

ADM200 : Tomcat Administration

Code : ADM200

Duration : 3 days

Category : Administration

Audience :

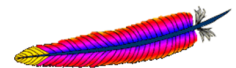
System Administrators and Web Developers who need to administer and control the Tomcat Server and who need to deploy applications onto Tomcat.

Prerequisites :

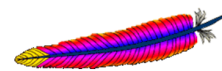
Participants should be familiar basic computing skills like browsing the Web and accessing the directory structure. Knowledge of Web Applications and other Web Servers is beneficial.

Realization :

The theory is covered using presentation slides. The concepts are further explained using demos. The theory is alternated with exercises. The course material is in English.



Tomcat Administration



Contents :

This course covers the administration of the Apache Tomcat web server which is the most popular platform for deploying Java-based Web applications. The course starts with discussing the different options for installing Tomcat. Next it is shown how Java web applications using servlets and JSP's can be deployed on the server. The web application structure and configuration options with the deployment descriptor are also covered. Participants will become familiar with the internal architecture of the Tomcat server, with JMX (Java Management Extensions) and the use of JMX to manage and monitor the server. Attention is also paid to the setup of virtual hosting in Tomcat and the different ways to secure web applications using authentication and SSL. It is further discussed how Tomcat can be integrated with the Apache Web Server which may serve the static pages or which may have the role of loadbalancer. The way Tomcat can be configured to enable Web applications to connect to databases is also a course subject. Finally it is discussed how Tomcat can be configured in a cluster to ensure the failover in cases of server crashes and to enable the scalability of applications. The JMeter tool will be used to test the performance of Web applications.

Module 1 : Tomcat Introduction

- What is Tomcat?
- What is the ASF?
- Apache Name and Marketshare
- Java Overview
- Java EE Servers
- Tomcat and JDK versions
- Servlet and JSP versions
- Tomcat Binary Distributions
- Zip Installation
- Exe Installation
- Tomcat Directories
- Server Configuration Files
- Other Configuration Files
- Tomcat's webapps directory
- Tomcat Manager Application
- Troubleshooting

Module 4 : Tomcat Class Loading

- Class Loading
- Class Loading Process
- Class Loaders in JVM
- Delegation Model
- Custom Class Loaders
- Class Loader Behavior
- Class Loader Namespace
- Example Custom Class Loader
- Tomcat Custom Class Loaders
- Tomcat Class Loaders
- System Class Loader and Tomcat
- Common Class Loader
- Web Application Class Loader
- Class Loader Order

Module 7 : Connecting to Databases

- Java Database Connectivity
- JDBC Overall Architecture
- JDBC Operation
- JDBC Executing a Statement
- Sample code JDBC
- ClassNotFoundException
- Evolving JDBC versions
- JDBC Driver Types
- Tomcat and JDBC
- JNDI Emulation and Pooling
- Configuring JNDI Resources
- Context.xml in META-INF
- JDBC in Web Applications
- Tomcat Connection Pooling
- Preventing Connection Leaks

Module 2 : Java Web Applications

- What is a servlet?
- Servlet Characteristics
- Possible servlet tasks
- What is a JSP?
- JSP Translation Time
- JSP Request Time
- Form Submissions
- POST and GET Data
- Sessions
- Web Application Structure
- Registering Web Applications
- WAR Files
- Deployment Descriptor
- Defining Custom URL's
- Preloading pages
- Error pages

Module 5 : Tomcat and JMX

- What is JMX?
- JMX API
- JMX Goal
- Where is JMX used?
- Managed Beans
- Standard MBeans
- MBean Server
- Naming MBeans
- JMX Architecture
- JVM Instrumentation MBeans
- Accessing the JMX Agent
- JMX in Tomcat

Module 8 : Tomcat Security

- Verifying Download Integrity
- Remove Default Applications
- Change SHUTDOWN command
- Special Tomcat Account
- Securing JVM
- Securing Web Applications
- HTTP Basic Authentication
- HTTP Digest Authentication
- Declarative security
- Programmatic security
- Form-based Authentication
- Combined Security Mechanisms
- SSL Overview
- SSL Characteristics
- SSL Handshakes

Module 3 : Tomcat Architecture

- Tomcat Architecture
- Structure server.xml
- The Server
- The Service
- Connectors
- Deployment Scenario's
- The Engine
- The Host
- The Context
- Resources
- The Realm
- The Valves
- Lifecycle Listeners
- Apache Portable Runtime
- Remaining Classes

Module 6 : Virtual Hosting

- Virtual Hosting
- Name-based Virtual Hosts
- Virtual Host Configuration
- Engine with Virtual Hosts
- Directory Structure Virtual Hosts
- Virtual Host Element
- Host File Name-based Hosting
- IP-based Virtual Hosts
- Multiple IP addresses per NIC
- Separate JVM for Each Host
- Server Configuration more JVM's
- Host Configuration more JVM's

Module 9 : Tomcat Logging

- Logging
- Logging in Java
- Java Util Logging
- Levels and Log Methods
- Tomcat Logging
- Logging Configuration
- log4j Characteristics
- log4j Configuration
- Loggers
- Logger Output Hierarchy
- Inheriting Logging Levels
- Logger Names
- Log Levels
- Appenders and Layouts
- Log Analyzer Tools
- Commons Logging

Module 10 : Stack Tracing

Error Conditions
Exceptions in Java
Exception Handling
Syntax Exception Handling
Finally Clause
Exception information
Stack Traces
Generated Stack Trace
Predefined Exceptions
NullPointerExceptions
ClassCastException
NumberFormatException
Multiple catch clauses
User Defined Exceptions
Chained Exceptions
Reading Stack Traces
Assertions

Module 11 : Tomcat and Apache

Tomcat Apache Communication
Apache Web Server
Advantages Using Web Server
Apache Installation
Apache Directory Structure
Apache Directories
Configuring AJP
Configuring mod_jk Connector
Install mod_jk
Create mod_jk.conf File
Create a Worker
Configure httpd.conf
Proxying traffic to Tomcat
Using mod_proxy

Module 12 : Tomcat Clustering

What is Clustering?
Clustering Terminology
Clustering Types
Tomcat Vertical Clustering
Load Balancing
Sticky Sessions
Load Balancing Configuration
Property File Load Balancing
Distributed Web Applications
Session Sharing Backends
In-Memory Session Replication
SimpleCluster Configuration
Apache Tribes Framework
Delta and BackupManager
Persistent Session on File System
Persistent Session in Database