Xebia
Training UK

AGILE AND JAVA SPECIALISTS

2012

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Summary

About Xebia

Xebia is an international IT company focused on Enterprise Java and emerging technologies, Agile development methods and outsourcing services. Xebia consists of over 300 professionals in the Netherlands, France, India and the UK. Passion for in-depth technology, along with Lean, Agile and Scrum practices are Xebia's driving force and competitive edge.

Xebia distinguishes itself as an organization in which craftsmanship, productivity and software quality are part of its DNA.

About Xebia Training

Xebia Training is an international Agile and Java training centre and an integral Business Unit of Xebia. Xebia Training follows in the footsteps of Xebia by offering training courses delivered by the pioneers in their fields (Jeff Sutherland, Kirk Pepperdine, Mack Adams, Arlen Bankston, Antonio Goncalves, Petra Skapa, Martijn Verburg, the Poppendiecks, Gilles Mantel and Ben Evans to name but a few). The focus of Xebia Training is therefore twofold:

Advanced technical Java training courses that tackle recurrent issues faced by the development teams (performance tuning problems, poor code quality and so forth…).

Agile certifications (Scrum, Lean, Kanban...) and Software development training courses (eXtreme Programming and software craftsmanship).

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Ben Evans

"CEO at jClarity & concurrency expert"

His career highlights to date include: Performance testing engineer for the Google IPO, initial UK trials of 3G networks with BT, building award-winning websites for some of Hollywood's biggest hits of the 90s, developing some of the UK's very first true ecommerce websites and building low-latency flow trading systems handling order volumes in excess of $1tn pa. He helps to run the London Java Community, and represents the user community as a voting member on Java's executive governing body - the Java SE/EE Executive Committee.

Martijn Verburg

"CTO at jClarity & Java EE expert"

Martijn has over 10 years experience as a technology professional and OSS mentor in a variety of environments from start-ups to large enterprises. He is the leader of the London Java User Group (LJC), and leads the global effort of JUG members who contribute to JSRs and the OpenJDK. Martijn's first book «The Well-Grounded Java Developer» with Ben Evans is being published by Manning. As a leading expert on technical team optimization, his talks and presentations are in high demand by major conferences (JavaOne, Devoxx, OSCON, FOSDEM, TSSJS, JFokus, SDC, etc). He is known for challenging the industry status quo as the Diabolical Developer.

Kirk Pepperdine

"Java Champion"

Kirk Pepperdine has been a Java Champion since 2005 and is the main contributor to javaperformancetuning.com, generally considered the authority on Java performance tuning information. He is also the coauthor of Ant Developer's Handbook.

Antonio Goncalves

"Java Champion"

Antonio is a Java champion who has worked with Java technologies as a senior consultant for many years. He is also a member of the Java community process on Java EE 6 and co-founder of the Paris Java User Group. He has written 2 books on Java EE 5 and Java EE 6. Antonio is fluent in English, French, Spanish and Portuguese.

Petra Skapa

"Certified Scrum Trainer"

Petra has been using Agile methods continuously for a decade now. She was taught Scrum by Ken Schwaber in 2002 and has been a team member as a developer, Scrum Master and Agile Project Manager. She has been an Agile coach and consultant for the last 8 years with leading Agile consultancies and now as her own company. She's worked in 5 countries with over a dozen clients and numerous projects and products. Her experience has great diversity of domain, from airlines to retail, and medical to telecom. She has been leading enterprise Agile Transformations for over 5 years now. Petra is also a certified Scrum trainer.

Jeff Sutherland

"Co-founder of scrum"

Jeff Sutherland is the creator of Scrum, and was a signer of the Agile Manifesto, which marked the start of the Agile movement. He began his career as a fighter pilot in the US Air Force, and went on to join the faculty at the University of Colorado Medical School. Jeff has served as VP of Engineering or CTO at eleven software companies, managing the last seven entirely using Scrum, and achieved industry-leading, hyper-productive results. Jeff is the Chairman of the Scrum Training Institute, Senior Advisor to OpenView Venture Partners where he is Agile coach for portfolio companies and he is a more than popular key note speaker at conferences and events all over the world.

PROGRAM AND COURSE OVERVIEW

During this ScrumMaster certification course (CSM), all aspects of Scrum will be covered both in theory and practice. You will learn about the Scrum values and principles and the way in which these contribute to the success of your project.

By means of group exercises throughout the course and a 1-hour Scrum project on the second day, you will gain practical knowledge and you will experience what it is like to work in a Scrum team.

TOPICS YOU CAN EXPECT ARE:

- The metrics offered by Scrum (Product Backlog, Burndown Chart)
- How to introduce Scrum without the need to drastically change your organization
- How to scale a Scrum project from one team to multiple teams in a distributed (off-shore) environment

TARGET AUDIENCE AND PREREQUISITES

The ScrumMaster certification course is intended for everyone who is (interested in) working in or with a Scrum team. Regardless of your job title: you can be a tester, manager, analyst, programmer or …(fill in your own job title). The only thing we would strongly like to recommend is to have at least basic understanding of Scrum. This ScrumMaster certification course does cover the basics as well, but you and your fellow team members will get the most out of these two days when these basics can be treated as repetition instead of introduction. Read some books on the subject, learn from your colleagues who might already be working with Scrum and of course, follow our one-day Scrum Foundation training.

CERTIFICATION

Attending this training and completing an online exam is what it takes to become a Certified ScrumMaster (CSM). This ScrumMaster certification is granted by the Scrum Alliance and includes a one-year membership of the Scrum Alliance. Here you can find additional material and information only available to members. The ScrumMaster certification is valid for two years.

INTRODUCTION

Of the three Scrum roles Team member, ScrumMaster and Product Owner the role of the Product Owner is the most difficult. You have a crucial role in enabling the team through focus and feature flow, you have to balance all stakeholder needs and ensure a maximum return on investment (ROI). As a Product Owner it is your responsibility to describe, manage and prioritize the features of the project and/or program.

PROGRAM AND COURSE OVERVIEW

This 2-days Scrum Product Owner certification course provides everything you need to be an effective customer to a Scrum team and to maximize ROI. It is designed especially for product managers and line managers who want to maximize the benefits from their Agile projects by learning how to better prioritize and interface with Agile teams.

TOPICS YOU CAN EXPECT ARE:

- The essential concepts and tools of Scrum and how your particular role as a business customer will change when interacting with Agile teams
- How to effectively manage and prioritize product backlogs, plan releases and sprints, track and report progress
- How to scale Scrum to program-level efforts

On completion of the training, you will be registered as a Certified Product Owner (CSPO), which includes a one-year membership of the Scrum Alliance where valuable material and information is available exclusively to CSPO's.

BECOME PROFICIENT IN JAVA PERFORMANCE TUNING

This comprehensive 4-days workshop will provide you with techniques that have been proven to improve your ability to find and fix performance bottlenecks. What you won't find are tips and tricks that will be obsoleted with the next release of Java.

Instead the course focuses on a methodology that has evolved from years of experience solving performance problems found in a variety of languages running on number of different execution platforms. During the Java Performance Tuning course we will look at how Java works, tooling to expose performance bottlenecks and a methodology that helps you to decide on which tools should be used. The workshop contains more than a dozen exercises each taken from real world problems and each designed to challenge your thinking.

YOU'LL LEARN HOW TO:

- Quickly identify the root causes of poor performance in your applications
- Eliminate conditions that will prevent you from finding performance bottlenecks
- Find critical supportive evidence before deciding on a potentially expensive course of action
- Find performance issues before they make their escape into your production system

PROGRAM & COURSE OVERVIEW

DAY 1

- Defining the user experience
- Defining performance and performance tuning
- Performance tuning methodology
- Performance tuning model
- Response time budgeting
- Usage patterns
- Test harnesses
- Load, stress, and endurance testing

DAY 2

- System monitoring
- Memory management
- Garbage collection
- Object life cycles
- Monitoring garbage collection
- Tools for garbage collection analysis

DAY 3

- Tools to find latency
- Inter-process communications monitoring
- JDBC monitoring
- Threading and concurrent
- Java Management eXtentions (JMX)
- Thread profiling
- Execution profiling
- Memory profiling
- Memory leak and loitering objects diagnosis and repair
- Thread dump analysis

DAY 4

- Micro benchmarking
- Macro benchmarking
- Factors that affect benchmarks
- Analysis of benchmarking results
- Review of performance sensitive algorithms
- Performance tuning tactics
- Getting big gains first
- Psychology of performance tuning

While we like and use commercial tools, you won't find any of them featured here. Instead we will give you a battery of open source tooling. The use of OSS has enabled people to solve that nagging performance problem on the Monday following the course. More over, the techniques taught will improve your effectiveness with any tooling that you may already be using

This course, adapted from the trainers's 2012 book, is designed to reinvigorate a developer's skills and passion. It provides a good grounding in some of the techniques of greatest practical value to the Java developer.

INTRODUCTION

The course includes hands-on examples as well as discussion of topics such as:

- Pragmatic Software Development Life-Cycle (SDLC)
- Designing & architecting for Test Driven Development (TDD)
- Refactoring legacy code
- Classloading, bytecode and the HotSpot JVM
- Exploring functional programming concepts
- Introduction to Java 7
- Adopting java.util.concurrent

TRAINEES ADDRESS THE FOLLOWING QUESTIONS:

- How to re-architect an application to begin using Test-Driven approaches?
- What aspects of the HotSpot JVM and platform are most important to application developers?
- What's new in Java 7?
- What are the advantages of using java.util.concurrent over Java's "classic"

ABOUT OUR 1-DAY / WEEKEND COURSES

- A skills health-check
- A brush-up before job interviews
- A prerequisite for more advanced topics such as concurrency and performance

They are particularly suitable for developers working in finance or other demanding industries (including contractors, and people who want to break into those industries). Our instructors and authors all come from a background in financial and related industries, and there are plenty of real-world examples and real pitfalls covered in all of our courses. For example, many of the topics and exercises are derived from real scenarios and job interviews.

THE JAVA VIRTUAL MACHINE (1 DAY)

This 1-day course, derived from "The Well-Grounded Java Developer" by Ben & Martijn, takes the developer on an in-depth tour of the Java Virtual Machine. Intended for experienced Java programmers, who want to get deeper with the platform, this course will introduce the major subsystems of the JVM and practical ways to apply this knowledge in real applications.

We'll discuss the overall design of the JVM and the guiding principles which underlie it. We'll introduce the JVM's bytecode interpreter as a stack machine, and explain how to use javap to disassemble bytecode. We'll return to the subject of classloading, and build on the treatment in the Advanced Java Programming 1-day course.

Moving on, we'll begin to talk specifically about the HotSpot JVM (which forms the basis of both Oracle's JVM and the OpenJDK). We'll introduce OOPs as the runtime representation of Java objects, and discuss KlassOOPs as the VM's view of class metadata. This will set the stage for a full discussion of JIT compilation and the incredible optimization capabilities of HotSpot.

We'll finish off the day by returning to another topic from "Advanced Java Programming" – reflection. We'll look inside the platform to see how the reflection capabilities are implemented, to give developers much more insight into what the features actually do, and why a reflective call is so much slower than a regular version.

We'll work primarily with Java 6, although we'll do a couple of advanced topics which make use of new Java 7 features. There'll be plenty of hands-on exercises (at least 25% of the day), which are all derived from real codebases.

COURSE OUTLINE

- Design Goals
- The JVM Interpreter
- Classloading Revisited
- OOPs
- JIT Compilation
- Reflection Revisited

ABOUT OUR 1-DAY / WEEKEND COURSES

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They are particularly suitable for developers working in finance or other demanding industries (including contractors, and people who want to break into those industries). Our instructors and authors all come from a background in financial and related industries, and there are plenty of real-world examples and real pitfalls covered in all of our courses. For example, many of the topics and exercises are derived from real scenarios and job interviews.

ADVANCED JAVA PROGRAMMING (1 DAY)

This 1-day course, derived from "The Well-Grounded Java Developer" by Ben & Martijn, covers the topics to bring your skill levels up and prepares you for those vital job interviews.

It is also intended as a prerequisite course for the more advanced offerings in our catalogue. It ensures that attendees have the necessary groundwork before coming along to our "Java Performance Tuning" or "Practical Concurrency" courses. Those interested in our "Java Virtual Machine" course, will also find this a great course to start with, as it sets the scene and introduces themes that we'll explore more deeply.

Over the course of the day, we'll discuss the more advanced aspects of objects and collections, approaches to representing executing code (such as threadpools), reflection, classloading and finally monitoring with tools such as VisualVM.

We'll work primarily with Java 6, although we'll do a couple of advanced topics which make use of new Java 7 features. There'll be plenty of hands-on exercises (at least 25% of the day), which are all derived from real codebases.

COURSE OUTLINE

- Objects & Collections Advanced
- Representing Execution
- Reflection
- Classloading
- VisualVM and MXBeans

During this "Java Concurrency" course, you will learn how to write safe multi-threaded Java code that performs well on your hardware.

INTRODUCTION

- Welcome to the course
- How we deal with questions
- Exercises with partial solutions
- Certificate of Training

HISTORY OF CONCURRENCY

- Benefits of threads
- Risks of threads
- Threads are everywhere
- Short Java 7 Primer

THREAD SAFETY

- What is thread safety?
- Atomicity
- Locking
- Guarding state with locks
- Liveness and performance

SHARING OBJECTS

- Visibility
- Publication and escape
- Thread confinement
- Immutability
- Safe publication

COMPOSING OBJECTS

- Designing a thread-safe class
- Instance confinement
- Delegating thread safety
- Adding functionality to existing thread-safe classes
- Documenting synchronization policies

BUILDING BLOCKS

- Synchronized containers
- Concurrent containers
- Blocking queues and the producer-consumer pattern
- Blocking and interruptible methods
- Synchronizers
- Building an efficient, scalable result cache
- Summary

TASK EXECUTION

- Executing tasks in threads
- The Executor framework
- Finding exploitable parallelism

CANCELLATION AND SHUTDOWN

- Task cancellation
- Stopping a thread-based service
- Handling abnormal thread termination
- JVM shutdown

APPLYING THREAD POOLS

- Tasks and Execution Policies
- Sizing thread pools
- Configuring ThreadPoolExecutor
- Extending ThreadPoolExecutor
- Parallelizing recursive algorithms

SWINGWORKER AND FORK/JOIN

- SwingWorker (Java 6)
- Fork/Join (Java 7)
- Liveness, Performance, and Testing

AVOIDING LIVENESS HAZARDS

- Deadlock
- Avoiding and diagnosing deadlocks
- Avoiding and diagnosing deadlocks

PERFORMANCE AND SCALABILITY

- Thinking about performance
- Amdahls and Littles laws
- Costs introduced by threads
- Reducing lock contention
- Example: Comparing Map performance
- Reducing context switch overhead

TESTING CONCURRENT PROGRAMS

- Testing for correctness
- Testing for performance
- Advanced Topics

EXPLICIT LOCKS

- Lock and ReentrantLock
- Performance considerations
- Fairness
- Synchronized vs ReentrantLock
- Read-write locks

BUILDING CUSTOMS SYNCHRONIZERS

- Managing state dependence
- Using condition queues
- Explicit condition objects
- AbstractQueuedSynchronizer (AQS)
- Summary

ATOMIC VARIABLES AND NONBLOCKING SYNCHRONIZATION

- Disadvantages of locking
- Hardware support for concurrency
- Atomic variable classes
- Nonblocking algorithms
- Summary

CONCLUSION

- Tips on where to learn more
- Thank you!

PRESENTATION

This training aims to demystify the new Java EE platform. It combines presentations and hands-on labs to develop a comprehensive application with emphasis on good architecture.

Patterns of yesterday becoming today's anti-pattern, the race of decoupling and over layering … In this Java EE 6 course you will learn to use the technical blocks of Java EE 6 (JPA 2.0, EJB 3.1, JSF 2.0, Bean Validation 1.0, CDI 1.0 and JAX-RS 1.0) to best meet the needs of your users. For this Java EE 6 course to better meet your expectations, you will have to fill out a brief form to adjust the training to the level of the group.

You will leave with a copy of Antonio's Java EE 6 book, an IntelliJ IDEA and JRebel license.

TRAINEES WILL ADRESS THE FOLLOWING QUESTIONS:

- What's new in Java EE 6?
- How to quickly and simply develop an application?
- Why and how to refactor your architecture to meet new needs?
- What architectures can be modeled with Java EE 6?

PROGRAM

This course is the foundation course for developers who are planning to build and design applications on top of MongoDB. It covers data modeling, queries and insert/update/deletes, an introduction to map/reduce and basic administration

Day 1 – Developer Training Part I

- MongoDB Introduction
  - What is MongoDB and Why? (Core concepts; Environments; Documentation)
  - Different deployment models JSON
  - Installation
- CRUD and the MongoDB shell
  - Introduction to the MongoDB API and the core concepts of documents and collections
- Indexing and Schema Design
  - Indexing, query profiling and the query optimizer Some schema design case studies
  - Practice modeling various domains
  - Schemas for atomic operations

Day 2 – Developer Training Part II

- Drivers
  - How the drivers work in general
  - Driver APIs with examples
- Replication
  - Overview of replication
  - Setting up replica sets
- Sharding
  - Overview of sharding
  - How sharding affects application design
- Performance Troubleshooting
  - Getting information about MongoDB
- Performance indicators
- Additional topics as time/interest permits
  - GeoSpatial Indexes
  - GridFS Aggregation
- Q & A and Hands-on work

PROGRAM

This course covers everything a database administrator needs to know to successfully deploy and maintain a MongoDB database, diagnose performance issues, import and export data from MongoDB and establish the proper backup and restore routines.

Day 1 – Operations Training Part I

- MongoDB Introduction
  - What is MongoDB and Why? (Core concepts; Environments; Documentation)
  - Different deployment models
  - JSON
  - Installation
- CRUD and the MongoDB shell
  - Introduction to the MongoDB API and the core concepts of documents and collections
- Replication
  - Overview
  - Setting up replica sets

Day 2 – General Training Part II

- Sharding
  - Overview
  - Setting up sharding
- Performance Troubleshooting
  - Getting information about MongoDB
  - Performance indicators
- Monitoring
  - Typical monitoring setup
  - How to integrate with custom monitoring solutions
  - Red flags what to watch for
- Backups and Recovery
  - Mongodump based approaches
  - File system/storage level approaches
  - Tradeoffs
- Additional topics as time/interest permits

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