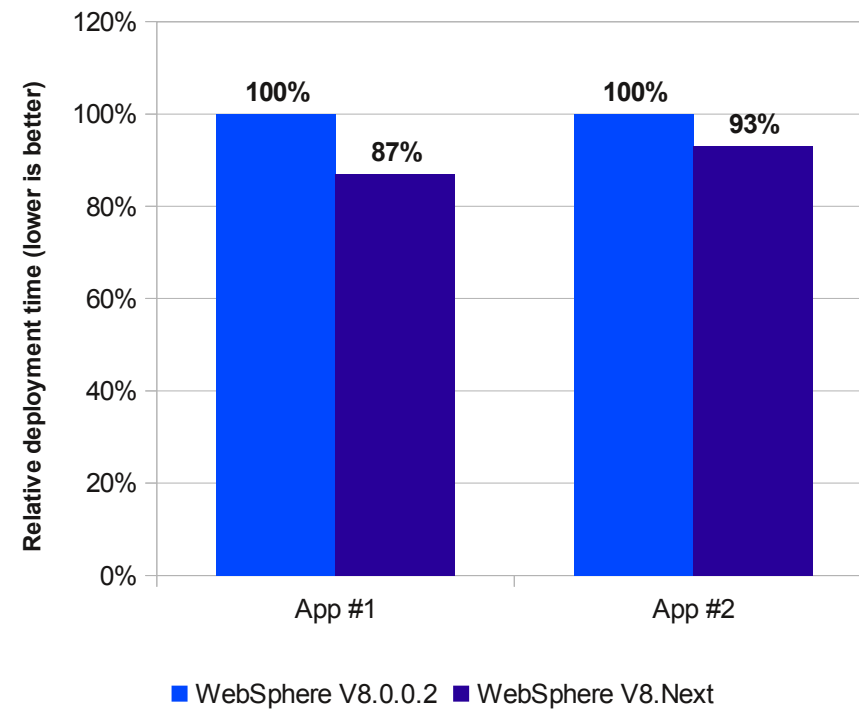
WAS Install Time



Application Deployment Time

- **Application deployment times reduced by as much as 13%**
 - Optimizations to annotation scanning logic
 - Consolidation of functions

Application Deployment Time



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