

SOA Architecture and Design Principles

Course Summary

Description

This course will provide each student with an overview of key concepts and issues associated with the adoption of a service-oriented architecture, including SOA principles, service design and infrastructure. It will explore the definitions and principles of each type of fundamental shared service to include presentation, business, and data services. Additionally, the course explores SOA runtime governance, service bus, service registry, security and service monitoring issues. This course trains students to apply key Service-Oriented Architecture (SOA) principles to their current SOA adoption plans, understand the scope and characteristics of SOA service infrastructure and understand the design principles associated with SOA common infrastructure and shared services

Objectives

At the end of this course, students will be able to:

- Understand the principles of design using a layered services architecture
- Depict the characteristics of a data service, shared business service, and presentation service
- Illustrate the security issues for shared services within an enterprise SOA
- Demonstrate SOA runtime and service lifecycle management issues
- Illustrate the BEA product mapping strategies as they relate to shared service access, governance, security, and service management
- Discuss the design considerations in using an SOA service registry, Enterprise Service Bus, and a security services infrastructure
- Understand best practices for our application's service design considerations
- Depict the different integration patterns utilized in an SOA environment.
- Depict the role of the Self-Service pattern, Collaboration, Information Aggregation and Extended Enterprise pattern
- Understand the role of the Integration patterns: Access Integration and Application Integration
- Depict the use of composite patterns
- Define the application patterns for the complete realm of integration patterns

Topics

- Introduction to SOA
- SOA Implementation
- SOAD
- RUP Approach for SOA
- Business Process and use Cases
- Service Discovery
- Service Functional Design
- Business Process Development
- SOA Governance

Audience

This course is designed for Java developers, project leaders, IT architects and other technical individuals that need to understand how to develop and implement SOA and event-driven architectures.

Prerequisites

Each student should have an understanding of application development and have an enterprise architecture background.

Duration

Two days

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Course Outline

- I. Introduction to SOA**
 - A. SOA business challenges
 - B. Service Oriented Architecture
 - C. UDDI Registry
 - D. Service Requestor
 - E. Web Service
 - F. B2C vs B2B
 - G. Defining XML
 - H. Defining SOAP
 - I. Architecture
 - J. Messages
 - K. Web Services Descriptive Language (WSDL)
 - L. Definition
 - M. Usage
 - N. Application Server
 - O. Enterprise Service Bus
 - P. Process Server
 - Q. Message Broker
 - R. Business process modeling
- II. SOA Implementation**
 - A. Components
 - B. SOAP
 - C. XML
 - D. UDDI
 - E. WSDL
 - F. J2EE Integration
 - G. JMS
 - H. Enterprise Service Bus
 - I. EJB Service Interface
 - J. Process Servers
 - K. eCommerce usage
 - L. Hosted
 - M. Published
 - N. Discovery
 - O. Usage
 - P. Development using WebLogic Workshop
- III. Service Oriented Architecture Object Analysis & Design (SOAD)**
 - A. Objectives
 - B. Introduction to SOAD
 - C. Applying SOAD Principles
 - D. Abstraction
 - E. Encapsulation
 - F. Application
 - G. Modularity
 - H. Hierarchy
 - I. Granularity concepts
 - J. Coupling
 - K. SOAD Methodology Steps
 - L. Stage 1-Process Modeling
 - M. Stage 2-Service Identification
 - N. Stage 3-Service Design & Implementation
 - O. Stage 4-Process Implementation
- IV. RUP Approach for SOA**
 - A. RUP Methodology
 - B. Rational Unified Process phases
 - C. Inception Phase
 - D. Elaboration Phase
 - E. Construction Phase
 - F. Transition Phase
 - G. SDLC and the Rational Unified Process
 - H. RUP Implementation
 - I. Artifact discovery
 - J. Usage in SOAD environment
- V. Business Process and Use Cases**
 - A. SOAD stages
 - B. Business Process Models
 - C. Requirements
 - D. Internal/External partners
 - E. Process models
 - F. Building Use Cases
 - G. Overview
 - H. Actors and Processes
 - I. Classification
 - J. Use Case Modeling Steps
 - K. Use Case vs. Business Process
 - L. Diagramming
 - M. Use Cases
 - N. Business Process
 - O. UML usage
 - P. Design Patterns and best practices

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Course Outline (cont'd)

VI. Service Discovery

- A. Overview
- B. Identifying services
- C. Processes vs subsystems
- D. Service hierarchy
- E. WSDL generation
- F. WSDL components
- G. Ports
- H. Porttypes
- I. Messages
- J. Bindings
- K. Discovering patterns

VII. Service Functional Design

- A. Service Overview
- B. Implementation alternatives
- C. Use Case analysis
- D. Classes
- E. Relationships
- F. Class diagram development
- G. UML class notation
- H. Design alternatives
- I. Top-Down
- J. Bottom-Up
- K. Meet-in-middle
- L. Implementation patterns
- M. JMS-based
- N. JCA-based
- O. JAX-RPC
- P. Message broker
- Q. Mappings
- R. Data
- S. Interfaces

VIII. Business Process Development

- A. Business Process diagrams
- B. Advantages/Disadvantages
- C. Business Process evolution
- D. BPM
- E. BPEL
- F. BPEL Modeling
- G. Flow objects
- H. Connecting objects
- I. Artifacts
- J. Defining eBusiness Integration Patterns
- K. Business
- L. Integration
- M. Application
- N. Runtime
- O. Business patterns
- P. Self Service
- Q. Collaboration
- R. Information aggregation
- S. Extended Enterprise
- T. Integration Patterns
- U. Process
- V. Application
- W. Information

IX. SOA Governance

- A. Challenges and Risks in SOA
- B. Need for SOA Governance
- C. SOA Governance Model
- D. Roles
- E. Address SOA Governance Challenges
- F. Establishing decision rights for your SOA environment
- G. Defining appropriate services
- H. Managing the lifecycle of service assets
- I. Measure effectiveness