

Java Performance Tuning & Optimization

Duration: 3 Days

Description

Java is one of the most in demand and highest paying programming language. Java is a very popular language and JVM is a popular platform to build high performance programs in Java. This course will be your one-stop guide to optimize the performance of your Java applications.

Is your Java service slower than you would like; consuming too many system resources or lagging in performance as load increases? In this course, Java Performance Tuning, you will learn how to maximize the performance of Java applications. First, you will discover tools and techniques for analyzing the performance of your application and troubleshooting performance issues. Next, you will learn about the JVM internals that influence performance and how to tune them. Finally, you will gain best practices for writing high performing application code. When you're finished with this course, you will have the skills and knowledge needed to build and run highly performant Java applications in production.

This three day Java Performance Tuning training teaches performance tuning concepts applicable to the Java programming language. Learn the conceptual background for Java garbage collection, how it applies to Java garbage collectors on the Hotspot JVM, and more.

Delegates will learn how to

- Monitor operating system performance
- Describe basic principles of performance
- Describe the operation of generational garbage collection
- List the garbage collectors available in Java including the G1 collector
- Monitor performance at the JVM and application level
- Monitor and analyze Java application performance using Java Mission Control and Flight Recorder
- Profile the performance of a Java application
- Tune garbage collection in a Java application
- Apply basic performance tuning principles to a Java application

Outline

Java Virtual Machine and Performance Overview

- JVM Overview
- What is Performance?
- Performance Methodology

The JVM and Java Garbage Collection

- HotSpot GC Basics
- The GC Aging Process
- G1 GC

Java Garbage Collectors

- Garbage Collecting Algorithms
- Types of GC Collectors
- JVM Ergonomics

Command Line JVM Monitoring

- GC Monitoring Options
- JIT Monitoring Options

Mission Control and JVM Monitoring Tools

- Monitoring with VisualVM
- Monitoring with Mission Control

Java Flight Recorder

- Creating Flight Recordings
- Analyze a Flight Recording

Monitoring Operating System Performance

- Monitoring CPU Usage
- Monitoring Memory Usage
- Monitoring Network I/O
- Monitoring Disk I/O
- Monitoring Processes

Performance Profiling Tools

- Overview of Profiling Tools
- CPU Profiling
- Heap Profiling

Troubleshooting Performance Issues by Profiling

- Memory Leak Profiling
- Detecting Memory leaks
- Detecting Contention and Locking Issues

Garbage Collection Tuning

- Tuning with Serial GC
- Tuning with Parallel GC
- Tuning with Concurrent GC
- Tuning with G1 GC

Language Level Concerns and Garbage Collection

- Object Allocation
- Working with Large Objects
- Explicit Garbage Collection
- Finalizers
- Memory Leak Detection Tools
- Object References

Prerequisites

Knowledge of Java Programming