

# Oracle WebLogic Server 14c: Administration II

JAVA

DURATION

**5 Days**

MODULES

**2 Lectures**

COURSE CODE

—

## Course Overview

This Oracle WebLogic Server 14c: Administration II training is a continuation of Oracle WebLogic Server 14c: Administration I. It teaches you how to perform important administrative tasks, employing best practices that enable you to make the most of your WebLogic applications.

## What You Will Learn

### Course Introduction

- Course Objectives
- Target Audience
- Course Prerequisites
- Introductions and Setting Expectations
- Course Schedule
- Course Practices
- For More Information
- Related Training

### WebLogic Server Review

- Objectives
- Agenda
- Oracle WebLogic Server: Overview
- WebLogic Server Domain
- Administration Server
- Managed Servers
- Machines and Clusters
- WebLogic Server Application Services
- WebLogic Server Application: Example
- Agenda
- Start Scripts

- Node Manager
- WebLogic Tools: Administration Console
- WebLogic Tools: WebLogic Scripting Tool (WLST)
- Deployment
- Summary

## Upgrading WebLogic Server

- Objectives
- Agenda
- Definition of Upgrade
- Patch
- Minor Upgrade
- Major Upgrade
- Quiz
- Agenda
- What Is a Rolling Upgrade?
- Multiple Installation and Domain Locations
- Leverage WebLogic Clusters to Avoid Down Time
- Quiz
- Agenda
- Rolling Upgrade Process: Overview
- Backup
- Shutdown
- Upgrade
- Restart
- Quiz
- Summary
- Practice 3-1 Overview: Setting Up the Course Practice Environment
- Practice 3-2 Overview: Performing a Rolling Upgrade

## Creating and Using Domain Templates

- Objectives
- Agenda
- Domain Template Review
- Agenda
- Template
- Template Exclusions
- Script Replacement Variables
- Agenda
- Extension Template: Concepts
- Agenda
- Fusion Middleware (FMW) Templates
- Quiz
- Agenda
- Why Use Custom Templates

- Template Builder
- Selecting the Template Domain Source
- Review Configuration and Create Template
- SQL Scripts and LDAP Data
- Creating an Extension Template
- Using a Custom Template with the Configuration Wizard
- Post Domain Creation Tasks
- Using a Custom Extension Template with the Configuration Wizard
- Summary
- Practice 4-1 Overview: Creating and Using a Custom Domain Template

## WebLogic Server Startup and Crash Recovery

- Objectives
- Agenda
- Node Manager Architecture
- Node Manager Default Behavior
- Configure Java-Based Node Manager
- Agenda
- Starting the Node Manager at System Startup
- Configuring the Node Manager as a Windows Service
- Configuring the Node Manager on UNIX Systems
- Primer on Linux systemd and systemctl
- Example NodeManager Service Unit File
- Control and Check Service Status
- Configuring NodeManager with systemd
- Configuring the Node Manager as an inetd Service
- Registering and Managing inetd Services
- Configuring the Node Manager as an xinetd Service
- Agenda
- How the Node Manager Restarts an Administration Server
- How the Node Manager Restarts a Managed Server
- RestartInterval and RestartMax
- Crash Recovery
- CrashRecoveryEnabled
- Quiz
- Summary
- Practice 5-1 Overview: WebLogic Server Startup and Crash Recovery
- Solaris-Specific Configuration
- Solaris
- Example SMF Manifest File
- Set Up and Start Node Manager with SMF

## WebLogic Scripting Tool (WLST)

- Objectives
- Agenda

- WebLogic Scripting Tool (WLST)
- Agenda
- Jython
- Using Jython
- Variable Declaration
- Conditional Expressions
- Loop Expressions
- I/O Commands
- Exception Handling
- Quiz
- Agenda
- WLST Modes
- WLST Example
- Running WLST Scripts
- WLST Development Tools
- configToScript()
- Script Recording Using the Administration Console
- Oracle Enterprise Pack for Eclipse
- WLST Command Tips
- General WLST Commands
- Offline WLST Commands
- Online WLST Commands
- Quiz
- Agenda
- WebLogic JMX Overview
- Configuration MBeans
- Runtime MBeans
- WebLogic Server MBean Examples
- MBean Properties in the Administration Console
- Browsing MBean Documentation
- Referencing MBeans in WLST
- Quiz
- Agenda
- Creating a Domain Using a Standard Template
- Creating a Domain Using a Custom Template
- Connecting to a Server
- Password Management
- WLST Variables
- Password Management
- Configuring a Server
- Monitoring a Server
- Adding a Server to a Cluster
- Creating a Data Source
- Monitoring a Data Source
- Creating an LDAP Authentication Provider
- Modifying a Domain Offline

- Deploying an Application
- Creating a Dynamic Cluster
- Scaling Up a Dynamic Cluster
- Dynamic Cluster Scaling
- Scaling Down a Dynamic Cluster
- Script Interceptors
- Quiz
- Agenda
- Some FMW Commands
- Summary
- Practice 6-1 Overview: Creating and Modifying a Domain with WLST
- Practice 6-2 Overview: Monitoring a Domain with WLST

## RESTful Management Services

- Objectives
- Agenda
- What Is REST?
- WebLogic Server and REST
- What Can Be Monitored Using WebLogic REST?
- Clients and WebLogic REST
- Enabling REST Management
- Supported Representations
- REST Resource Access Roles
- Agenda
- WebLogic RESTful Interfaces
- REST Operations Flow
- Example: Returning Server Information Using cURL
- Typical REST Operations
- Common WebLogic REST Results
- WebLogic REST Error Handling
- Understanding WebLogic REST Requests
- WebLogic REST MBean Hierarchy
- WebLogic Legacy REST Resources
- WebLogic REST Response Bodies
- Example: Listing Server Information by Name
- Invoking Operations
- Create Forms
- Creating Resources
- Agenda
- Common Workflows
- Summary
- Quiz
- Practice 7-1 Overview: Creating and Managing Servers Using REST

## Secure Sockets Layer (SSL)

- Objectives
- Agenda
- What Is SSL?
- SSL Terminology
- Symmetric Encryption and Decryption
- Asymmetric Encryption and Decryption
- Digital Certificates
- Digital Certificate: Example
- Certificate Authorities
- SSL Communication
- One-Way SSL Handshake
- Two-Way SSL Handshake
- Quiz
- Agenda
- WebLogic and SSL
- Demo Certificates
- WebLogic SSL Requirements
- WebLogic SSL Connections
- Agenda
- What Is a Keystore?
- keytool Utility
- Working with a Keystore
- Configuring WebLogic Keystores
- Quiz
- Agenda
- Configuring SSL for WebLogic
- SSL and WebLogic Proxy Plug-Ins
- SSL and Hardware Load Balancers
- SSL and Oracle HTTP Server
- Quiz
- Summary
- Practice 8-1 Overview: Setting Up SSL

## Application Work Managers

- Objectives
- Agenda
- WebLogic Server Threads
- Monitoring a Server Thread Pool
- Monitoring Server Threads
- Stuck Thread Handling
- Configuring Stuck Thread Handling
- Application Stuck Thread Handling
- Quiz

- Agenda
- Work Managers
- Work Manager Scope
- Work Manager Architecture
- Quiz
- Agenda
- Request Classes
- Creating a Work Manager
- Creating a Request Class
- Constraints and Stuck Threads
- Creating a Constraint
- Work Manager WLST Example
- Work Managers and Stuck Threads
- Assigning Work Managers to Applications
- Quiz
- Summary
- Practice 9-1 Overview: Creating and Using Work Managers

## Working with the Security Realm

- Objectives
- Agenda
- Security Realm: Review
- Default Security Configuration
- Agenda
- How WebLogic Resources Are Protected
- Examples of WebLogic Resources to Protect
- Users and Groups
- Group Membership
- Roles
- Policies
- Configuring New Users
- Configuring New Groups
- Configuring Group Memberships
- Configuring New Roles
- What Is Role Mapping?
- Configuring Role Mapping
- Configuring Roles Using WLST
- Configuring New Policies
- Configuring Policies Using WLST
- Security Configuration Sources
- Configuring Sources Using WLST and weblogic.Deployer
- Deployment Descriptor Security Example: weblogic.xml
- Deployment Descriptor Security Example: web.xml
- Embedded LDAP Server
- Configuring the Embedded LDAP Server

- Quiz
- Practice 10-1 Overview: Creating Users, Groups, Roles, and Policies
- Agenda
- Auditing
- Sample Auditing Output
- Security Audit Events
- WebLogic Auditing Architecture
- Custom Versus Default Auditing Provider
- Creating the Default Auditing Provider
- Configuring the Default Auditing Provider
- Configuration Auditing
- Quiz
- Summary
- Practice 10-2 Overview: Configuring WebLogic Auditing

## Disaster Recovery and Migration

- Objectives
- Agenda
- Disaster Recovery Concepts
- Site Symmetry
- Recommended Architecture
- General Best Practices
- Hosts File: Example
- Quiz
- Agenda
- Administration Server Review
- Impact of Administration Server Failure
- Backing Up a Domain Configuration
- Recovery of the Administration Server Configuration
- Restarting an Administration Server on a New Computer
- Quiz
- Agenda
- Java Transaction API (JTA) Review
- What Is Service Migration?
- Service Migration Prerequisites
- Service Migration Architecture: Database Leasing
- Service Migration Architecture: Consensus Leasing
- What Is a Migratable Target?
- Service Migration Policy Options
- Configuration Roadmap
- JTA Service Migration: Before Failure
- JTA Service Migration: After Failure
- Configuring JTA Service Migration
- Set Up Automatic JTA Service-Level Migration
- Quiz

- Practice 11-1 Overview: Configuring JTA Service-Level Migration
- Agenda
- Pinned Services
- Pinned Services High Availability (HA) Challenges
- High Availability Options for Pinned Services Clusters
- Whole-Server Migration
- Automatic Server Migration Architecture: Before Failure
- Automatic Server Migration Architecture: Machine Failure
- Configuration: Overview
- Quiz
- Summary

## Managing Data Sources

- Objectives
- Agenda
- Review: JDBC
- Data Source: Review
- XA Data Source Review
- Agenda
- Why Manage a Data Source?
- Suspend a Data Source
- Resume a Data Source
- Data Source Interceptors
- Data Source Interceptor
- Practice 12-1 Overview: Controlling a Data Source
- Agenda
- Oracle Real Application Clusters (RAC): Overview
- Oracle GridLink for RAC
- Agenda
- Multi Data Sources
- Multi Data Source Architecture
- Comparison of GridLink and Multi Data Sources
- Failover Option
- Load Balancing Option
- Quiz
- Agenda
- Connection Testing
- Agenda
- Creating a Multi Data Source
- Configuring a Multi Data Source
- Multi Data Source WLST Example
- Managing Multi Data Source Members
- Quiz
- Summary
- Practice 12-2 Overview (Optional): Creating and Using a Multi Data Source

## Diagnostic Framework

- Objectives
- Agenda
- WebLogic Diagnostics Framework (WLDF)
- WLDF Architecture
- Diagnostic Archives
- Configuring Server Diagnostic Archives
- Diagnostic Modules
- Dynamic Diagnostic Modules
- Resource Descriptors
- Creating a Diagnostic Module
- WLST: Example
- WLST Commands for WLDF
- Quiz
- Agenda
- What Is a Diagnostic Image?
- Capturing a Server Diagnostic Image
- WLST: Example
- Quiz
- Agenda
- What Is a Harvester?
- Metric Collectors
- Configuring a Metric Collector
- WLST: Example
- Quiz
- Agenda
- Policies and Actions
- Policy Types
- Configuring Policies
- Configuring Actions
- Elastic Actions and Scaling
- Scale Up Action
- Scale Down Action
- Quiz
- Summary
- Practice 13-1 Overview: Using a Built-in Diagnostic Module

## WebLogic and Coherence Integration

- Objectives
- Agenda
- Oracle Coherence: Overview
- Agenda
- Types of Session Persistence
- Coherence\*Web

- Coherence\*Web and WebLogic Clusters
- Coherence\*Web Session Failover
- Configuring Coherence\*Web in WebLogic
- Quiz
- Practice 14-1 Overview: Configuring Coherence\*Web
- Agenda
- Coherence and WebLogic Server
- WebLogic Managed Coherence Servers Operations
- What Is a Grid Archive (GAR)?
- Coherence Application Deployment on WebLogic
- Coherence Container: Benefits
- Coherence Cluster
- Managed Coherence Server
- Quiz
- Summary
- Practice 14-2 Overview: Configuring Managed Coherence Servers

## Application Staging and Deployment Plans

- Objectives
- Agenda
- Review: Java EE Applications
- Review: Deployment
- Agenda
- Server Staging Modes
- Staged Mode Example
- No Stage Mode Example
- External Stage Mode Example
- Configuring the Staging Mode
- Quiz
- Agenda
- Development to Test to Production
- Examples of Deployment Descriptor Values That Can Change
- Agenda
- Java EE Deployment Descriptors
- Annotations
- appmerge and appc
- Managing Precedence
- Quiz
- Agenda
- What Is a Deployment Plan?
- Using Deployment Plans for Different Environments
- Deployment Plan Example
- Staging Deployment Plans
- Quiz
- Agenda

- Creating a Deployment Plan
- Creating a New Deployment Plan
- Using the Administration Console to Generate a Deployment Plan
- Modifying and Saving Data to Create a New Plan
- New Deployment Plan Shows Changed Values
- Using an Existing Deployment Plan to Configure an Application
- Using an Existing Deployment Plan
- WLST createPlan
- weblogic.PlanGenerator
- Using Plan Generator
- Oracle Enterprise Pack for Eclipse
- Managing Deployment Plans
- Summary
- Practice 15-1 Overview: Creating and Using a Deployment Plan

## WebLogic, Docker, and Kubernetes

- Objectives
- Agenda
- Traditional System Architecture
- History and Multi-Dimensional Evolution of Computing
- Container Use Case: Ready to Run Application Stack
- Container Use Cases: Microservices and One-Time Jobs
- Container Use Cases: Automation and Consolidation
- Virtual Machines Versus Containers
- Agenda
- Docker Architecture and Terminology
- Docker Images
- Docker Hub
- Why Docker Is Popular?
- Agenda
- Kubernetes: What Is It?
- Why Kubernetes?
- Basic Principles
- Applications in Kubernetes
- Deployments and Pods
- Accessing Applications in Kubernetes
- Other Kubernetes Terminology
- K8s Dashboard and Kubectl Output Examples
- Agenda
- Docker WebLogic Domain Image and Configuration Overrides
- Domain Introspection and Config Override Generation
- Supported User Configuration Overrides
- Unsupported User Configuration Overrides
- Configuration Overrides
- WebLogic Operator Lifecycle Management
- WebLogic Lifecycle Management

- Oracle Fusion Middleware Images
- Agenda
- Oracle Linux Container Services
- Host Resource Requirements
- Time Synchronization and Request Forwarding for Kubernetes
- Kubernetes Port Use
- Docker Container Registry
- Oracle Registry Mirror Servers
- Using Private Docker Registry
- Local Container Registry
- Consider Using minikube Tool
- Summary
- A Production Redeployment
- Objectives A-2
- Agenda A-3
- HTTP Sessions and Redeployment A-4
- Agenda A-5
- Redeployment Strategies A-6
- Agenda A-7
- Application Availability A-8
- What Is Production Redeployment? A-9
- Advantages of Production Redeployment A-11
- Production Redeployment Process A-12
- Application Retirement A-13
- Review: Administration Channel A-14
- Administration Mode A-15
- Distributing a Versioned Application A-16
- Deploying in Administration Mode A-17
- Rolling Back to the Previous Version A-18
- Quiz A-19
- Agenda A-21
- Redeployment Process: Overview A-22
- Configuring Application Deployment Versioning A-23
- Deploying a New Version of an Application A-25
- Distributing and Starting a Versioned Application in Administration Mode A-29
- Transitioning a Versioned Application from Administration Mode to Active A-32
- Rolling Back a Versioned Application to a Previous Version A-34
- Quiz A-35
- Agenda A-36
- Requirements and Restrictions A-37
- Summary A-38
- [Optional] Practice Appendix A-1 Overview: Using Production Redeployment A-39
- B WebLogic Optimizations for Exalogic
- What Is Exalogic? B-2
- What Is InfiniBand? B-4
- Exalogic Networks B-5

- Exalogic Machine Topology B-6
- InfiniBand Networking Concepts B-7
- Default Compute Node Network B-8
- Recommended FMW Topology on Exalogic B-9
- Exalogic Shared Storage Concepts B-10
- Recommended FMW Storage on Exalogic B-11
- WebLogic Server Optimizations: Overview B-12
- Creating a Cluster Replication Channel B-13
- Using SDP for Replication B-14
- Using Multiple Ports for Replication B-15
- Other Replication Optimizations B-16
- Oracle Exabus B-17
- Other WebLogic Optimizations B-18
- Enabling Other Optimizations B-19
- What Is Exadata? B-20
- Exadata InfiniBand Connectivity B-21
- Enabling SDP for Exadata Connectivity B-22
- C Oracle Cloud
- Agenda C-2
- What Is Cloud? C-3
- What Is Cloud Computing? C-4
- History – Cloud Evolution C-5
- Components of Cloud Computing C-6
- Characteristics of Cloud C-7
- Cloud Deployment Models C-8
- Cloud Service Models C-9
- Industry Shifting from On-Premises to the Cloud C-13
- Oracle IaaS Overview C-15
- Oracle PaaS Overview C-16
- Oracle SaaS Overview C-17
- Summary C-18
- D Oracle Java Cloud Service Overview
- Objectives D-2

#### Introducing Java Cloud Service : Your Platform for Running Business Applications in the Cloud D-3

- Java Cloud Service: Three Options D-4
- Java Cloud Service Main Use Cases D-5
- Java Cloud Service Feature: Provisioning D-6
- Java Cloud Service Feature: Patching D-7
- Java Cloud Service Feature: Backup / Restore D-8
- Java Cloud Service Feature: Scaling D-9
- Oracle Coherence Option: Data Caching and Scaling D-10

#### Oracle Coherence Option: Your Cloud Data Grid Scalable, Fault-Tolerant Cloud Infrastructure D-11

- How You Interact with Java Cloud Service D-12
- Speaking of Dev Environments... Developer Cloud Service D-13
- Java Cloud Service On-Premises! D-14
- Summary D-15