A4M36ISS: Introduction

Jiří Pechanec
QA Engineer
September 17th, 2015

Agenda

- Goals
- Organizational details
- Introduction into system integration
    - Principles
    - Past/Present/Future
- Tools/Products used

Goals and Organization

About team

- Red Hat
- Middleware QE (JBoss)

Goals

- Introduce into system integration world
- Overview of SI open-source software
- Find future Red Hatters :-)

Organizational details

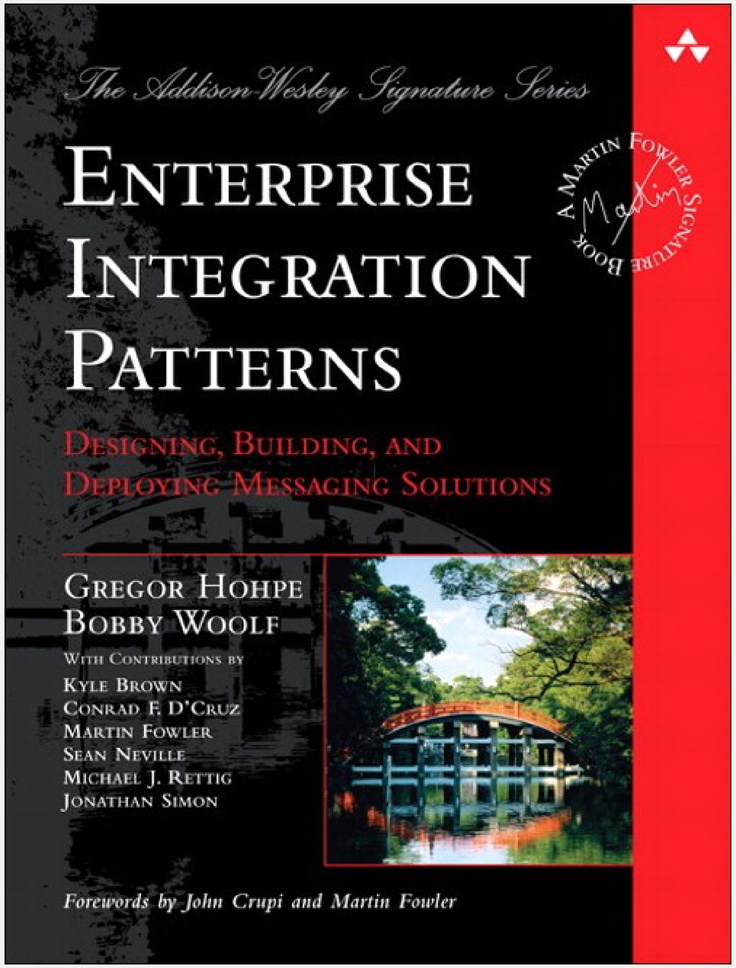
- 8 topics in 4 days
- Mostly theory followed by a lab
- Grading based upon a team project
- Materials on-line
  - https://developer.jboss.org/wiki/SystemIntegrationWithJBoss

Introduction into System Integration

Why?

- Organic growth of an enterprise
- Mergers and acquisitions
- New values created by combinations of existing products
- Incremental legacy application replacements
- Access internal data from public facing applications

Bible


The Addison-Wesley Signature Series

ENTERPRISE INTEGRATION PATTERNS

DESIGNING, BUILDING, AND DEPLOYING MESSAGING SOLUTIONS

GREGOR HOHPE
BOBBY WOOLF

WITH CONTRIBUTIONS BY
KYLE BROWN
CONRAD F. D'CRUZ
MARTIN FOWLER
SEAN NEVILLE
MICHAEL J. RETTIG
JONATHAN SIMON

Forewords by John Crupi and Martin Fowler

Why?

- Organic growth of an enterprise
- Mergers and acquisitions
- New values created by combinations of existing products
- Incremental legacy application replacements
- Access internal data from public facing applications

Why?

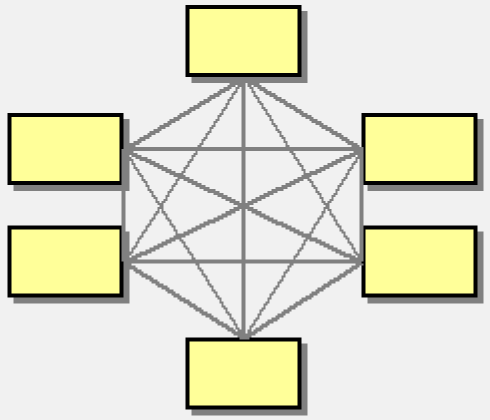
- Organic growth of an enterprise
- Mergers and acquisitions
- New values created by combinations of existing products
- Incremental legacy application replacements
- Access internal data from public facing applications

Architectures

- Spaghetti
- Hub-and-spoke
- Bus
- Service Oriented Architecture
- Service Component Architecture
- Event-Driven Architecture
- Microservices

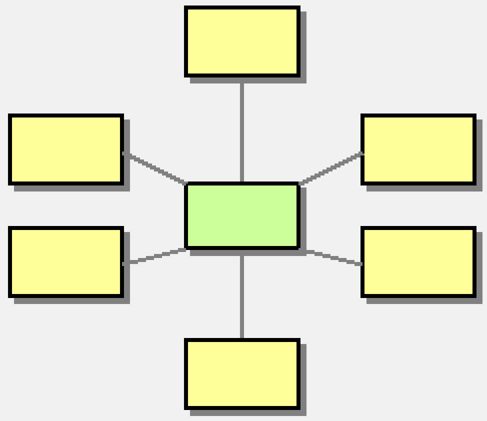
Spaghetti

- Ad-hoc integration
- No system
- Difficult to introduce a new system
- Almost impossible to do a change
- Requires modification of source code of integrated systems



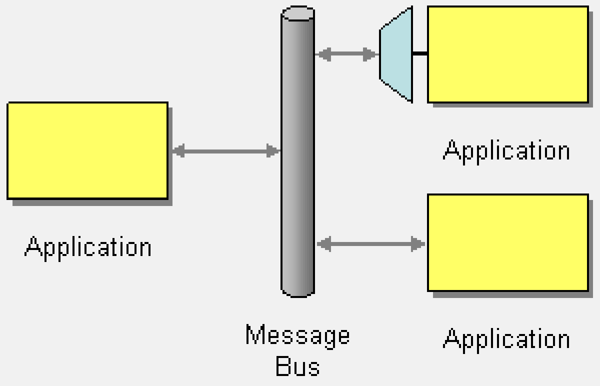
Hub-and-spoke

- Every system speaks only to a central node
- Clients effectively decoupled
- Easy to add a new node
- Difficult to modify existing API
- Can have scalability issues
- Most useful application
    - Message Broker



(Enterprise Service) Bus

- Applications communicate via (virtual) bus
- Main features
  - Connectivity
  - Routing
  - Transformation



Service Oriented Architecture

- Everything is a service with defined contract
- Mostly associated with web services
  - SOAP
  - WSDL
  - UDDI
- Descriptive registry of services
- WS-* specifications

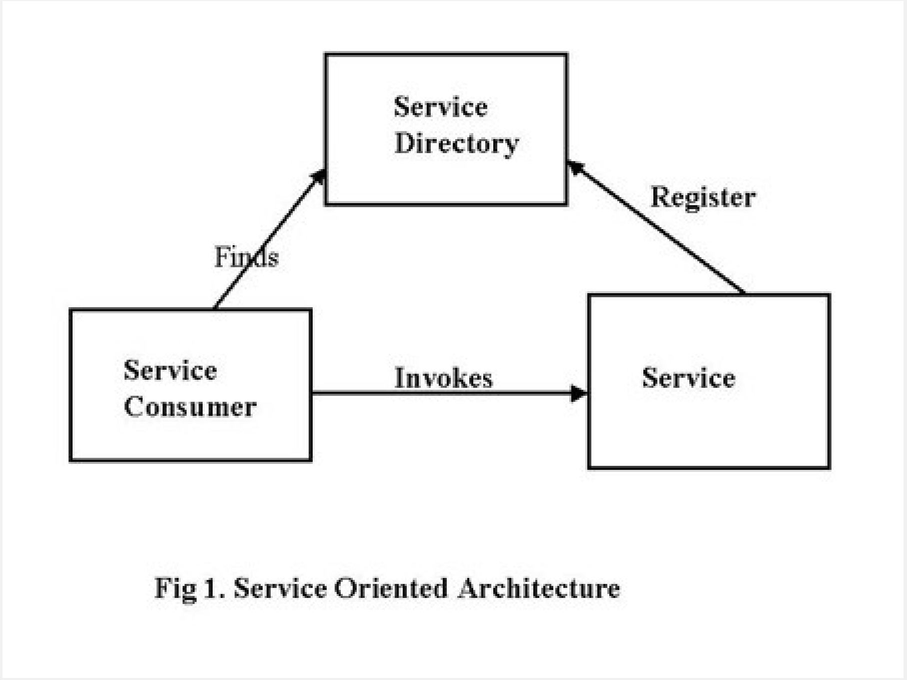
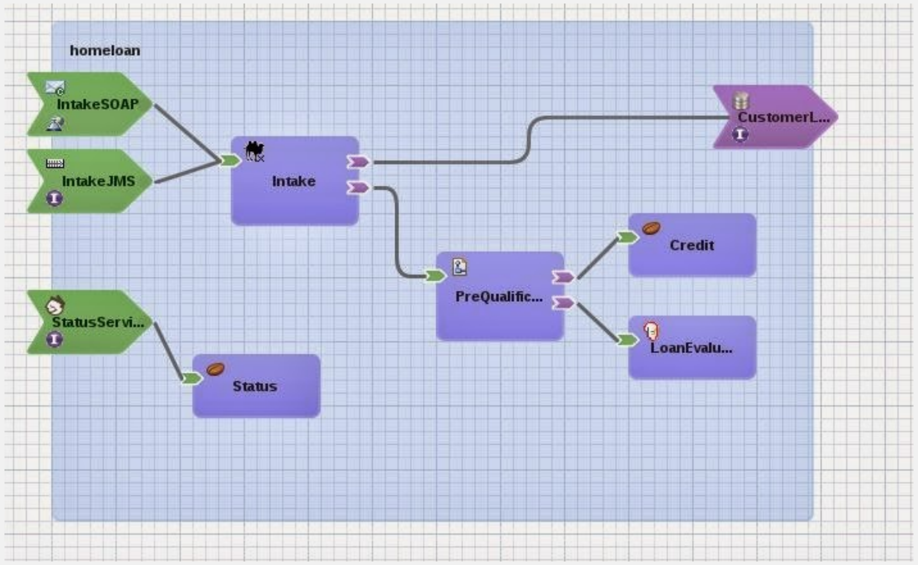


Fig 1. Service Oriented Architecture

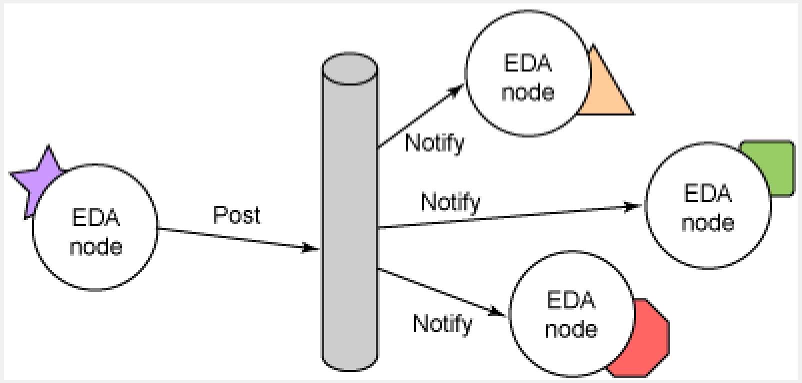
Service Component Architecture

- Artifacts
  - Component
    - Properties
    - Implementation
  - Composite
  - Entry point/service
  - Reference
  - Wire
- Not too widely used
- Defined as OASIS standard
  - Assembly model, language bindings,...
- Strict interface description and matching



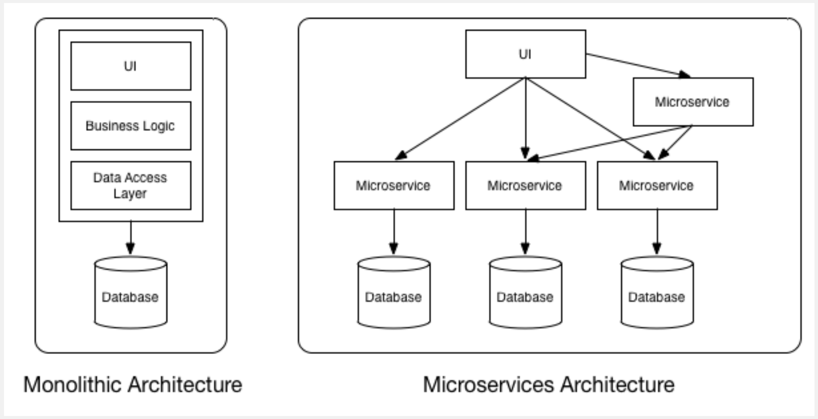
Event-Driven Architecture

- Services produces events and react to events
- Strongly decoupled
- Very scalable
- Event processing
  - Simple
  - Complex, Stream
- Difficult to understand
- Difficult to debug and monitor



Microservices

- SOA done right
- Lightweight
- Tries to avoid application container – just simple application
- Services easily replaceable
- Smart endpoints/dumb pipes
  - Is not there a risk of spaghetti?
- Perfect match for (Linux) containers - Docker



Product levels

- Integration frameworks
  - API to implement EIPs
  - Basic communication protocols
- Enterprise Service Bus
  - Standalone container
  - Managed deployments
  - Monitoring
- Integration Suite
  - BPM
  - BAM

Tools/Products used

Products used

- Apache Karaf
- Apache Camel
- JBoss Fuse
    - Fabric8
- JBoss SwitchYard
- JBoss A-MQ/ActiveMQ
- apiman
- Docker

Apache Karaf

- OSGi-based container
- Runtime for other products/projects
  - Hot deployment
  - Dynamic configuration
  - Centralized logging
  - Shell
  - JAAS integration
  - Blueprint DI
- Supports Apache Felix and Eclipse Equinox runtime
-

Apache Camel

- Integration framework
- Routing and mediation engine
- Configurable via
  - Spring/Blueprint XML
  - Java/Scala DSL
- Support for almost all EIP
- URI-based enpoint configration
- Integrated test kit

JBoss Fuse

- Enterprise Service Bus
- Inside
  - Karaf
  - Camel
  - ActiveMQ
  - CXF
- Fabric8
  - Central management and provisioning of large-scale installations
    - Ssh
    - jclouds
    - OpenShift

JBoss SwitchYard

- SCA-related service development and integration framework
- Augmentation of plain Camel with declarative
  - Transformation
  - Validation
  - Policy
  - Security
  - Routing
- Integration with
  - jBPM
  - BPEL
  - Drools

JBoss A-MQ

- Standalone message broker
- Inside
  - Karaf
  - Apache ActiveMQ
- Multi-protocol
  - Openwire
  - AMQP
  - STOMP
  - MQTT
- Cluster, mesh and network of brokers
- Manageable by Fabric8

apiman

- Open-source API Management
- Web-based configuration and management
- Policy Engine
  - Embeddable
  - Java EE
  - Vert.x
- Under fast development
- Centralization
  - Security
  - Quotas
  - Metrics

Docker

- Lightweight virtualization
- Complete isolated filesystem for a set of processes
  - Same kernel used
- Layering and inheritance
- Image registry
- But be careful with security
  - Docker is about running random crap from the Internet, as root and expecting not to be hacked ;-)

redhat

Questions?

plus.google.com/+RedHat

facebook.com/redhatinc

linkedin.com/company/red-hat

twitter.com/RedHatNews

youtube.com/user/RedHatVideos