

Java Performance and Tuning

Course Summary

Description

Students who attend Java Performance and Tuning will leave this course armed with the required skills to improve their Java applications using sound coding techniques and best practices.

Objectives

After taking this course, students will be able to:

- List possible metrics for measuring software performance
- Explain the effect of OO design on software performance
- List and describe types of benchmarks and the criteria that should be considered when constructing a benchmark plan
- Explore the most useful targets for profiling, and the most common tools/techniques for profiling
- Describe two strategies for improving performance as a result of profiling data
- List and explain the five most common problem areas for good performance with Java
- Use the JDK to collect runtime profiling data
- Successfully read the profiling data generated by the JDK to detect performance bottlenecks
- Instrument your own code to collect method execution time data
- Learn code optimization techniques relating to object management, exceptions, threads, and serialization
- Understand the JVM Architecture from the perspective of performance
- Examine and work with Java language features that can impact performance
- Understand optimizing data structures in Java
- Choose the correct Collection for the task
- Leverage the built in Collections algorithms to enhance your code performance and security
- Examine the many Java 8 features to understand their impact on performance

Topics

- Writing High Performance Applications
- Effective Java
- Data Structures
- Performance and Java

Audience

This is an intermediate level Java SE (JSE) developer course, designed for experienced Java developers. Attendees should have current hands-on experience in developing basic Java applications.

Prerequisites

Before taking this course, students should attended the Java Programming Fundamentals for OO Experienced Developers course or have equivalent development skills.

Duration

Three days

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Course Outline

- I. *Writing High Performance Applications***
 - A. Memory Management Issues
 - B. Memory Consumption of Java Data Types
 - C. CPU Performance Issues
 - D. Threading Issues
 - E. Profiling and Benchmarking
 - F. Java Microbenching Harness (JMH)
 - G. Code Optimization Techniques
 - H. Design Optimization Techniques

- II. *Effective Java***
 - A. Creating and Destroying Objects
 - B. Factory Methods
 - C. Impact of Finalizers
 - D. Classes and Interfaces
 - E. Immutability
 - F. Composition vs. Inheritance
 - G. Exceptions
 - H. Threading Constructs to Avoid

- III. *Data Structures***
 - A. Efficient Strings and Arrays
 - B. Efficient Use of Collections
 - C. Choosing a Collection
 - D. Tuning Collection Constructors

- IV. *Performance and Java***
 - A. Performance Across Java Versions
 - B. Impact of Java 8 Concurrency Updates
 - C. Tiered Compilation
 - D. Nashorn versus Java 7's JavaScript Engine
 - E. Lambda Expressions versus Inner Classes
 - F. Impact of Streams versus Collections
 - G. Date/Time Classes
 - H. I/O Stream Recommendations
 - I. Encoding/Decoding
 - J. Strings and String Interning