

## TT7100 Service-Oriented Architecture / SOA Analysis and Design (5 days)



**Service-Oriented Architecture Analysis and Design** is a five day in-depth SOA training course geared for software architects and designers who need to understand what SOA is, the impact of SOA, what it means in terms of today's systems and architectures, and how to apply the concepts in designing distributed architectures. Geared for software architects and designers, this course explores what services and service-oriented architectures are and what best practices and design patterns to use in designing SOA-based applications. This course presents a strong perspective on services as an essential and important part of enterprise systems as well as how to identify, design, and develop of complex services using sound analysis and design techniques and best programming practices.

### ► Course Objectives: What You'll Learn

Students who attend **Service Oriented Architectures Analysis and Design** will leave the course armed with the required skills to design and lead the implementation of realistic SOA-based business application projects. This course provides coverage of advanced SOA concepts and practices for enterprise applications. In addition, there is an extensive review of topics such as Enterprise Service Bus (ESB), the Business Process Execution Language (BPEL), SOAP, Web Services Description Language (WSDL), and Web services.

Working in a dynamic, interactive discussion and demo environment, students will be able to:

- Explain the business impact of SOA
- Understand the history of services-oriented architecture and what design processes led up to SOA
- Discuss the challenges to adopting SOA in the enterprise
- Apply the concepts and principles of SOA to on-going and future projects
- Understand the various web service standards available to support SOA
- Explain how Enterprise Application Integration affects the reuse of existing applications
- Relate what SOA means from architectural and development perspectives
- Discuss business process analysis and its relation to BPEL
- Understand the difference between OO analysis and design and SOA analysis and design
- List the various roles involved in Service-oriented Analysis and Design (SOAD)
- Perform SOA Analysis to identify useful and manageable services
- Perform SOA Design to craft architectures that support the required data and communication dynamics for identified services
- Understand the importance of business process modeling
- Understand the difference between RPC's and REST as a means of requesting resources
- List the advantages of web services as a distributed systems technology

### COURSE SNAPSHOT

**Duration:** 5 days (can be tailored)

**Focus:** SOA - analysis and design

**Skill-level:** Intermediate to Advanced

**Targeted Audience:** Software Architects/Designers, Business and Systems Analysts

**Course Format:** Extensive hands-on analysis and design labs (non-programming); Expert lecture combined with open discussions and high-level demonstrations

**Language / Tools:** BPEL/XML/SOAP/WSDL. This course is programming language independent/neutral, and is delivered using a variety of open source BPMN and BPEL design tools as well as web service clients and engines. Students use machines in class to work with selected SOA tools. This is not a coding class.

**Delivery Options:** Available for onsite private classroom presentation, or live online / virtual presentation

**Customizable:** Yes

- Explain governance and how it applies to SOA and IT in general
- Compare SOA best practices
- Understand the responsibilities crucial to governance
- Explain what an Enterprise Service Bus is and its relationship to SOA
- Discuss ESB security and roles
- Understand the relationship between the Service Component Architecture (SCA) and Service Data Objects (SDO)
- Understand web service and their standards
- Understand the Web Services Description Language and Universal Description Discovery and Integration (UDDI).

The course provides a solid foundation in basic terminology and concepts, extended and built upon throughout the engagement. Processes and best practices are discussed and illustrated through dynamic discussions, hands-on design labs and group activities.

### ► Audience & Pre-requisites: Who Should Attend

This is an **intermediate to advanced** level SOA training course, designed for architects and analysts who need to identify, design, and lead the implementation of SOA projects. We will explore and

apply the terminology, the specification, the processes and technologies specific to SOA.

Attendees should have an extensive working knowledge of developing enterprise applications. Designing and analysis working knowledge is also extremely beneficial.

#### ► Related Courses – Suggested Learning Path

**Take Before:** Students should have basic development and analysis skills and a working knowledge in the following topics, or attend one or more of these courses as a pre-requisite:

- **TT4000 Understanding Internet Architectures**

**Take Instead:** We offer other courses that provide different levels of knowledge or focus:

- Choose from our unique SOA Seminar Series topics: **TT7001 SOA Overview for Non-Technical Stakeholders; TT7010 SOA Management; TT7015 SOA Leadership; TT7020 SOA Processes**
- If your team needs high level SOA training, the **TT7000 Understanding SOA** or **TT7001 Understanding SOA for Non-Technical Stakeholders** course(s) may be more appropriate.
- For business and systems analysts and are less design-oriented, please consider **TT7110 Service-Oriented Architectures Analysis**
- For those focusing on using SOA and Web Services, please consider **TT7150 Mastering Service-Oriented Architecture (SOA) and J2EE Web Services.**
- For basic developer training in web services, consider: **TT7300 Core Web Services for J2EE (or JEE) Developers**, or the more in-depth **TT7301 SOA and Web Services for J2EE (or JEE) Developers.** We also offer other web services courses that integrate J2EE-JEE, XML, SOA and other topics. See our course list for details.

**Take After:** We offer a variety of introductory through advanced security, development, project management, engineering, architecture and design courses. Students may want to consider the following topics as a follow-on to this course.

- **TT7030 SOA Governance**
- **TT7040 Understanding SOA Security**
- **TT8500 Secure SOA (comprehensive)**
- Additional programming, SOA and web services topics – Intro through Advanced
- Secure coding, development and design topics
- Software engineering or design topics
- Architecture & Analysis courses

Please note all development courses may also be offered in other programming languages or tailored to suit your unique requirements. We will work with you to come up with the best solution to ensure your needs are met, whether we customize the material, or devise a different educational path to help your team best prepare for this training. Please contact us for recommended next steps tailored to your longer term education, project or

development objectives.

#### ► Experiential Learning: Hands-On Labs

This class is “technology-centric”, designed to train attendees in essential analysis and design skills, coupling the most current, effective techniques with the soundest industry practices.

This workshop is about **50% dynamic lab exercises** and **50% lecture**. Throughout the course students will be led through a series of progressively advanced topics, where each topic consists of lecture, group discussion, comprehensive hands-on lab exercises, and lab review. Multiple detailed lab exercises are laced throughout the course, designed to reinforce fundamental skills and concepts learned in the lessons. At the end of each lesson, developers will be tested with a set of review questions to ensure that he/she has fully understands that topic.

#### ► Delivery Environment: Tools to Use

Although this training is skills-centric, this course can be delivered using a variety of software combinations. The default set of tools are open source and easily downloaded for use after the class. Please inquire for details and options. Our detailed lab workbooks are complete with software-specific instructions, screen shots and step-by-step tutorials for using the software you select. In most cases we can easily port our classes to run in the environment of your choosing.

#### ► Easy & Secure Set Up! LoadNGo™ Instant Classroom Kit

For course deliveries or virtual presentation using open-source tools or demonstrations, we’ll provide our unique **LoadNGo Instant Classroom Kit**, which enables students to run the entire course off of a DVD that hosts the entire course set up software, labs, and other pertinent useful educational resources, whitepapers and more. You only need to provide the hardware and appropriate O/S, and we’ll do the rest. No installation needed. **Great for secure environments.** Minimum set up burden for your team or firm, with maximum results for your students.

No matter which set up option or software your firm requires, we’re pleased to provide a detailed set up guide for all private or on-site courses, and as much assistance as you require to prepare your students or classroom for the course. Our support personnel and instructors can be contacted for any advice you may require to prepare your classroom and/or students for attendance.

#### ► Student Materials: What You’ll Receive

Our robust course materials include much more than a simple slideshow presentation handout. Student materials include a comprehensive hard-copy course manual, complete with detailed course notes, code samples, diagrams and current reference materials, all directly related to the course at hand, indexed for ease of use. Step-by-step lab instructions and project descriptions are clearly illustrated and commented for maximum learning.

In addition to everything students need for the course, the **LoadNGo Instant Classroom Kit** described above also includes of workshop labs and solutions; non-restricted workshop software, APIs, documentation, technical education papers, and specifications and tutorials pertinent to the training course. Our course kits are designed to serve as an excellent and useful reference set, long after we leave your classroom.

► **Optional Pre / Post-Testing & Skills Assessment**

We work with you to ensure that your resources are well spent. Through our basic course pre-testing and/or post-course assessments, we ensure your team is up to the challenges that this course offers. Our goal is to structure the best solution to ensure your needs are met, whether we customize the material, or devise a different educational path to prepare for this course.

Please contact us for details about our online pre and post test assessment services, custom managed training plans for one student or your entire organization, or our custom online training program management system for monitoring the courses or

progress while skilling your students of all experience levels.

► **Bridging the Gap: Collaborative Mentoring Services**

Our team of technical experts is also available for various project assistance services to help your team apply their newly-learned classroom skills to their real-world project in a meaningful, practical way, right after the training ends.

Our custom **collaborative mentoring programs** integrate with or extend your team’s classroom training experience, to help bring these skills into existing (or inherited) legacy projects, into new projects, or to simply keep your students sharp them in between projects. Our programs can be highly involved and closely integrated with your project timelines or group development efforts, or can be less involved, serving simply as an overarching educational framework or ‘spot check’ to keep your group skills moving forward in between projects or waiting for projects to begin. Please contact us for details about this exciting custom service.

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**Workshop Topics Covered**

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**Need more info?** Please note that a more detailed outline of the course table of contents, lists of lab exercises and project descriptions is available. Please contact us at [Training@triveratech.com](mailto:Training@triveratech.com) for info.

**Need courseware?** This course is fully customizable, and also available for license with complete support for qualified organizations. Please contact [Courseware@triveratech.com](mailto:Courseware@triveratech.com) for details.

**Session: SOA Overview**

- Service Defined
- SOA Defined
- Organizational Framework
- Technical Framework
- Orchestration
- Reusability
- Services vs SOA
- SOA in the past
- What is new in SOA
- Business impact/ROI
- Myths/Reality
- Adoption issues

**Session: SOA: the Business Proposition**

- Web services standards
- ESBs
- Leveraging business processes

- Challenge to adoption
- The SOAD Process
- Roles and Skills

**Session: SOA: an Architectural Perspective**

- SOA Design Principles
- RPC vs. REST
- Web services, SOAP, and WSDL
- Architectural Issues
- SOA Maturity Model

**Session: SOA: a Development Perspective**

- The SOAD Process
- Architecture
- OO/UML
- Services, operations and data
- Policies
- W3C standards
- Web services standards
- Testing

**Session: Service-Oriented Architecture**

- Principles
- Business Process-driven development
- Roles
- Messaging
- Transactions

- Security
- Business modeling
- Design issues
- EAI
- ESB
- Web services
- RPC vs. REST
- Web services, SOAP, and WSDL
- Integrating legacy applications
  - Extending the lifetime of legacy apps
- External integration
- Governance
  - What needs to be governed and what is already governed?
  - Governing IT vs. SOA
  - Continuous improvement
- Strategies

**Case Study Workshop**

- Discovery and Identification
- Recognizing Potential for Reusability
- Motivation for Service-Based Approach
- Problems With Ad Hoc Approach
- Advantages of Managed Approach
- Harvesting Reusable Services
- Refactoring and Agility in Face of Change
- Issues Yet to Be Adequately Resolved

### Session: Defining Business Processes

#### Using BPEL

- BPEL Overview
- Top-down Process Design
- Bottom-up Process Design
- Using WSDL
- Process Elements and Properties
- Select Expression Language
- Partner Links
- Variables
- Fault Handler
- Compensation Handlers
- BPEL Process as a Service

### Service-oriented Analysis and Design

- OOAD vs. SOAD
- Analysis
- Design
- Implementation
- Process

### Session: SOA Analysis

- Use cases
- Identifying services
- Operations and data formats
- Error conditions
- Service reusability
- Identifying processes
- Best practices

### Session: SOA Design

- Business process modeling
- XML and XML Schema
- Asynchronous services
  - Callbacks
  - Messaging

- Non-blocking calls
- Best practices

### Session: SOA Best Practices

- Planning
- Standardizing
- Designing
- Managing
- Implementing

### Session: SOA Patterns

- Direct Connections
- Broker Interactions
- Serial Process Flows
- Serial and Parallel Processes

### Session: SOA Anti-Patterns

- SOA Adoption antipatterns
- Service identification & design antipatterns
- Service realization antipatterns

### Session: SOA Governance

- Governance Overview
- Importance
- Responsibilities
- Implementation

### Session: Enterprise Service Bus

- Overview
- Role in SOA
- Security Issues
- Scenarios and Analysis
- ESB Issues

### Session: SCA and SDO

- Overview
  - Service Components
  - Service Data Objects
- ### Session: Web Services Overview
- W3C standards
  - WSDL
  - UDDI
  - Tools
  - Implementation technologies

### Session: Introduction to WSDL

- Overview
- Documents
- Ports
- Bindings
- UDDI
- Syntax

### Session: Introduction to SOAP

- Overview
- Syntax
- Envelope
- Header
- Body
- Fault
- HTTP Binding

### Session: Messaging in SOA

- Overview
- Reliability
- Delivery
- Addressing
- Security
- Notification

## ► Why Work With Trivera Technologies?

Whether you are a project leader choosing a training provider or course to bring to your team, or an organization or an instructor looking to potentially license or use course materials to train your own team, or a student looking for an exciting, targeted training class to attend or to recommend to your colleagues - ***Our single focus is to make YOUR training event or experience a success.*** Here's why choosing Trivera Technologies as your education resource takes the risk right out of your decision making process...

- **We provide a solid SOA architecture, design and implementation development foundation.** Students will learn how to develop (and reuse!) essential SOA development and design skills and concepts properly, using best design practices, grounding them for advanced curriculum. Students will be prepared for designing and implementing real solutions, right after the class ends. Students will learn the importance of developing and maintaining well-designed, reusable and secure applications and services.
- **Our courses are focused - no "fluff" included.** We offer more than a "laundry list" approach to teaching. All lessons have clear objectives, are fundamental to core SOA development and design practices, and are reinforced by hands-on labs and solid practical examples. Each lesson has performance driven objectives that ensure students will learn technologies and skills core to fundamental server-side application design – nothing more, nothing less.
- **Our materials are comprehensive, and current.** Our comprehensive manuals include not only a hard copy of the course presentation, but also detailed reference notes, pertinent diagrams and charts, current lists of suggested online resources and articles, and often technical

tutorials or white papers geared to the topics at hand. Our dedicated course development team keeps everything as current as possible with both industry trends and software editions to ensure your team is getting the most current information available.

- **We set you up!** Hands-on courses also include our unique materials for each student, complete with our **LoadNGo Instant Classroom** course set up DVD, software, and a multitude of learning resources that complement the course. Run the course right off the DVD – minimal set up for your company – maximum results for your students.
- **We foster "Learning by Doing"**. Progressive labs are designed in such a way that students get a firm grasp on fundamental skills while they work toward designing a complete application. All labs are take-home, and all solution code is presented in an easy to use self-study format for future use and review.
- **True content ownership gives us flexibility & quality above the rest.** These course materials are wholly-owned by our company and fully customizable - at little or no cost- to help you best meet your learning objectives. We write and own what we teach. We have many dedicated experts available worldwide to instruct your team, and can provide services around the globe, either locally or virtually. We work closely with you to produce the most effective events and materials for your team, within your desired timeframe and budget.
- **We have to adhere to higher standards.** As a courseware provider to other organizations, training firms or independent instructors, our content and hands-on lab materials are licensed internationally by dozens of firms, and are therefore subject to very stringent quality requirements. Not only will your organization benefit from our own technical team's technical expertise, but also the feedback of hundreds of students and trainers using these materials, worldwide, on a regular basis. This unique fact guarantees that our materials are not only robust and interesting, but also technically correct, current and of the highest quality and usability.
- **We bring years of practical, current experience into the classroom and content.** Our instructors and course authors are also skilled mentors, Java, JEE/JavaEE, J2EE, .Net, Agile, SOA, and web services developers, architects and security-oriented professionals. We believe that learning, using and maintaining solid software execution and delivery methods are as important as gaining sharp coding skills. Best Practices for software development and execution, beyond technical coding skills, are enforced throughout all of our courses and discussions. Our team brings this extensive experience into every classroom and engagement. Our team has trained thousands of students.
- **We're skills-centric.** Although our team has extensive experience using a variety of tools and solutions, our core content is "technology-centric". Our aim is to teach you the best skills and solutions out there – not to sell you software from any particular vendor.
- **We're technical authors, contributors and industry speakers.** Our team was selected to write the online *J2EE, EJB, EJB CMP-CMR and Web Services Tutorial Series for IBM developerWorks®* ([www.ibm.com](http://www.ibm.com)) These are the same instructors who train our classes and author the courseware. Most of our trainers/consultants have also authored additional articles on web services, EJB, Struts, J2EE / JEE and advanced Java topics, and are recognized speakers and presenters on the industry technical seminar circuit. Our team is comprised on several successful published authors. Members of our team have written or contributed to: *Eclipse Kick Start, Mastering Eclipse; Professional Jakarta Struts; Using Java Tools for Extreme Programming; Mastering Resin; Mastering TomCat and others.*
- **Our services are guaranteed.** Whether you're a stakeholder organizing your firm's educational services, a student in our live or virtual classroom or a trainer using our materials to educate your own client or team – **Our core mission is to make YOU a success in the classroom.**

#### ► For Additional Information

**Need dedicated training?** All courses can be brought onsite or run virtually for a **private presentation**, customized to suit your unique requirements or goals. Please contact [Training@triveratech.com](mailto:Training@triveratech.com) for course details, Public Schedule dates and locations, and Special Discount Offers.



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