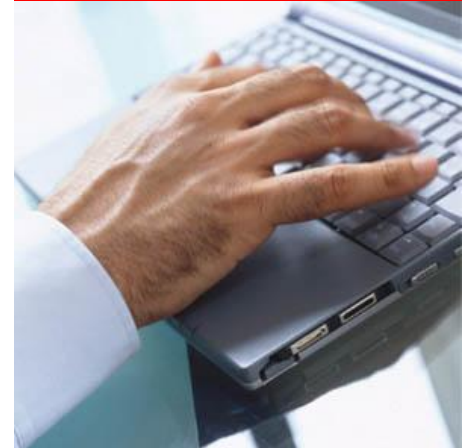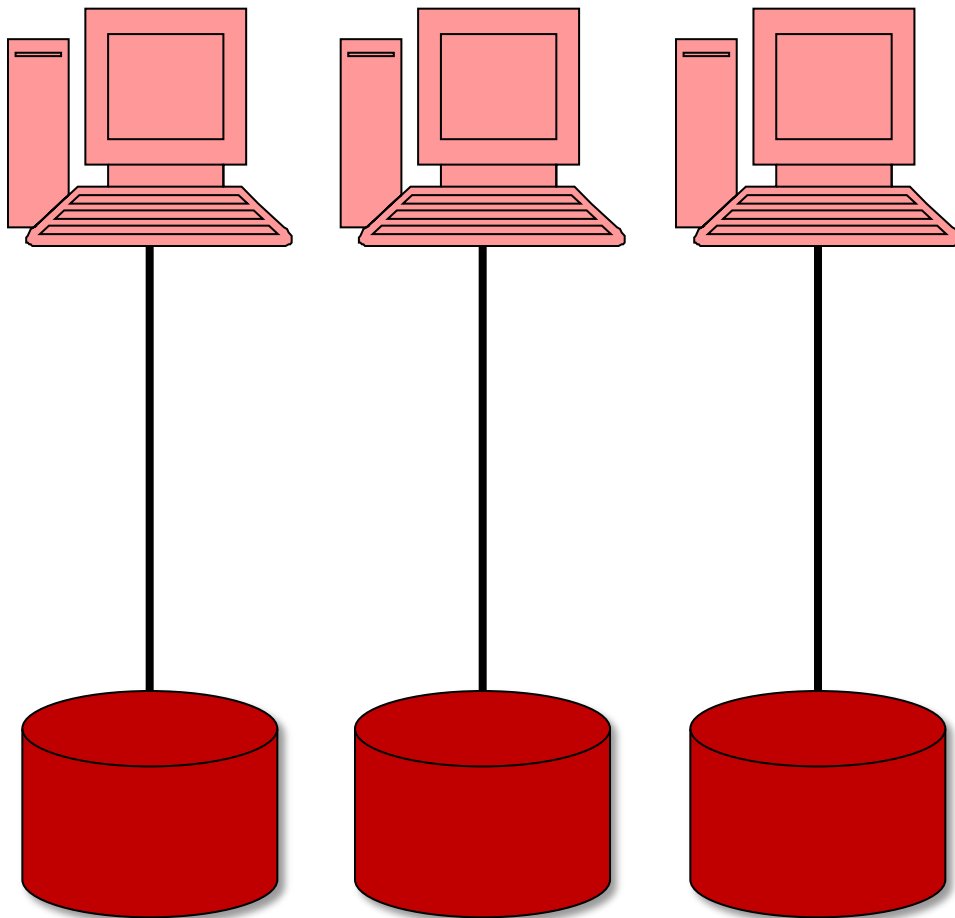# ORACLE®

Getting Started with WebLogic Server

Agenda

- Need for a Java Application Server
- Oracle WebLogic Server 11g
  - Core Capabilities Overview
  - Installing & Configuring WebLogic Server
  - Developing with WebLogic Server
  - Managing & Monitoring WebLogic Server
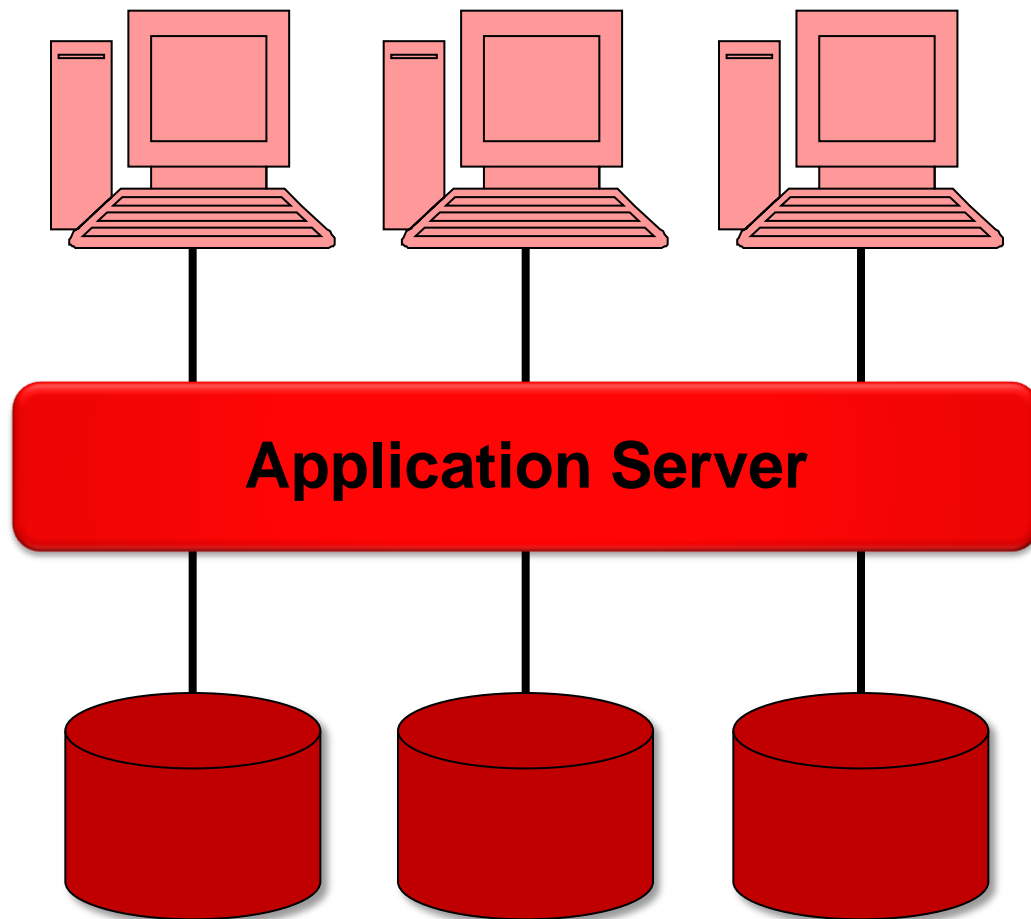
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Before Application Servers…

Client + Application Tier

- **User Interface**
- **Business Logic**
- **Data Connectivity**
- **Security Logic**
- **Transaction Management**
- **Thread Management**
- **Memory Management**
- **Session Management**

Database Tier

After Application Servers…

Application Server

Client Tier
• **User Interface**

Application Tier
• **Business Logic**   • **Data Connectivity**   • **Security Logic**   • **Transaction Management**   • **Thread Management**   • **Memory Management**   • **Session Management**

Database Tier

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Java EE (JEE) Application Server
Services Provided

Presentation Services
- Java Servlets
- Java Server Pages (JSP)
- Java Server Faces (JSF)

Business Logic Services
- Enterprise Java Beans (EJBs)
- Java Persistent Architecture (JPA)
- Java Messaging Services (JMS)
- Java Database Connectivity (JDBC)

Integration Services
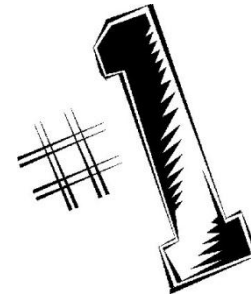- Java Connectivity Architecture (JCA)
- Java Web Services (JWS, JAX-WS)

Container Services
- Java Transaction Services (JTS)
- Java Authentication & Authorization Container (JAAC)
- Java Management Extensions (JMX)
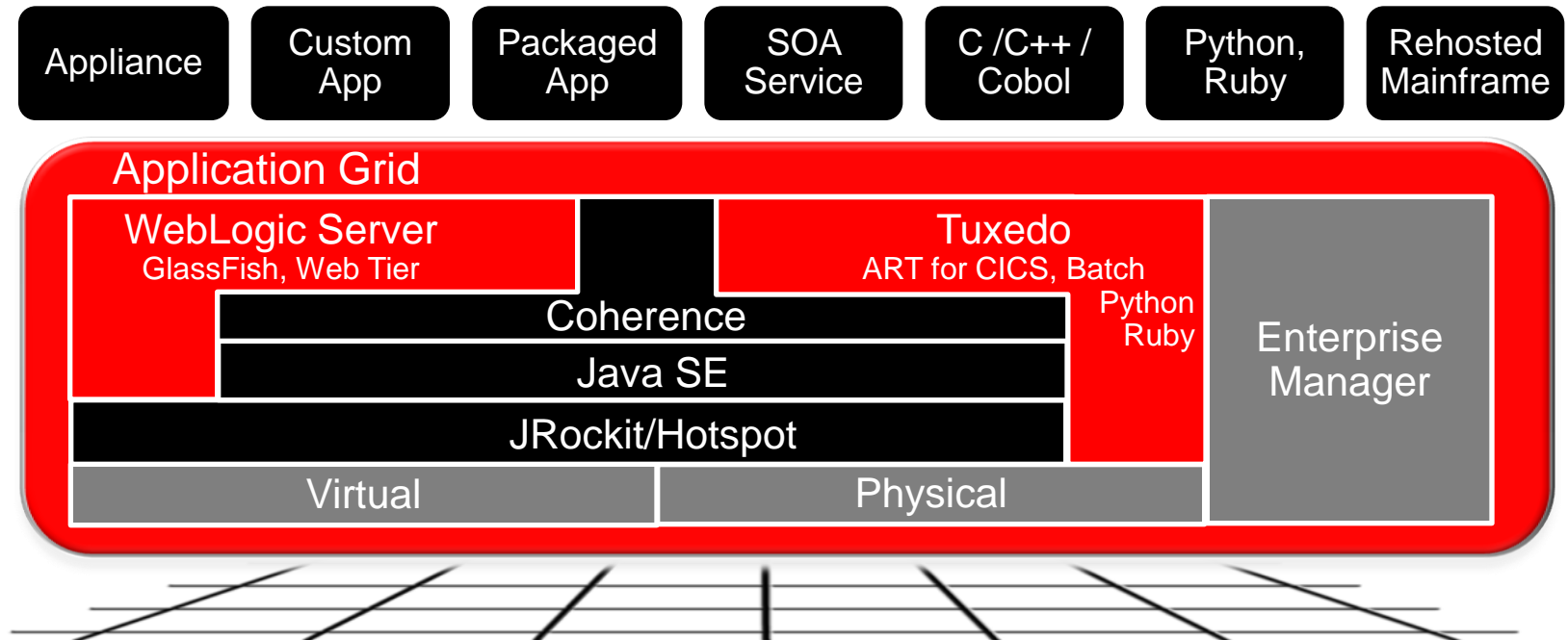
Oracle WebLogic Server 11g
Foundation for Fusion Middleware & Fusion Applications

- World Wide Market Share Leader
- Ranked "Leader" 9 years running
- #1 with Developers
- Unparalleled Manageability
- World Record Performance

Oracle WebLogic Server 11g
Part of Application Grid

Appliance	Custom App	Packaged App	SOA Service	C /C++ / Cobol	Python, Ruby	Rehosted Mainframe

Application Grid

WebLogic Server
GlassFish, Web Tier

Tuxedo
ART for CICS, Batch

Python Ruby

Coherence

Java SE

JRockit/Hotspot

Virtual | Physical

Enterprise Manager

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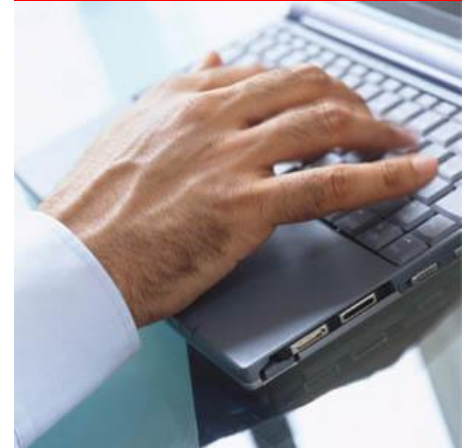# Oracle WebLogic Server 11g

Enterprise Capabilities

(Reliability, Performance, Scalability, Manageability, Security)

Developer Friendly

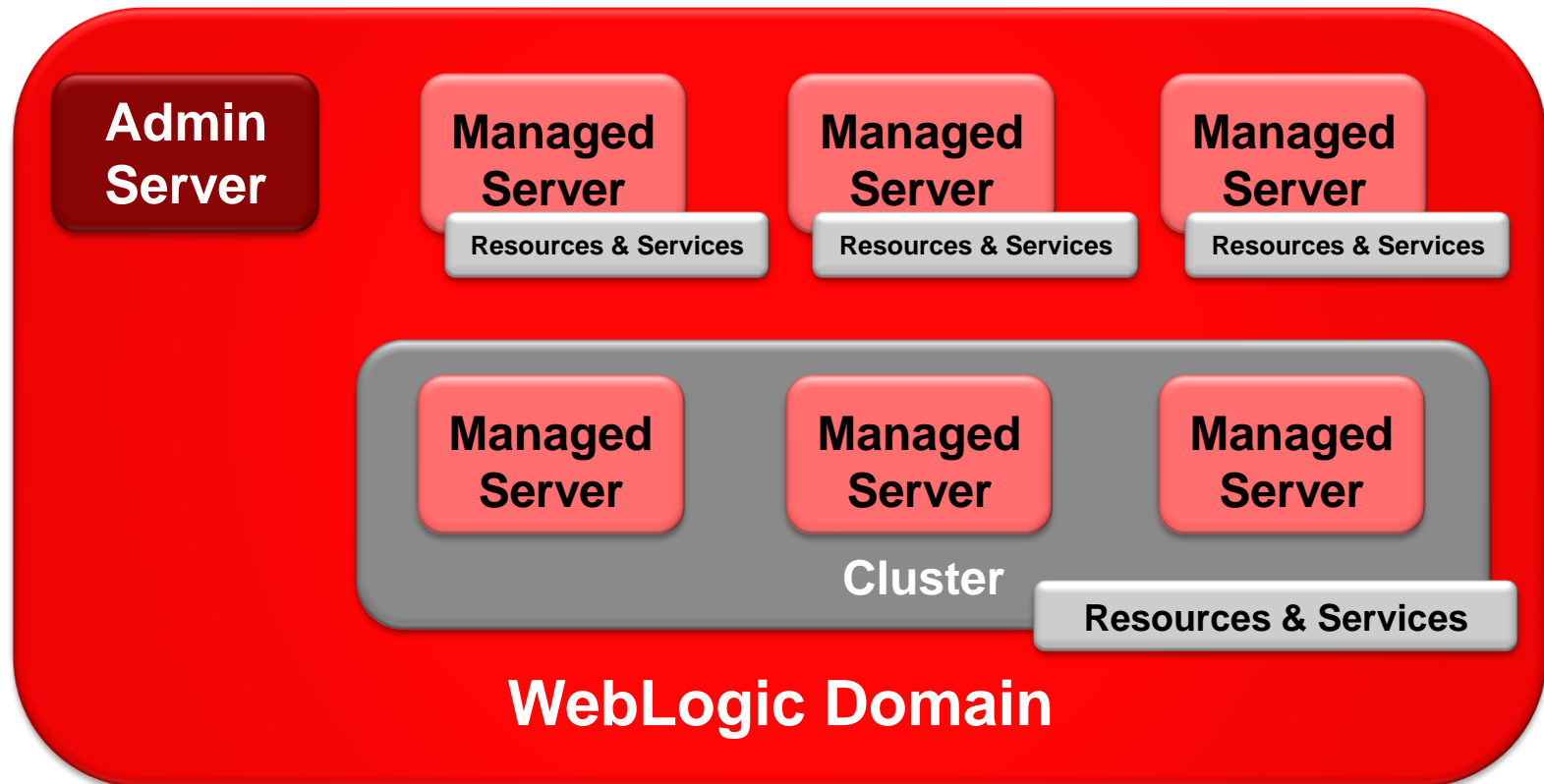**Foundation for Oracle Products**

Agenda

- Need for a Java Application Server
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  - Developing with WebLogic Server
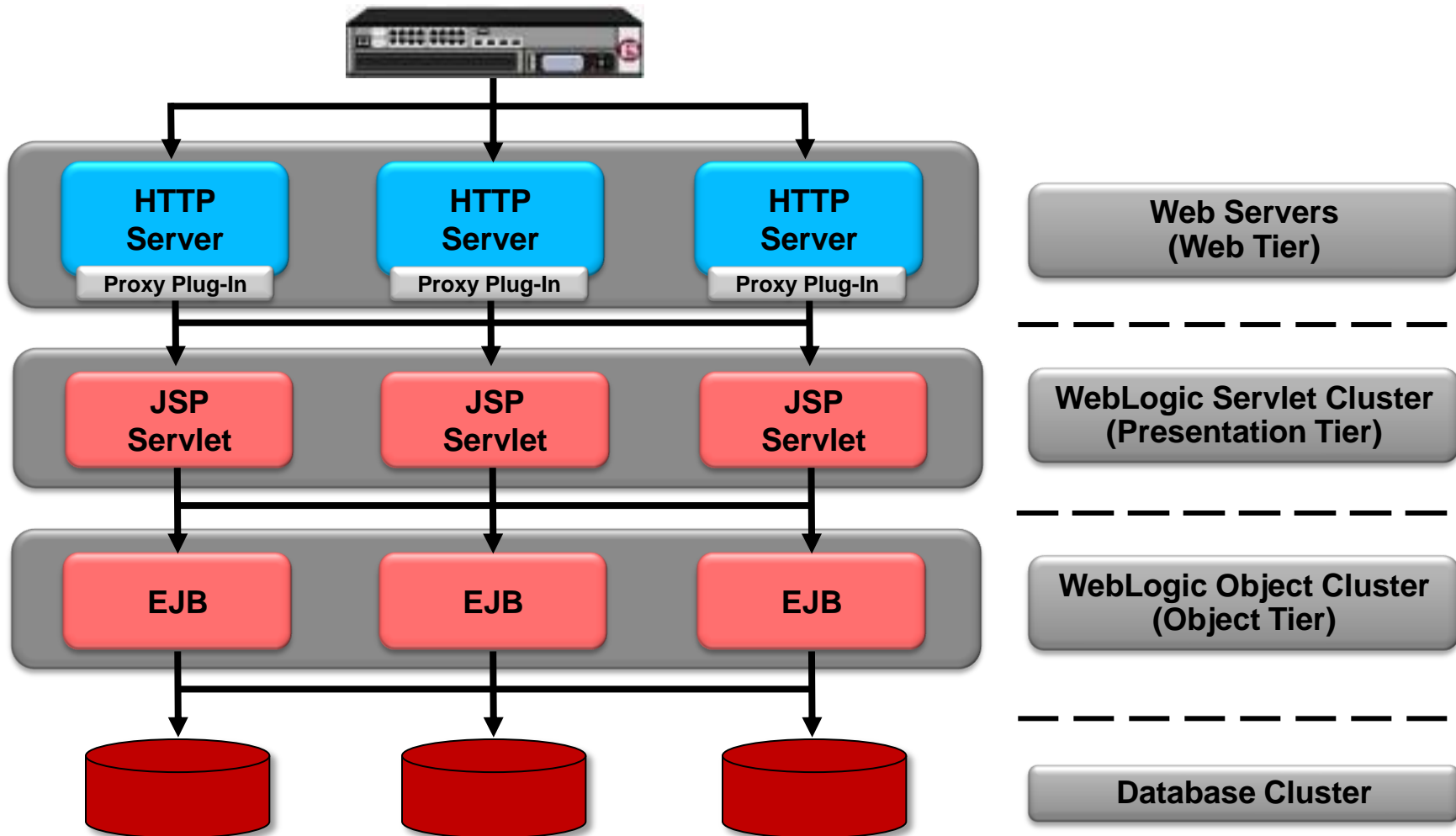 - Managing & Monitoring WebLogic Server

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Oracle WebLogic Server 11g
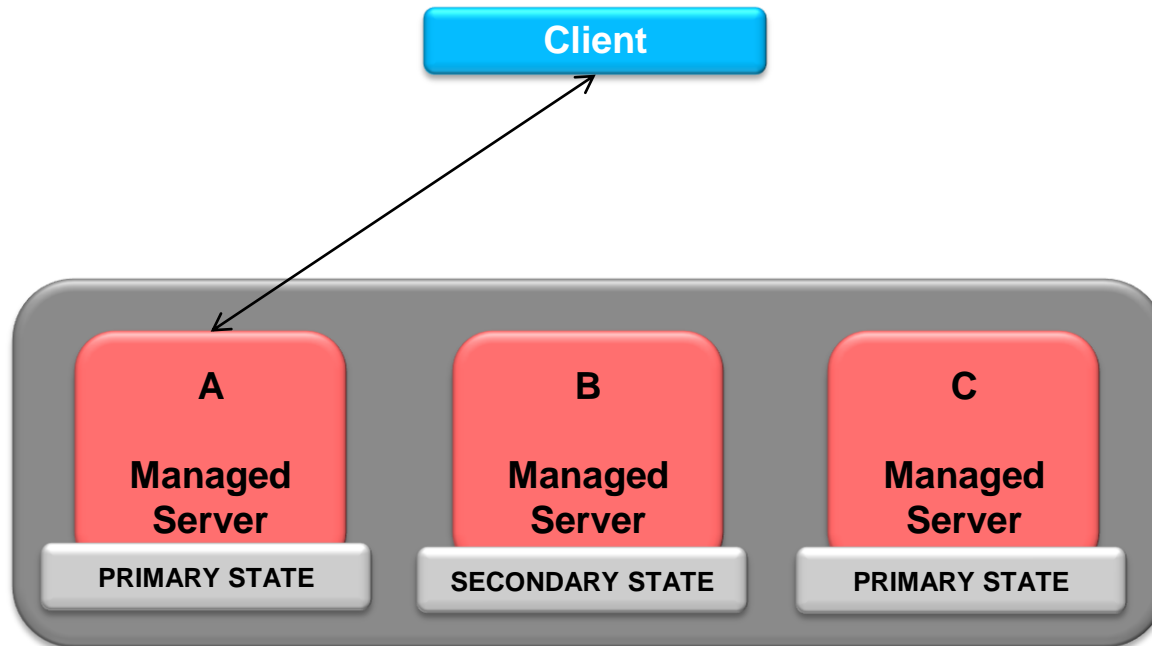Core Capabilities: Administrative Topology

Oracle WebLogic Server 11g
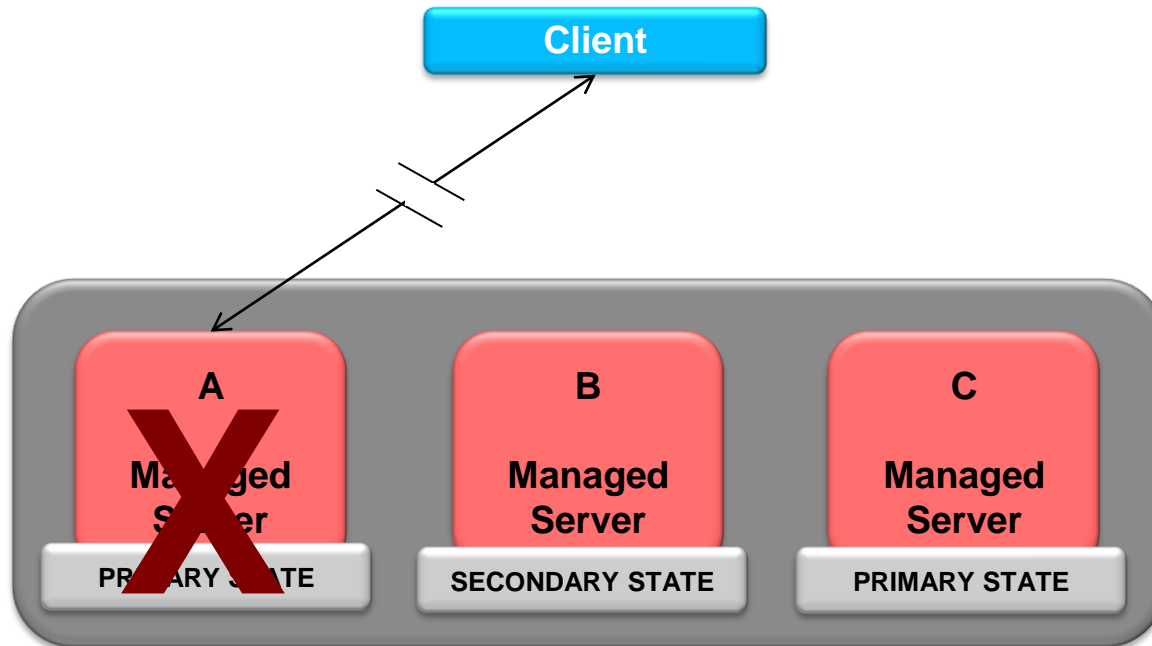Core Capabilities: Clustering & Load Balancing

HTTP Server — Proxy Plug-In	HTTP Server — Proxy Plug-In	HTTP Server — Proxy Plug-In		Web Servers (Web Tier)
JSP Servlet	JSP Servlet	JSP Servlet		WebLogic Servlet Cluster (Presentation Tier)
EJB	EJB	EJB		WebLogic Object Cluster (Object Tier)
				Database Cluster

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Oracle WebLogic Server 11g
Core Capabilities: Failover

Client

A

Managed Server

PRIMARY STATE

B

Managed Server

SECONDARY STATE

C

Managed Server

PRIMARY STATE

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Oracle WebLogic Server 11g
Core Capabilities: Failover

Client

A Managed Server — PRIMARY STATE

B Managed Server — SECONDARY STATE

C Managed Server — PRIMARY STATE

Oracle WebLogic Server 11g
Core Capabilities: Failover

Oracle WebLogic Server 11g
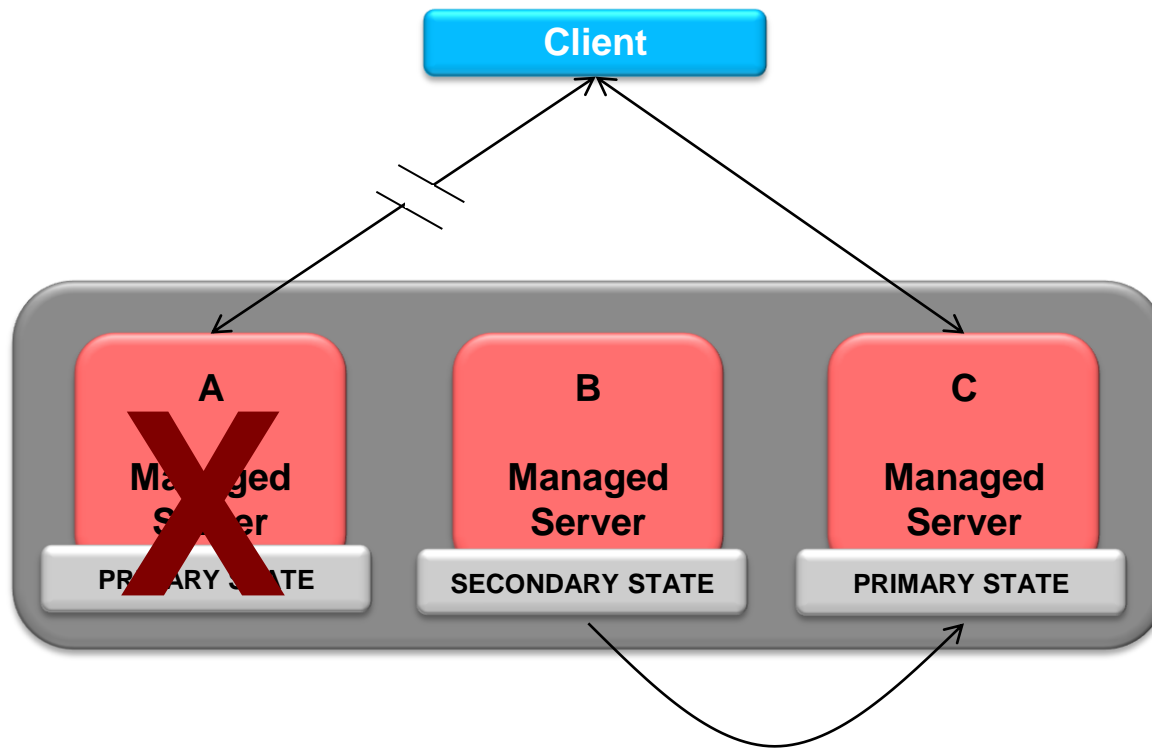
Core Capabilities: Performance

| Application Server Platform/CPU/Cores	SPECjApp Server2004 JOPS@Standard	Server Nodes	Date	Result
SPARC Enterprise T5440 SPARC T5440, 160cores	28,648	5	June 2010	World Record, Multi-Node
HP ProLiant BL460c Generation 6 Xeon X5570, 24 Cores	11,067	3	Nov 2007	World Record, Multi-Node, RAC
Dell PowerEdge 2950 Xeon 5470, 16 cores	7,311	2	May 2009	World Record, Dual Node
Dell PowerEdge R910 Xeon X7560, 32 Cores	11,057	1	April 2010	World Record, Single Node
Sun SPARC Enterprise T5220 Sun UltraSPARC T2, 8 cores	2,000	1	Oct 2007	Best on One CPU

SPECjAppServer Improvements
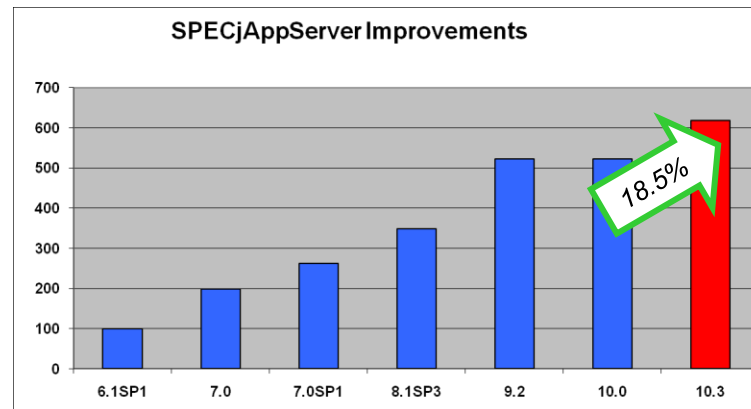
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Oracle WebLogic Server 11g
Core Capabilities: Standards Support

Java EE APIs	Support
JSP 2.1	✓
JSF 1.2	✓
Servlet 2.5	✓
EJB 3.0	✓
JAX-WS 2.0	✓
JMS 1.1	✓
JNDI 1.2	✓
JCA 1.5	✓
JTA 1.1	✓
JACC and JAAS 1.0	✓
JMX 1.2	✓
JEE App Deployment 1.2	✓
JEE Management 1.1	✓
JDBC 3.0	✓
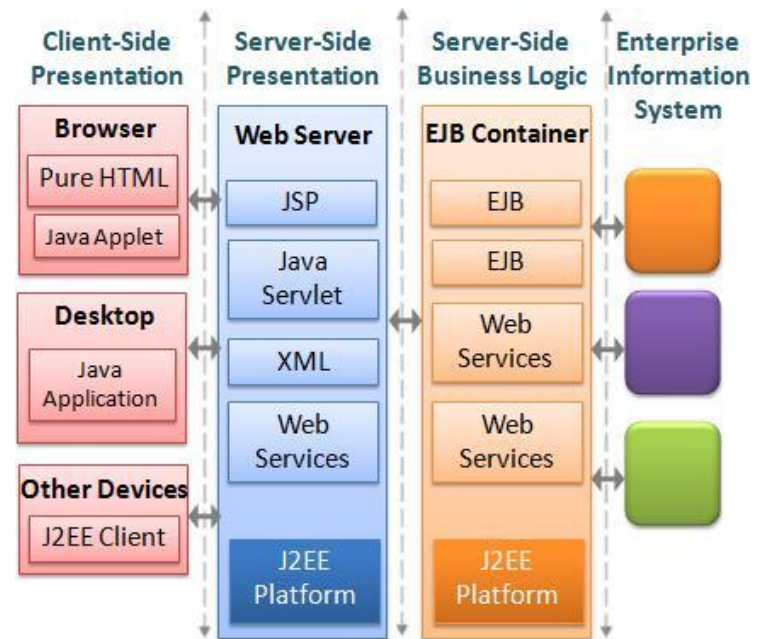
Develop Standards-Based Applications

Oracle WebLogic Server 11g
Core Capabilities: GridLink for RAC

WebLogic Domain

WebLogic Cluster

Managed Server | **Managed Server**

Multi Data Source

Data Source RAC Node 1 | **Data Source RAC Node 2**

Connection Pool | **Connection Pool**

RAC Node 1 | RAC Node 2

Oracle Database
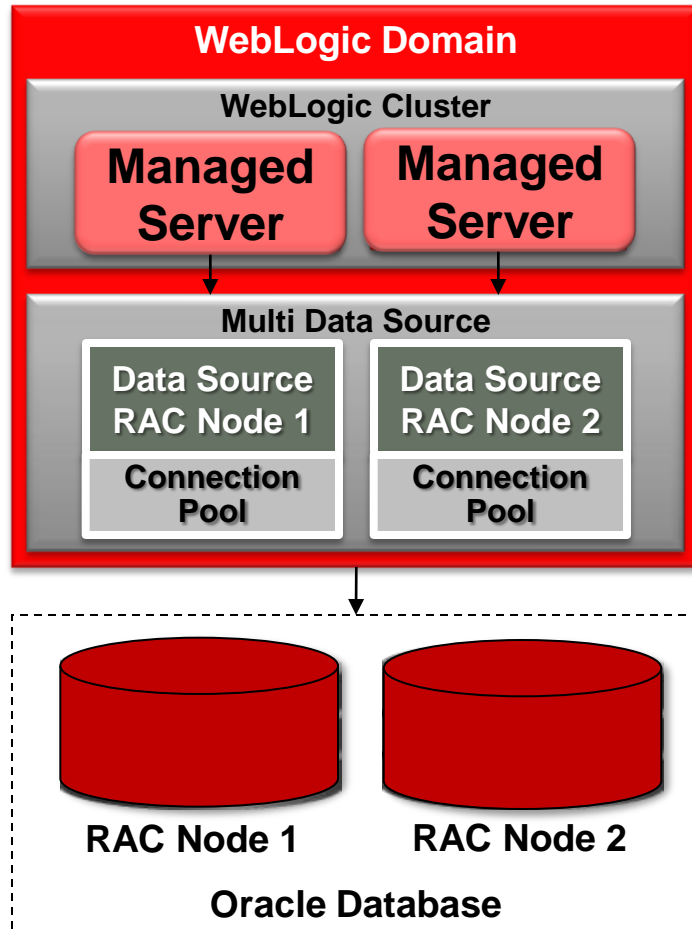
- Leverage Oracle RAC for any JEE application with zero code changes

- Only application server with declarative RAC integration

- Ability to provide unique connection partitioning

- Only RAC world record SPECjAppServer2004

Oracle WebLogic Server 11g
Core Capabilities: ActiveCache (Coherence Integration)

Without Active Cache
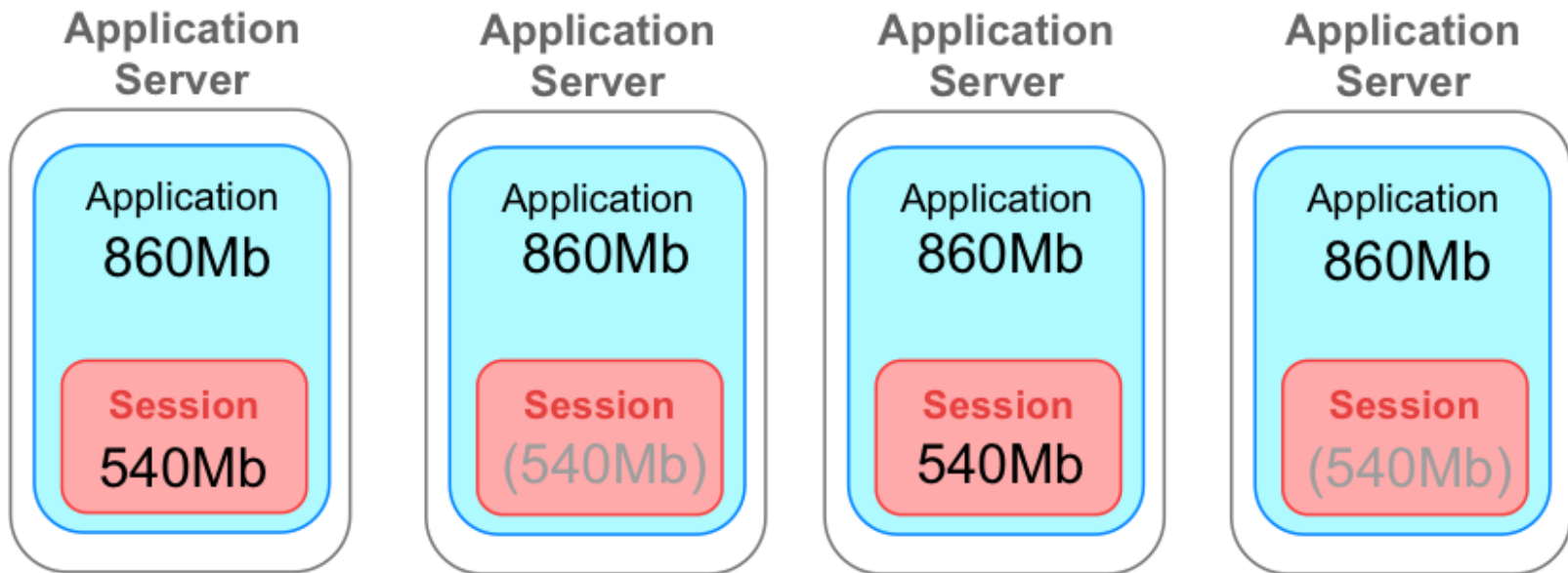
Oracle WebLogic Server 11g
Core Capabilities: ActiveCache (Coherence Integration)

With Active Cache

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Oracle WebLogic Server 11g
Installing WebLogic Server

http://www.oracle.com/technetwork/middleware/weblogic/downloads/index.html

Oracle WebLogic Server 11g
Installing WebLogic Server

- Four Installation Modes Available:
  - Graphical Mode
  - Console Mode
  - Silent Mode
  - Unzip Archive
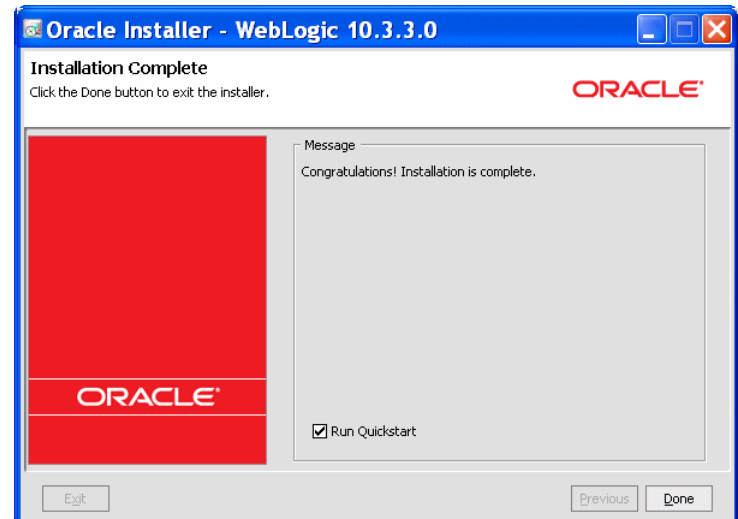
Oracle WebLogic Server 11g
Configuring WebLogic Server

- Two Tools
  - Configuration Wizard
    - Graphical Mode
    - Console Mode
  - WebLogic Scripting Tool
    - Jython-based
    - Console Mode
    - Script Mode
    - Embedded Mode
    - Ability to perform online & offline Tasks
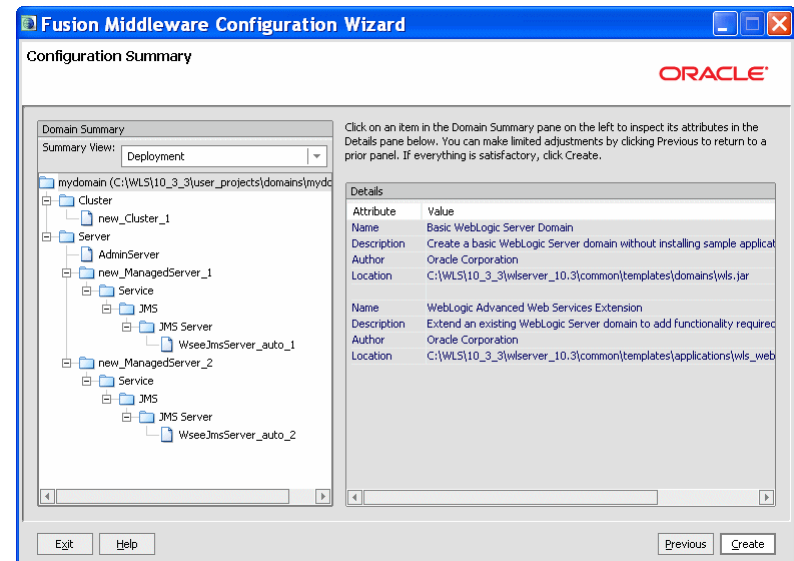
http://download.oracle.com/docs/cd/E14571_01/web.1111/e13752/toc.htm#i1038108

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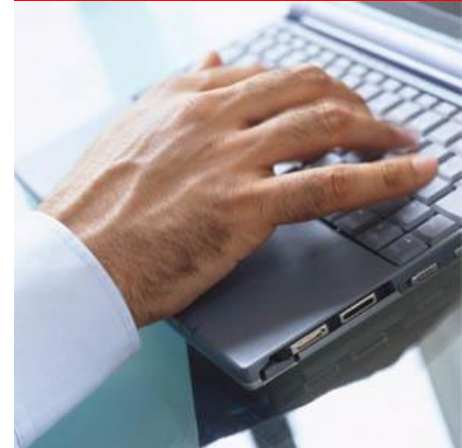
WebLogic Server for Developers
Developer Friendly Operations Platform

- **Best server tools integration**
  - Ant and upcoming Maven support
- **Delivered on most popular developer platform**
  - New Mac OS X developer support ; ongoing OEPE Eclipse releases
- **Simple developer installation**
  - New zip distribution
- **Early standards adoption**
  - New Java EE 6 Core API – JPA 2.0, JSF 2.0, JAX-RS
  - New Java SCA support – integrated with SOA SCA
- **Latest open source support**
  - Updating to Spring 3.0
- **Fusion Middleware Development**
  - ADF
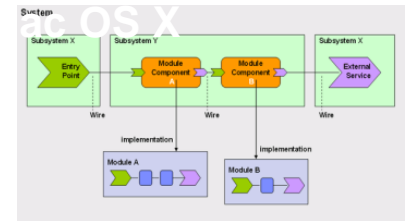
SCA

maven

Spring Framework

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Oracle WebLogic Server 11g

Development Tools:
Productivity with Choice

Feature Area	JDeveloper	OEPE	NetBeans
Java SE, EE	✔	✔	✔
Web Services and XML	✔	✔	✔
Mobile	✔		✔
Database	✔	✔	
SOA Suite	✔		
WebCenter	✔		
Modeling / UML	✔		
Scripting Languages	✔		✔
JavaFX			✔

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Oracle WebLogic Server 11g
Development Tools: Development Frameworks

- Oracle Application Development (ADF) Framework

View	→	ADF Faces
Controller		ADF Controller
Model		ADF Model
Business Services		ADF Business Components
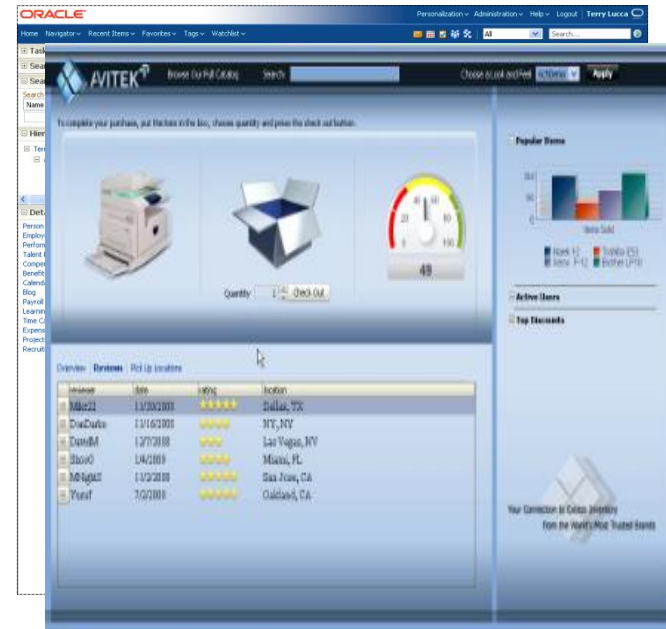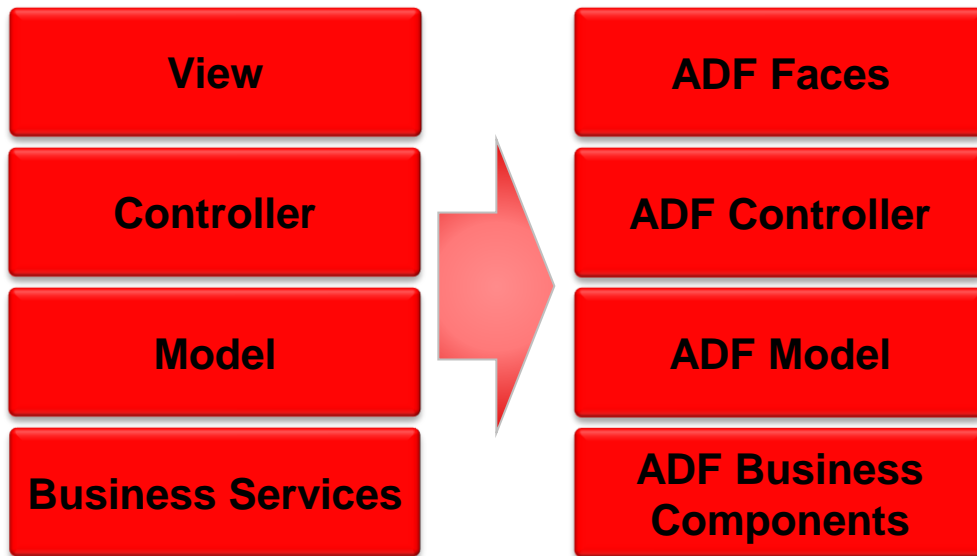
- Java Server Faces (JSF)
- Spring Framework
- Apache Struts

Oracle WebLogic Server 11g
Development Tools: Database Connectivity

- JDBC Classes

- EJB 3.0 (JPA) Object-Relational Mapping
  - EclipseLink
    - JPA 2.0 Reference Implementation
    - Open Source contribution by Oracle
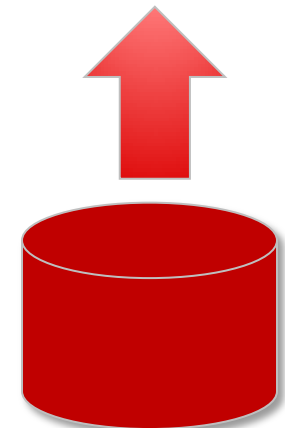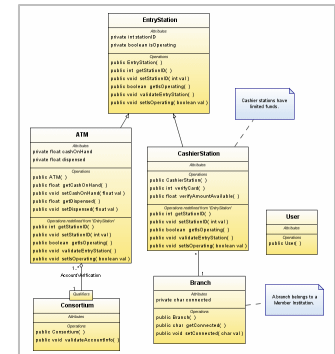 - TopLink
    - Oracle's JPA Implementation
    - Based on EclipseLink contributions
    - Out-of-the-Box Support with WebLogic

Oracle WebLogic Server 11g
Development Tools: Asynchronous Applications

- Out-of-the-box **integrated** Java Messaging Server
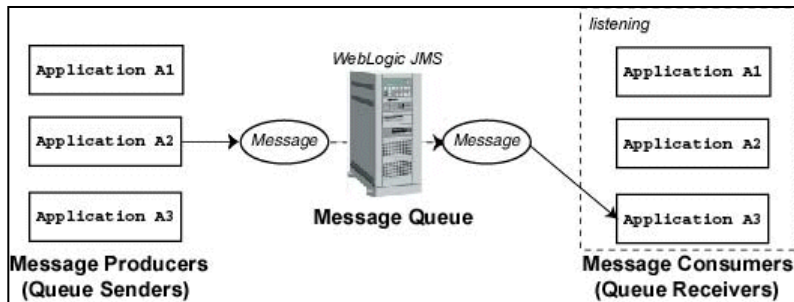
Point-to-Point Messaging (Queues)
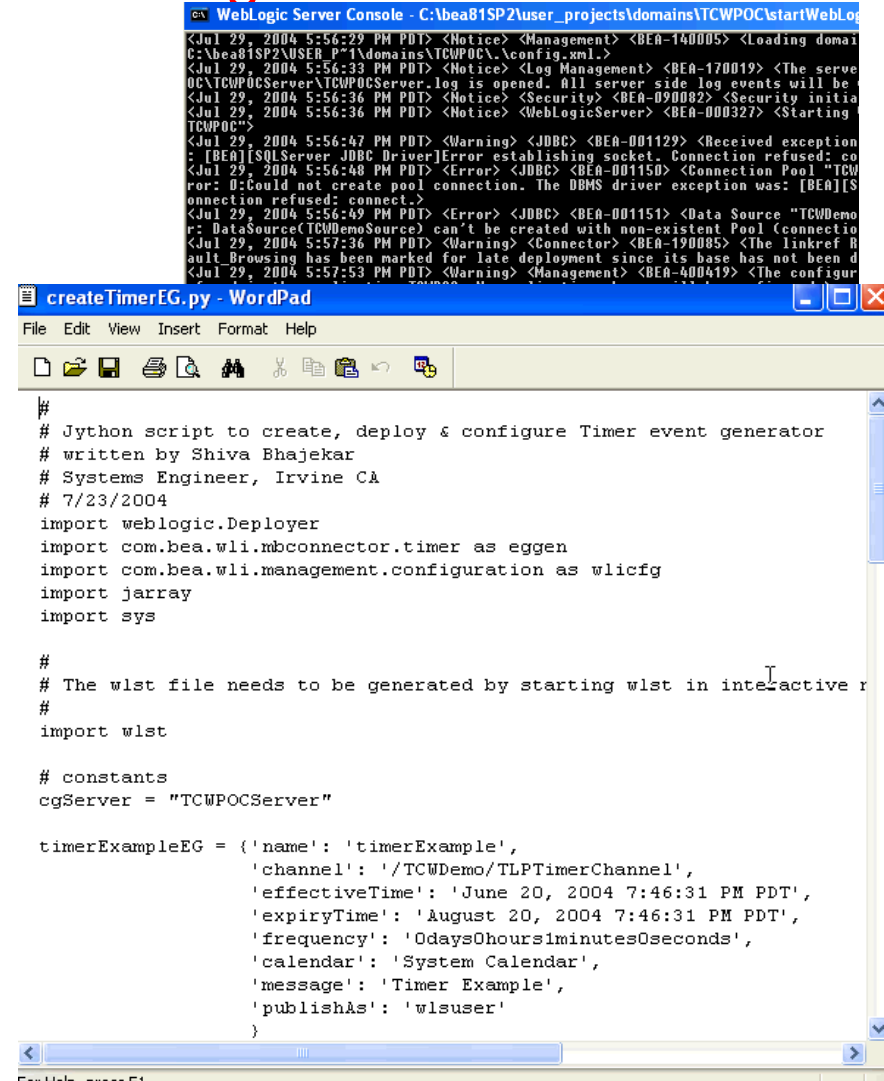
Publish/Subscribe Messaging (Topics)

- Message Persistency:
  - Database Store OR File Store
- HA / Failover via Clustering
- High Performance
- WebLogic JMS "C" API
- 3rd Party JMS Providers
- Message Operations Control (pause/resume/insert/remove)

WebLogic Benefits for Developers

Developers can script container configurations

- WebLogic Scripting Tool (WLST)

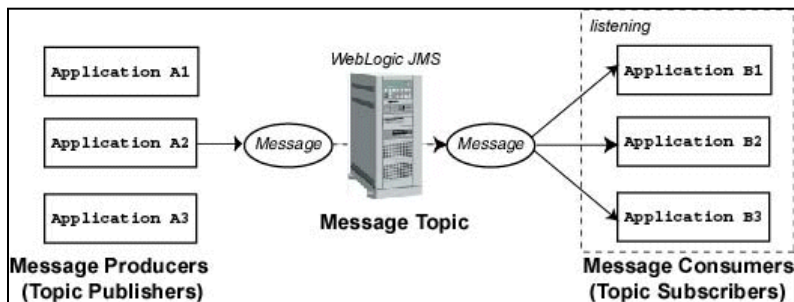- Command-line scripting interface for managing and monitoring WebLogic Server instances, clusters, and domains

- Provides a way for developers to create services in WebLogic (Data Sources, Message Queues, Servers, etc) automatically so QA and SCM can replicate with using WebLogic admin console.

- Provides a repeatable process for propagating configuration changes across environments

- Quickly allows environments to be replicated and migrated

WebLogic Benefits for Developers

Built-in Profiler - JRockit Mission Control

- An extension to JRockit which provides **profiling, monitoring, managing and diagnostics** of your Java applications (even production!)

- Exposed through JRockit Mission Control GUI

  – JRockit Management Console

  – JRockit Flight Recorder

  – Memory Leak Detector

- Integrated in the JVM

  – Near zero overhead

  – Available on-demand, no instrumentation needed
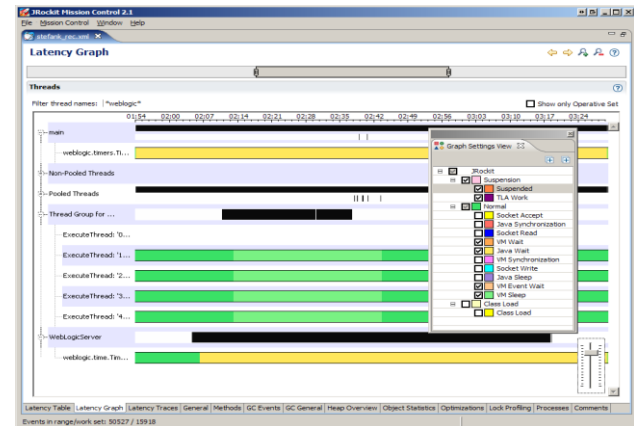
WebLogic Benefits for Developers
FastSwap

- Traditional JEE development cycle:

    Edit > Build > Deploy > Test

- Developers must complete cycle for every code change
- Some IDEs remove the Build step through conditional compilation:

    Edit > Deploy > Test

- FastSwap's goal is to eliminate the Deploy step too:

    Edit > Test

- Ex: a web developer changes his code, refreshes his browser, and immediately sees the results

- WebLogic implementation
    – Uses JSE 6.0 Dynamic Class Redefinition and applies it in a server context

- End Result

    Fast Turnaround Times

Develop

Deploy

Accelerate Development Cycle

Debug

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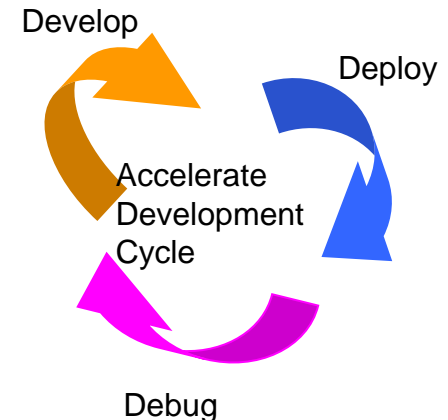
WebLogic Benefits for Developers

Application Release Lifecycle

- JDBC/JMS Modules
  - Separate JDBC/JMS configuration from domain configuration
  - Package into application (versus server-wide scope for all applications)

- Deployment Plans
  - Mechanism for capturing environmental specific details of an application
    - Captures vendor specific artifacts
    - Allows for configuration updates without modifying the archive
  - XML document - one for each environment where application will be deployed

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WebLogic Benefits for Developers

Application Modularity

- Shared Libraries
  - Deploy Java classes/WARs/EJB-JARs/EARs as Libraries
  - Other applications can reference them
  - Versioning supported
  - NO classloader issues

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WebLogic Benefits for Developers

Application Modularity

my-web-1.war	my-web-3.war	my-web-2.war
my-ejb-1.jar		my-ejb-2.jar

Deployment view

Runtime view

App-1.ear

my-web-1.war
my-ejb-1.jar
my-web-3.war

App-2.ear

my-web-2.war
my-ejb-2.jar
my-web-3.war

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WebLogic Benefits for Developers

Filtering Class Loader

```
           ┌─────────────────────────┐
           │  System ClassLoader     │
           └─────────────────────────┘
                        ▲
           ┌─────────────────────────┐         filter:
           │  FilteringClassLoader   │     org.apache.log4j.*
           └─────────────────────────┘
                        ▲
           ┌─────────────────────────┐
           │  Application ClassLoader │
           └─────────────────────────┘
                    ▲       ▲
          ┌──────────────┐   ┌──────────────┐
          │ Web          │   │ Web          │
          │ ClassLoader 1│   │ ClassLoader 2│
          └──────────────┘   └──────────────┘
                 ▲
       ┌────────────────────┐
       │ TagFileClassLoader │
       └────────────────────┘
           ▲          ▲
    ┌──────────┐  ┌──────────┐
    │ JSP CL   │  │  JSP CL  │
    └──────────┘  └──────────┘
```
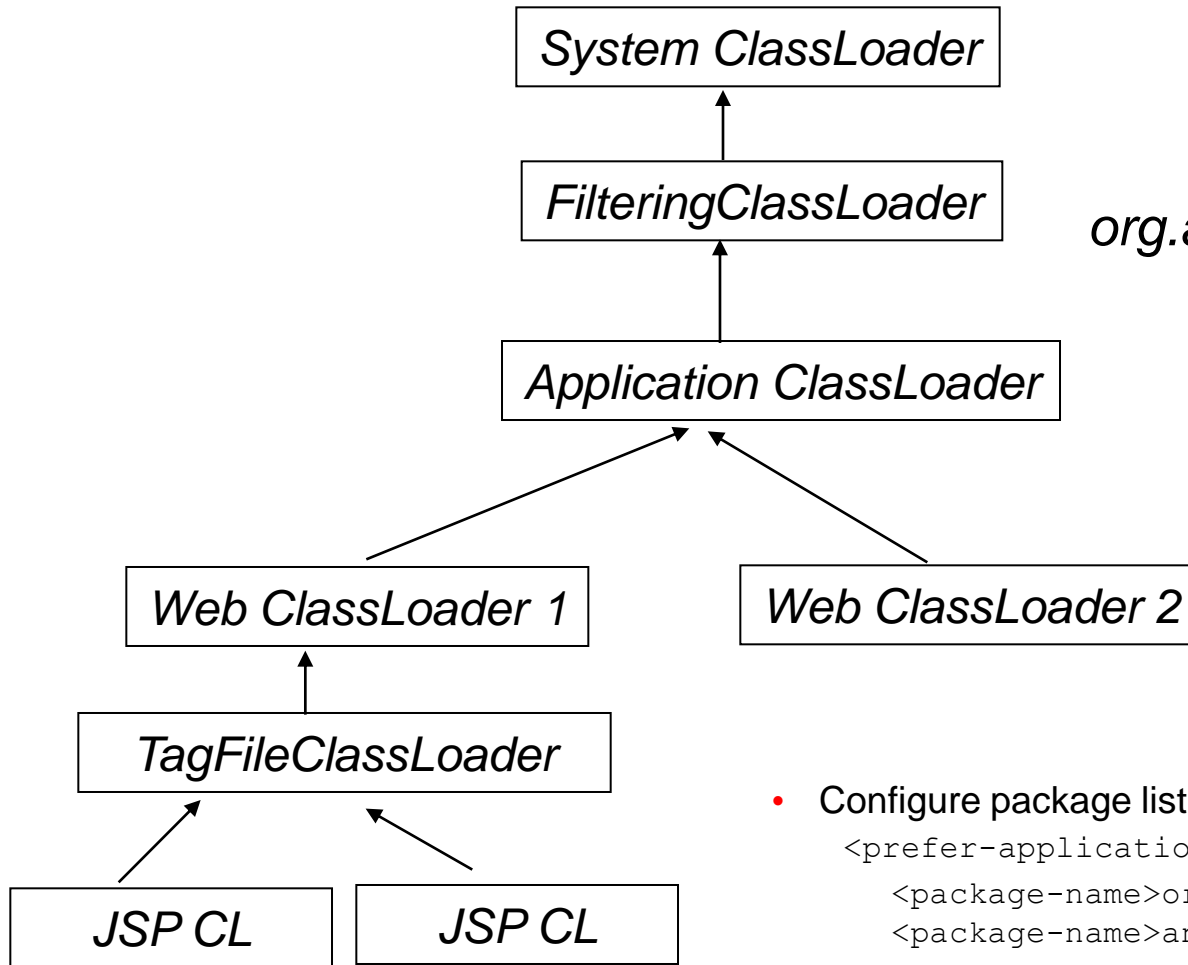
- Configure package list in weblogic-application.xml
  ```
  <prefer-application-packages>
     <package-name>org.apache.log4j.*</package-name>
     <package-name>antlr.*</package-name>
  </prefer-application-packages>
  ```

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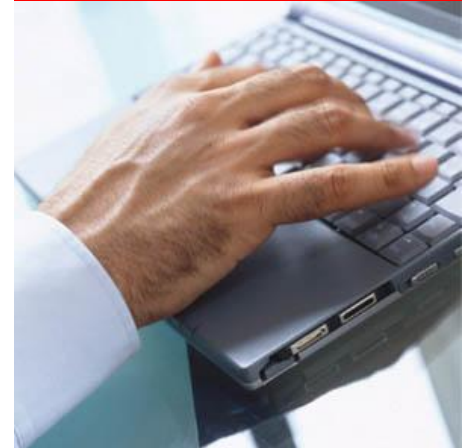
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Oracle WebLogic Server 11g

Managing & Monitoring WebLogic Server – WLS Console

- **Start/Stop Managed Servers**

- **Manage clusters**

- **Manage services**
  - JDBC, JMS, etc.

- **Configure Work Managers**

- **Configure and deploy your applications**

- **Monitor server and application performance**

- **View server and domain log files**

- **Edit runtime deployment descriptors**

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Oracle WebLogic Server 11g

Managing & Monitoring WebLogic Server – WLST

- Jython-based

- Console Mode

- Script Mode

- Embedded Mode

- Perform online & offline Tasks

- Can be called from ANT

- Recordable from WebLogic Console

http://download.oracle.com/docs/cd/E14571_01/web.1111/e13715/intro.htm#i1034798

Oracle WebLogic Server 11g

Managing & Monitoring WebLogic Server – via Enterprise Manager

- Monitor and manage multiple:
  - WebLogic domains
  - WebLogic Server versions
- Provides JVM diagnostics
- Monitor FMW stack, Database, and Applications from same console

EM Grid Control

WebLogic Server 11g	WebLogic Server 11g	WebLogic Server 9.2	WebLogic Server 8.1
Admin. Server	Admin. Server	Admin. Server	Admin. Server
Managed Server 1-n	Managed Server 1-n	Managed Server 1-n	Managed Server 1-n
Domain a	**Domain b**	**Domain c**	**Domain d**

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Oracle WebLogic Server 11g
Management Pack Enterprise Edition for WebLogic

- Java Application Performance
  - Automatic service end-point detection
  - POJO framework (struts) support
  - Architectural Topology
  - In-context performance
  - SQL View
- Configuration Management
  - Discovery & asset tracking
  - Track configuration changes
  - Configuration provisioning
  - Ensure compliance with standards
- Provisioning and Patch Automation
  - Provisioning framework with deployment procedures
  - Customizable Deployment Procedures → install, patch, clone, add capacity

Composite Application Performance

Configuration Management

Provisioning & Patch Automation
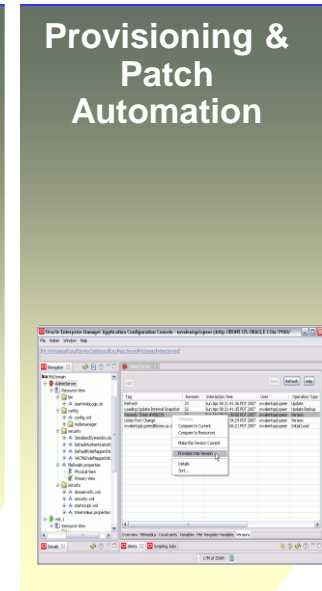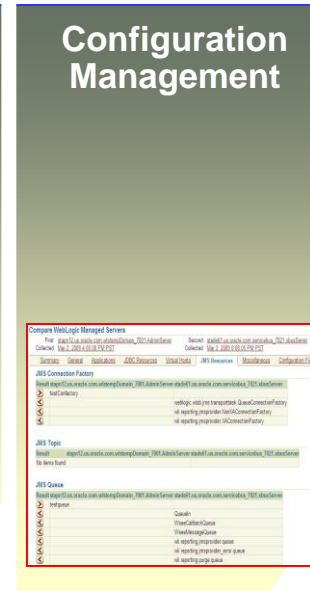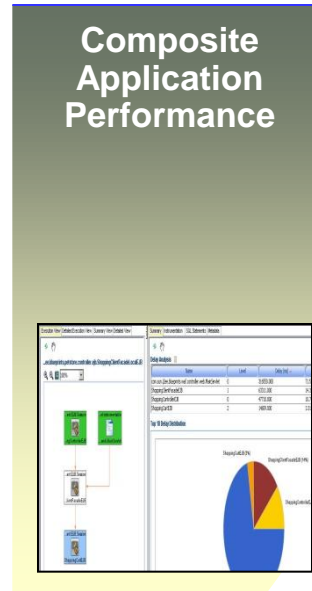
Management Pack EE for WebLogic

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Fusion Middleware Control

- **Enterprise Manager Grid Control**
  - Cross platform management and monitoring– database, middleware, applications
  - Multiple WebLogic domains

- **Enterprise Manager Fusion Middleware Control**

  New
  - Direct administration of Fusion Middleware components
  - Single WebLogic domain

- **WebLogic Server Administration Console**
  - Core WebLogic Server administration
  - Single WebLogic Domain

Grid Control

Performance Management	Provisioning/ Patching	Configuration
SOA Plus	Coherence	Diagnostics

Fusion Middleware Control

SOA	WebCenter	Identity
OHS/WebCache	WebLogic	Forms/Reports

WebLogic Administration Console

Domain	Clusters/ Servers	Application Configuration
J2EE Configuration	JMS Configuration	Security Configuration

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Oracle WebLogic Server 11g

Licensable Packages

WebLogic Server Standard Edition

= Web Tier
+
WebLogic Server
+
Oracle TopLink and Application Development Framework
+
JDeveloper
+
Enterprise Pack for Eclipse

WebLogic Server Enterprise Edition

= WebLogic Server Standard Edition
+
Clustering
+
Virtual Assembly Builder

WebLogic Suite

= WebLogic Server Enterprise Edition
+
Coherence EE
+
iAS EE: Forms/Reports Discoverer/Portal

WebLogic Suite Virtualization Option

= JRockit Virtual Edition

WebLogic Server Management Pack EE

= Configuration Management Pack
+
 Provisioning and Patch Automation Pack
+
Composite Application Performance Management
+
Enterprise Manager JVM Diagnostics

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Questions

ORACLE