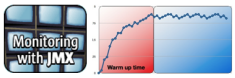
JAV650 : Java for Application Managers

Code : JAV650 **Duration :** 2 days **Category :** Java



Audience :

Java Application Managers responsible for the monitoring, management and troubleshooting of Java Applications.

Prerequisites :

General basic knowledge of computer systems and software development. Programming experience is an advantage in following this course.

Java for Application Managers

Realization :

In this hands-on course the theory is treated by means of presentation slides and is interchanged with exercises. Demos are used to clarify the theory. The course material is in English.

Contents :

In this course the foundations of the Java SE and EE platform, the Java language and the options to manage and monitor Java software are discussed. The participants become familiar with Java applications and their data types, the object oriented nature of Java, the packaging of Java applications, the principles of garbage collection and the Java thread model. A key module in the course treats the various logging mechanisms in Java software and the configuration of logging. Also attention is paid to principles of exception handling in Java and how stack traces can be interpreted. The Java EE standard is discussed and attention is paid to Java EE Web Components like servlets and JSP's. In this respect the reference implementation for Web Components Tomcat is treated. The participants also become familiar with Java Management Extensions (JMX) as a standard and API for the (remote) management and monitoring of Java Applications. The principles of memory management in Java and the various options to configure garbage collection are discussed as well. The final subject of the course is the performance monitoring and performance tuning of Java applications. Optional appendixes about Java Database Connectivity (JDBC) and the Java Messaging Service (JMS) are provided and will be discussed if this is the desire of the class.

Module 1 : Java Intro

Java Versions
Java Overview
Java Editions
Java Platform
Java Libraries
Types of Java Applications
Compiling and Running Programs
Compiler and Interpreter Operation
Standalone Application structure
Java Variables
Primitive Data Types
Classes and Objects
Inheritance
Casting Objects
Packages
Packaging in JAR files
Garbage Collection
Java Thread Model
Thread Characteristics

Module 2 : log4j Logging

Logging in Java
log4j characteristics
log4j Basic Concepts
java.util Logging
Logging API
Simple Logging
Logging Configuration
log4j properties
Configuration Options
XML Configuration
Loggers
Logger Output Hierarchy
Inheriting Logging Levels
Logger Names
Log Levels
Appenders
Layouts

Module 3 : Stack Tracing

Error Conditions
Exceptions in Java
Exception Handling
Syntax Exception Handling
Stack Traces
Generated Stack Traces
Finally Clause
Exception information
Predefined Exceptions
Multiple catch clauses
ArrayIndexOutOfBoundsException
NullPointerExceptions
ClassCastExceptions
NumberFormat Exceptions
Creating Exception Classes
Throwing Exceptions
Chained Exceptions
Assertions

Module 4 : Java EE

Java EE Standard
Java EE Servers
Servlets
Java Server Pages
Translation and Request Time
EJB Components
Java EE API's
Apache Tomcat
Tomcat Directories
Configuration Files
Tomcat Architecture
Tomcat's webapp directory
Web Application Structure
Deployment Descriptor
Form submissions
Session Scope
Tomcat Logging

Module 5 : Java Management Extensions

What is JMX?
JMX Goal
Where is JMX used
Managed Beans
MBean flavors
JMX Architecture
Java SE 5.0 Mbeans
Naming MBeans
MBean Server
Registering Mbeans
Manipulating MBeans
Notifications
Notification Listener

Module 6 : Memory Management

JVM's Internal Architecture
Java Memory Management
Object Lifecycle
Strong Object References
Invisible and Unreachable
Circular References
Garbage Collection
Generational GC
Heap Space Organization
GC Algorithms
Finalization

Module 7 : Java Performance Tuning

Influences on Performance
History of Java Performance
JIT Compilation
Hotspot JVM
Garbage Collection
Monitoring, Profiling, Tuning
String Handling
Buffered and New I/O
Synchronization
Collections
Exception Handling
Serialization
Lazy Loading

Optional Appendix : JDBC

Java Database Connectivity (JDBC)
JDBC Overall Architecture
JDBC Operation
ClassNotFoundException
Using Tomcat and JDBC
Configuring JNDI JDBC Resources
Context.xml in META-INF
JDBC in Web Applications

Optional Appendix : JMS

What is JMS?
Message Consumption
Messaging Domains
Queues
Topics
JMS Terminology
JMS Programming Model