

Advanced Enterprise Java

Course Summary

Description

This course is designed to provide developers and architects with best practices for building reliable distributed systems. The course covers a variety of patterns and anti patterns for introducing reliability into a system. The course requires active discussion, as many different scenarios will be discussed in the class.

Objectives

- Identify and implement techniques for reliability
- Identify common errors that compromise reliability
- Identify and implement common patterns that increase reliability
- Utilize JMX to collect management and instrumentation data from Java programs
- Identify and implement best practices for using logging frameworks
- Understand how automated testing can improve reliability
- Apply testing best practices to improving reliability
- Understand how to automate the troubleshooting process

Topics

- What is reliability?
- Reliability patterns?
- Reliability anti patterns?
- JMX
- Interesting usages of JMX
- Scripting application servers (WebSphere, WebLogic)
- Effectively using Logging & Tracing
- Automated Unit Testing
- Mock Objects
- Integrated Testing
- Clean Code
- Automated troubleshooting

Audience

This course is designed for programmers and architects who want to engineer reliability into existing systems or newly developed systems.

Prerequisites

Students should have J2EE Programming experience.

Duration

Five days

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Course Outline

I. What is reliability?

This section of the course is an exploration of what reliability means. How can we tell if a system is reliable and what are the bread techniques for building reliability into new systems and existing systems. The mind set and process behind reliability is covered.

II. Reliability Anti-Patterns

This section covers some of the most common errors and mistakes that comprise reliability when building systems. We will not only examine the unreliable designs but also the thought process and development process that allow such known unreliable designs to make it into production systems.

III. Reliability Patterns

This section covers a variety of patterns, which can be applied to increase reliability. The patterns cover techniques, which can be used to quickly identify problems in production systems and to make sure that a problem in one part of a distributed system does not quickly spread to other parts of a distributed system.

IV. Runtime Application Instrumentation with JMX

This section provides an introduction to JMX the Java Management Extension the Java technology that is designed to provide developers with the ability to collect management and instrumentation data from Java applications. Writing JMX beans will be covered along with how JMX is used by WebSphere Application Server and application server scripting.

V. Effective Logging & Tracing

This section covers the best practices for using logging frameworks such as Log4J. Particular attention will be paid to identifying and eliminating slopping logging and tracing practices that clutter log files and make it difficult to perform real time monitoring of J2EE applications.

VI. Automated Testing

This section provides a very solid introduction to three types of automated testing. Unit testing, Mock Objects and Integration testing frameworks. In particular, students will learn how to use JUnit, JMock, EasyMock and FIT and Fitness. The focus will be on building a comprehensive holistic understanding of automated developer testing and how it can be applied to improve reliability.

VII. Clean Code

This section focuses on how to write "clean code" that is easy to maintain. The focus in on laying down principles of clean code and providing a process and techniques that can be applied to clean up existing code bases through refactoring and clean coding principles.

VIII. Automated Trouble Shooting

This section focus on developing the skills to create troubleshooting playbooks before applications are put into production so that support staff can use the playbooks to troubleshoot production problems. Focus will be on automating the troubleshooting procedures for use during development, testing and production. This section puts all the material learned during the course together.