



A Beginners Guide to Fusion Middleware

Hans Forbrich
Forbrich Computer Consulting Ltd.

Congratulations of Brazil for your OTN Tour!

Thank you to our interpreter

And

Thank You for inviting me ...



A Beginners Guide to Fusion Middleware

Hans Forbrich
Forbrich Computer Consulting Ltd.

Who am I

- Hans Forbrich
 - Owner and principal consultant, Forbrich Computing
 - Programming since 1969
 - Oracle developer and DBA since 1984 (v4)
 - Oracle consultant and trainer since 2003
 - Oracle University partner
 - Oracle University Instructor of the Year for 2010
 - Oracle ACE Director

Agenda

- What is Fusion Middleware?
- Java and JEE – the core
- WebLogic Server
- Experiences in Installing
- Where to look for help
- Conclusion

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What is Middleware?

Software between the User and the Data

- Runs the business logic and display logic
- Saves maintenance cost
- Saves maintenance time

BUT

Data may live 30+ years

Application may live 5+ years

Introducing: Fusion Middleware

- Fusion Middleware = FMW = Fusion
- FMW is a stack of
 - Middleware components that
 - Provide a framework to deliver
 - Secure applications and application parts

Middleware Components?

- In an 'N-tier' architecture, middleware
 - Sits between client and data
 - Provides secure services, load management
 - Reduces or eliminates need to deploy software to the client
- Typically includes
 - HTTP server to receive and route requests
 - Application Server to respond to requests
 - Application Services and Libraries

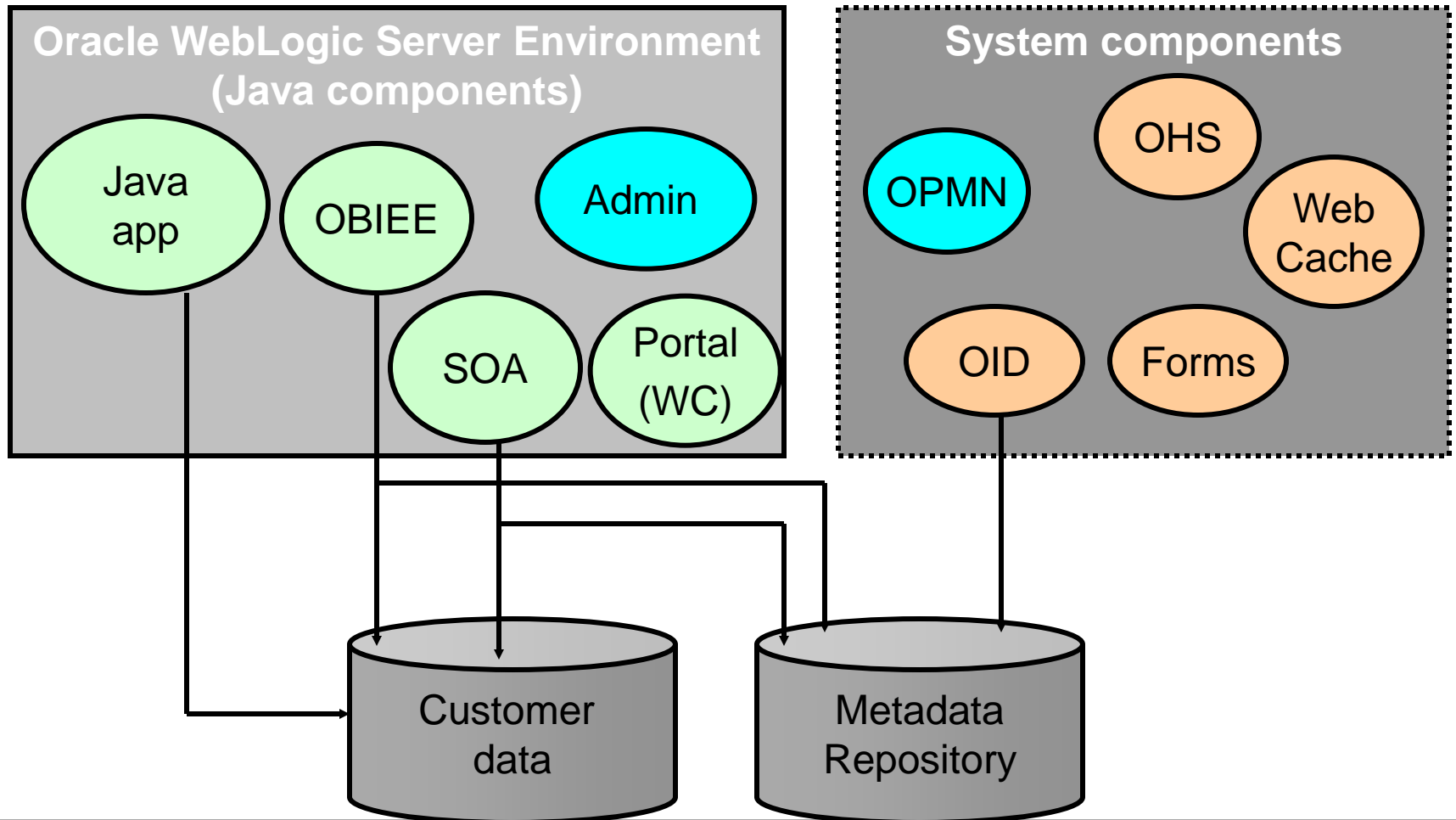
Framework?

- A number of applications may be deployed in FMW specifically to provide services that may be used by end-user applications
 - HTTP Server to receive and route requests
 - JVM to provide a common execution environment
 - JEE container provides Enterprise Services that may be called by JEE-style applications
 - OID/OVM provides fast lookup service useful in security and configuration

FMW Stack

- Core is WebLogic Server
- May be System Components
 - Forms, HTTP Server (OHS), WebCache, OID, Discoverer
- May be Java components
 - OBIEE, WebCenter, SOA
- Some components may require a configuration or persistence repository
 - OID, WebCenter ...

Sample FMW Environment



Quick FMW Install overview

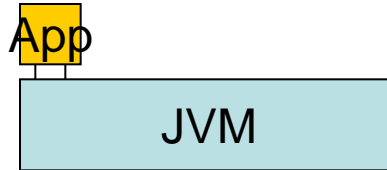
Common installation/configuration steps:

1. Install Database (if needed).
 - FMW Support Repository into Database Home
2. Install Repository Creation Utility (if needed).
 - Configure the Repository
3. Install WebLogic Server.
 - Into FMW_Home/WLS_Home
4. Install Fusion Middleware Component (for example, OID).
 - Into FMW_Home/{component}_Home
5. Configure all software.

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What is Java

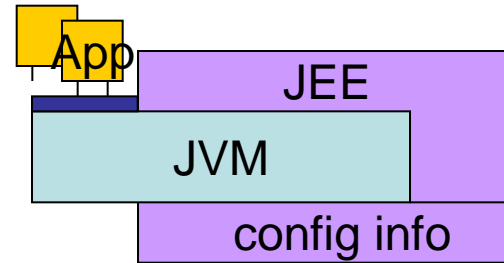
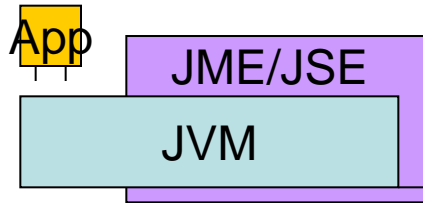


1. *A language*, created in the early 1990s by Sun
2. *An operating environment*, called JVM
3. *A set of standard libraries* that perform common work
4. Application specific libraries

Some *approximate* TimeLines

	Java		Java 2			Java '5'	
Lang	1.0	1.1	1.2			1.5	
JVM	1.0		1.2	1.3	1.4	1.5	1.6
Libs	1.0		1.2 J2ME	1.3 J2ME	1.4 J2ME	JME	1.6
			1.2 J2SE	1.3 J2SE	1.4 J2SE	JSE JFX ...	
			1.2 J2EE	1.3 J2EE	1.4 J2EE	JEE	
Approx Year	~1994		~1997		~2002	~2005	~2009

How I look at Java/JVM/JEE



- Java Virtual Machine plugs into OS
- Java Libraries extend Java Virtual machine
 - JSE includes JME
 - JEE includes JSE
- Many can be running
 - at different versions
 - at the same time
 - on one host!
- EE Libraries need configuration info
 - JDBC moved from EE to SE and that also requires configuration

Java Compile Environment

- To compile a Java program
 - Set the class path to include libraries,
 - Then

```
javac MyApp.java
```

- Creates 'bytecode' file MyApp.class

Java RunTime Environment

- To execute a Java program
 - Set the class path to include libraries,
 - Then

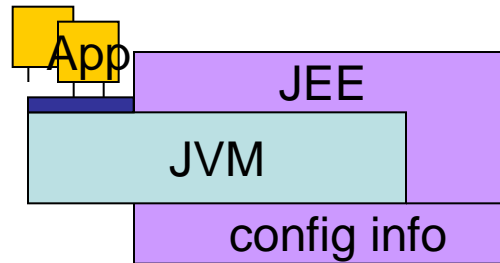
`java MyApp`

- This
 - Starts the JVM
 - Loads and executes the MyApp class bytecode
 - Stops the JVM

What is Enterprise Edition

- J2EE/JEE Libraries and Environment
- J2EE is the OLDER version
- Provides services to client applications
- Runs 24x365
- Responds to requests
- Two major types of client apps
 - Web (JSP, Servlet)
 - Business Logic (Enterprise Java Beans)

What is JEE



- JEE libraries implement the JEE spec
 - JDBC, JNDI, JAAS, JMS ...
- Config info tells the JEE libraries how to handle the application requests
 - Eg: different JDBC data source
- Container is vendor-specific configuration

JEE Execution

- Since JEE is up 24x7, the 'start/load/run/stop' cycle does not work
- Instead, the container provides a class that will keep the JVM up

```
java -jar oc4j.jar
```

```
java <opts> weblogic.Server
```

- Applications are compiled to be identified and initialized by the container

JEE Applications

- Coded to the JEE lifecycle (start, execute ...)
- Use a lot of lookups to maintain independence
 - Data sources (like ODBC)
 - ‘EmployeeDB’ ⇔ jdbc:oracle:thin://myhost:1521:empdb
 - ‘CustomerDB’ ⇔ jdbc:oracle:thin://yourhost:1521:custdb
 - Developer codes EmployeeDB and CustomerDB
 - Administrator maps to jdbc...
 - Security roles
 - Role ⇔ User ⇔ Group & Role ⇔ User
 - Developer codes to Role
 - Administrator maps User ⇔ Group and Group ⇔ Role
- Mapping done by edit configuration file or using console

Important references

- <http://www.theserverside.com/>
- Search for 'Free Book' and 'Mastering EJB'
 - [Home](#) > [Topics](#) > [EJB design and application development](#) > [EJB programming](#)
 - *Free Book: Mastering Enterprise JavaBeans 3.0*
- <http://tahiti.oracle.com>

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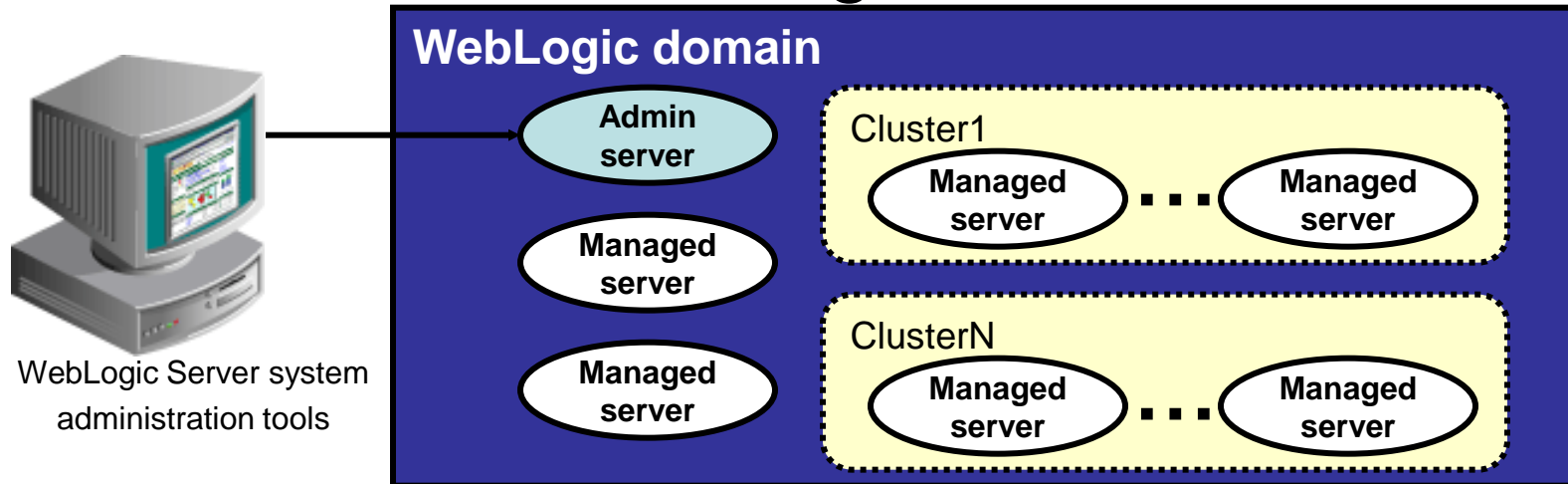
So What is WebLogic Server

- JEE environment
- Deployment environment
- Administration environment

- Used for pure JEE applications
- Used as core for Fusion Middleware
 - Many FMW components are JEE apps

WLS Domains

- Domain is the 'unit of administration'
- You deploy an app to a domain
- One Admin Server (console)
- Zero or more Managed Servers



Admin Server

- Accessed using Administrator tools
 - (Console, EM, WLST)
- Maintains logs and the configuration repository for all Managed Servers
- Starts/stops Managed Servers
- Handles notifications to Administrator and to Managed Servers
- <http://localhost:7001/console>

Managed Server

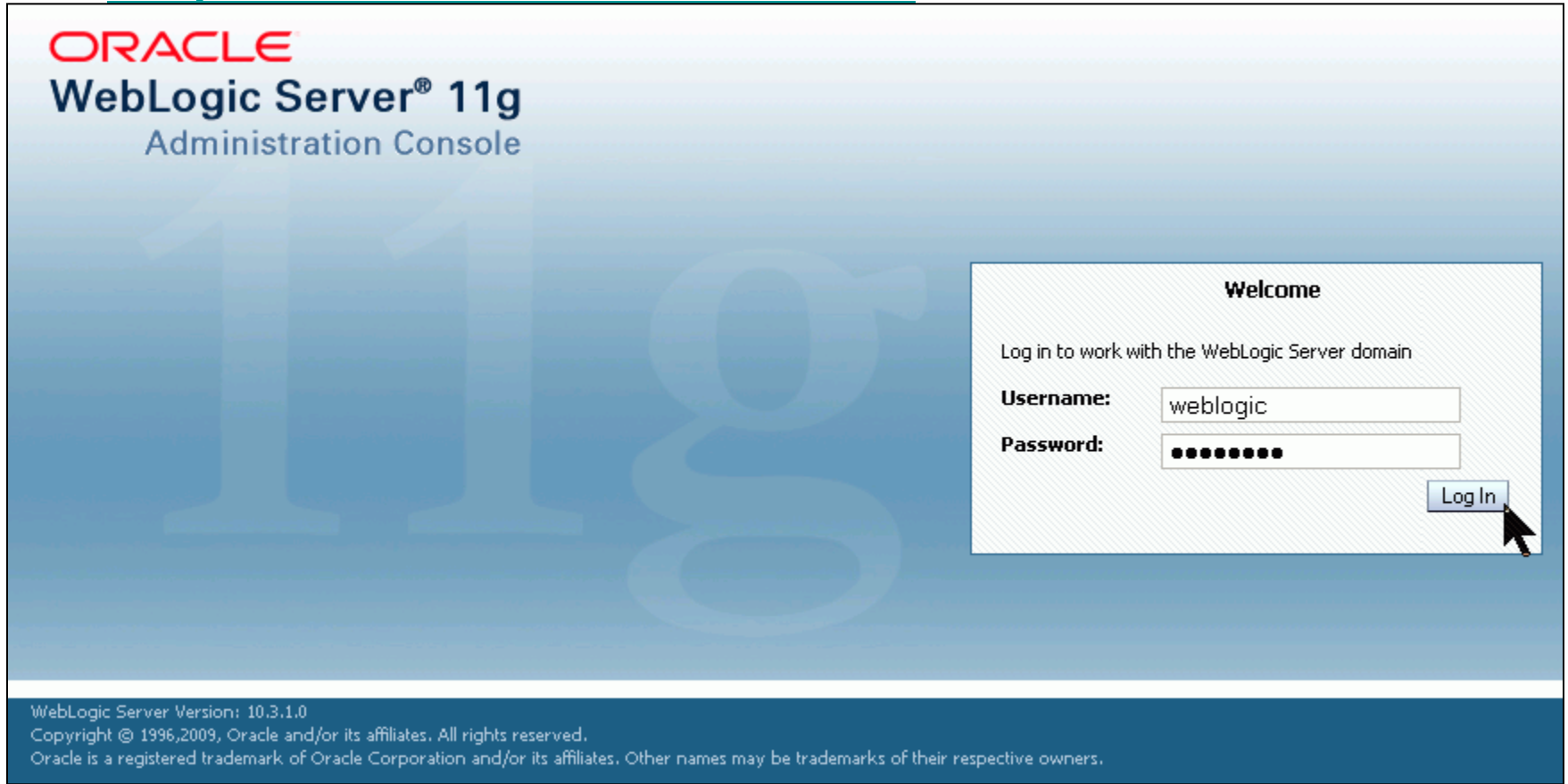
- Configured using Admin Console Wizard
 - `<WL_HOME>/common/bin/config.sh`
- May be on different host than Admin Server
- Accessed through Admin Server
- Gets startup config from Admin Server
 - Startup mode (dev vs prod) ... security
- May have local logs
- Has it's own ports

WLS Startup

- Main OS configuration in
 - `setWLSEnv.sh`
- Startup using
 - `DOMAIN_NAME/bin/startWebLogic.sh`
 - `java Weblogic.Server`
 - (several other ways)

Admin Console

- <http://host:7001/console>



The screenshot shows the Oracle WebLogic Server 11g Administration Console login page. The page has a blue gradient background with the text "ORACLE WebLogic Server® 11g Administration Console" in the top left. A large, faint "11g" watermark is visible in the center. On the right side, there is a white login box with a hatched background. Inside this box, the text "Welcome" is at the top, followed by "Log in to work with the WebLogic Server domain". Below this, there are two input fields: "Username:" with the value "weblogic" and "Password:" with a masked password of ten dots. A "Log In" button is located at the bottom right of the login box, with a mouse cursor pointing at it. At the bottom of the page, there is a dark blue footer containing the text: "WebLogic Server Version: 10.3.1.0", "Copyright © 1996,2009, Oracle and/or its affiliates. All rights reserved.", and "Oracle is a registered trademark of Oracle Corporation and/or its affiliates. Other names may be trademarks of their respective owners."

Basic Navigation

ORACLE WebLogic Server® Administration Console

Oracle WLS Console | WLDf Console Extension

Home Log Out Preferences Record Help

Welcome, weblogic | Connected to: MedRecDomain

Home > MedRecDomain > Summary of Servers > MedRecAdmSvr

Change Center

View changes and restarts

Click the Lock & Edit button to modify, add or delete items in this domain.

Lock & Edit

Release Configuration

Domain Structure

- MedRecDomain
 - Environment
 - Servers
 - Clusters
 - Virtual Hosts
 - Migratable Targets
 - Machines
 - Work Managers
 - Startup & Shutdown Classes
 - Deployments
 - Services
 - Security Realms
 - Interoperability
 - Diagnostics

Settings for MedRecAdmSvr

Configuration | **Protocols** | Logging | Debug | Monitoring | Control | Deployments | Services | Security

Notes

General | **HTTP** | jCOM | IIOP | Channels

Click the **Lock & Edit** button in the Change Center to modify the settings on this page.

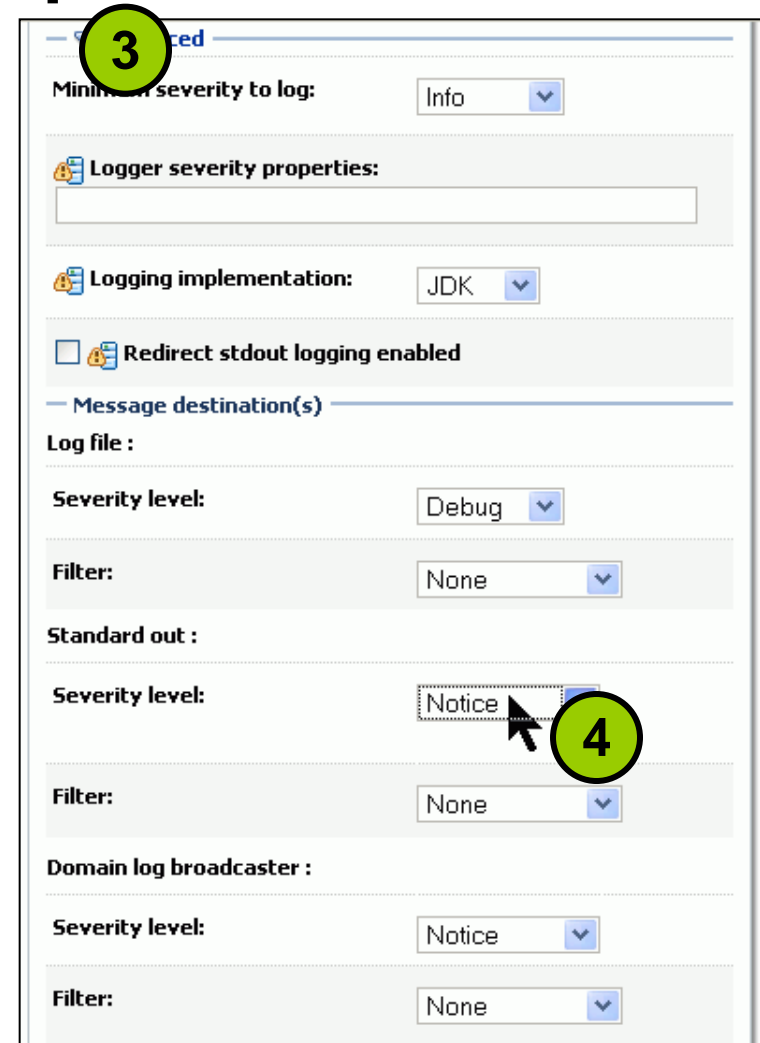
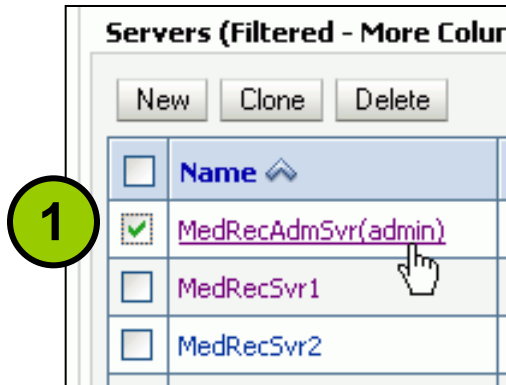
Save

Web-based clients communicate with WebLogic Server using HTTP (HyperText Transfer Protocol).

Use this page to define the HTTP settings for this server.

Default WebApp Context Root: Returns the original context-root for the default Web application for this Web server. Alternatively, you can use the context-root attributes in application.xml or weblogic.xml to set a default Web

Accessing Properties



Deploy JEE Apps

- Several methods are available to deploy applications:
 - Administration Console
 - WebLogic Scripting Tool (WLST)
 - `weblogic.Deployer` Java class
 - `wldeploy` Ant task
 - Autodeployment folder

Deploy through Console

Change Center

View changes and restarts

No pending changes exist. Click the Release Configuration button to allow others to edit the domain.

Lock & Edit

Release Configuration

Domain Structure

- MedRecDomain
- Environment
- Deployments
- Services
- Security Realms
- Interoperability
- Diagnostics

Settings for MedRecDomain

Configuration | Monitoring | Control | Security | Web Service Security

General | JTA | EJBs | Web Applications | Logging | Log Filters

Save

A domain is a collection of WebLogic Server instances that is managed by a set of administrative options that apply to all servers in the current domain.

* Name: MedRecDomain

Enable Administration Port

Administration Port: 9002

Production Mode: true

Enable Cluster Constraints

New buttons

No check box to disable

Prepare New Deployment

- Use the Admin Console to start the Deployment Wizard
 - Select Deployments from General panel
 - Identify the app (.war/.ear) & Click 'install'
 - Select to deploy as 'library' or 'application'
 - Configure security, data sources, etc
- Start/Stop/Undeploy as needed.

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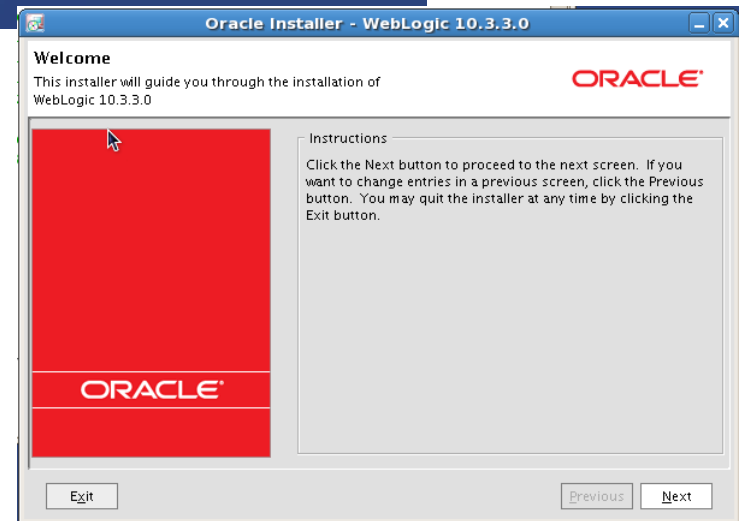
Installation

- FMW installation is confusing because each component is installed separately.
- You **MUST** know what you need to install
 - Planning
- You **MUST** decide whether you need a repository
- You **MUST** understand the WLS concepts to provide a usable environment

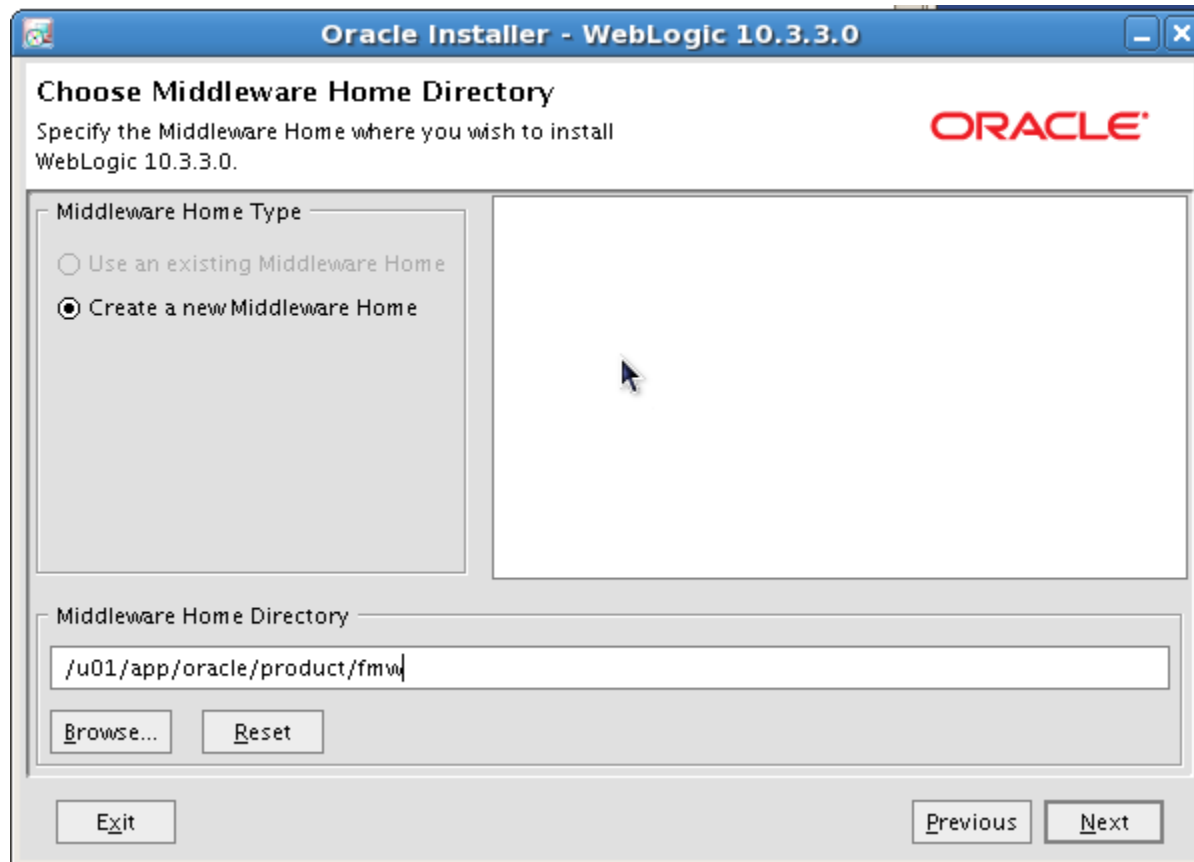
Installation - Start

```
x2  
x3  
yast_el4_x86_32.tar  
yast_el4_x86_64.tar  
yast_el5_x86_32.tar  
[oracle@thishost dnl]$ ./wls1033_linux32.bin
```

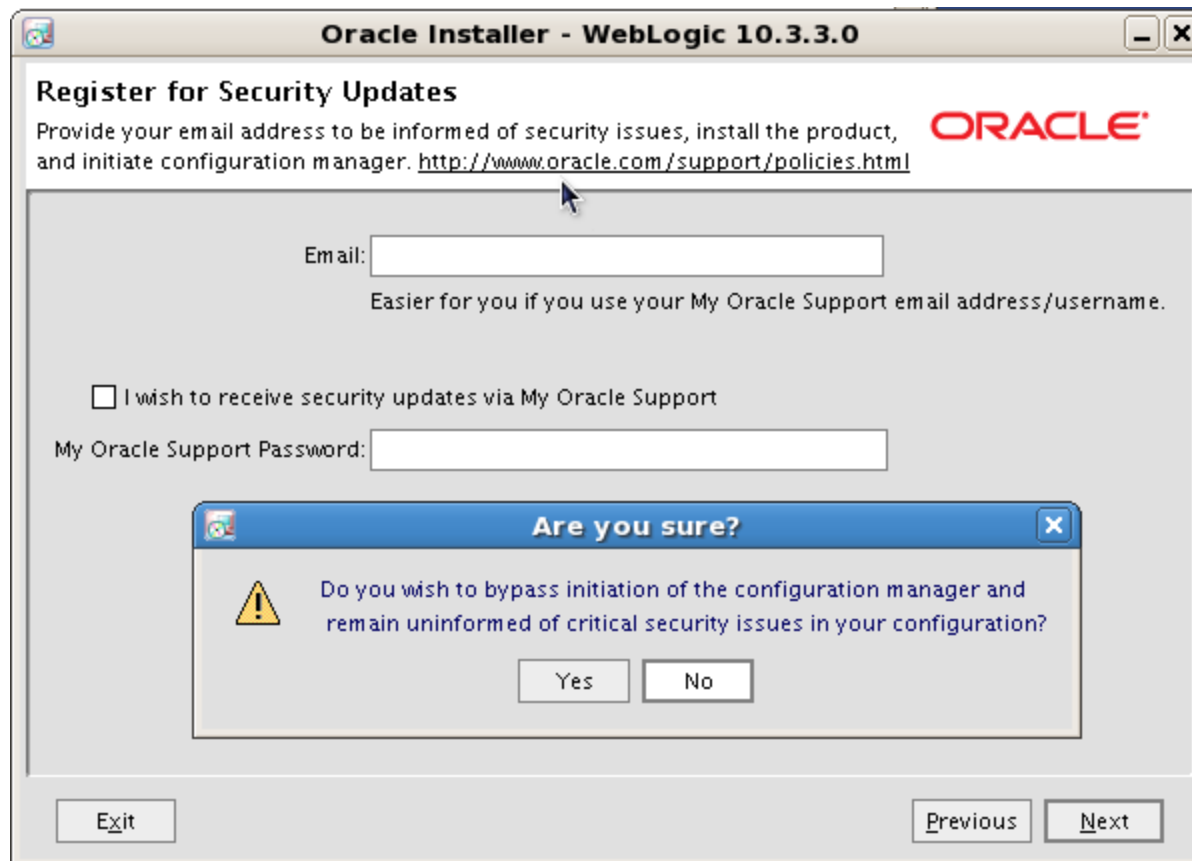
```
yast_el4_x86_32.tar  
yast_el4_x86_64.tar  
yast_el5_x86_32.tar  
[oracle@thishost dnl]$ ./wls1033_linux32.bin  
Extracting 0%.....
```



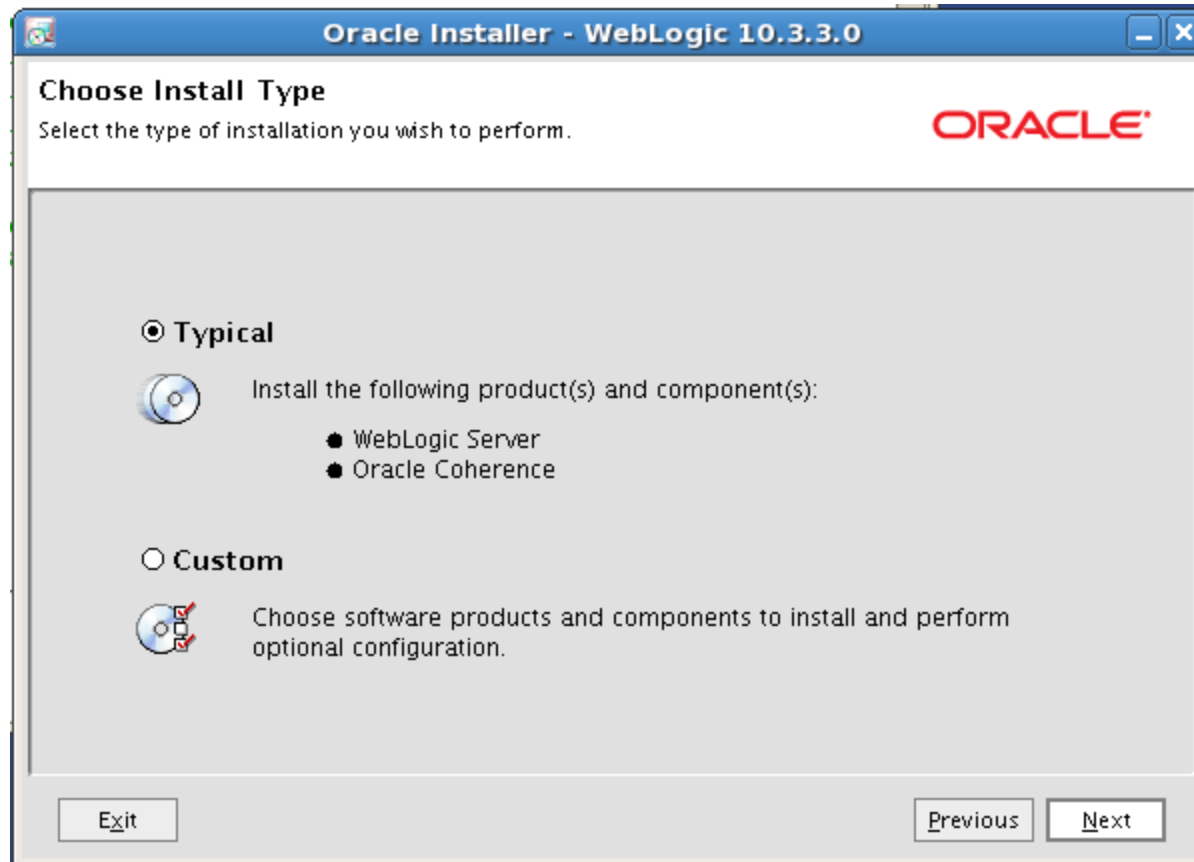
Installation – Select FMW Home



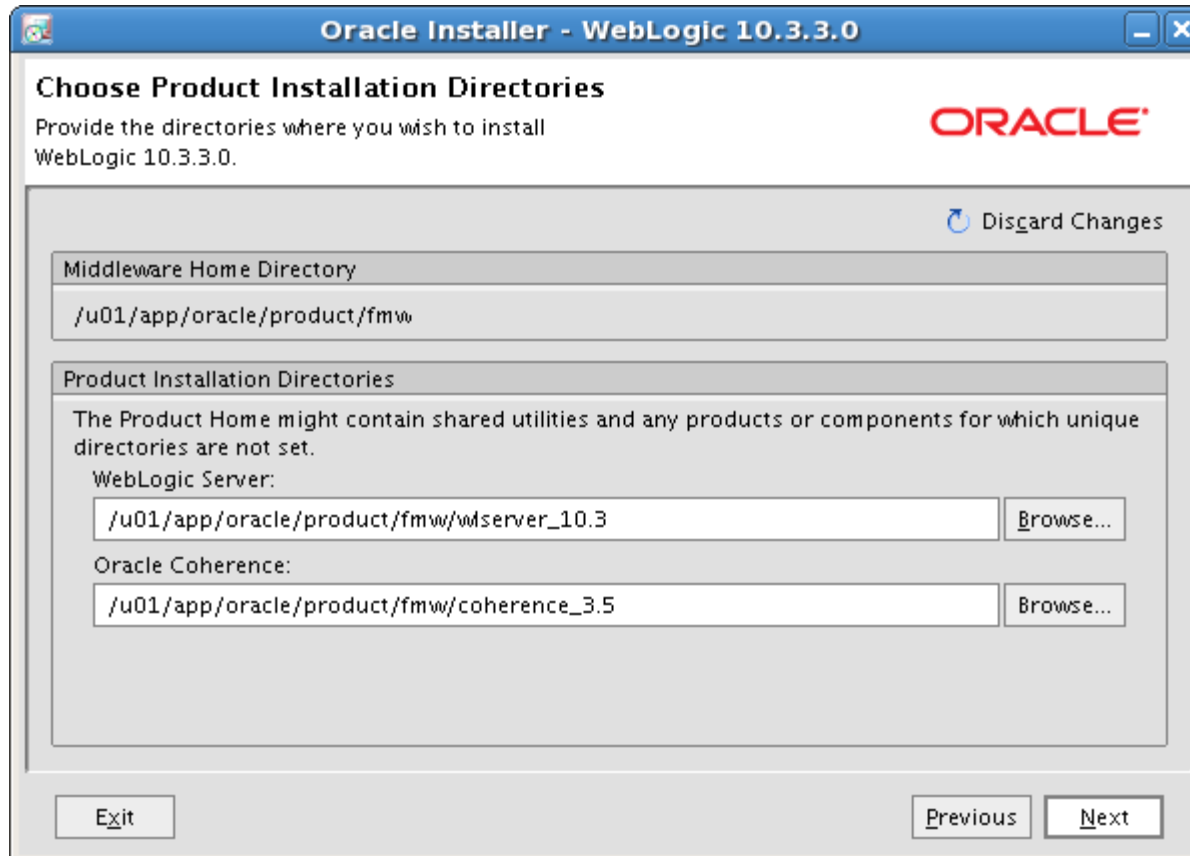
Installation – OCM



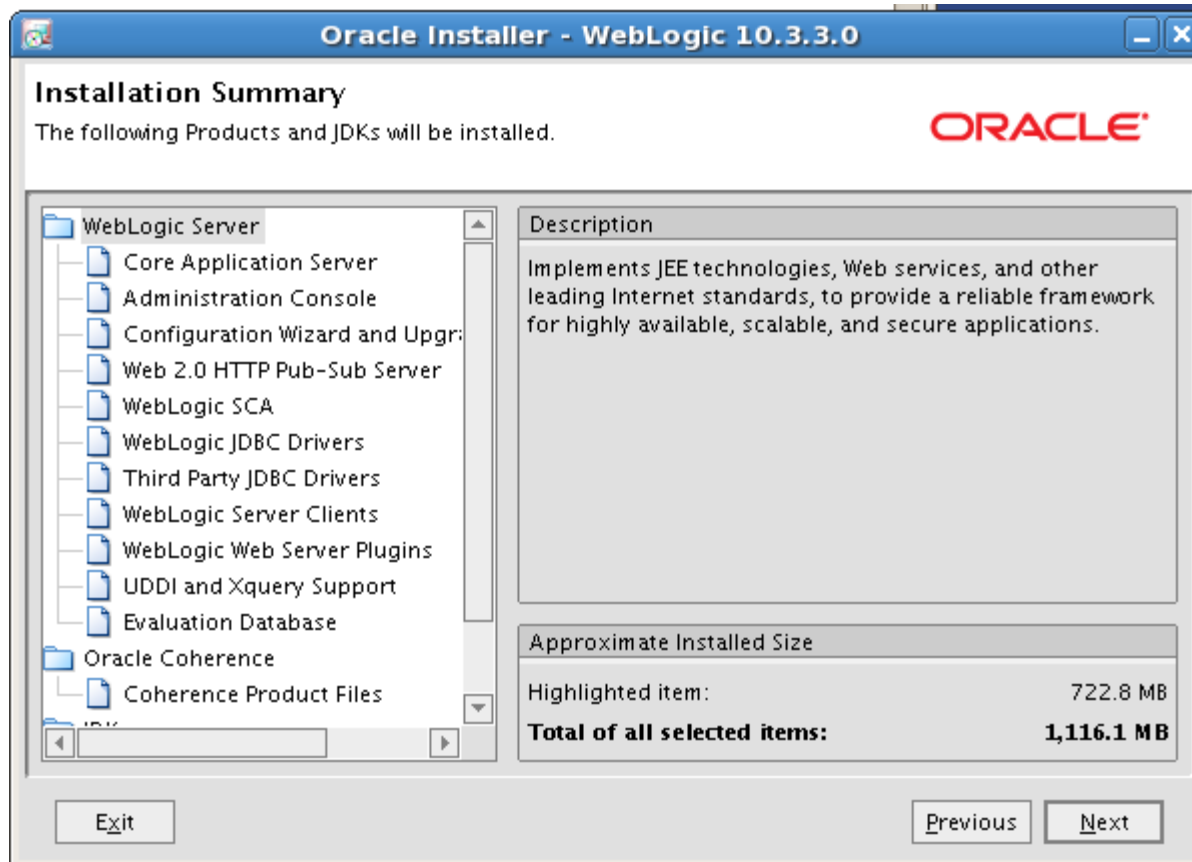
Installation - Type



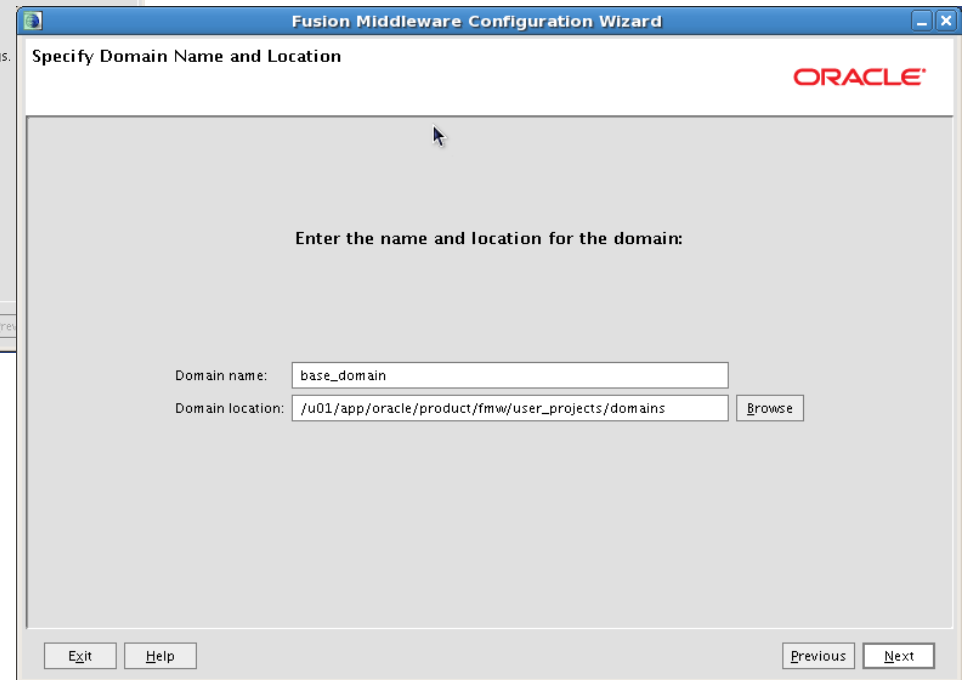
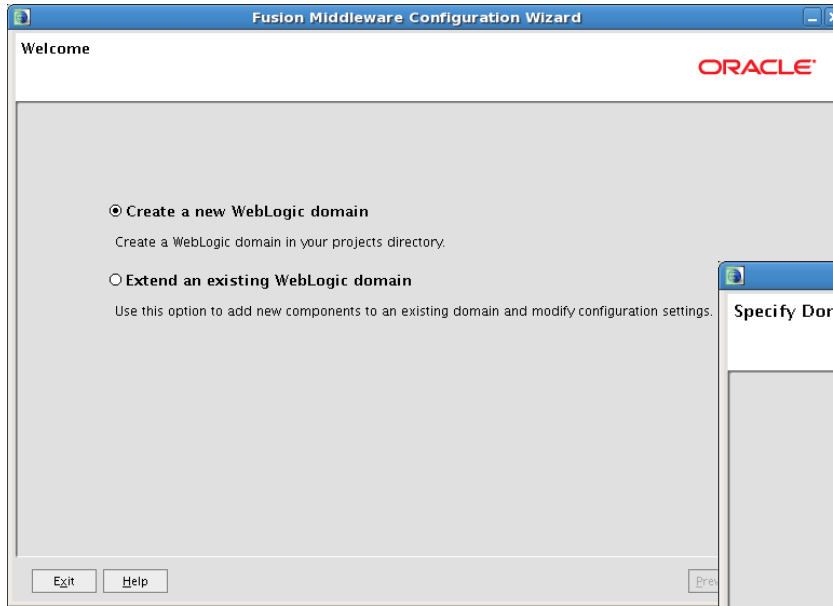
Installation – Component Homes

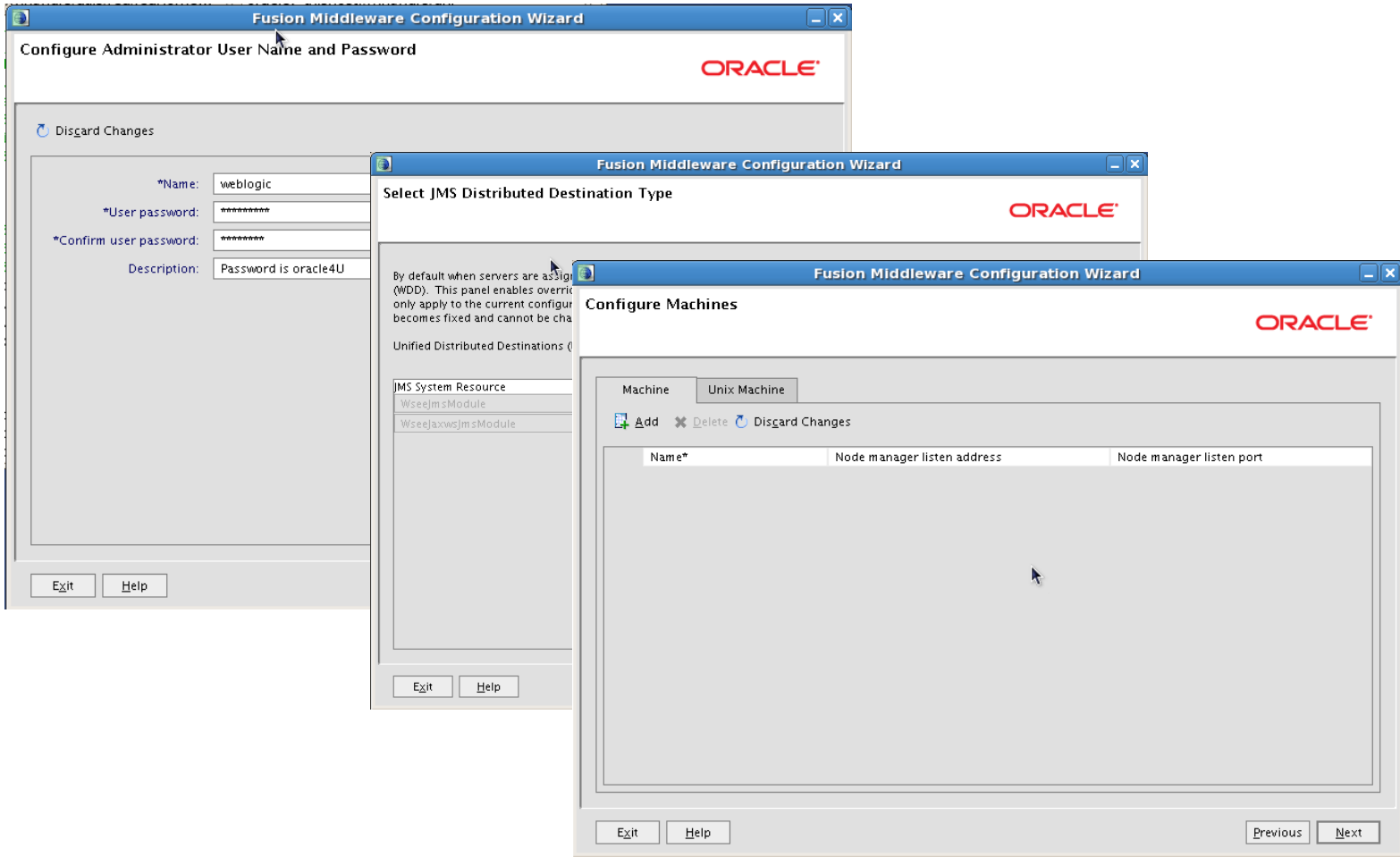


Installation!

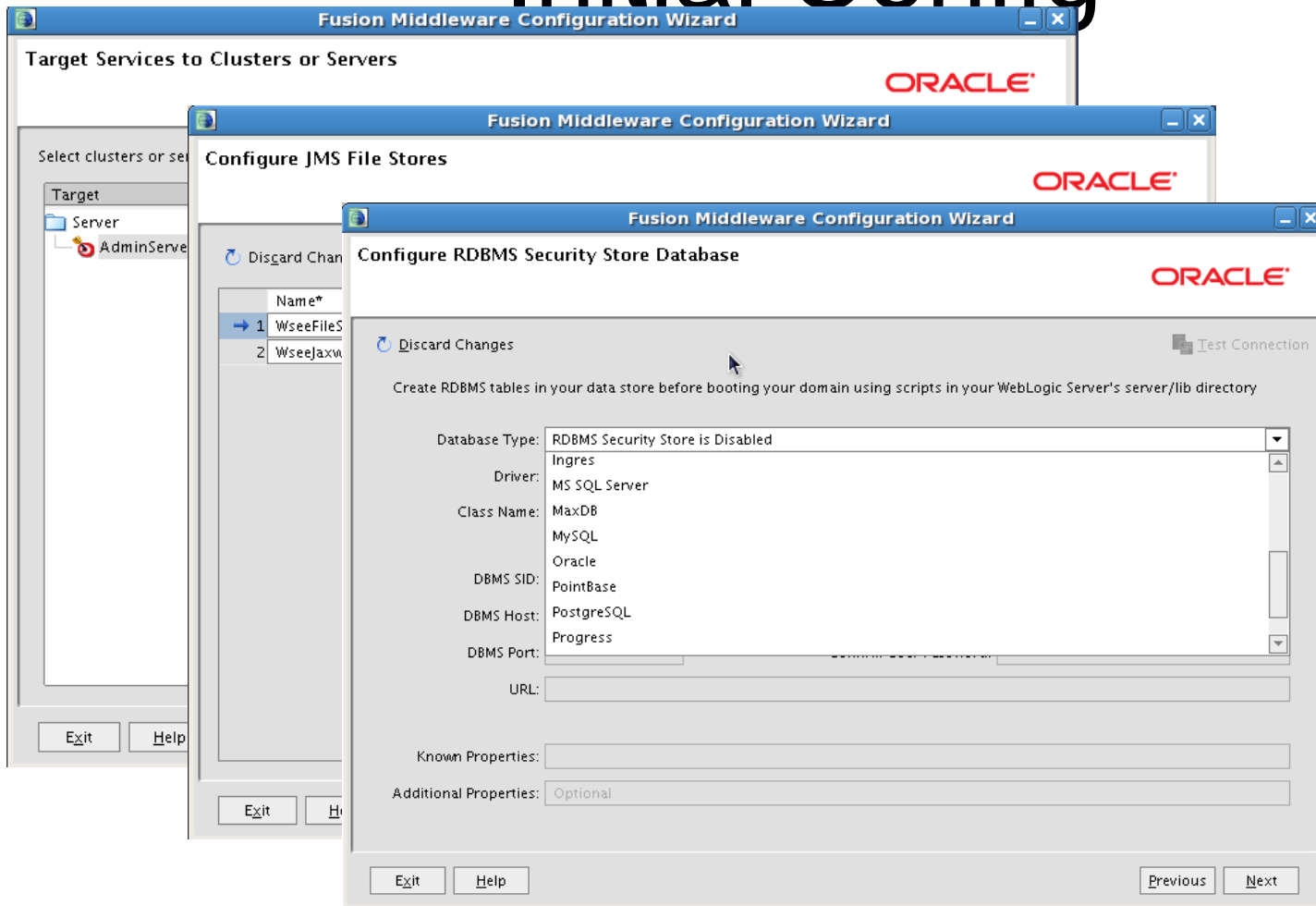


Installation – Config Wizard





Initial Config



Fusion Middleware Configuration Wizard

ORACLE

Configuration Summary

Domain Summary

Summary View: Deployment


- base_domain (/u01/app/oracle/product/fmw/use)
 - Server
 - AdminServer
 - Service
 - JMS
 - JMS Server
 - WseeJmsServer
 - WseejaxwsJmsServer
 - Self Tuning
 - Work Manager
 - weblogic.wsee.mdb.Dispatch
 - weblogic.wsee.jaxws.mdb.Di

Click on an item in the Domain Summary pane on the left to inspect its attributes in the Details pane below. You can make limited adjustments by clicking Previous to return to a prior panel. If everything is satisfactory, click Create.

Attribute	Value
Name	Basic WebLogic Server Domain
Description	Create a basic WebLogic Server domain without installing sample
Author	Oracle Corporation
Location	/u01/app/oracle/product/fmw/wserver_10.3/common/templa
Name	WebLogic Advanced Web Services for JAX-WS Extension
Description	Extend an existing WebLogic Server domain to add functionality
Author	Oracle Corporation
Location	/u01/app/oracle/product/fmw/wserver_10.3/common/templa
Name	WebLogic Advanced Web Services for JAX-RPC Extension
Description	Extend an existing WebLogic Server domain to add functionality
Author	Oracle Corporation
Location	/u01/app/oracle/product/fmw/wserver_10.3/common/templa

Exit
Help
Previous
Create

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Help???

- <http://theserverside.com>
 - Articles, Community, General information
- <http://otn.oracle.com>
 - Product Technical Information
 - Fusion Middleware : WebLogic Server
- Oracle University
 - <http://education.oracle.com>
- <mailto:laoug@forbrichcomputing.ca>

OTN



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Oracle Technology Network > Middleware > WebLogic Server > Overview

- Fusion Middleware Home
- AIA Foundation Pack**
- Business Intelligence
- Coherence
- Developer Tools
- Event-Driven Architecture Suite
- GlassFish Server
- Identity Management
- JRockit
- SOA Suite
- TopLink
- Tuxedo
- WebCenter Suite
- WebLogic Server
- Complex Event Processing

Overview

Downloads

Documentation

Learn More

Community



Oracle WebLogic Server

Oracle WebLogic Server 11g Release 1 (10.3.2) updates the world's best application server for building and deploying enterprise Java EE applications with support for new features for lowering cost of operations, improving performance and supporting the Oracle

applications portfolio.

WebLogic Server with JRockit Virtual Edition now available!

[Click here](#) for more information.

Technical Information

- [Supported System Configurations](#)
- [Oracle WebLogic Server Feature Matrix](#)
- [Datasheet: Oracle WebLogic Server Enterprise Edition \(pdf\)](#)
- [Datasheet: Oracle WebLogic Server Standard Edition \(pdf\)](#)
- [Datasheet: Oracle WebLogic Suite \(pdf\)](#)
- [Datasheet: Oracle WebLogic Suite](#)

News & Community XML

- [Oracle WebLogic Server & Real Application Clusters](#)
- [BEA Support Information](#)
- [Extending WLST with your own commands](#)
- [Oracle Lifetime Support and WebLogic Server](#)
- [WebLogic Server Blog](#)
- [Article: Spring 2.5.3 and WebLogic Server 10.3](#)

What I have seen

- WebLogic Server is much bigger and much richer than OC4J
- Dedicated person/team is required
- Training and practice!



Thank You CLOUG & LAOUG

Hans Forbrich

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