

Apache Tomcat 9 Administration and Deployment (3 days)

By Dr. Vishwanath Rao

1. Tomcat Introduction

- History of Tomcat
- Version Number and Features
- Tomcat Components
 - Catalina
 - Jasper
 - Coyote
- JEE Overview
 - MVC Design Pattern
 - Servlets/JSP
 - Directory Structure
 - JNDI

2. Installing Tomcat

- Download
- Installation
- Environment Variables
- Starting the Server
- Verifying Server Operation
- Stopping the Server

3. Tomcat Directory Structure

- Batch files in /bin
 - .exe files
- /conf
 - server.xml
 - context.xml
 - web.xml
- /logs
- /webapps
- /lib
- /work
- /temp

4. Configuring Tomcat

- Role of server.xml
- Instance Layout
 - Server
 - Service
 - Virtual Host
 - Context
- server.xml elements

- <Server>
- <Service>
- <Connector>
- <Engine>
- <Host>
- <Context>
- <Realm>
- <Valve>

4. Deploying Web Applications

- JEE Specification for Web Applications
 - Servlets and JSP
 - Model View Controller (MVC) Design Pattern
 - Directory Structure
 - web.xml
- Document Base
- Context and the Document Base
- Default Context Descriptor
- Placing the Web Application Folders and Files under the Application Base
- Deploying a WAR file
- AutoDeploy

5. The Tomcat Manager

- /manager Web Application
 - Managing Web Applications
 - Deploying
 - Listing Deployed Applications
 - Reload Existing Applications
 - Starting/Stopping
 - Undeploying
- Listing Server Status
- Listing Security Roles in the User Database

6. JNDI Data Sources and JDBC

- JNDI
- JDBC
 - Drivers
 - Data Sources in JDBC 2.0 and Later
 - Connection Pooling
- Commons Database Connection Pooling
 - Installation
 - Guarding against Application Program Failure
 - Configuration
- Data Source Definition
 - Web Application context.xml
 - context.xml in /conf

- GlobalNamingResources in server.xml
- Troubleshooting

7. Security

- Web Application Security
- Java SecurityManager
 - Overview
 - Standard Permissions
 - Tomcat Permissions
 - Starting Tomcat with a Security Manager Using the Default Policy File
- Secure Socket Layer (SSL)
 - Generating a keystore File
 - Modifications to server.xml for SSL Support in Tomcat
- tomcat-users.xml

8. Logging

- Logging Overview
- Web Application Logging Techniques
 - javax.servlet.logging
 - javax.servlet.ServletContext
 - log4j

9. Monitoring and Performance Tuning Tomcat

- Tomcat
- JVM
- JMX (Java Management Extensions)
- JMX MBeans in Tomcat
 - Engine
 - JKMain
 - String Cache
 - Server
 - Users
- Configuring Tomcat to use MBeans
- Accessing MBeans
 - jconsole
 - jVisualVM
 - PSI Probe

10. Clustering

- Using Clustering for Replication and Load Balancing
- Running Multiple Instances of Tomcat
 - Directory Setup
 - Port Number Modifications
 - All to All with DeltaManager
 - Backup to One Cluster with BackupManager
- Enabling Session Replication
 - Session Persistence Using Shared File System

- Session Persistence Using Shared Database
- Session Persistence using Shared Database: Database Table
- In-memory Replication Using SimpleTcpCluster
- Load Balancing Using mod_jk Connector to Apache2x Web Server