

## Java Performance Tuning and Optimization

**Duration:** 3 Days

### What you will learn

This Java Performance Tuning and Optimization training will deep dive into performance tuning methodologies and performance tuning theories, teaching you practical tips that will help you solve difficult performance problems related to Java applications. Expert Oracle University instructors will help you hone your skills during a series of hands-on labs derived from real world performance tuning issues.

Learn To:

Set up a performance tuning environment.

Monitor Java applications.

Apply rigor to the task of performance tuning.

Develop applications by using the Java programming language Implement interfaces.

Handle Java programming exceptions.

Use object-oriented programming techniques.

Use various tools and mechanisms for monitoring, profiling and tuning Java applications.

### Live Virtual Class Format

A Live Virtual Class (LVC) is exclusively for registered students; unregistered individuals may not view an LVC at any time. Registered students must view the class from the country listed in the registration form. Unauthorized recording, copying, or transmission of LVC content may not be made.

### Audience

Architect

Java Developers

Java EE Developers

Support Engineer

Technical Consultant

### Related Training

#### *Required Prerequisites*

Use object-oriented programming techniques

Develop applications by using the Java programming language

Implement interfaces and handle Java programming exceptions

#### *Suggested Prerequisites*

Administer basic Windows, Linux or Solaris systems

### **Course Objectives**

Apply basic performance tuning principles to a Java application

Monitor performance on Solaris, Linux and Windows at the OS/JVM/Application level

Profile the performance of a Java Application

Tune the performance of a Java application at the language level

Describe various garbage collection schemes

Tune garbage collection in a Java application

Apply best practices for performance testing

### **Course Topics**

#### **Introduction to Java Performance Tuning**

Course Introduction

Course Agenda

#### **JVM and Performance Overview**

JVM Overview

Performance Principles

Common Performance Problems

Performance Methodology

Development and Performance

#### **Monitoring Operating System Performance**

Monitor CPU Usage

Monitor Network I/O

Monitor Disk I/O

Monitor Virtual Memory Usage

Monitor and Identify Lock Contention

#### **Monitoring the JVM**

HotSpot Generational Garbage Collector

Monitor the Garbage Collector with Command Line Tools

Monitor the Garbage Collector with VisualVM

Monitor the JIT Compiler

Throughput and Responsiveness

#### **Performance Profiling**

NetBeans Profiler, Oracle Solaris Studio, and jmap/jhat

Profile CPU Usage

Profile JVM Heap

- Find Memory Leaks
- Identify Lock Contention
- Heap Profiling Anti-patterns
- Method Profiling Anti-patterns

### **Garbage Collection Schemes**

- Garbage Collection
- Generational Garbage Collection
- GC Performance Metrics
- Garbage Collection Algorithms
- Types of Garbage Collectors
- JVM Ergonomics

### **Garbage Collection Tuning**

- Tune the Garbage Collection
- Select the Garbage Collector
- Interpret GC Output

### **Language Level Concerns and Garbage Collection**

- The best practices for Object Allocation
- Invoking the Garbage Collector
- Reference Types in Java
- The use of Finalizers

### **Performance Tuning at the Language Level**

- String-efficient Java Applications
- Collection Classes
- Using Threads
- Using I/O Efficiently