Enterprise Application Integration Patterns – Course Outline

# Duration

2 days

# Objectives

After this course the participants will understand the capabilities of Apache Camel

* Understanding EAI Patterns and standard notations used for elements participating in EAI
* Understand how to split complex integration scenarios into smaller recurring problems solved using individual EAI Patterns
* How to implement Enterprise Application Integration Patterns (EIPs) using Apache Camel and how to deploy and run on Apache Karaf
* Understanding SEDA queues, integration with Apache ActiveMQ through Blueprint XML DSL as well as using programmatic API.
* Understanding different types of end points – FTP, JMS, DB, Webservices and custom endpoint (both producer and consumer)
* Understanding message parsers and formatters – CSV, Fixed Length, Custom endpoint
* Understanding intermediate processor component to do transformation, message enrichment and writing custom processor
* Understanding and using content based routers
* Understand relevance of EAI Patterns in the era of Big Data, IoT, Cloud and Microservices
* Understand some of the Microservices Patterns

# Audience

This course is for architects and senior developers who have worked on several parts of Application Integration solution using leading, proprietary EAI tools / software like TIBCO.

# Pre-requisite

* A good knowledge of solving integration problems
* A basic understanding of distributed systems concepts (SOA, web services, messaging) and the related standards
* Though not mandatory, a good working knowledge of Java, including a good understanding of Java developments tools (Maven, Eclipse) is preferable as some of the examples are based on Java platforms

# Outline

## Day 1 – Session 1

* Solving Integration Problems using Patterns
* Integration Styles – Compare and Contrast
  + File Transfer
  + Shared Database
  + Remote Procedure Invocation
  + Messaging
* Components of a Messaging System
  + Message Channel
  + Message
  + Message Endpoint
  + Message Translator
  + Message Router
  + Pipes and Filters
* Case Study / Demo of a typical Integration Problem using Apache Camel and some of its out-of-the-box components

## Day 1 – Session 2

* Characteristics of Messaging Channel
  + Point-to-Point Channel
  + Publish-Subscribe Channel
  + Datatype Channel
  + Invalid Message Channel
  + Dead Letter Channel
  + Guaranteed Delivery – Reliable Queues and Durable Consumers
  + Channel Adapter
  + Messaging Bridge
  + Message Bus
* Case Study / Demo using Active MQ / Rabbit MQ (AMQP) depicting p2p, pub-sub, request-response protocol
* Different types of Message Construction
  + Command Message
  + Document Message
  + Event Message
  + Request – Reply
  + Return Address
  + Correlation Identifier
  + Message Sequence
  + Message Expiration
  + Format Indicator
* Demo: Creating our own custom -parsers to construct message as part of orchestration.

## Day 2 – Session 1

* Overview of Message Routing patterns
  + Content Based Router
  + Message Filter
  + Splitter and Aggregator
  + Resequencer
  + Routing Slip
  + Process Manager
  + Message Broker
* Demo: How to customize and use Content Based Router in Apache Camel using DSL
* Different ways to transform Messages
  + Envelope Wrapper
  + Content Enricher and Content Filter
  + Normalizer and Canonical Data Model
* Understanding Messaging Endpoints
  + Messaging Gateway
  + Messaging Mapper
  + Transactional Client
  + Types of Consumers
    - Polling
    - Event Driven
    - Competing
    - Selective
  + Message Dispatcher
  + Idempotent Receiver
  + Service Activator
* Case study: Demo of complete orchestration and execution of messaging system involving all the components discussed above

## Day 2 – Session 2

* Best Practices in designing control systems around EAI solution
  + Control Bus
  + Detour
  + Wire Tap
  + Message History and Store
  + Smart Proxy
  + Test Message and Channel Purger
* Complete Case Study of an EAI problem statement
* Relevance of EAI Patterns in the era of Big Data, IoT, Cloud and Microservices
  + Leveraging Big Data tool set to handle high volume of data – both batch and real time
  + How EAI plays a role in IoT
  + Integration with Cloud infrastructure and extending boundaries
  + Characteristics of Microservices
* Microservices Patterns especially API Gateway

# Software Requirements

* Windows 7/8/10 Operating System or Ubuntu 12.X or highter
* Java 1.8 (preferred)
* Eclipse IDE (Mars or higher) for JavaEE developers along with Maven plugin. Also need internet connection to download required libraries thrugh