**Course Title: Java Performance Tuning & Troubleshooting**

**Training Duration: 3 Days**

**Course Outline**

**JVM and Performance Overview**

JVM Overview

Hotspot VM Architecture

Java Performance

Common Performance Problems

Performance Methodology

Development and Performance

**JVM and Garbage Collection**

Garbage Collection Overview

Generational Garbage Collection

Garbage Collection and Performance

Java Garbage Collectors

**JVM Monitoring**

Why Monitoring?

What to Monitor

GC Monitoring Tools

-verbose:gc

-XX:+PrintGCDetails

jps

**Mission Control and Visual JVM Monitoring**

VisualVM

visualgc

Mission Control

JMX and MBeans

Mission Control Management Console

**Java Flight Recorder**

Java Flight Recorder

Flight Recordings

JVM Browser

JFR General Tabs

Configuring Java Flight Recorder

Avoiding Common JFR Pitfalls

**Java Profiling**

Profiling Java Applications

Java Profiling Tools

CPU Profiling

Heap Profiling: Overview

Memory-Leak Profiling

Lock-Contention Profiling

**Garbage-Collection Tuning**

Garbage Collection

Heap Sizing Tools

Java Garbage Collectors

Performance Choices

Serial Collector

Throughput Collector

Concurrent Collector

G1 Collector

G1 Collector: Best Practices

Tuning the Permanent Generation

Concurrent Collector: “Losing the Race”

**Performance Testing JEE Web Applications**

Importance of Performance Tests and Benchmarks

Introduction to Load and Stress Test Tools

Configuring the Grinder

**Tuning WebLogic Server Resources**

Domain Startup Mode

Native IO Performance

Stuck Threads

Tuning Chunk Size

WebLogic Work Managers

Threadpool and Priority

Scheduling Guidelines

Work Manager Configuration

**Tuning Container Components**

Tuning JSP

Using the JSP Compiler jspc

Using the Precompile Option

Tuning Servlets

Setting JSP Page Check Interval

Setting Servlet Reload Check Interval

**Tuning JDBC**

Tuning Connection Pools

Tuning Statement Caches

Performing Batch Updates

Tuning Transactions

Tuning Database Specific Parameters

**Tuning JMS**

Tuning JMS Clients

Defining Aggregation and Message Pipeline

Describing Persistence Techniques

Listing Throttling Techniques

Considerations for Store and Forward message

**Troubleshooting WebLogic Server JEE Applications**

Common Java Errors

Classpath Errors

Threading Architecture

Troubleshooting Work Managers

Deadlock Problems

Deployment Problems

**Troubleshooting JDBC**

Data Source Management

JDBC Diagnostics

Debug Flags

Connectivity Problems

Connection Leaks

Database Availability

**Troubleshooting JMS**

JMS Resources Management

Message Logging

Diagnostics

Debug Flags

Overload Protection

Lost Messages

Duplicate Messages

**Troubleshooting Cluster Deployment**

Common Issues with Node Manger

Unicast Communication

Replication Debug Flags

Typical Replication Issues