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Dal Cloud Computing al Composable Business: l'orientamento di IBM

Impact2014

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April 27 – May 1 | The Venetian – Las Vegas, NV

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Agenda

- Composable Business
 - The big picture
- Private Cloud
 - IBM PureApplication System (IPAS)
- WebSphere Application Server v8.5.5
 - Liberty profile
 - peculiarities



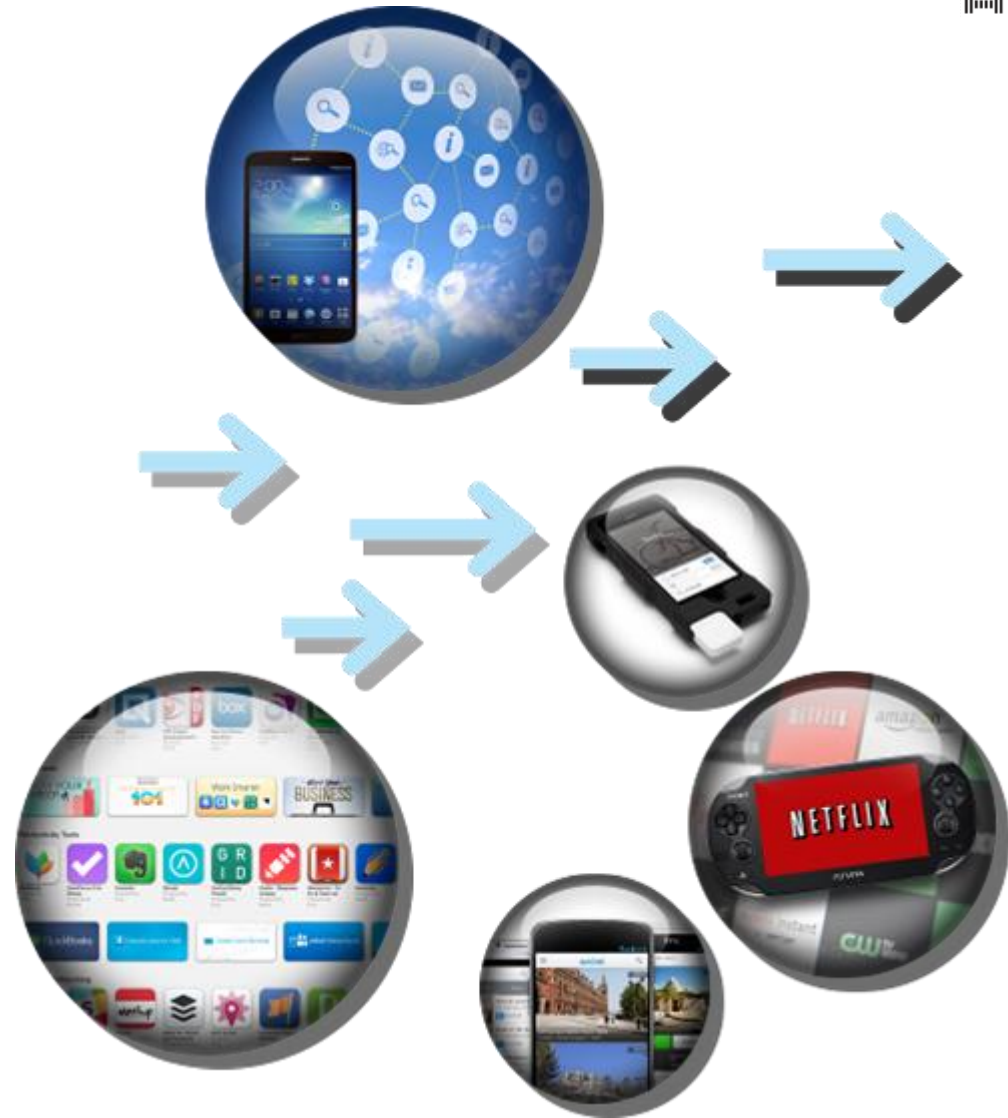
Shifts

in the digital economy

Shift in personalized computing to mobile using cloud services

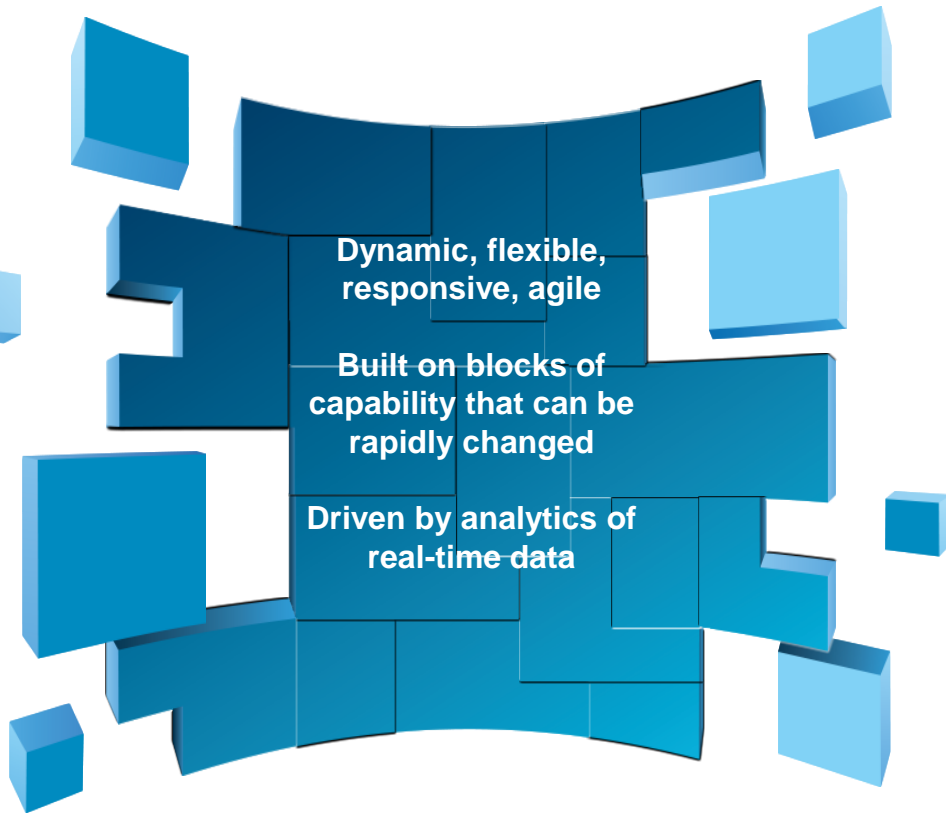
Shift towards unbundled business offerings

Shift towards killer-apps transforming industries





Responding to these shifts requires companies to Become a Composable Business



Restlessly Reinvent and
Innovate processes

Make Better Decisions in real time
with **Actionable Insights**

Accelerate **Time to Market**

Integrate
Business & Technology



How do become a composable business



Cloud as the growth engine of your business

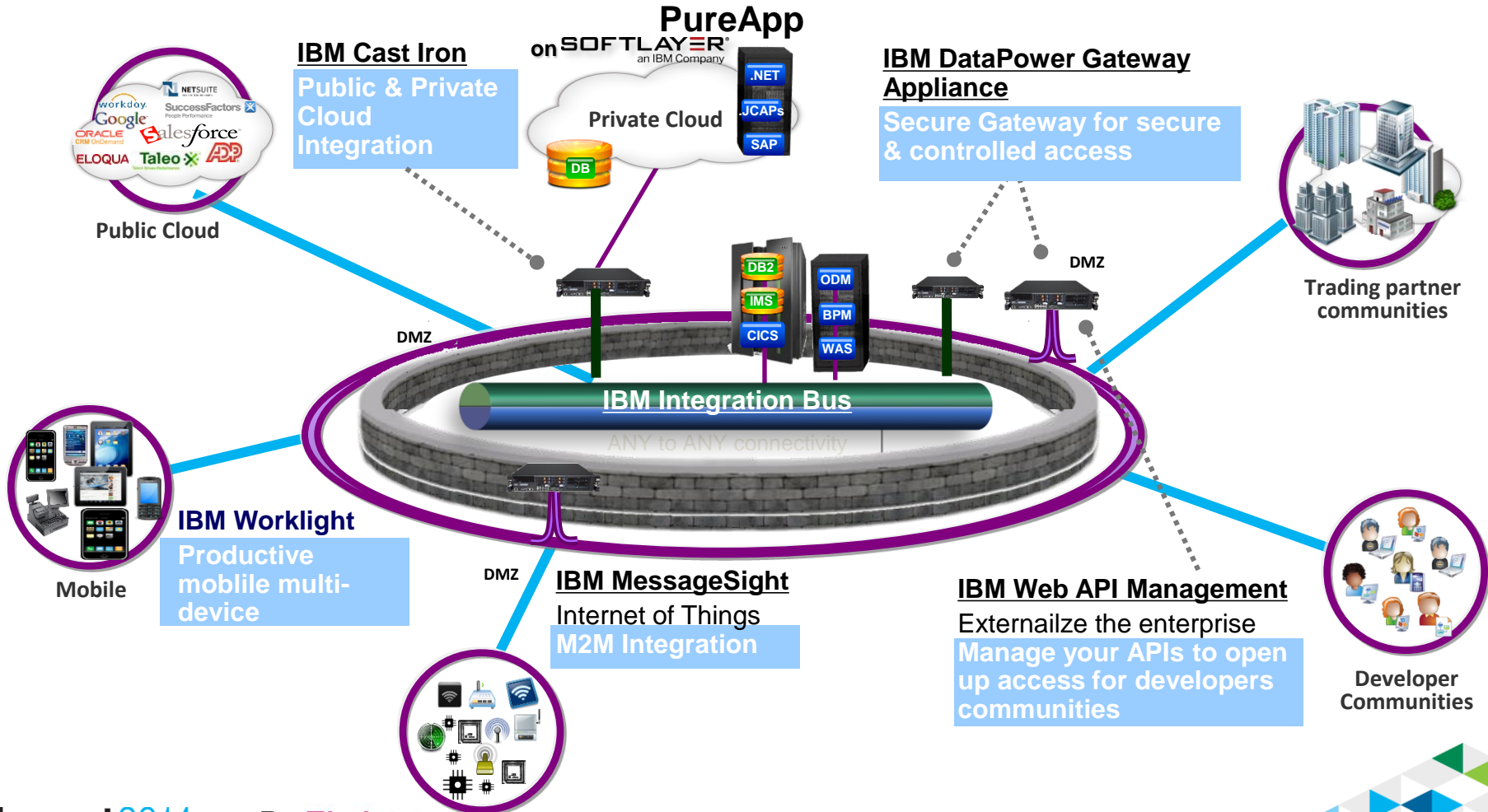
Mobile to reinvent how you engage

Big Data to transform your enterprise and industry





Supporting Dynamic Hybrid Cloud scenarios



A composable business enables digital reinvention harnessing three big technology shifts

1

Remake the Enterprise for the Era of *Cloud* as the growth engine of your business

2

Enable *Mobile* for the enterprise to reinvent how you engage

3

Transform industries and professions with *Data*

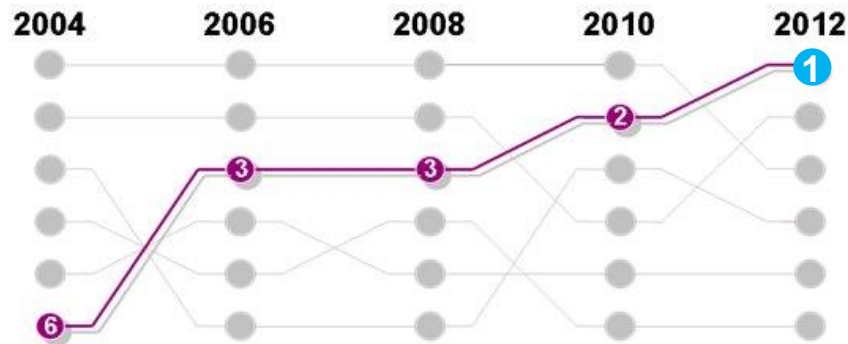


IBM PureApplication™ System



Increasing demands are placed on IT

Technology is the leading force for impacting business

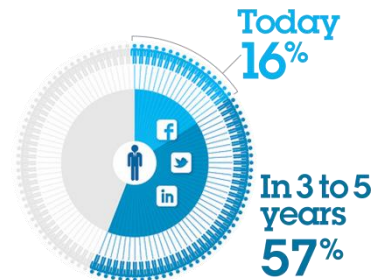


1. **Technology factors**¹
2. People skills
3. Market factors
4. Macro-economic factors
5. Regulatory concerns
6. Globalization

New models of client engagement are driving increased requirements



90% of mobile users keep their device within arm's reach **100%** of the time²



% of CEOs using Social to Connect with Customers¹



8 zettabytes of digital content created by 2015³



Clients struggle to overcome barriers of time, cost and risk

Typical IT Project Time and Budget

Phase	Time (days)	Budget
Specify/design	73 - 96	14% - 16%
Procure	57 - 112	19% - 21%
Implement	74 - 93	12%
Configure/test	74 - 80	10% - 11%
Cluster & HA	66 - 104	11% - 12%
Backup	44 - 108	10%
Tune	89 - 98	9% - 10%
Management	67 - 110	9 - 10%

Top Causes of Project Delays





Hardware



Software

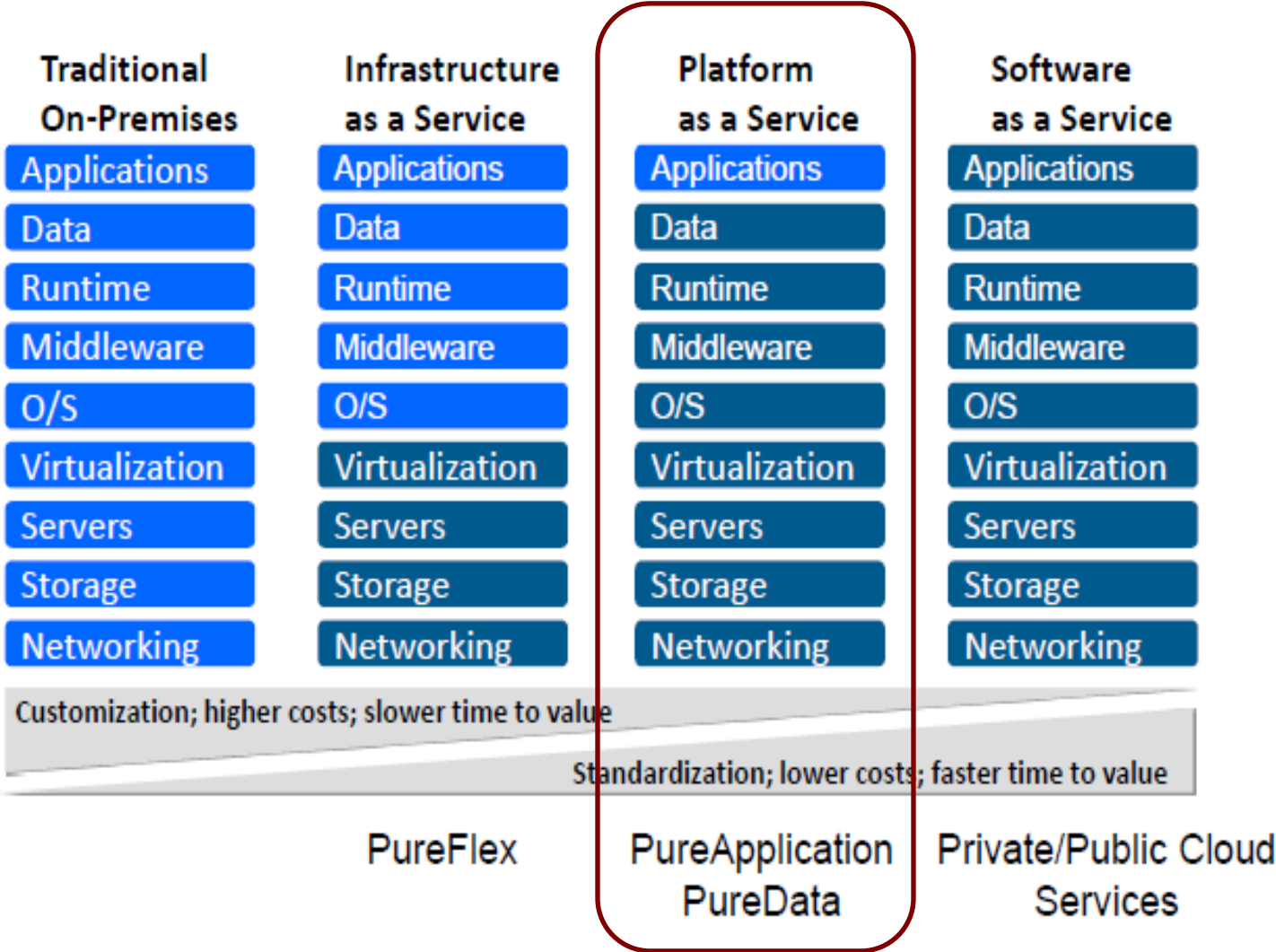


PureSystems: The Family

<h2>PureFlex</h2>  <p>MSP Editions</p> <p>Flex System</p>  <p>Infrastructure</p> <p><i>Delivering Cloud Infrastructure Services</i></p>	<h2>PureApplication</h2>  <p>New Models</p> <p>Application Platform</p> <p><i>Delivering Cloud Application Platform Services</i></p>	<h2>PureData</h2>  <p>New Analytics Model</p> <p>Data Platform</p> <p><i>Delivering Big Data Platform Services</i></p>
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Positioning Platform as a Service (PaaS)



Introducing IBM PureApplication System

Combining virtualized workloads with scalable infrastructure

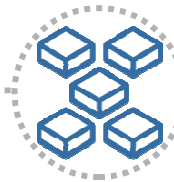
Middleware
Data and Runtime



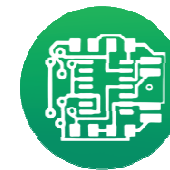
Deploy
From Weeks to Minutes



Manage
From Separate to Integrated



Compute
32-608 Way Configuration



Storage
Solid State Devices Relieve Spindles



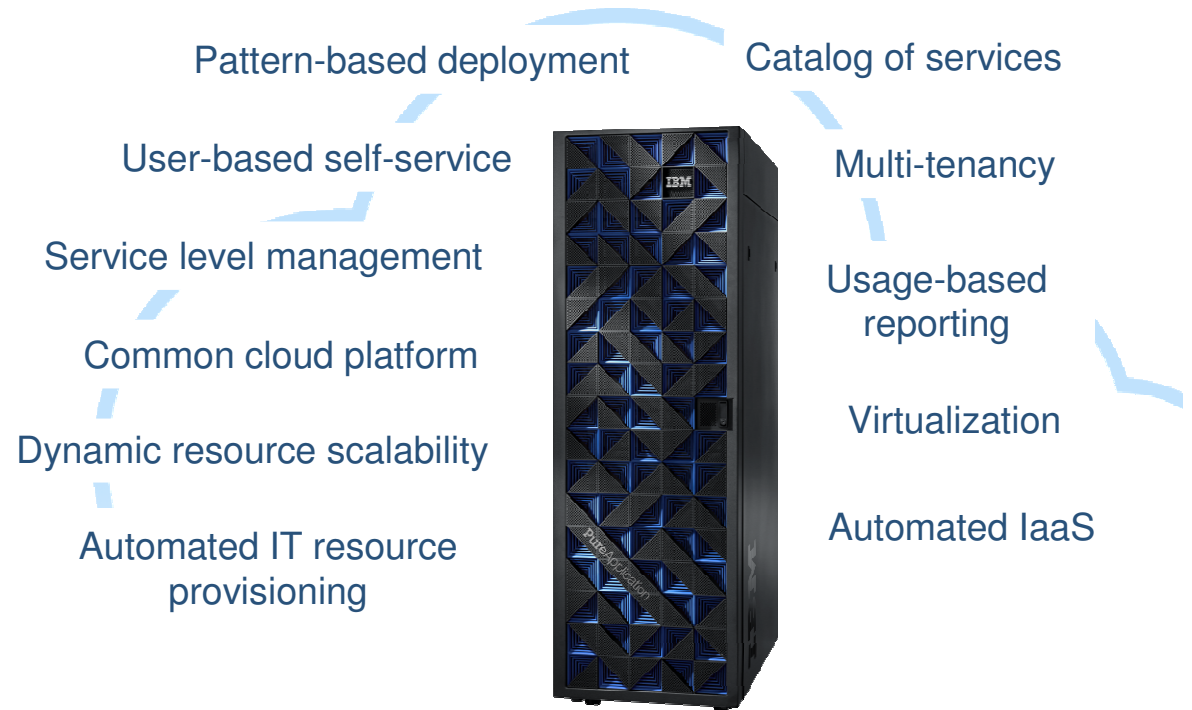
Interconnect
Local Speeds Compute, Storage



IBM PureApplication System: the ideal cloud application platform

Expert Integrated System:

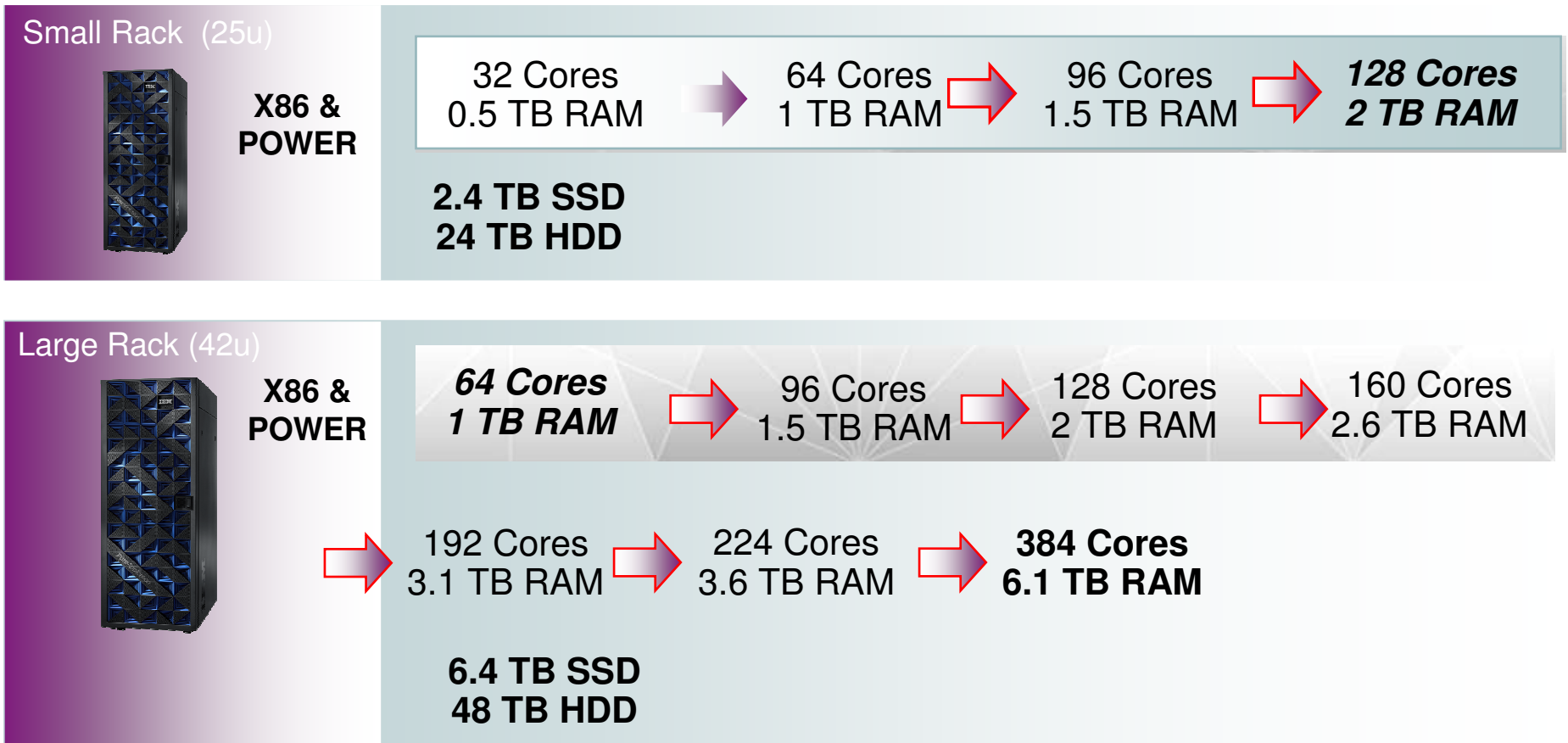
- Integration by design
 - Application server
 - Database services
 - Integrated infrastructure
- Built-in expertise
 - Infrastructure, platform, and application patterns
- Simplified experience
 - Simplifying lifecycle deployment and management of applications
 - Single point of management



PureApplication
Cloud Application Platform (PaaS)



PureApplication System Configurations



→ Upgrades



IBM PureApplication System: unique capabilities

- Pattern
- Single patch update across entire system
- Virtual Application deployment
- Policy-based placement
- Application level prioritization and isolation
- Performance optimization
- Dynamic scaling of applications and VM resources
- Automatic configuration of deployed workloads w/ network, storage, monitoring w/o scripting
- Advanced license management
- Place/rebalance VMs, aware of all system resources
- Log aggregation
- Assisted physical to virtual migration
- Integrated monitoring of all resources (hw, middleware, applications)



PureApplication

Cloud Application Platform (PaaS)

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Leveraging the Power of Patterns

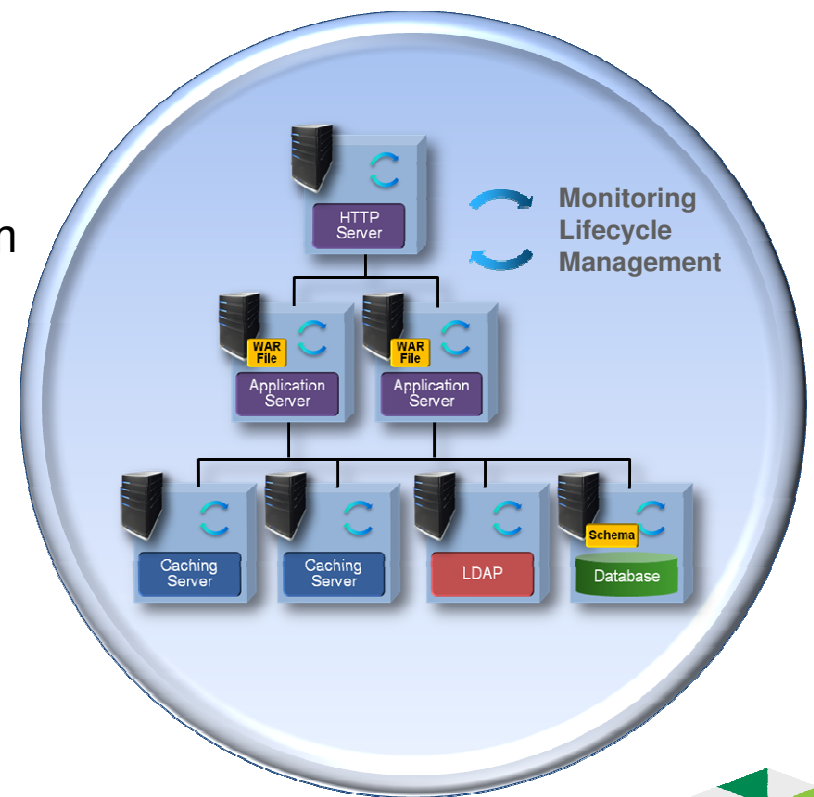
- Application topologies are complex
 - Require deployment, configuration, management and maintenance of operating systems and multiple middleware components
- As the topologies get more complex
 - Applications take longer to set up
 - They get harder to consistently deploy across the application lifecycle
 - They are difficult to manage and update
- With the PureApplication System you can
 - Create reusable patterns providing consistent, repeatable deployment of entire application environments
 - Reduce application deployment times while improving monitoring, management, and maintenance
 - Provide cloud capabilities such as automated provisioning , customer self-service and elastic scaling



Patterns of Expertise: Proven best practices and expertise for complex tasks learned from decades of client and partner engagements that are captured, lab tested and optimized *into a deployable form*

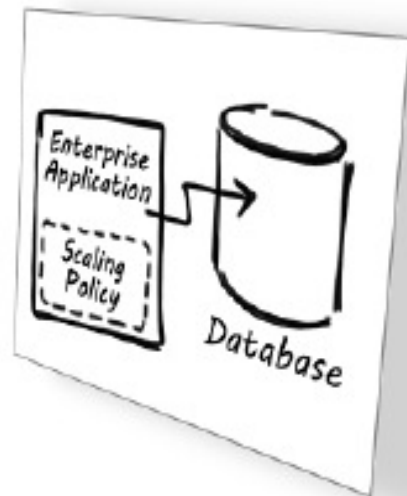
What is a Pattern?

- The pre-defined architecture of an application
- For each component of the application (i.e. database, web server, etc)
 - Pre-installation on an operating system
 - Pre-integration across components
 - Pre-configured & tuned
 - Pre-configured Monitoring
 - Pre-configured Security
 - Lifecycle Management
- In a **deployable form**, resulting in **repeatable deployment with full lifecycle management**

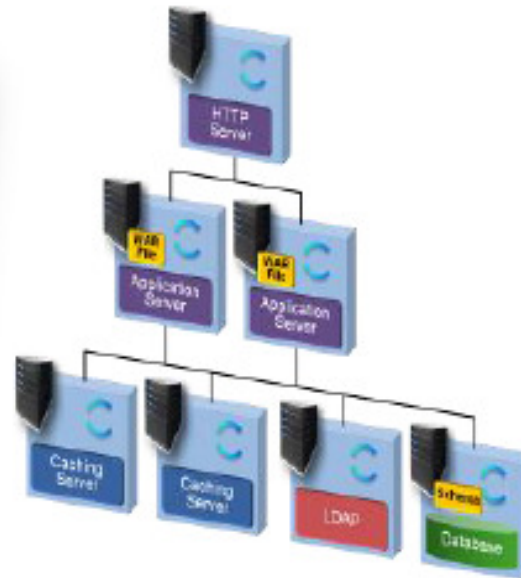


Patterns are a Key Capability for Cloud Application Platforms

What the business wants...



What's required...



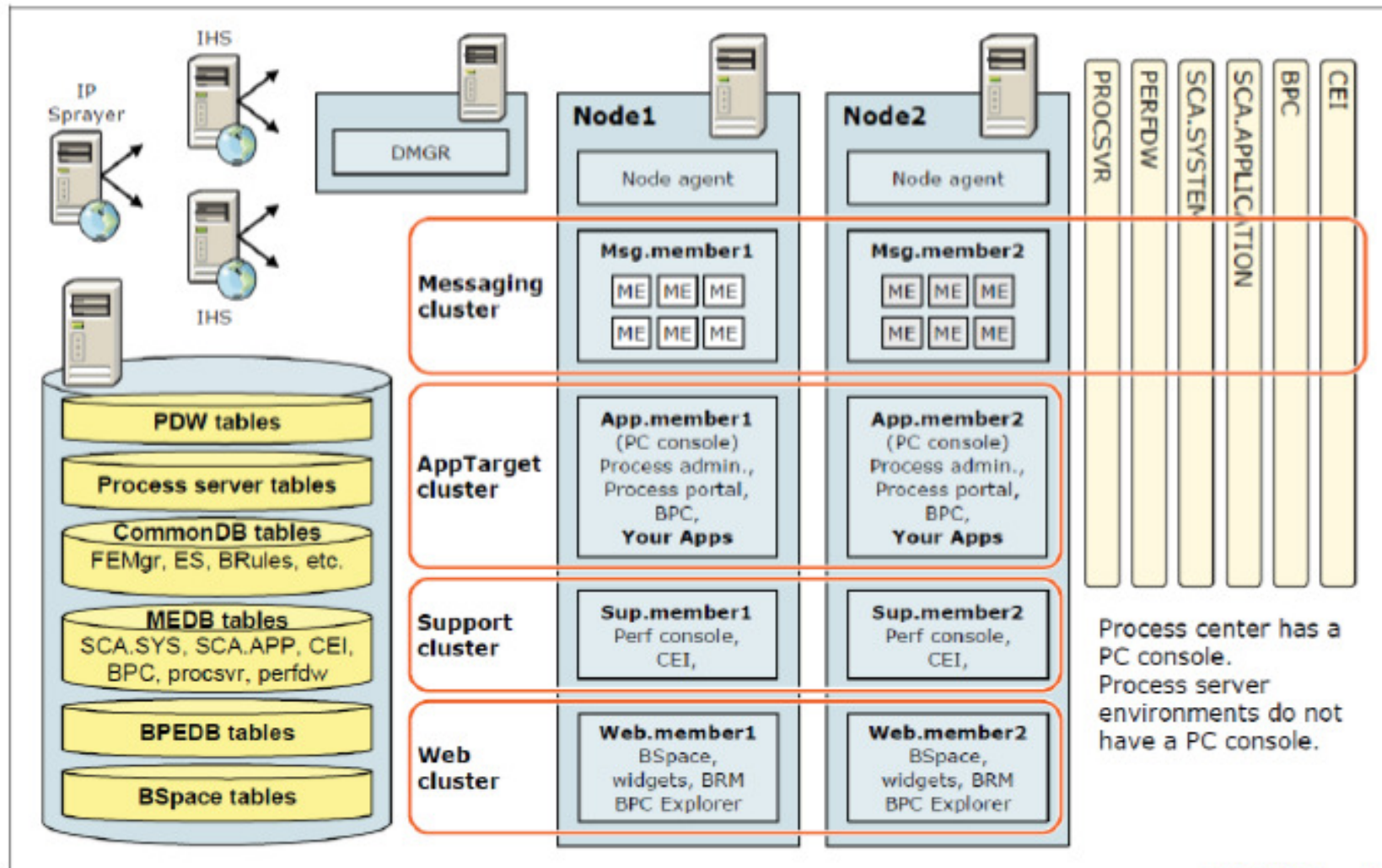
A pattern automates...



Patterns impact both top line revenue growth and bottom line cost saving



Example: IBM BPM Best Practice (Golden) Topology



From individual infrastructure components to software patterns

Software Patterns: Proven best practices and expertise learned from decades of client and partner engagements

- Pre-defined architecture of an application or Cloud service
- Captures best practices for complex tasks
- Optimized into a deployable form
- Repeatable deployment with full lifecycle management



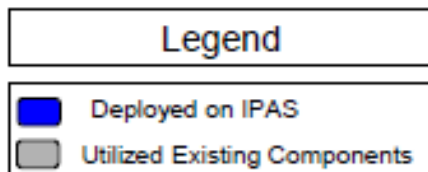
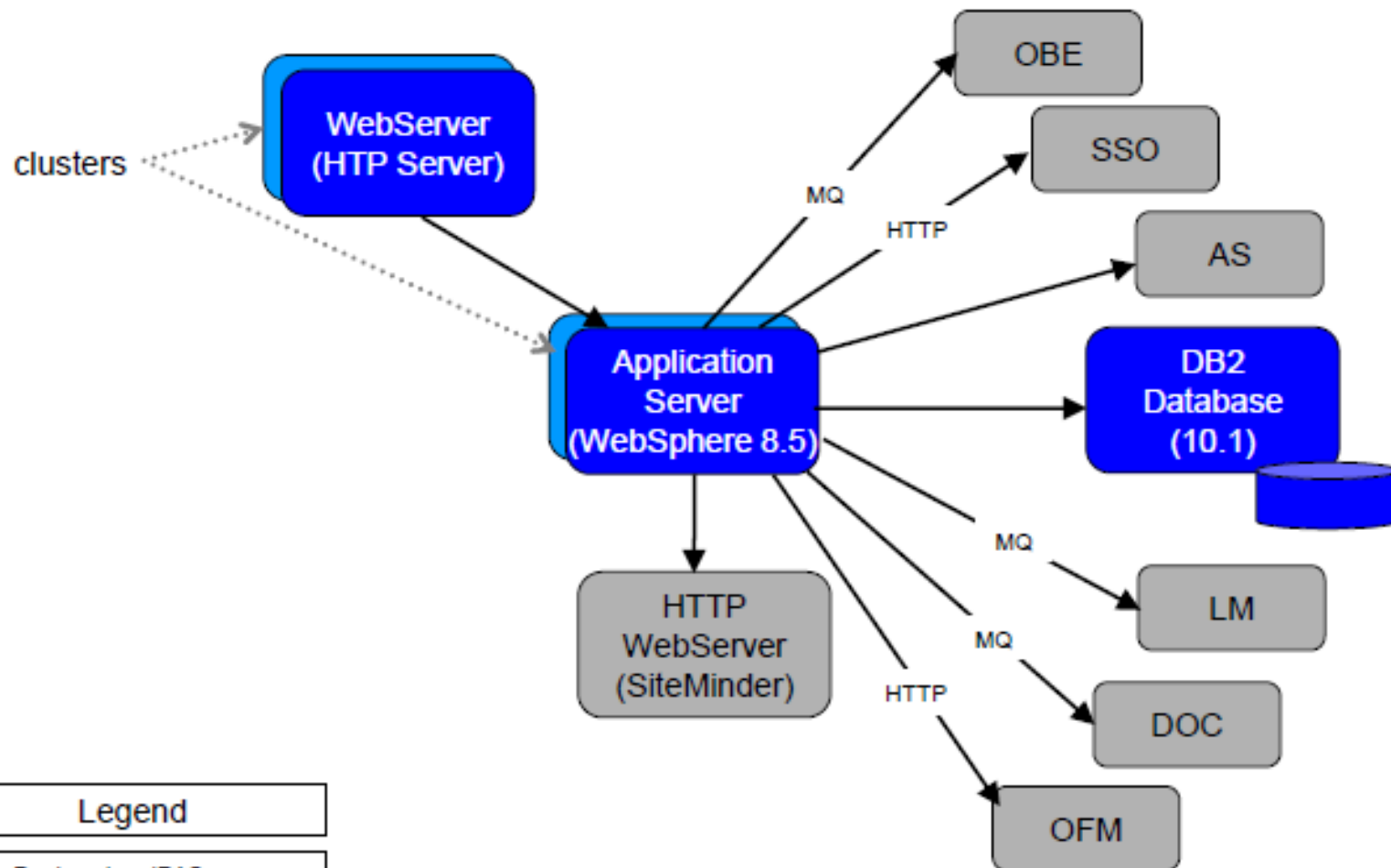
The diagram illustrates a software pattern lifecycle. It features a central circular flow with four main stages: Design, Build, Deploy, and Monitor. Each stage is represented by a small icon and a text label. The 'Monitor' stage is further detailed with sub-labels: 'Monitoring', 'Lifecycle', and 'Manage'. The entire diagram is set against a light blue background with a subtle grid pattern.

Three ways to get the value of patterns of expertise

- Use **IBM** patterns of expertise throughout the system
- Patterns Add **third-party** application patterns of expertise
- Capture **your own** expertise



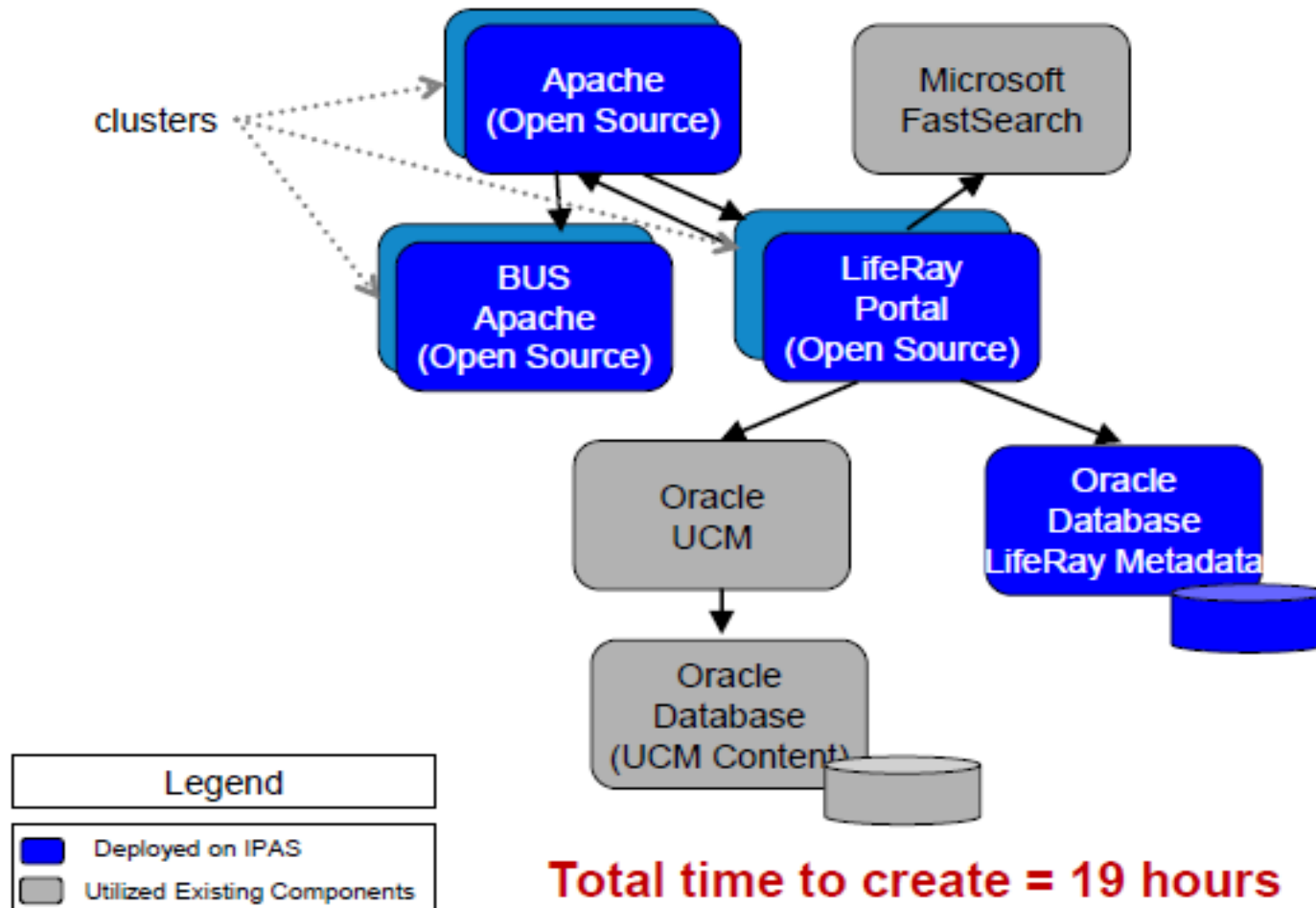
Customer Virtual Application Pattern - all IBM middleware



Total time to create = 3 hours
Total time to provision = 20 minutes



Customer Virtual System Pattern - no IBM middleware



Total time to create = 19 hours
Total time to provision = 33 minutes



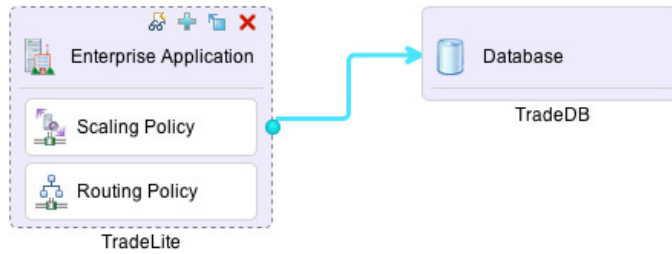
Diagram | List View | Source

Save | Save As | Layout | Undo | Redo

Hints

- Assets**
- Asset name
- Application Components
 - Additional archive file
 - Enterprise Application
WebSphere Application Server
 - Existing Web Service Provider Endpoint
 - Policy set
 - Web Application
WebSphere Application Server
 - Database Components
 - Data Studio web console
 - Database
DB2
 - Existing Database
DB2
 - Existing Database
Informix
 - Existing Database
Oracle
 - Existing IMS Database
 - Messaging Components
 - Existing Messaging Service
WebSphere MQ
 - Queue
WebSphere MQ
 - Topic
WebSphere MQ
 - OSGi Components
 - Existing OSGi Bundle Repository
 - OSGi Application
WebSphere Application Server
 - Transaction Processing Components
 - Existing CICS Transaction Gateway
 - Existing IMS TM

+ Add policy for application



Enterprise Application
WebSphere Application Server

Name:
TradeLite

EAR file:
artifacts/tradelite.ear [Edit](#) [Delete](#)

Total transaction lifetime timeout (seconds):

Async response timeout (seconds):

Client inactivity timeout (seconds):

Maximum transaction timeout (seconds):

Interim fixes URL:
Click select button to update

Select

Ignore inapplicable ifix updates:

Maximum Session Count:

Scaling Policy
Web/Enterprise Application

Enable session caching:

Maximum Session Cache Grid Size:
UNCAPPED

Scaling Type
Response Time Based

Scaling in and out when Web response time is out of threshold range(ms):
Range: 1000 - 5000

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

*** Minimum time (seconds) to trigger add or remove:**

Diagram | List View | Source

Save | Save As | Layout | Undo | Redo

Hints

- Assets
- Asset name
- Application Components
 - Additional archive file
 - Enterprise Application
WebSphere Application Server
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 - OSGi Application
WebSphere Application Server
 - Transaction Processing Components
 - Existing CICS Transaction Gateway
 - Existing IMS TM

+ Add policy for application

Scaling Type

Response Time Based

Scaling in/out when Web response time is out of threshold range(ms):



Range: 1000 - 5000

Instance number range of scaling in/out: *



Range: 1 - 10

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

120

Enterprise Application
WebSphere Application Server

Name: TradeLite

EAR file: artifacts/tradelite.ear [Edit] [Delete]

Total transaction lifetime timeout (seconds):

Async response timeout (seconds):

Client inactivity timeout (seconds):

Maximum transaction timeout (seconds):

Interim fixes URL: Click select button to update

Select

Ignore inapplicable ifix updates:

Maximum Session Count:

Scaling Policy
Web/Enterprise Application

Enable session caching:

Maximum Session Cache Grid Size: UNCAPPED

Scaling Type: Response Time Based

Scaling in and out when Web response time is out of threshold range(ms):



Range: 1000 - 5000

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

* Minimum time (seconds) to trigger add or remove:

Scaling Policy: Automated Vertical and Horizontal Scaling

A user may also manually adjust the amount of resource allocated to a running pattern as well.

Maximum CPU and memory (minimums specified at initial deployment)

- CPU added in 1 vCPU increments (2-8 vCPU)
- Memory added in 1 GB increments (4-16 GB)

If both vertical and horizontal scaling are enabled, vertical scaling will be performed first, as its effect is more immediate

Scaling Policy
Web/Enterprise Appli

Enable session caching:

Maximum Session Cache Grid Size:
8 GB

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

Maximum vCPU Count:
8

Maximum Virtual Memory Size:
3072

← CPU Based

Scaling when CPU usage is out of threshold range(%):
10% 100%
Range: 20% - 90%

* Minimum time (seconds) to trigger add or remove:
300

* Scaling Action Type:
Add or remove node, but increase vCPU count before adding node

→ Database Connection Based

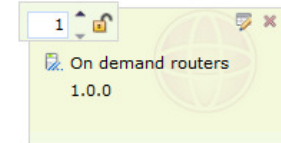
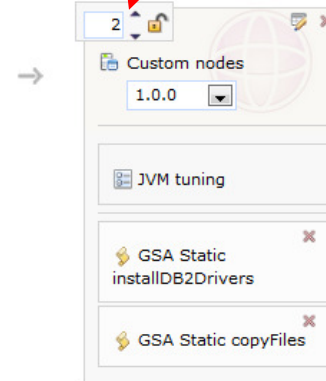
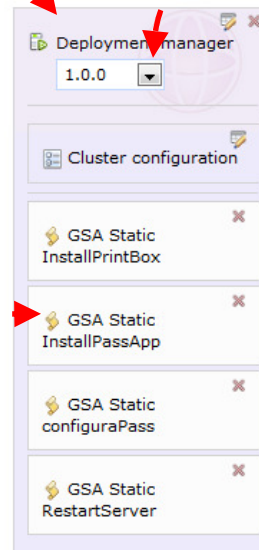
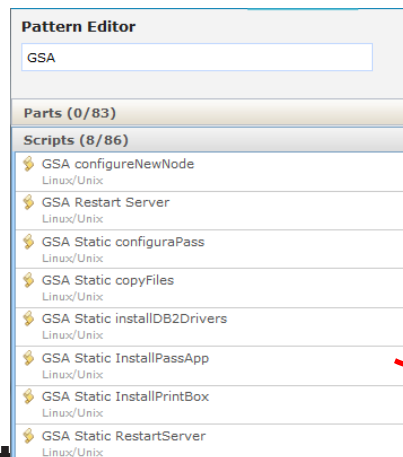
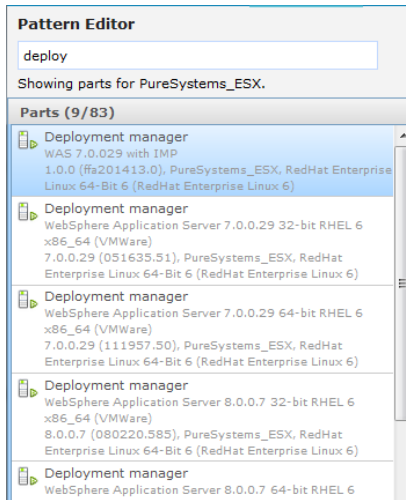


Virtual System Pattern creation

Il pattern viene creato tramite drag'n'drop di parti e script da una palette al Canvas.

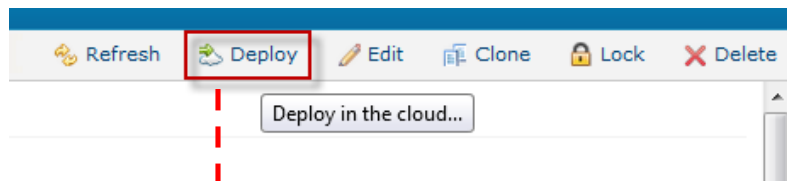
La versione del sw può essere cambiata prima del deployment.

Il numero dei nodi può essere cambiato secondo necessità.



Virtual System Pattern deployment

Cliccando su Deploy, il pattern viene deployato.



Si definisce un nome per il Virtual System e l'ambiente (Environment Profile) su cui verrà deployato.

Vengono impostate password di default per middleware e sistema operativo.

Vengono configurate le parti (ad es. Memoria, numero di core).

Deployment History

Dopo aver cliccato su 'Deploy', PureApplication comincia a creare le risorse (macchine virtuali), le fa partire ed esegue gli script nell'ordine stabilito.

Al termine dell'esecuzione avremo ottenuto un sistema completamente funzionante.

Inizio alle 6:44, Fine alle 7:28 – Totale 44 minuti

The virtual system has been deployed	May 15, 2014, 7:28:46 PM
Script package Must Gather Logs on virtual machine vm203028-Custom Node-Gesiass Ambiente Collaudo Static 1-463 completed successfully	May 15, 2014, 7:28:46 PM
Script package Must Gather Logs on virtual machine vm203029-Custom Node-Gesiass Ambiente Collaudo Static 1-464 completed successfully	May 15, 2014, 7:28:46 PM
Script package Must Gather Logs on virtual machine vm203025-DMGR-Gesiass Ambiente Collaudo Static 1-461 completed successfully	May 15, 2014, 7:28:45 PM
Starting virtual machines in virtual system Gesiass Ambiente Collaudo Static 1.	May 15, 2014, 6:49:15 PM
Registering virtual system Gesiass Ambiente Collaudo Static 1	May 15, 2014, 6:44:35 PM
Pattern deployment starting.	May 15, 2014, 6:44:33 PM
Generating model for topology and network	May 15, 2014, 6:44:07 PM
Reserving cloud resources	May 15, 2014, 6:44:05 PM
Deployment has been queued	May 15, 2014, 6:44:02 PM



Node addition to a cluster

Avendo creato un cluster statico, l'aggiunta o la diminuzione dei nodi deve essere effettuata manualmente. Per aggiungere un nodo al cluster, è sufficiente selezionarne uno già in funzione ed attivare la sua clonazione con un click. Dopo pochi minuti il nuovo nodo sarà aggiunto alla cella, e funzionante.

Virtual machines 4 total - 4 started

Show deleted virtual machines

Name	CPU	Memory	SSH	Actions	Group Actions
vm203007-DMGR-Gesiass Ambiente Collaudo Updated 3-315	0%	31%	Log In	Manage	<input type="checkbox"/>
vm203018-Custom Node-Gesiass Ambiente Collaudo Updated 3-316	1%	21%	Log In	Manage	<input type="checkbox"/>
vm203019-Custom Node-Gesiass Ambiente Collaudo Updated 3-317	0%	11%	Log In	Mar	<input type="checkbox"/>
vm203020-ODR Node-Gesiass Ambiente Collaudo Updated 3-318	1%	23%	Log In	Manage	<input type="checkbox"/>

Clone this virtual machine

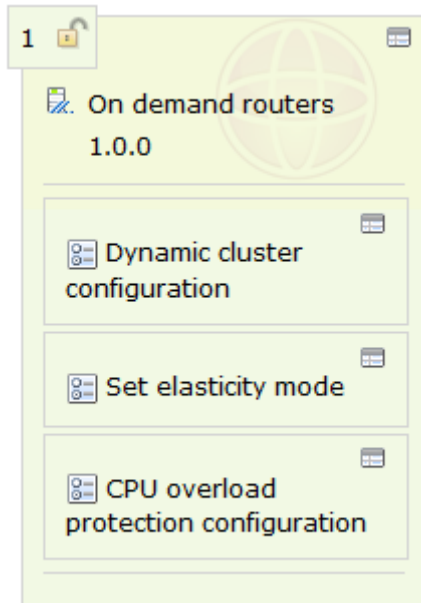
Inizio alle 7:51, Fine alle 8:04 – Totale 13 minuti

Virtual system is ready	May 15, 2014, 8:04:26 PM
Clone of virtual machine is complete.	May 15, 2014, 8:04:26 PM
Script package Must Gather Logs on virtual machine vm203030-Custom Node-Gesiass Ambiente Collaudo Static 1-465 completed successfully	May 15, 2014, 8:04:25 PM
Executing script package Must Gather Logs on virtual machine vm203030-Custom Node-Gesiass Ambiente Collaudo Static 1-465	May 15, 2014, 8:04:11 PM
Generating model for topology and network	May 15, 2014, 7:52:07 PM
Reserving cloud resources	May 15, 2014, 7:52:04 PM
Processing has started	May 15, 2014, 7:52:04 PM
Clone of virtual machine has started.	May 15, 2014, 7:51:57 PM

PureApplication System further feature

Cluster statico vs. cluster dinamico

- E' però possibile creare lo stesso ambiente utilizzando un cluster dinamico, impostando le policy per 'Elasticity'.
- In questo caso, il sistema potrebbe autonomamente aggiungere o togliere nodi in funzione delle policy.
- La modalità operativa può essere impostata in 'automatic' (il sistema agisce in modo autonomo) o 'supervised', nel qual caso il sistema 'suggerisce' le modifiche, che devono essere accettate o meno da un amministratore.



Parameters for script Dynamic cluster configuration

- * DYNAMIC_CLUSTER_PREFIX: HVDC
- * NUMBER_OF_DYNAMIC_CLUSTERS: 1
- * MAXIMUM_INSTANCES_PER_NODE: 1
- * MAXIMUM_NODES: 8
- * MINIMUM_TOTAL_INSTANCES: 1

Parameters for script Set elasticity mode

- * ELASTICITY_MODE: Supervised
- * ELASTICITY_OPERATIONS_TIME_OUT: 120

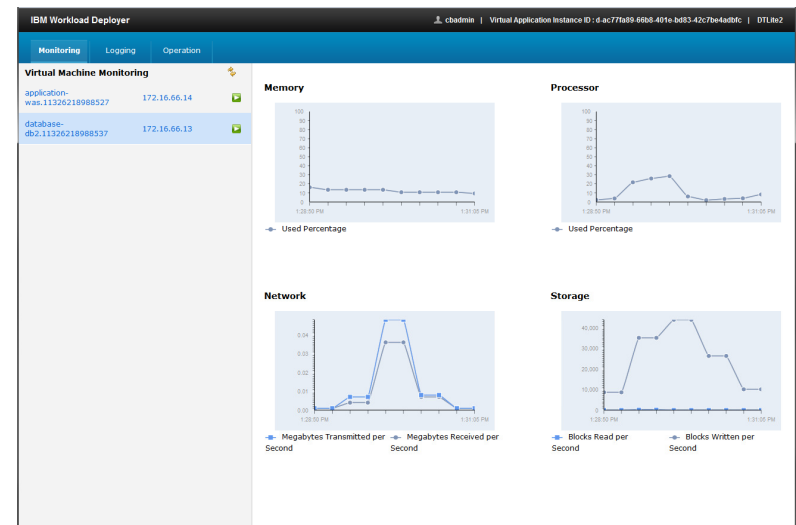
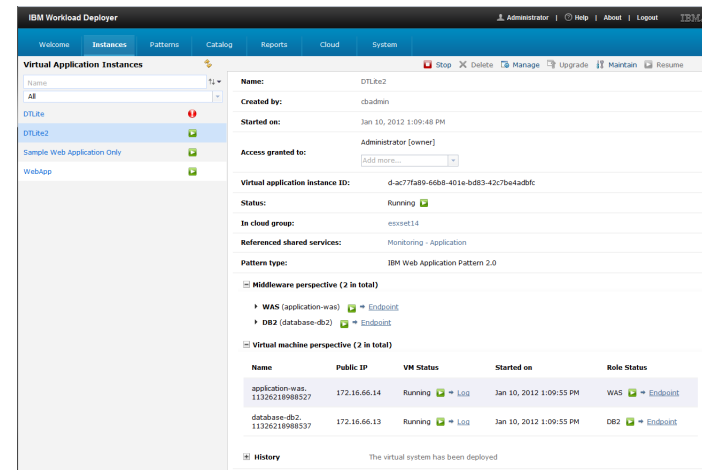
Submit

Select	Action	Task ID
<input type="checkbox"/>	Accept	484331084 DCPC0321I: The application placement controller detected that the system performance can be improved ...

PureApplication System Monitoring

▶ Integrated Components

- Context aware links for drill-down navigation
- Seamless drill-down security
- Single place to view all events
- Integrates into enterprise monitoring



PureApplication System Monitoring

- ▶ Role based drill-down
 - Deployers
 - Can drill down only into their middleware/db metrics
 - Monitor Operators
 - Allowed access to all user deployments
 - Monitor Administrators of cloud and hardware
 - Have Operator access
 - Allowed to see all hardware

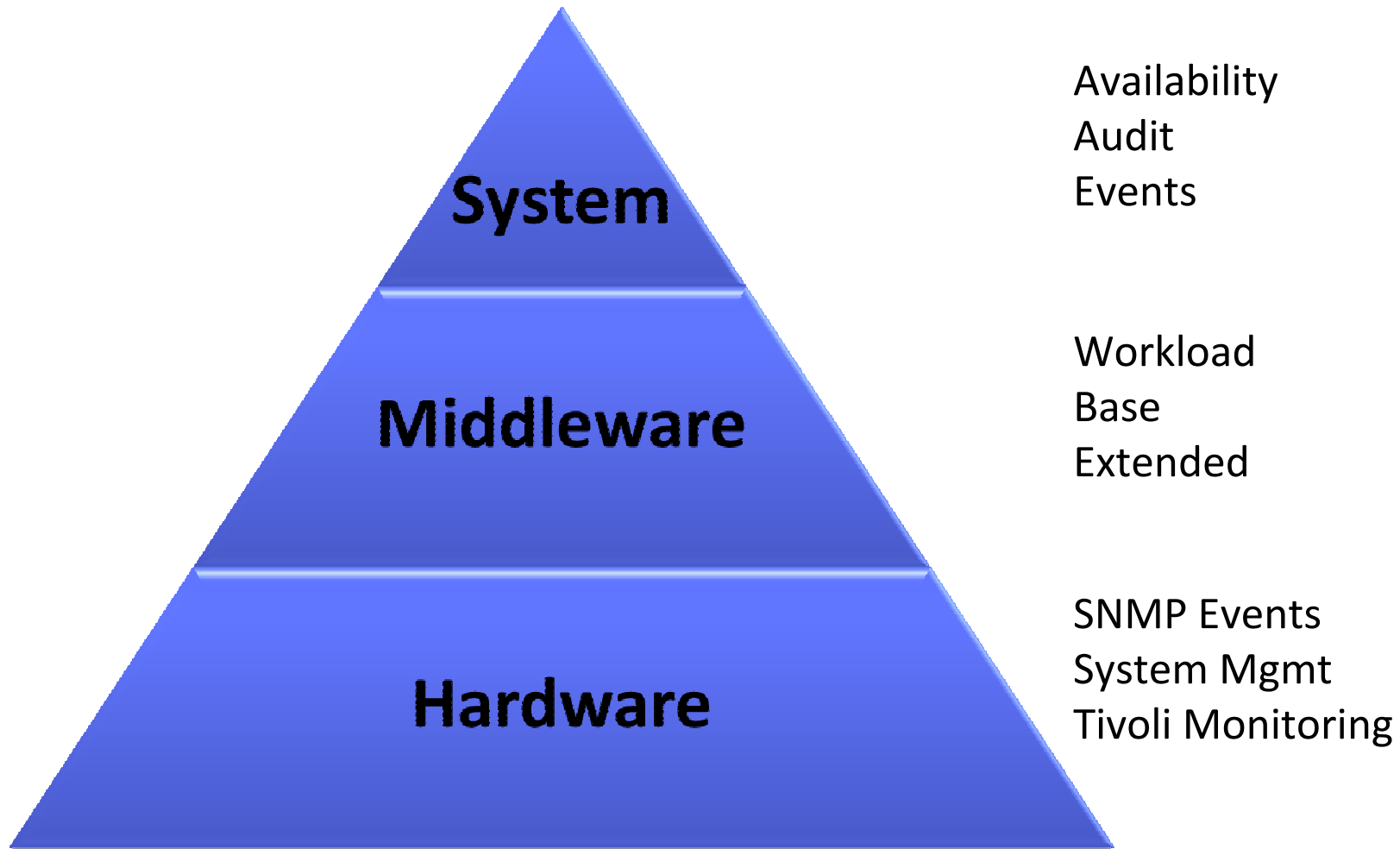
The screenshot displays the IBM PureApplication System Monitoring interface. It includes several panels:

- Navigator:** Shows a tree view of system components like 'Andys TradeLife', 'ipaa-b-20', and 'ipaa-b-21'.
- Space Used Percent:** Two 3D bar charts showing disk usage for different nodes.
- Disk Usage:** A table and a 3D bar chart showing disk usage details for various mounts.
- Role Type Perspective Deployment Overview:** A diagram showing the relationship between System Monitoring, HTEMS, DW, and RTEMS, along with their respective hostnames and IP addresses.
- Table:** A table listing roles, their states, and availability.

Role Name	Role ID	Role State	Role Availability	Hostname	Public IP Address	Node ID
HTEMS	ITM-Hub-TEMS.11343683358655	RUNNING	NORMAL	ipaa-lpar-120-011.purescale.raleigh.ibm.com	172.17.120.11	ITM-Hub-TEMS.11343683
DW	ITM-Data-Warehouse.11343683358656	RUNNING	NORMAL	ipaa-lpar-120-014.purescale.raleigh.ibm.com	172.17.120.14	ITM-Data-Warehouse.11343683
RTEMS	ITM-Remote-TEMS.11343683358657	RUNNING	NORMAL	ipaa-lpar-120-013.purescale.raleigh.ibm.com	172.17.120.13	ITM-Remote-TEMS.11343683

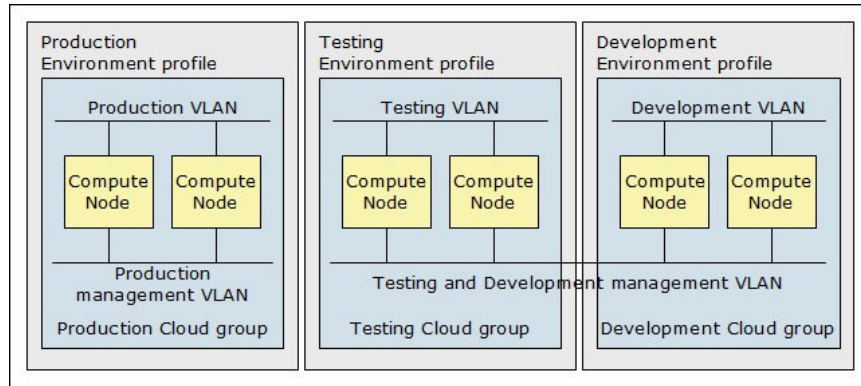


Monitoring Layers

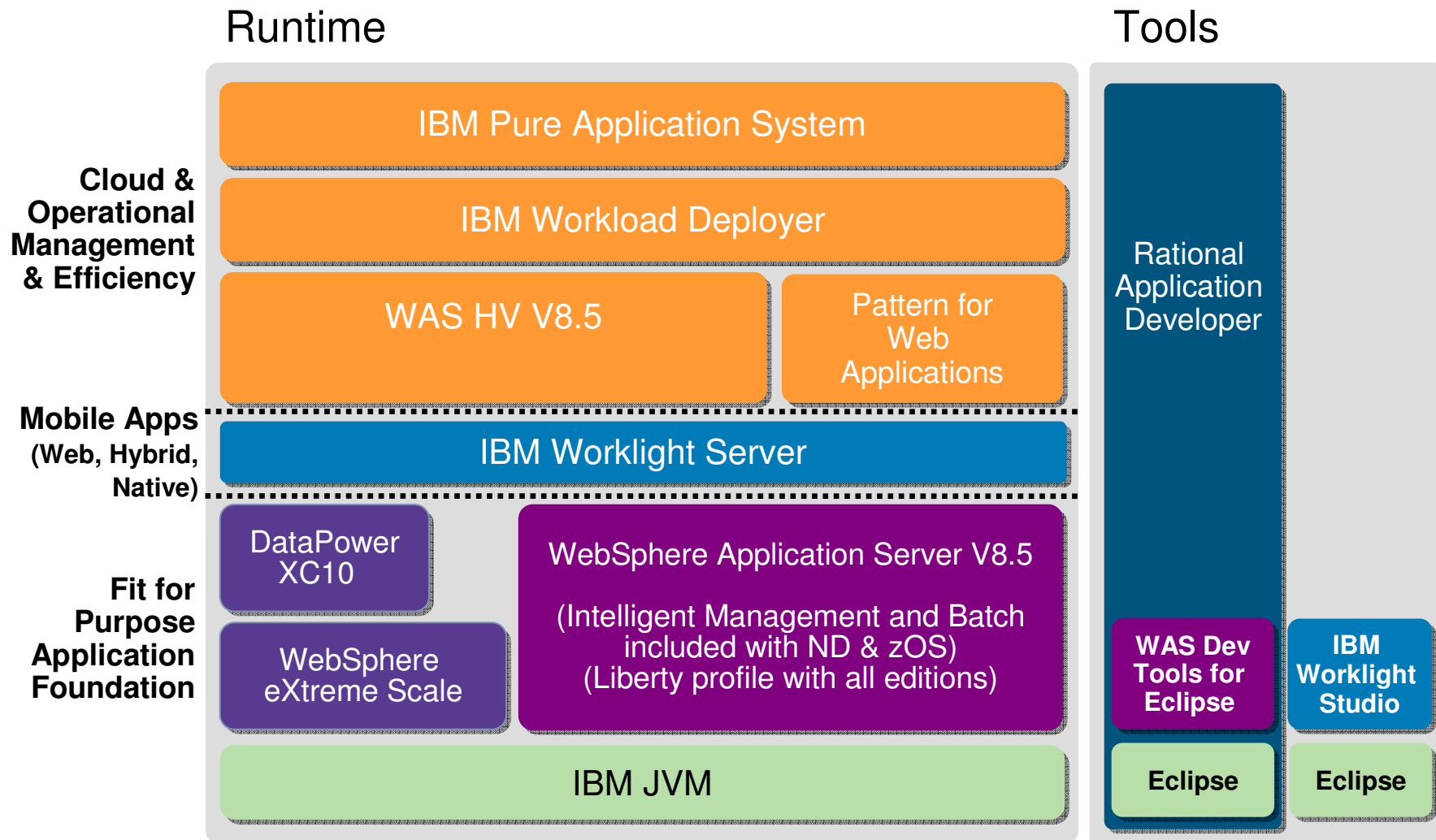


Workloads Consolidation

- IBM PureApplication System can host multiple running environments completely isolated
- The resources dynamic assignment allows environments to grow or shrink depending on the workload and the incoming requests



WebSphere Application Infrastructure (June 2012)



WebSphere Application Server V8.5 Delivered

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

Impact 2014
model

Be First. ▶▶▶

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

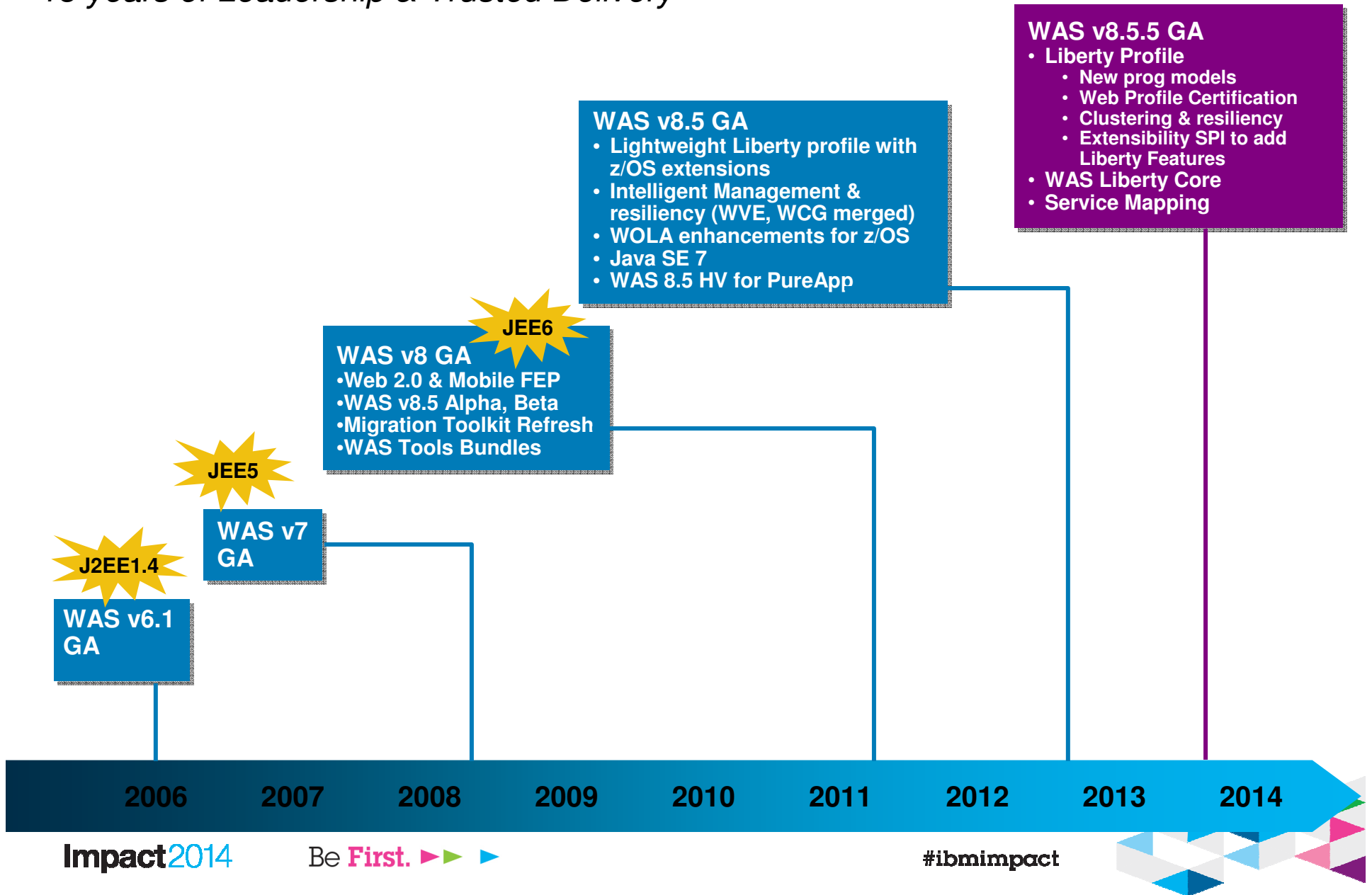
- Selectable JDK
- WebSphere Batch enhancements
- Admin Security Audit
- OSGi Blueprint security improvements
- Cross Component Trace (XCT)
- Enhanced IBM Support Assistant
- Better log and trace filtering

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WebSphere Application Server

15 years of Leadership & Trusted Delivery



WAS v8.5.5 Delivers

Fit for Purpose Servers enabling unmatched combination of Application Server runtime and development experience, from the highly resilient to the lightweight and nimble

Developer Experience	Application Resiliency	Operational Excellence
<p>Fast, flexible, and simplified application development</p> <ul style="list-style-type: none">▪ New lightweight WebSphere Application Server Liberty Core edition▪ Liberty Profile<ul style="list-style-type: none">▪ Java EE 6 Web Profile<ul style="list-style-type: none">▪ EJB Lite, CDI, Managed Beans▪ Web Services▪ JMS, MDB▪ NoSQL DB (MongoDB Client)▪ Support for WebSphere Web Cache (DynaCache)▪ Add custom and third party Liberty features▪ Asynchronous work management▪ Enhanced developer tools▪ Supported WAS and WDT on developer desktops	<p>Intelligent Management and Enhanced Resiliency</p> <ul style="list-style-type: none">▪ WAS ND and WAS z/OS full profile enhancements in v8.5 **<ul style="list-style-type: none">▪ App Edition Mgmt▪ App Server Health Mgmt▪ Dynamic Clustering▪ Intelligent Routing▪ Messaging resiliency▪ Enterprise Java Batch▪ Memory leak protection▪ Liberty Profile collective administration▪ Liberty Profile clustering▪ Intelligent management in WebSphere web server	<p>Improved Operations, Security, Control & Integration</p> <ul style="list-style-type: none">▪ Liberty profile<ul style="list-style-type: none">▪ Security enhancements▪ Problem determination▪ Monitoring▪ Service Mapping▪ SIP improvements▪ Improved Load Balancer for IPV4 and IPV6▪ Liberty profile packaging and install enhancements▪ WebSphere Extreme Scale integration▪ Performance enhancements



New!

Developer Experience

WebSphere App. Server Liberty Core v8.5.5

Liberty Core, a new Liberty profile only edition, enabling rapid development of lightweight, flexible and extensible applications for maximum density deployments

What is Liberty Core:

- ✓ Simple, lightweight and low cost WAS edition
- ✓ Alternative to open source , and including WebSphere QoS
- ✓ Liberty profile only (not full-profile WAS)
- ✓ Subset of Liberty in WAS, ND (no JMS, WS, WXS)
- ✓ Scoped to Web Profile capabilities
- ✓ Easily embeddable (zip and go)
- ✓ Extensible via Liberty Extensions SPI
- ✓ Clear migration path up the stack to WAS and ND (gaining prog models, management, resiliency, scale)



Benefits for developers:

- ✓ Lightweight, flexible and easy to use runtime; rapid server restart
- ✓ Free to download tools with support on developer desktop

Benefits for operations:

- ✓ Fidelity across WAS editions; consistent dev / test / run
- ✓ Manage across traditional and cloud infrastructures

Benefits for customers and partners:

- ✓ Easy extensibility for custom features and 3rd party components
- ✓ Ideal for packaging lightweight web applications

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Enhanced!

Developer Experience

WAS v8.5.5 Liberty Profile “Enhanced”

WAS v8.5.5 delivers significant enhancements to Liberty profile, including new programming models, administration, qualities of service and development tools

Dynamic Server Profile
Not static like Web Profile; configured by app at a fine-grained level

“Developer First” Focus
Simplified, shareable XML server config. New integrated messaging server, DynaCache support, new prog. models, such as Web Services, JMS & EJB-Lite.

Enhanced!

Start fast, run efficiently
Starts in <3s; Mem footprint <50MB; (TradeLite benchmark)

Small Download
50MB for Web Profile features



WAS v8.5.5 Liberty Profile & WAS Developer Tools for Eclipse (WDT)

Integrated tools
Powerful tools in WDT Eclipse feature. Enhanced for v8.5.5 prog models, Maven integration, ++

Dynamically Extensible
Install new features from repository (local or remote) with no svr restart

New!

Web Profile Certified
Create web apps for the Java EE Web Profile standard.

Lightweight cluster Mgmt
Liberty servers can join a lightweight cluster for workload balancing and high availability

New!

Unzip install and deploy
IM or unzip to install. New option to deploy “server package” of app + config + required subset of server runtime for highest density deploy

Liberty Extensions
Add custom features and integrate 3rd party components via Liberty extensions interface

New!

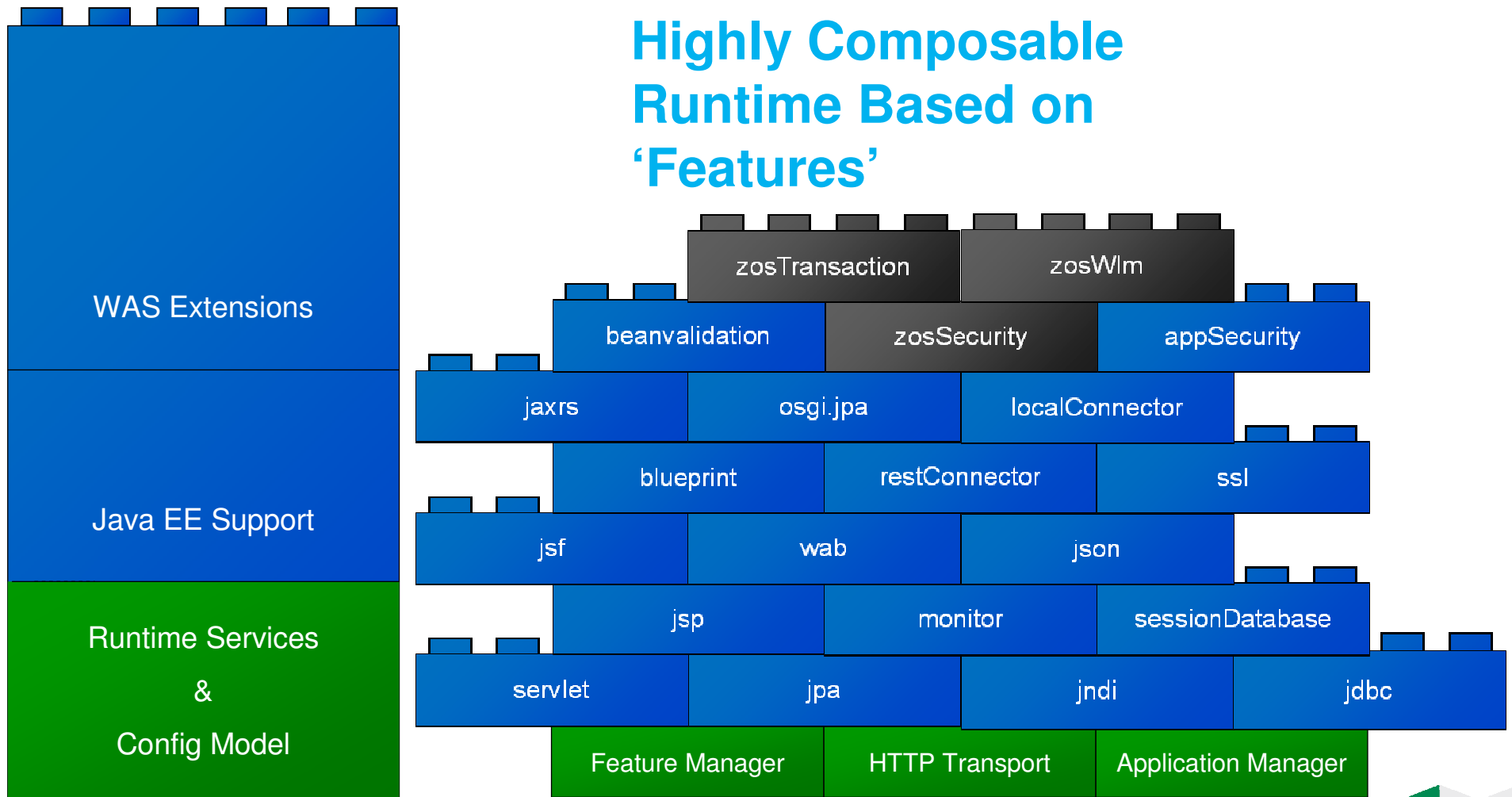
Fidelity to full profile WAS
Same reliable containers & QOS. Develop on Liberty profile and deploy to Liberty or full-profile WAS



Liberty feature set – V8.5

WAS v8.5.5 delivers programming model and qualities of service enhancements to the Liberty profile, expanding the scope of Liberty based applications and deployment

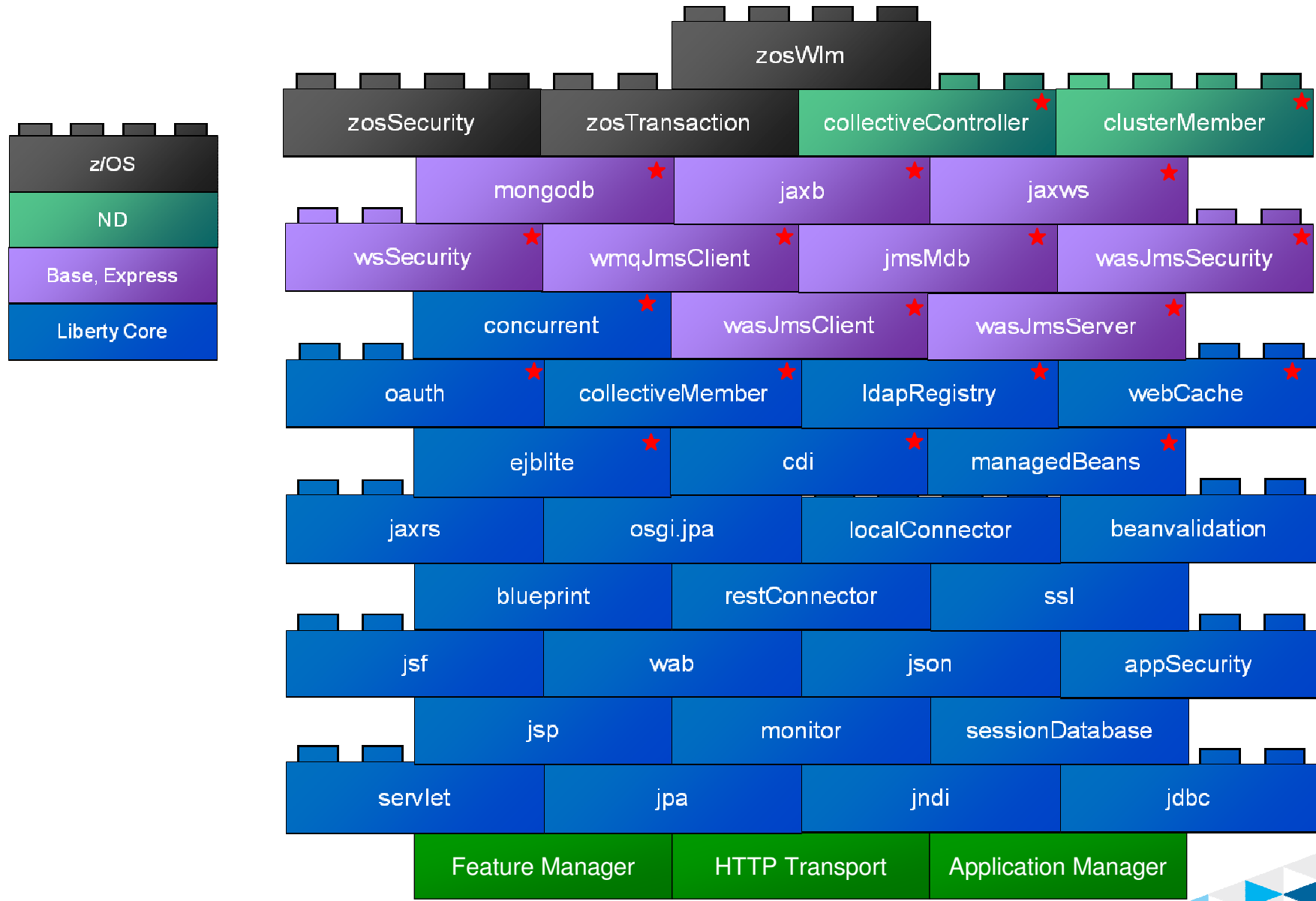
Highly Composable Runtime Based on 'Features'



Enhanced!

Developer Experience

Liberty feature set – V8.5.5



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WAS v8.5.5 Liberty Profile #libertyimpact



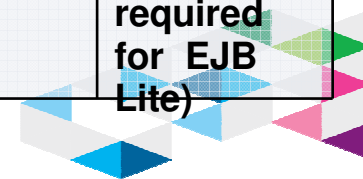
Liberty – EJB-lite Support

The EJB-Lite support in WAS v8.5.5 provides a subset of the full EJB 3.1 API enabling a convenient and lightweight EJB implementation meeting the needs of many applications

- EJB 3.1 Lite is a key component of the Java EE Web Profile spec
- Subset of EJB 3.1 spec focused on session beans and local interfaces
- Keeps EJB implementation small and lightweight
- Available in all WAS editions

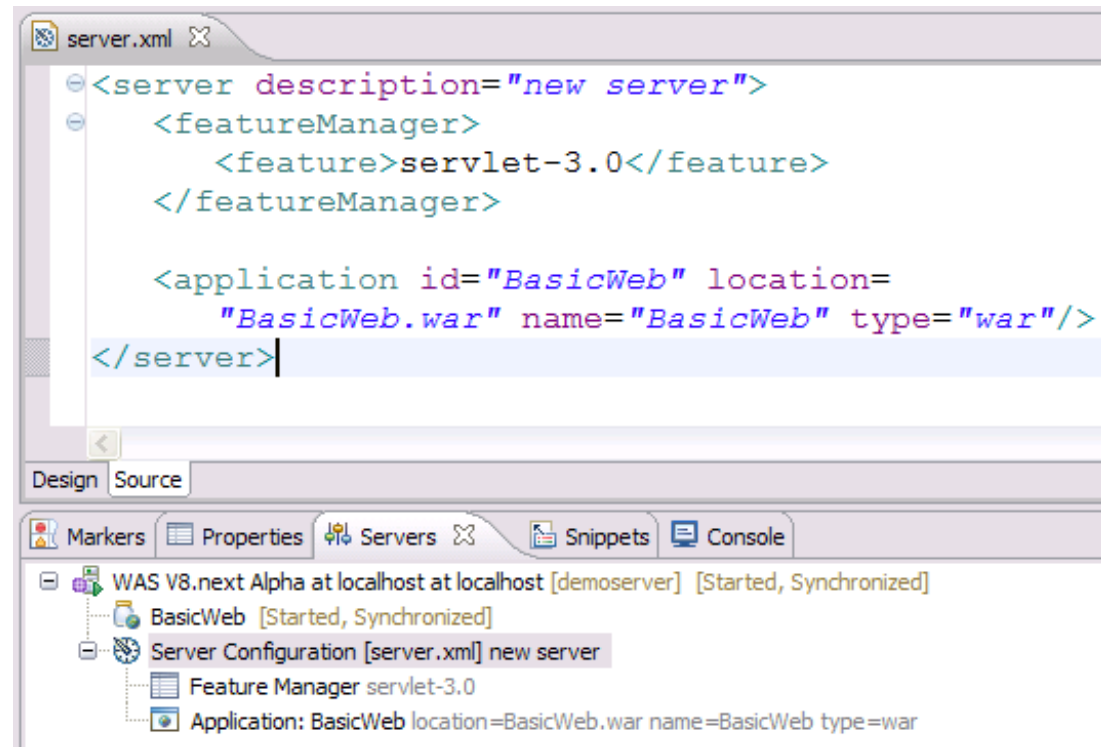


	EJB 3.1 Lite (Liberty and Full Profile)	Full EJB 3.1 (Full)
Session Beans (stateful, stateless, singleton)	✓	✓
Message Driven Beans		✓
2.x/1.x CMP/BMP Entity		✓
Java Persistence 2.0	✓	✓
Local/No Interface	✓	✓
3.0 Remote		✓
2.x Remote Home/Component		✓
JAX-WS web services		✓
JAX-RPC web services		✓
EJB Timer Service		✓
Async Bean Invocation		✓
Interceptors	✓	✓
RMI-IIOP interop		✓
Container managed transactions / Bean managed	✓	✓
Declarative/Programmatic Security	✓	✓ (only required for EJB Lite)
Embeddable API	✓	



Simplified Server Configuration

- ▶ Simplest case: One XML file for all server configurations
- ▶ Editable within the workspace
- ▶ Exportable, shareable, versionable

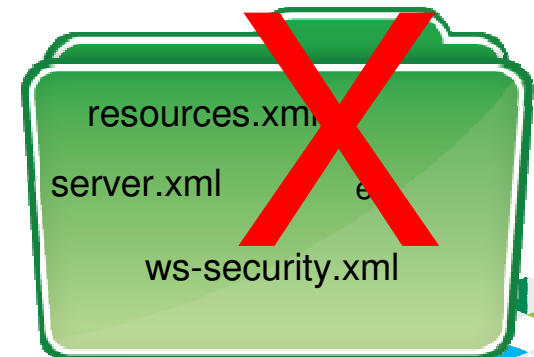


```
<server description="new server">
  <featureManager>
    <feature>servlet-3.0</feature>
  </featureManager>

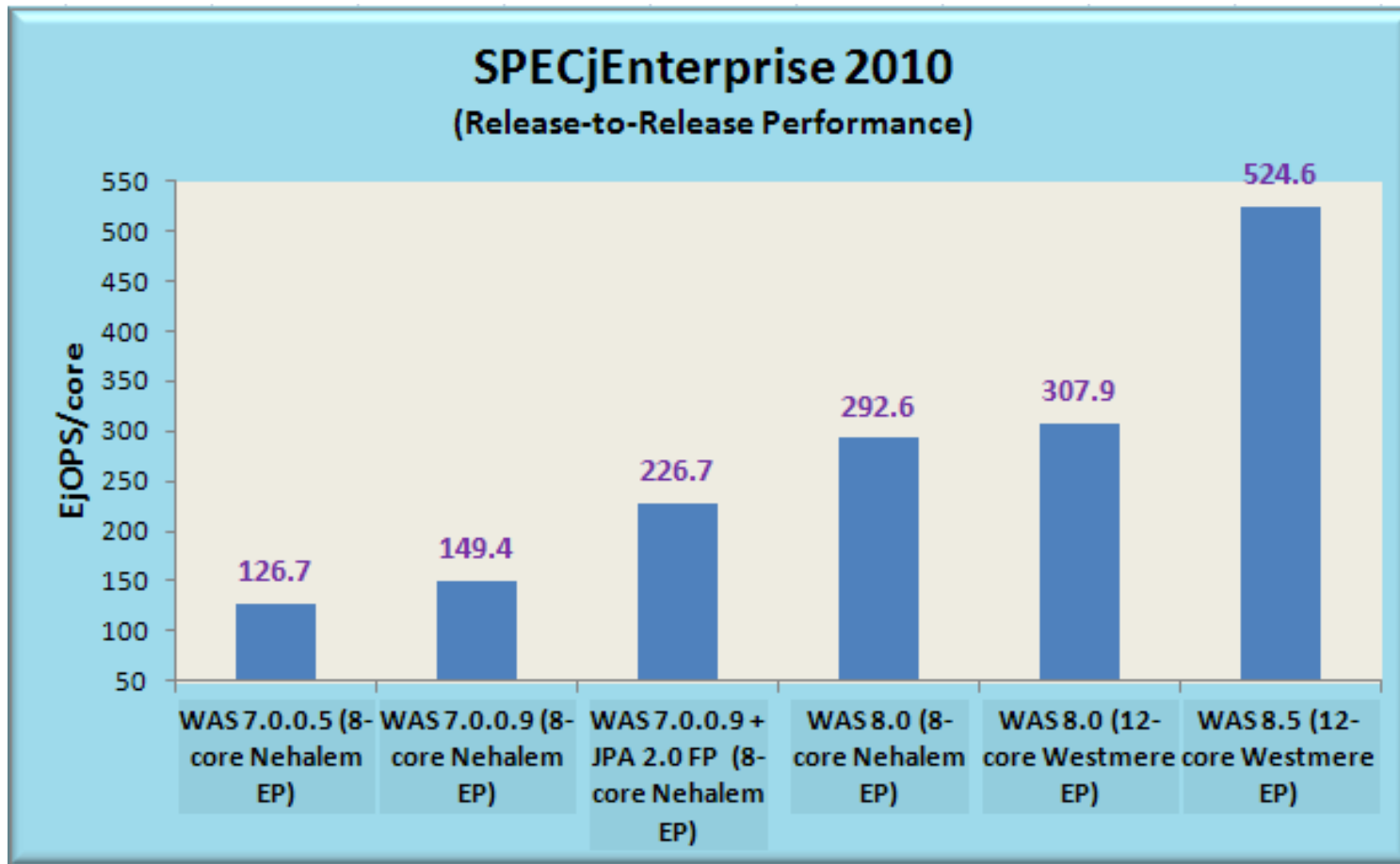
  <application id="BasicWeb" location=
    "BasicWeb.war" name="BasicWeb" type="war"/>
</server>
```

The screenshot shows the 'server.xml' file in an IDE. The code defines a server with a description 'new server', a feature manager containing 'servlet-3.0', and an application named 'BasicWeb' located at 'BasicWeb.war'. Below the code editor, the 'Servers' view shows a 'WAS V8.next Alpha at localhost at localhost [demoserver] [Started, Synchronized]' with a sub-entry for 'BasicWeb [Started, Synchronized]' and a 'Server Configuration [server.xml] new server' entry.

No need for Admin Console, wsadmin,
or extended EARs



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>

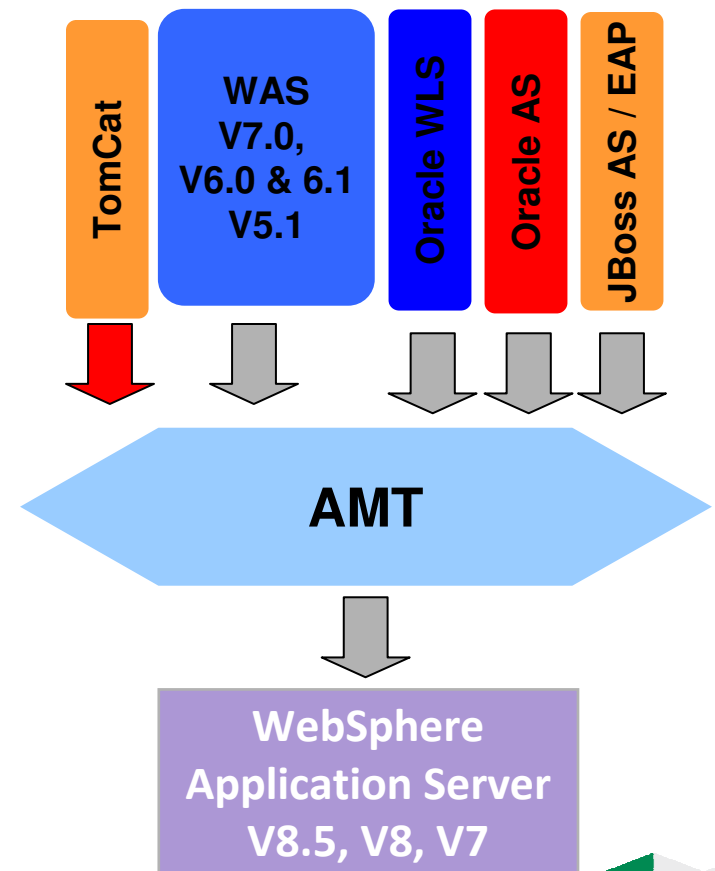


Application Migration Tooling V3.0

Enhanced!

Migrate applications to WebSphere faster with minimized risk

- ▶ Migrate apps from older WAS 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>
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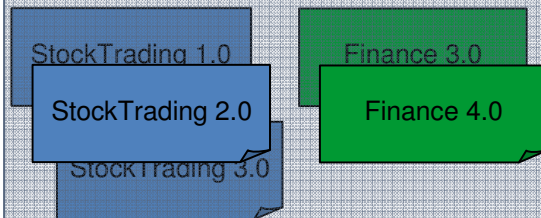
#ibmimpact



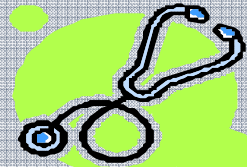
Intelligent Management

Extending QoS through autonomic computing

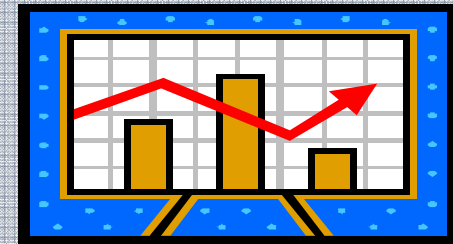
**Application
Edition
Management**
Self-Managing



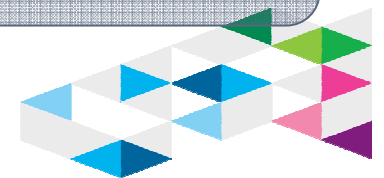
**Health
Management**
*Self-Protecting
Self-Healing*



**Dynamic
Clustering**
Self-Optimizing



Intelligent Routing



Application Edition Management

Seamless upgrades of WAS from one version to the next...

What is Application Edition Management?

- Seamless upgrades without interruption
- Deploy new applications easily
- Test specific version with a select group of users

Results In

- **Easy validation of new versions**
- **Supports “rolling” upgrades**
- **More agile and flexible deployments**



Application Edition Management Administrative Console - Edition Control Center

Edition Control Center

[Edition Control Center](#) > BeenThere

Manage editions of an application. The deployment targets for each edition were specified during the application install process. After install, an edition is initially in the inactive state. Inactive editions cannot be started. Activating an edition makes it eligible to be started. Validating an edition puts it into a special "validation mode" that configures the edition to run on a clone of its original deployment target. Validation mode requires assignment of a routing policy to the edition to control who may access it. Rolling out an edition performs an interruption-free upgrade of one edition to another on the same deployment target. Rolling out an edition that is in validation mode performs an interruption-free upgrade of the edition on the deployment target from which the validation mode target was cloned. After the rollout, the clone is deleted. Deactivation makes an edition ineligible to be started. Deactivating an edition will cause it to stop. The status column indicates whether an active or validation mode edition is running or stopped.

⊞ Preferences

Activate Validate Rollout Deactivate

☑ ☰ ⚙️ 📄

Select	Edition	Description	Target	State	Status
<input type="checkbox"/>	Base	Base Edition	ProductionDC1	Inactive	⊘
<input type="checkbox"/>	1.0	Generation 2 prototype	StaticTestCluster+Server1	Inactive	⊘
<input type="checkbox"/>	2.0	Generation 2	ProductionDC1	Active	➡
<input type="checkbox"/>	3.0	Project "Blue Diamond"	ProductionDC1-Validation	Validation	➡

Total 4



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**



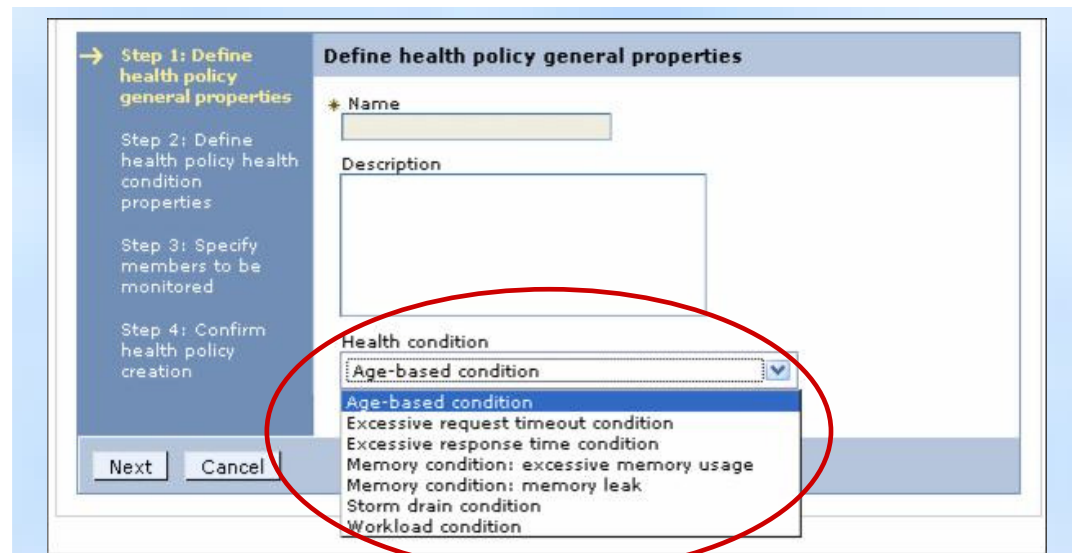
**Customizable
Health
Actions**



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
 - Capture diagnostics
 - Restart server
- Application server restarts are done in a way that prevent outages and service policy violations



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 – Preventive Action Avoids Outages

- **Proactively deal with application issues** before they become acute problems ... **automatically**
- **Health conditions and associated corrective actions**
 - Examples: Memory leaks, slow response times etc...



- **Provides insight!**

Results In:

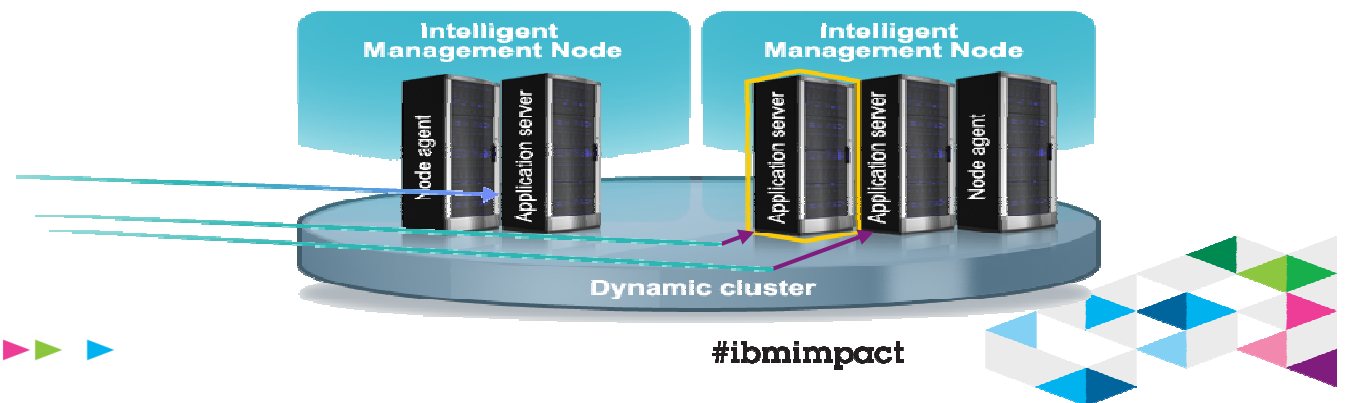
- **Better availability**
- **Less administration**
- **Satisfied end users**



Intelligent Management: 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
 - WebSphere manages to your service goals
- Programmatically respond to spikes in demand
 - Add or reduce application server instances as appropriate
- Automatically recovers from infrastructure problems
- Includes automatic start and stop of cluster members based on load for MQ-driven applications
- Decreases administrative overhead required to monitor and diagnose performance issues



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



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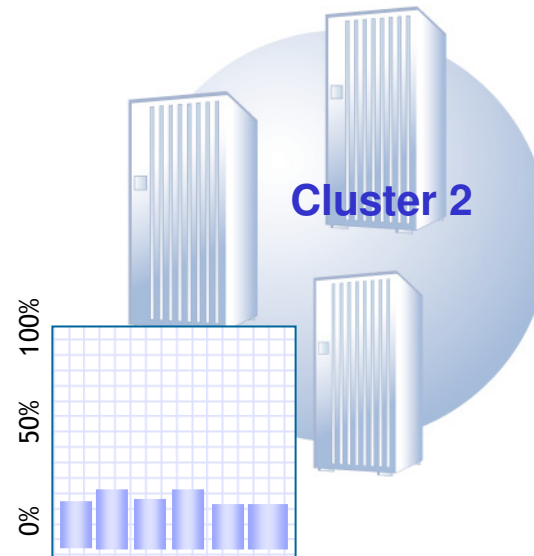
Normal Day at Insurance Company

Example: Dynamic WorkLoad Management Capability



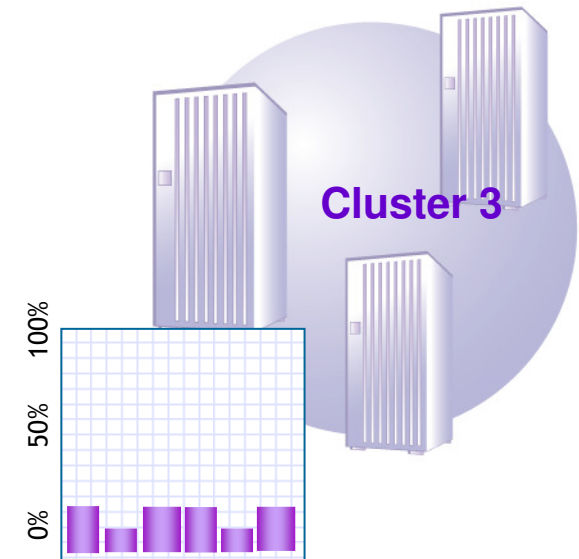
20% Utilized Servers

Claims Processing



15% Utilized Servers

Account Management

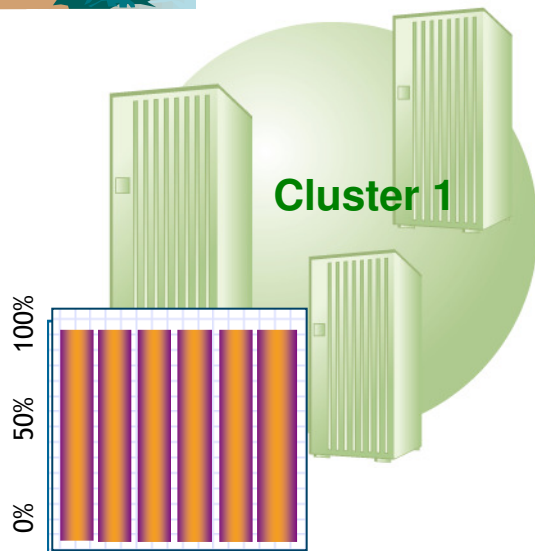


10% Utilized Servers

Billing Application



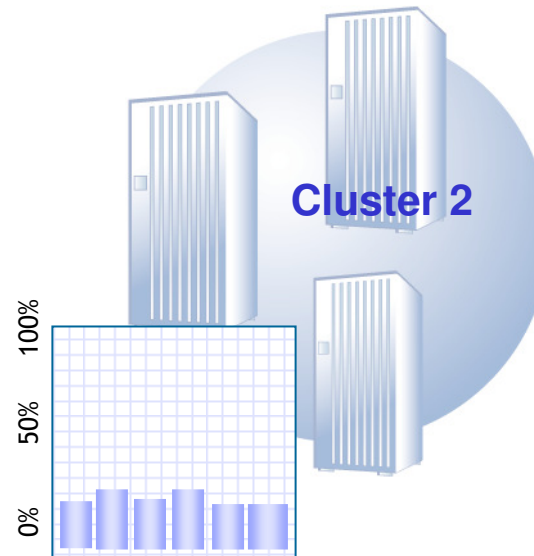
Hurricane Causes a Huge Increase in Claims



Hurricane hits the coast:
100% Utilized Servers
Denial of Service
Claims Processing

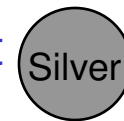


Gold

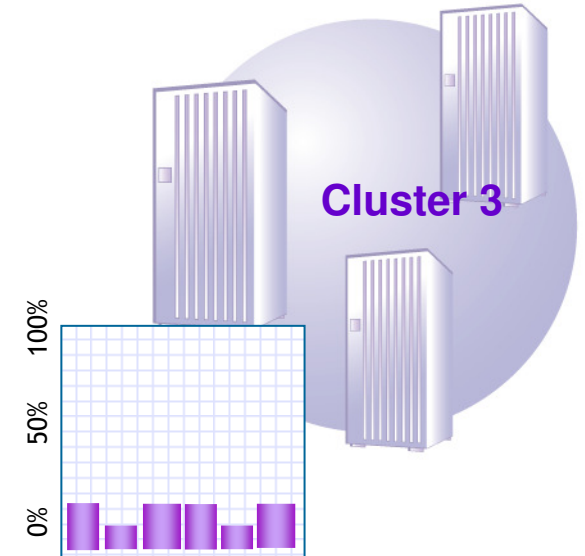


15% Utilized Servers

Account Management



Silver



10% Utilized Servers

Billing Application



Bronze

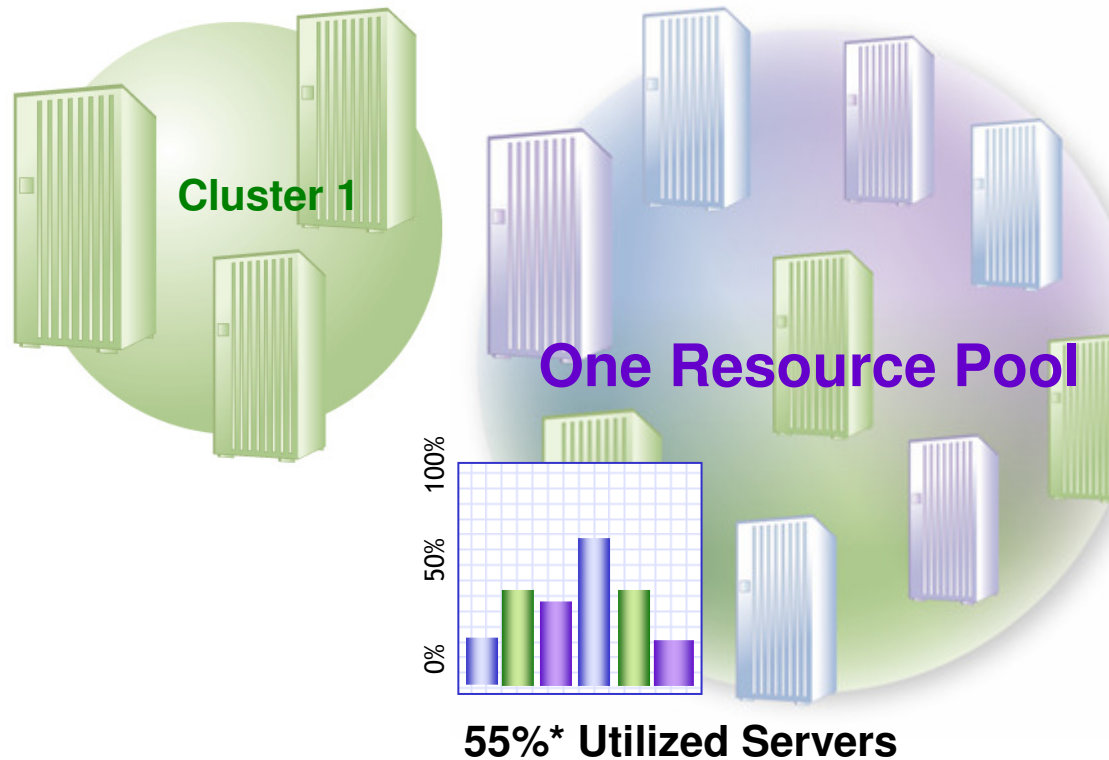
Claims Duration: *15% over target*
 Customer Complaints: *25% over target*
 CSR Efficiency: *30% below target*



Dynamic WorkLoad Management

Maximizes Utilization and Improves Responsiveness

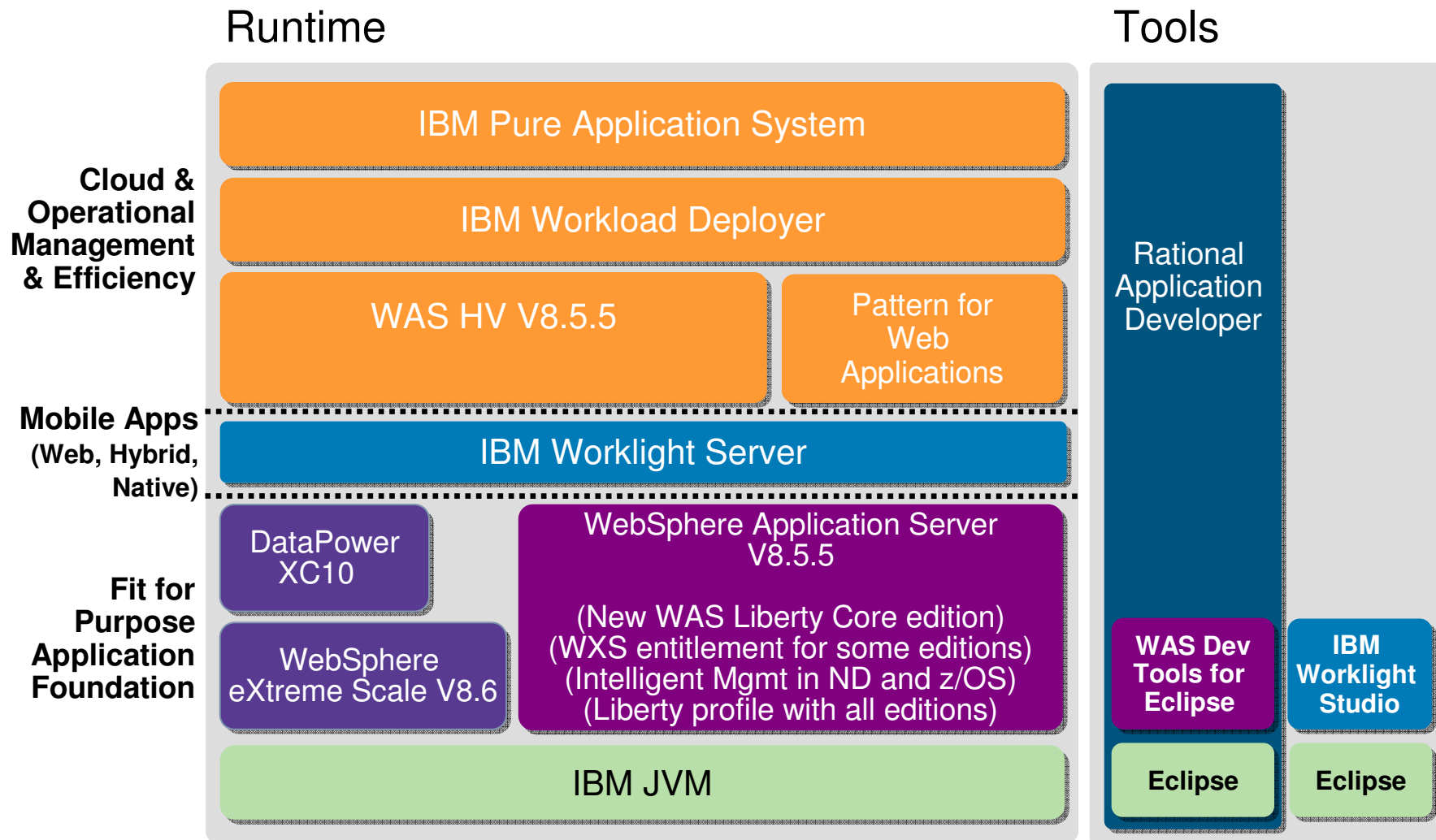
Peak Usage at Lower Cost....



- Dynamic WorkLoad Management**
- Results in:**
- Improved application performance with lower costs
 - Optimal throughput & responsiveness
 - Satisfied end users



WebSphere Application Infrastructure (June 2013)



Thanks

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