

IBM WebSphere Server Administration

This course teaches the administration and deployment of web applications in the IBM WebSphere Application Server. This course covers how to install IBM WebSphere Process Server in a network deployment environment. Students learn about the different deployment processes available for IBM WebSphere Process Server, as well as the deployment options for various WebSphere Process Server components.

Duration 24 hours

Course Objectives

Upon completion of the course, students will be able to:

- Install and configure WebSphere Application Server
- Install, configure and manage enterprise applications
- Configure web server integration
- Assemble enterprise modules into applications
- Use new Rapid Deployment features of WebSphere Application Server
- Use various troubleshooting tools and techniques to diagnose problems
- Configure database connections
- Configure runtime security
- Install and configure messaging applications
- Analyze and tune the performance of enterprise applications
- Perform basic administrative tasks using scripting
- Configure a cluster of WebSphere Application Servers

Minimum Pre-requisites

The student should have a good understanding of Web technology, Java, and operational skills for Windows. Administration skills for a web server like Apache or IBM HTTP Server would also be beneficial although not required.

Course Content

Chapter 1: Java EE and WebSphere Overview

- Goals of Enterprise Applications
- What is Java?
- What is Java EE?
- The Java EE Specifications
- Role of Application Server
- What is a Servlet?
- Servlet Execution
- What is a JSP?
- JSP Code Sample
- What is an EJB?
- EJB Types

- EJB Examples
- Model-View-Controller Architecture
- MVC – An Example
- WebSphere Application Server Platform
- "Base" Edition
- Other WAS Editions
- IBM HTTP Server
- Other Products
- Java EE and WebSphere Overview Questions
- Java EE and WebSphere Overview Answers
- Reference

Chapter 2: Application Server Installation

- General System Requirements
- Pre-Install Tasks
- Pre-Install Tasks
- WebSphere Profiles
- Creating Profiles
- Benefits of Profiles
- WebSphere Installation Types
- GUI Install - Launchpad
- Checking for Prerequisites
- Multiple Installations In a Single Machine
- Installing Sample Applications
- Product File Installation
- Profile Creation
- Specifying Security
- Installation Summary
- Installation Results
- First Steps
- Silent Install
- Installation Factory
- Product Files Directories
- Profile Directories
- Cell/Node/Server
- Config Directory
- Important Configuration Files
- Starting and Stopping the Server
- Application Server Installation Questions
- Application Server Installation Answers
- Reference
- Lab Summary
- Common Lab Errors

Chapter 3: Administration Console and Application Deployment

- Single Server Admin Structure

- Administration Clients
- Logging In
- Console Overview
- Navigation Tree
- Workspace Area
- Configuration and Runtime
- Help Area
- Save Configuration
- Save Conflicts
- Common Configuration
- Scope
- Application Installation
- Installation Steps
- Finishing Up
- Start Application
- Applications on File System
- Admin Console & Application Deployment Questions
- Admin Console & Application Deployment Answers
- Reference
- Lab Summary
- Common Lab Errors

Chapter 4: Web Server and Web Server Plug-in

- Using a Web Server
- Web Server Plug-in Architecture
- Web Server Integration
- IBM HTTP Server Installation
- IBM HTTP Server Services
- Plug-in Installation Scenarios
- Web Server Plug-in Installation
- Web Server Plug-in Installation – Separate Install
- Web Servers in WebSphere
- Defining Web Servers
- Mapping Applications to Web Servers
- Virtual Host
- Virtual Hosts in WebSphere
- Creating a Virtual Host in WebSphere
- Relation to Enterprise Applications
- Plug-in Syntax
- Web Server & Web Server Plug-in Questions
- Web Server & Web Server Plug-in Answers
- Reference
- Lab Summary
- Common Lab Errors

Chapter 5: Troubleshooting

- Problem Determination
- Error Reporting
- Browser to Web Server Connection Problem
- HTTP Request Problems
- HTTP Request Solutions
- Tools for Resolving WebSphere Problems
- Admin Console Messages
- Configuration Problems
- Runtime Messages
- Message Details
- Important Log Files
- Important Log Files
- Configuring JVM Log Files
- Viewing JVM Logs
- Log Format
- Event Types in JVM Log
- Event Types in JVM Type
- Setting the Log Levels
- Level Specification String
- Tracing
- Configuring Tracing
- Reading Java Exceptions
- Common Exceptions
- Server Does Not Start
- dumpNameSpace Tool
- Remote Debugging
- Thread Dump
- IBM Tools
- Troubleshooting Questions
- Troubleshooting Answers
- Reference
- Lab Summary
- Common Lab Errors

Chapter 6: Java EE Overview for Administrators

- Java EE Components
- Java EE Vendor Specifications
- Containers
- Java EE Blueprint
- Services
- JDBC
- Data Sources
- Java Naming and Directory Interface
- Java Message Service
- JavaMail
- Java EE Connector Architecture

- Java Transaction API
- Security
- Lifecycle Management
- Application Server Architecture
- Java EE Application Structure
- EAR File
- What are Modules?
- Java EE Deployment Descriptors
- Web Module
- EJB Module
- Client Module
- IBM Extensions
- Assembly Tools
- RAD Workspace and Projects
- General Application Structure

Chapter 7: JDBC and Data Sources

- What is JDBC?
- JDBC Driver
- Typical JDBC Use
- Problems to Address
- JDBC Data Sources
- Data Source Architecture
- Typical Use of Data Source
- Configuring JDBC in WebSphere
- Creating JDBC Provider
- Using WebSphere Variables
- Creating Data Source
- Connection Pools
- Data Source Resource Reference
- JPA and Data Source
- JPA Administration
- JPA Resource Reference
- Logging JPA SQL Statements
- Data Source Configuration Errors
- JDBC & Data Sources Questions
- JDBC & Data Sources Answers
- Reference
- Lab Summary
- Common Lab Errors

Chapter 8: JMS Overview and WebSphere MQ Configuration

- Messaging Introduction
- Messaging Example
- Messaging Components
- Messaging Types

- JMS (Java Messaging Service)
- Message Driven Beans (MDB)
- MDB as Message Consumer
- JMS Resources
- Messaging in WebSphere
- Default Messaging
- WebSphere MQ
- Which To Use?
- WebSphere MQ JMS Configuration
- WebSphere MQ JMS Provider
- Connection Factory
- Destination
- Activation Specification
- Binding MDB to Activation Specification
- Relationship Between Messaging Components
- JMS Messaging Configuration Questions
- JMS Messaging Configuration Answers

Chapter 9: JMS Using Default Messaging Provider

- Service Integration Bus
- Bus Members
- Messaging Engine
- Message Store
- Destination
- Default Messaging JMS Configuration
- Creating a Service Integration Bus
- Adding a Bus Member
- Bus Member Message Store
- Add a Destination
- Default Messaging JMS Provider
- JMS Connection Factory
- JMS Destination
- JMS Activation Specification
- MDB Listener Binding
- Relationship Between Messaging Components
- JMS Messaging Configuration Questions
- JMS Messaging Configuration Answers
- Resources
- Lab Summary
- Common Lab Errors

Chapter 10: WebSphere Security

- Security Overview
- Architecture Components
- Security Components
- Digital Certificates

- SSL (Secure Sockets Layer)
- SSL in WebSphere
- WebSphere SSL Configuration
- Java Security
- JAAS
- Java EE Security
- Authentication and Authorization
- Challenge Mechanism
- Configure Challenge Mechanism
- User Registry
- Federated Repositories
- Security Configuration
- User Registry Configuration
- Authentication Mechanism Configuration
- LTPA and Single Sign On Mechanism
- Configuring LTPA
- Admin Console Roles
- Fine Grained Administration Security
- Stopping Secure Servers
- WebSphere Security Questions
- WebSphere Security Answers
- Reference
- Lab Summary
- Common Lab Errors

Chapter 11: Java EE Security

- Authorization
- Java EE Roles
- Sample Role Mapping
- Mapping Roles to Users/Groups
- Look Up Users/Groups
- Special Roles
- Defining Roles
- Resource Protection in Web Module
- Resource Protection in EJB Module
- Unprotected Methods
- "Unchecked" Method Permissions
- Run-As Delegation
- Java EE Security Questions
- Java EE Security Answers
- Lab Summary
- Common Lab Errors

Chapter 12: Performance Management

- What Affects Performance
- How to Measure Performance?

- WebSphere Queuing Network
- Performance Tuning
- System Settings for Tuning
- Top Tuning Parameters
- Performance Monitoring Service
- Enabling Performance Monitoring
- Performance Statistics
- Performance Data Available
- Performance Servlet
- Tivoli Performance Viewer
- Launching Tivoli Performance Viewer
- Performance Advisors
- Tivoli Performance Viewer advisor
- Performance Data Options
- Summary Reports
- Viewing Performance Data
- Logging Performance Data
- Performance Questions
- Performance Answers
- Lab Summary
- Common Lab Errors

Chapter 13: Java Memory Management

- Java Heap Space
- Heap Size Limits
- Default Size Limits
- Garbage Collection Basics
- Allocation Failure (AF)
- OutOfMemoryError
- Memory Leak
- Free Space Threshold
- Garbage Collection Mechanism
- GC Performance Improvements
- Generational Garbage Collection
- Thread Local Heap (TLH)
- Memory Tuning Goals
- Steady State Heap Size
- Analyzing Steady State Behavior
- Effect of Initial Heap Size on GC
- Optimizing GC Duration
- Summary

Chapter 14: Memory Management in WebSphere

- Configuring the Heap
- Monitoring Memory Using PMI
- Analysis Using IBM Support Assistant

- Leak Advisor
- Summary
- Lab Summary
- Common Lab Errors

Chapter 15: Command Line Administration

- Command Line Tools
- Common Binary Commands
- wsadmin
- wsadmin Options
- Benefits of wsadmin
- Properties
- Security
- Scripting Languages
- JMX in WebSphere
- Default Scripting Objects
- Getting Help
- AdminConfig
- Object ID
- Saving Configuration
- AdminControl
- Object Names
- AdminApp
- AdminTask
- AdminTask exportWasprofile
- Common Scripting Patterns
- Profiles
- Things to Remember
- Command Line Administration Questions
- Command Line Administration Answers
- Reference
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- Common Lab Errors

Chapter 16: Web Server Management and Cluster Topology

- Web Server Management
- Administering IBM HTTP Server
- IBM HTTP Server Architecture
- Non-IHS Web Server
- Managing Multiple Web Servers
- Cluster
- Vertical Scaling
- Horizontal Scaling
- "Mixed" Scaling
- Heterogeneous Scaling

