

The Enterprise Service Bus as part of an integration strategy



**ESB FROM A TECHNICAL STANDPOINT: WHAT
IS ITS FUNCTION AND WHERE DOES IT FIT?**

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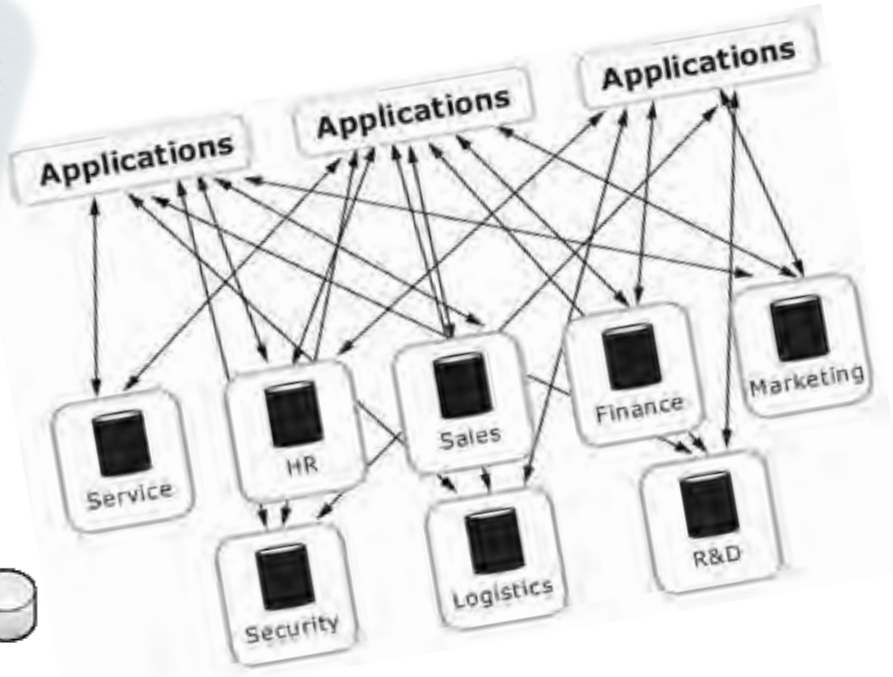
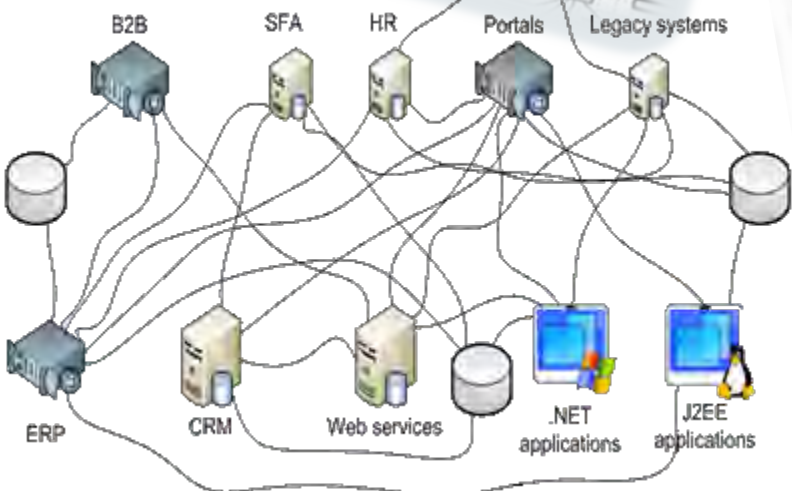
JUNE 17, 2013

What I'll cover

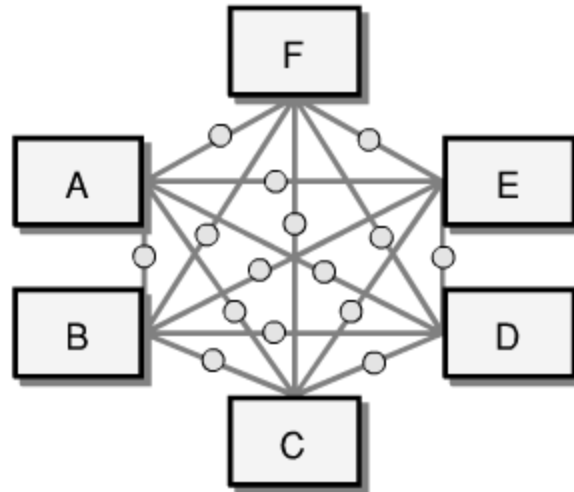


- **SOA**
- **ESB architecture**
- **The Yale SOA / ESB project**

Crazy Quilt of Integration Complexity



It only gets worse

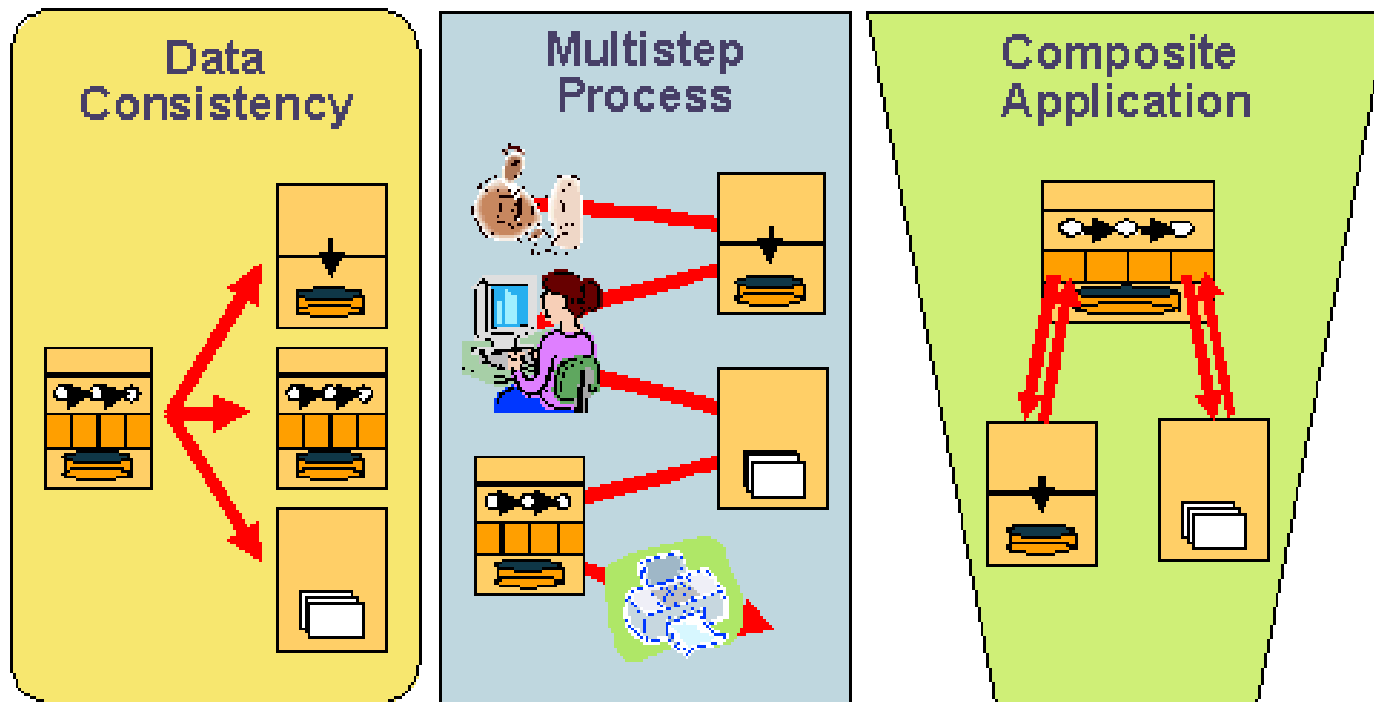


The Number of Connections Explodes with an Increasing Number of Systems

Integration Use Cases

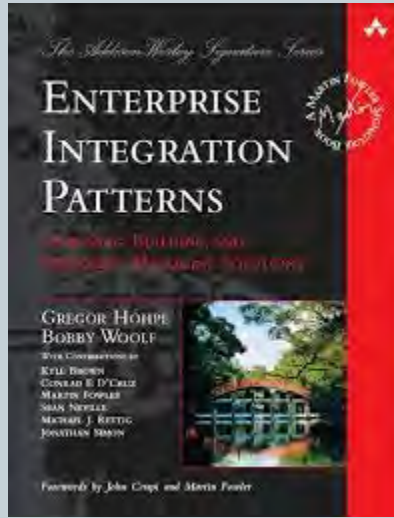


Figure 1. Integration Patterns



Source: Gartner (July 2008)

Enterprise Integration Patterns

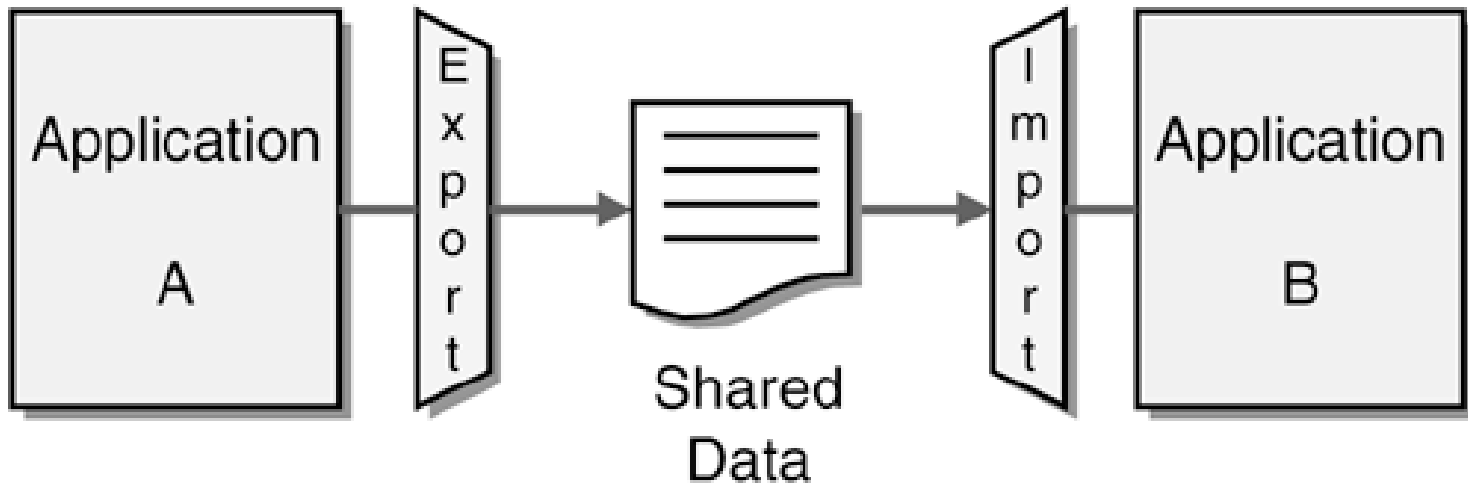
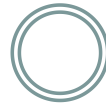


Enterprise Integration Patterns: Designing, Building, and Deploying Messaging Solutions

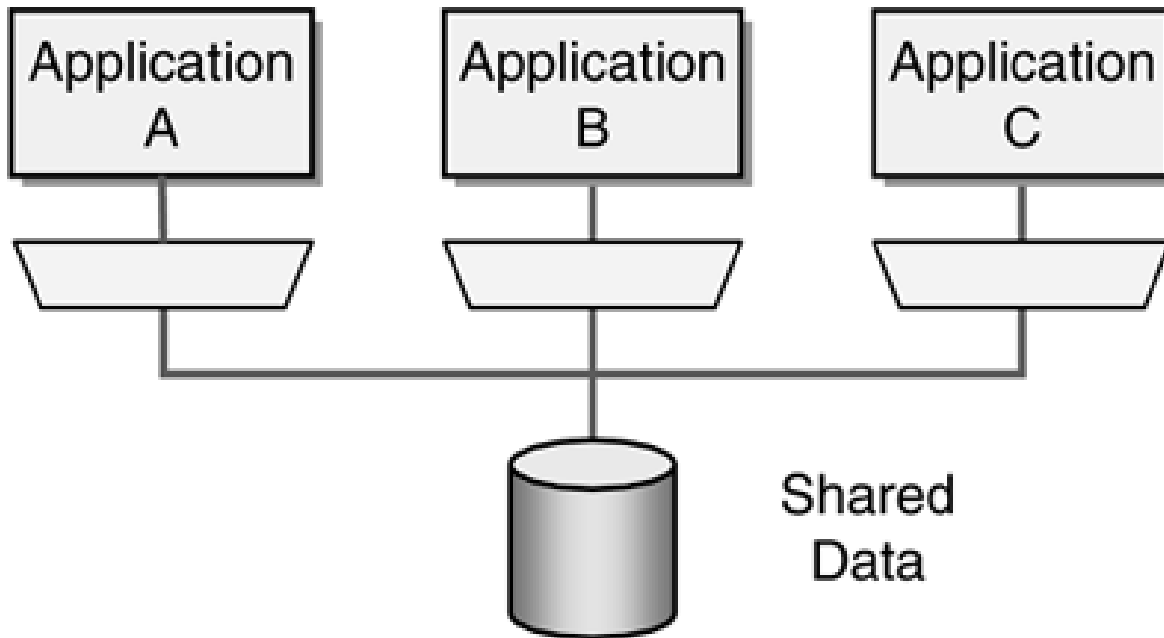
by
Gregor Hohpe,
Bobby Woolf,
Bobby Woolf

<http://proquest.safaribooksonline.com/book/technology-management/0321200683>

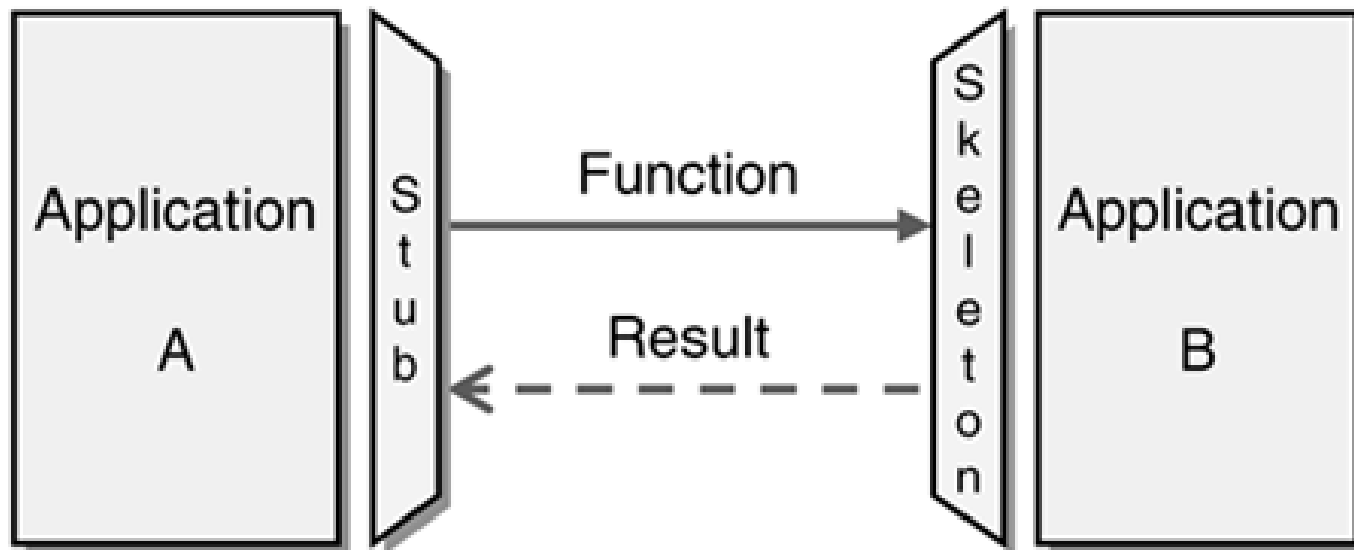
Integration Styles: File Transfer



Integration Styles: Shared Database

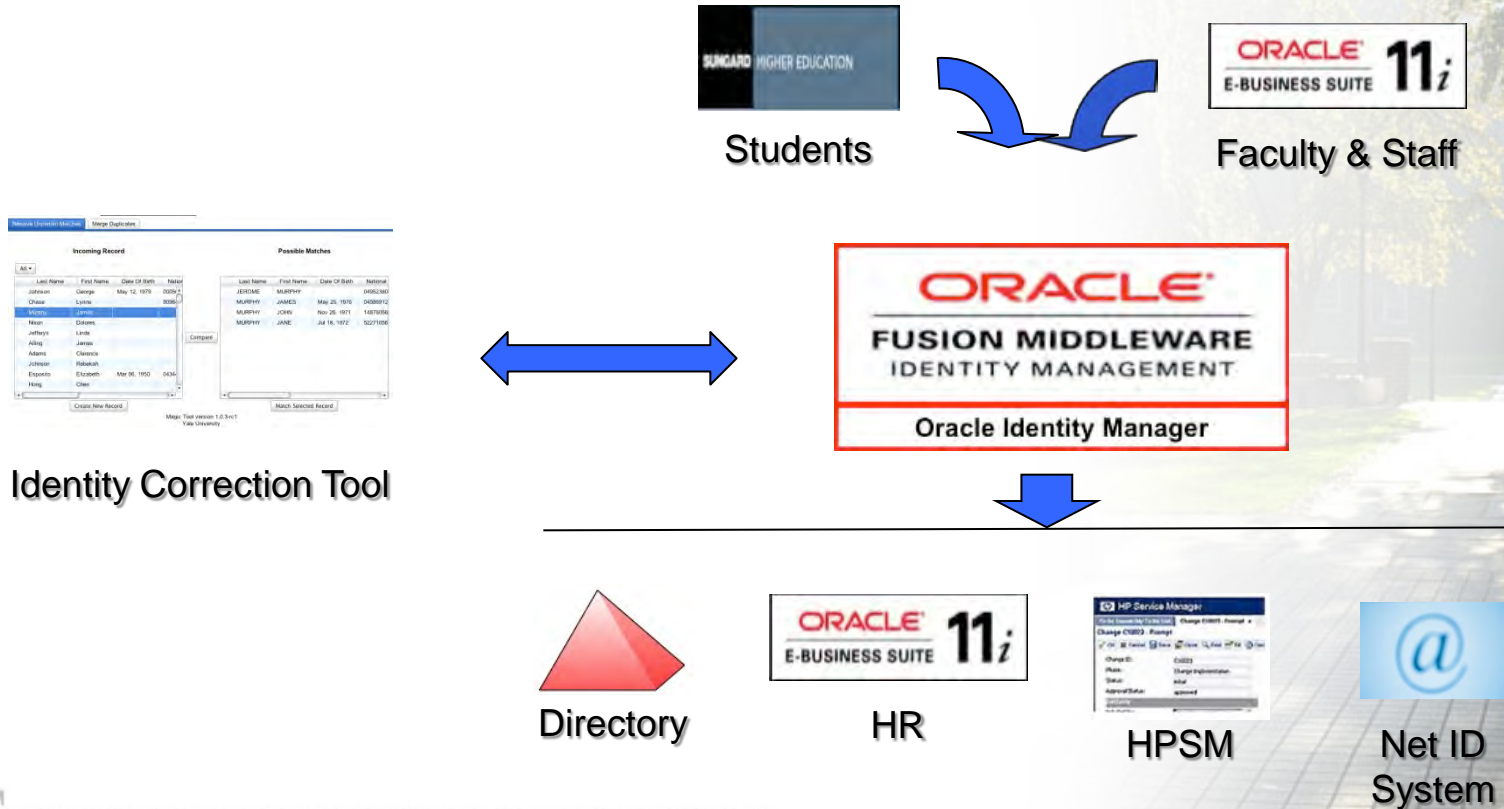


Integration Styles: Remote Procedure Call



Identity Sharing the New Way

- Data retrieved directly from HR and SIS
- Updates frequently
- Net ID, UPI and Directory updated immediately



The problem with tight coupling



Assumptions

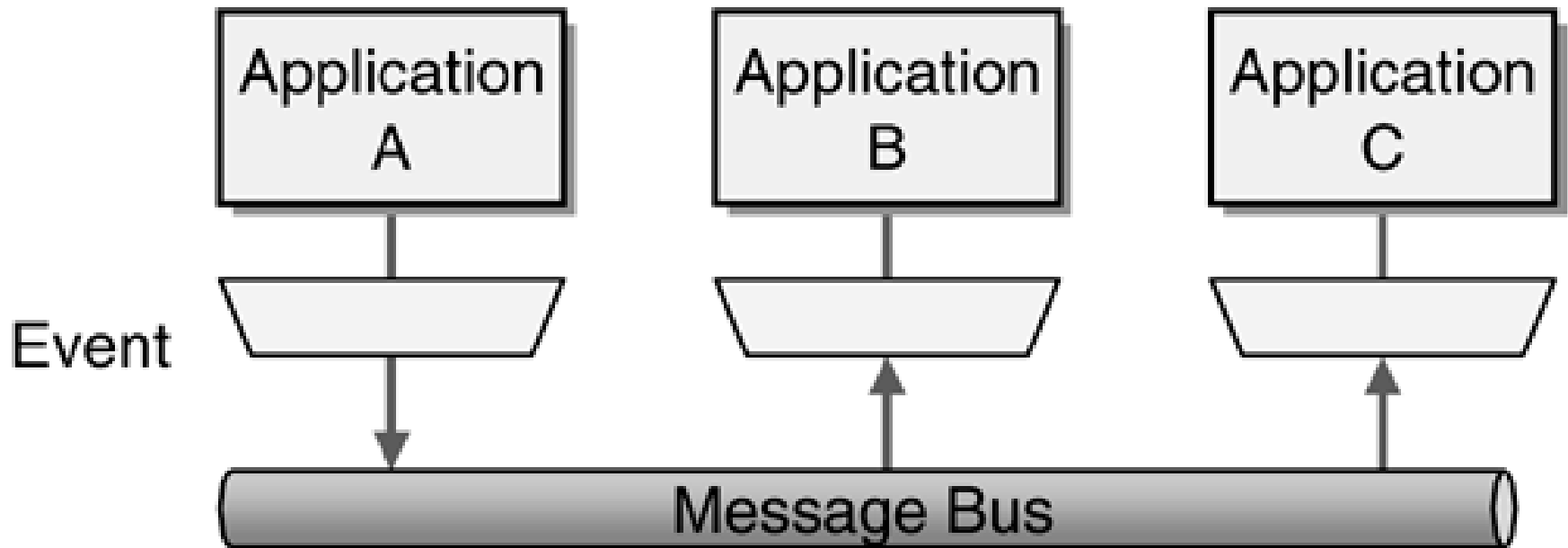
- Platform technology— internal representations of numbers and objects
- Location— hardcoded machine addresses
- Time— all components have to be available at the same time
- Data format— the list of parameters and their types must match

What is SOA

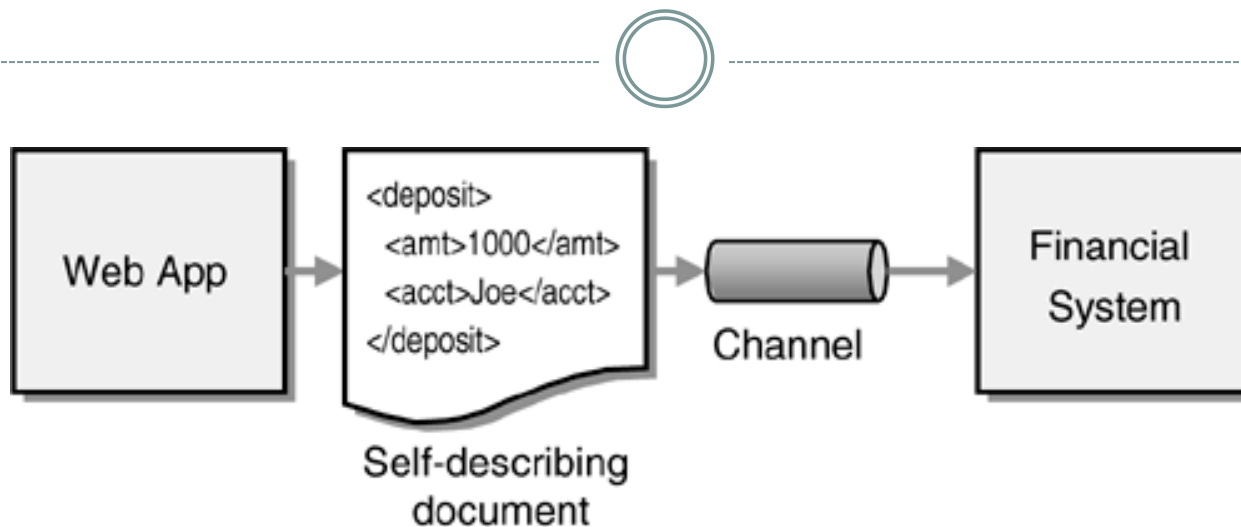


- *Service-Oriented Architecture* is a software architecture pattern in which applications or systems are constructed from underlying (and usually distributed) software services that conform to a specific set of characteristics.
 - **Loosely coupled**
 - Abstract & Location transparent
 - Contract based
 - Reusable & Composable
 - Discoverable
 - Stateless

Integration Styles: Messaging



Loose Coupling



- **Consumers are minimally impacted by changes to that service**
 - Implementation can change
 - Location can change
 - New features may be added

What is an ESB?



- **An Enterprise Service Bus is a runtime platform to help manage the operation of SOA services**
- **Must handle complex enterprise integration scenarios involving multiple (and often legacy) platforms, protocols and security models**

What is Yale doing about SOA?

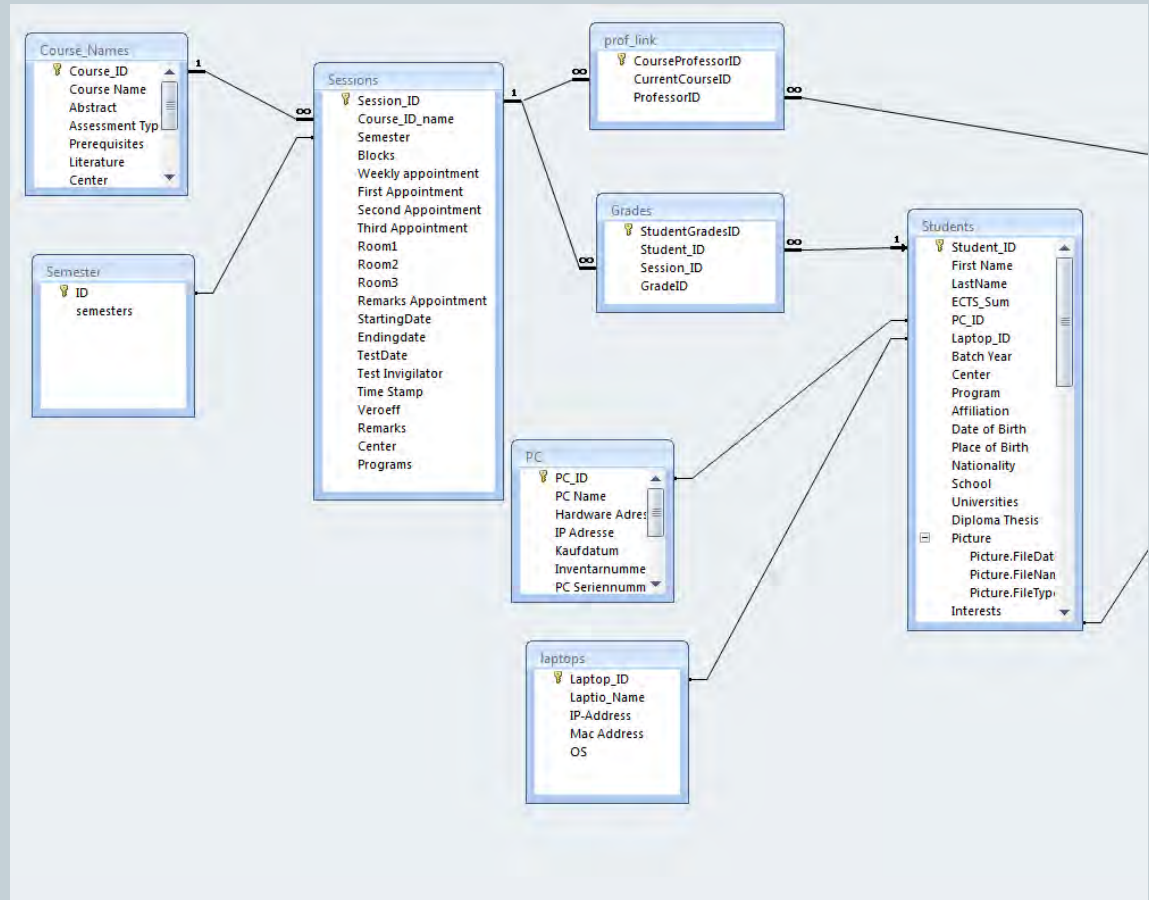


- SOA
 - Domain Model
 - Enterprise integration strategy

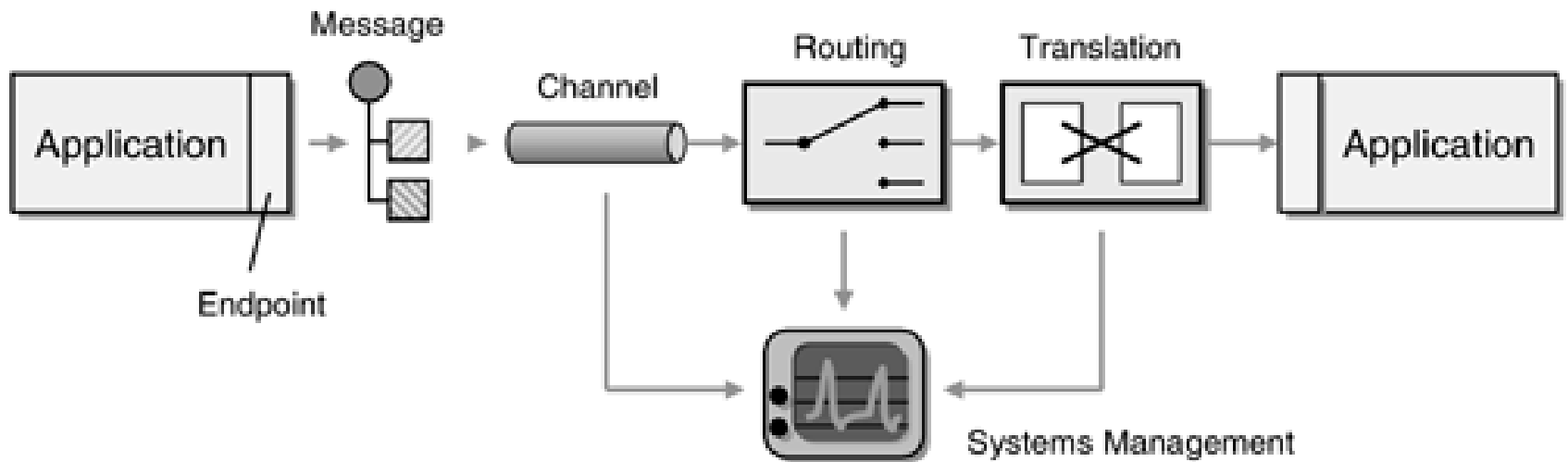
Domain Model



- An Example of a domain model that models student and courses



Basic Message-Based Integration

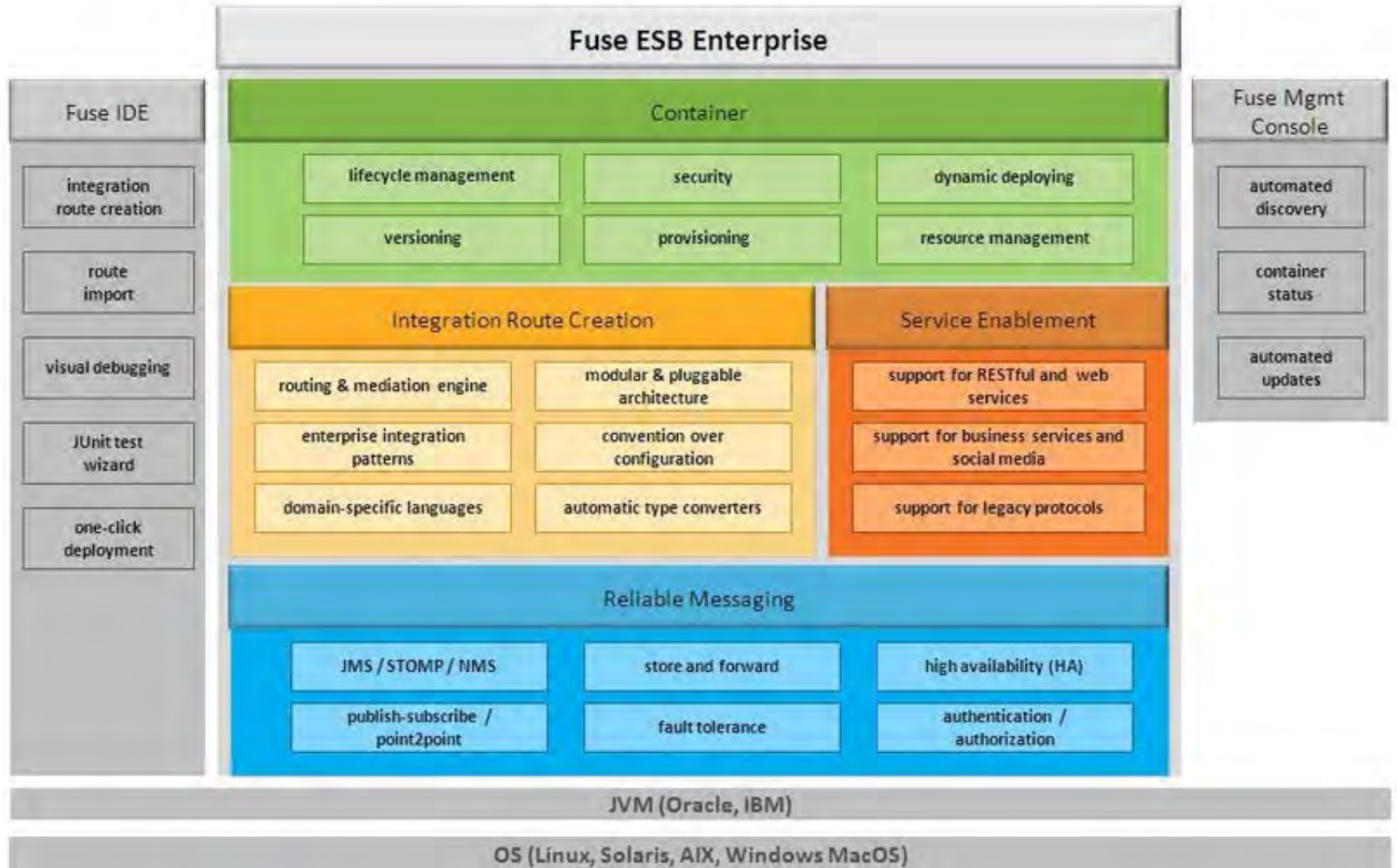


What is Yale doing with the ESB

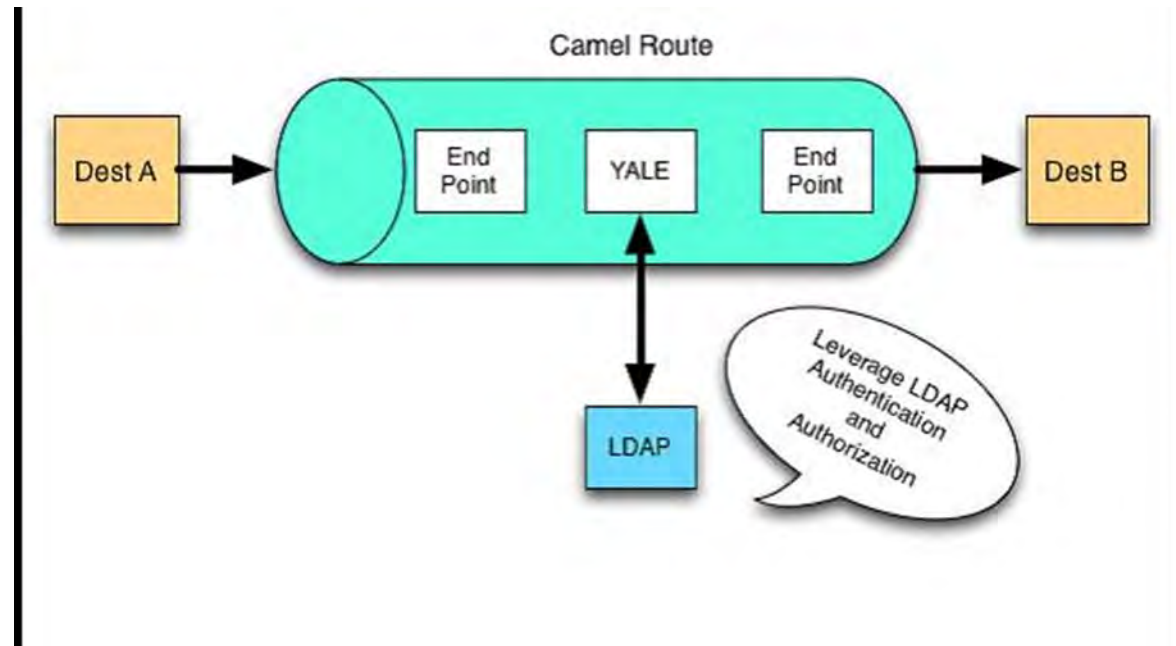


- ESB - Fuse
 - Open source stack with huge adoption
 - Complex & mature
 - Many Camel EIP components – no java required
 - Development environment for custom components
 - Templates for Yale

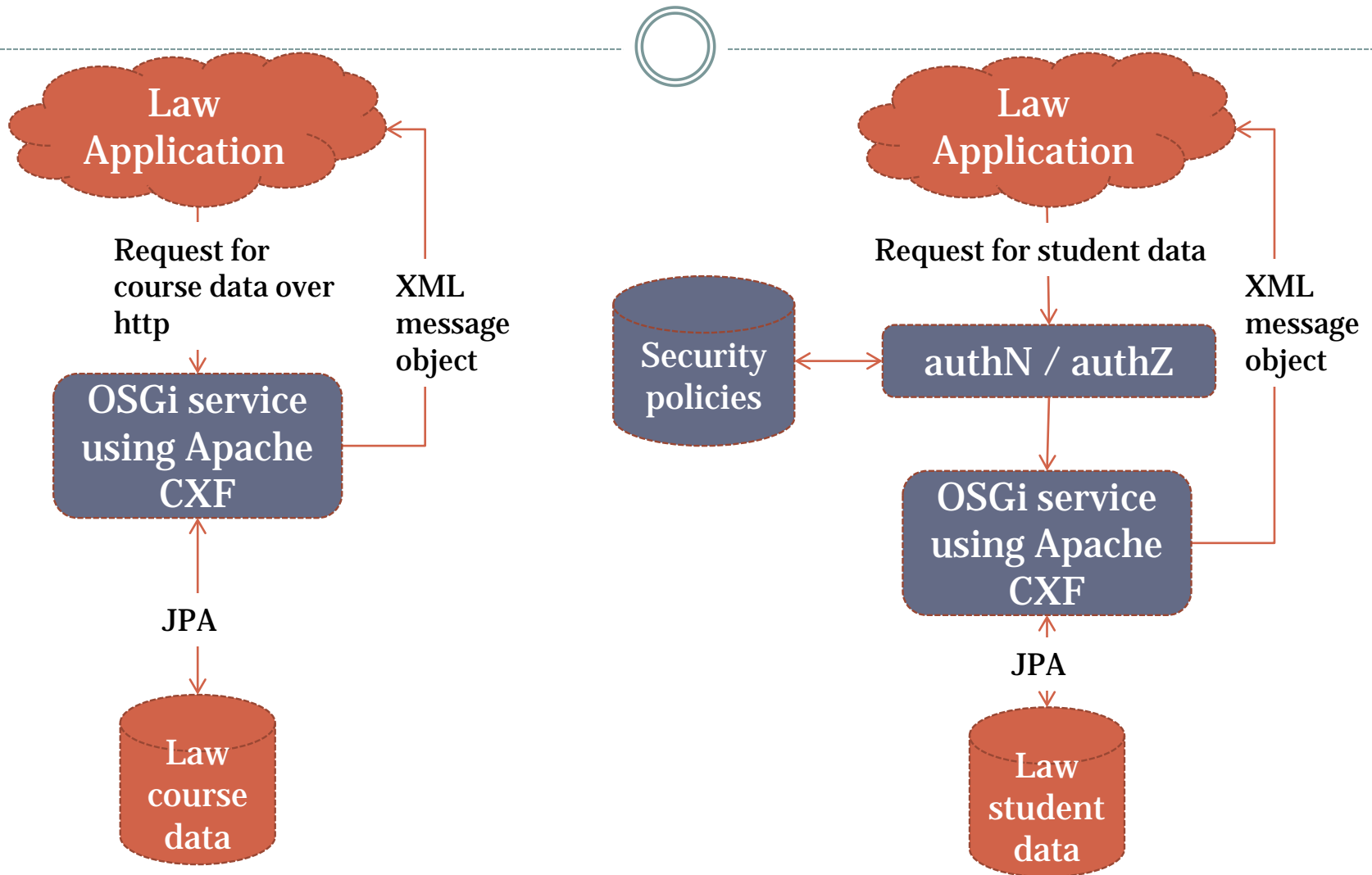
The Open Source Fuse ESB



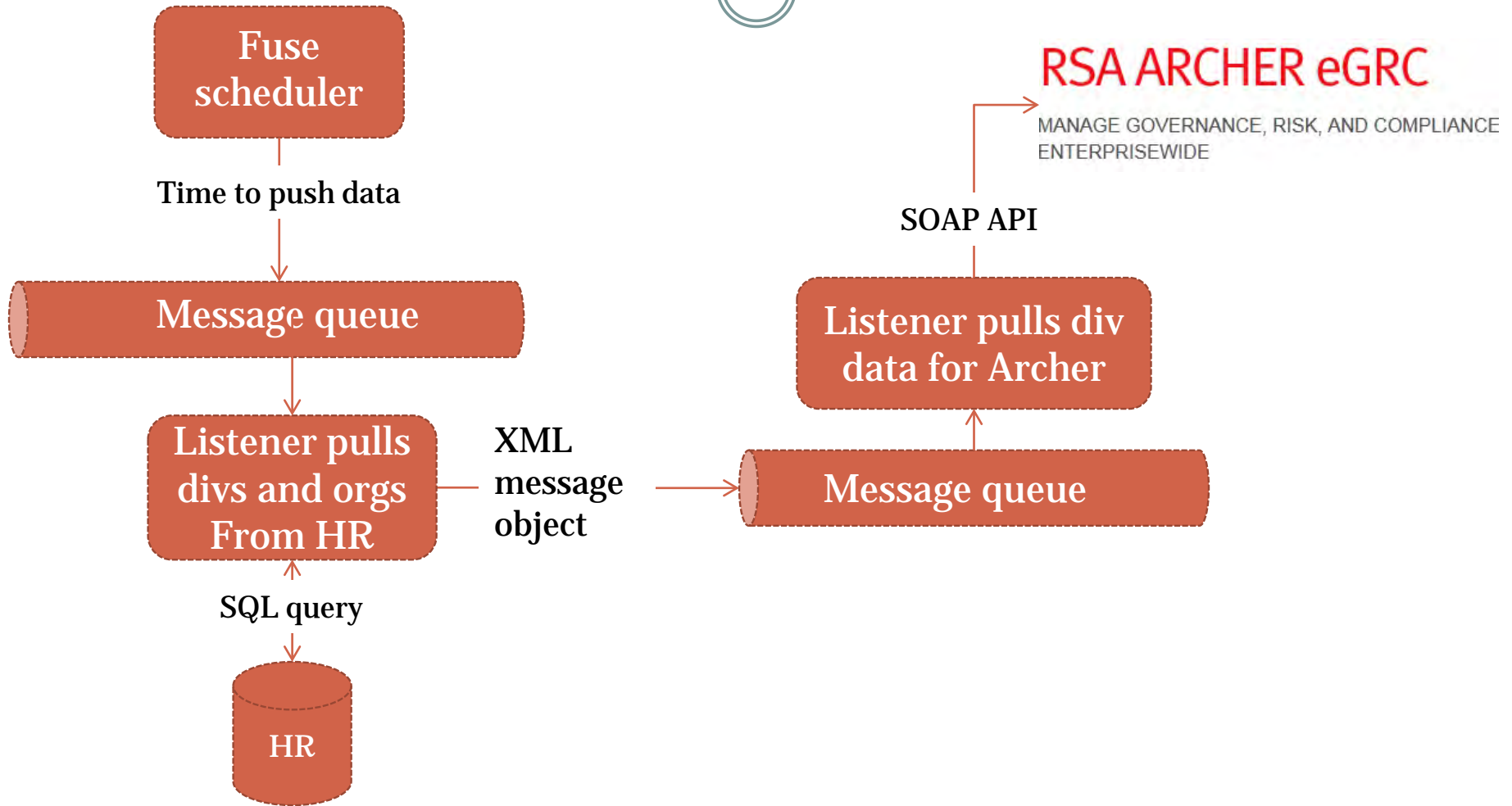
Added value - Security



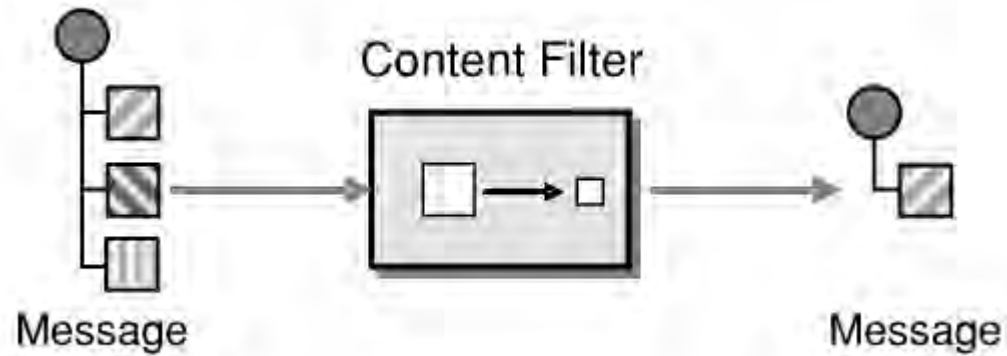
Law Bench on the ESB



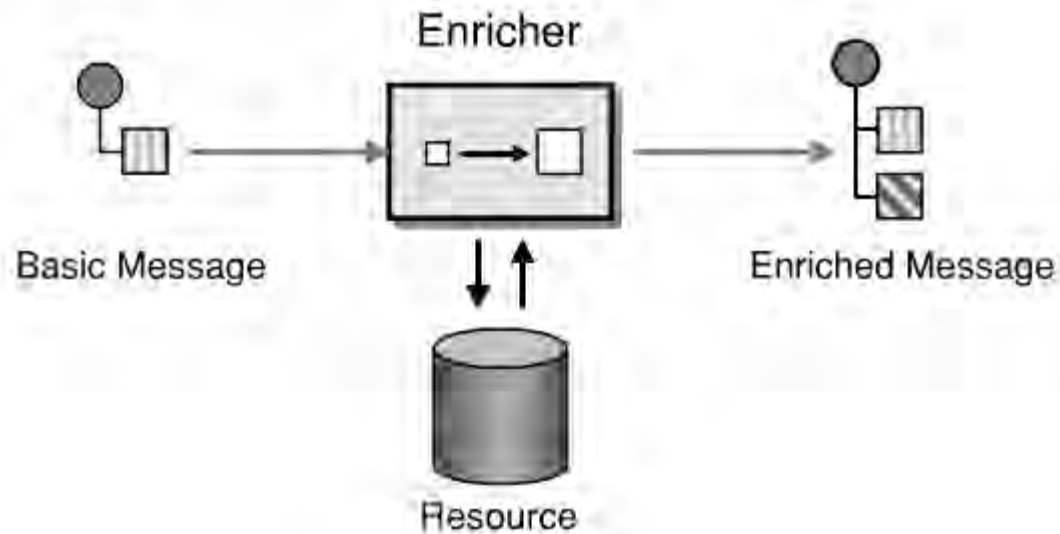
Archer on the ESB



Added value - Filtering



Added value - enrichment

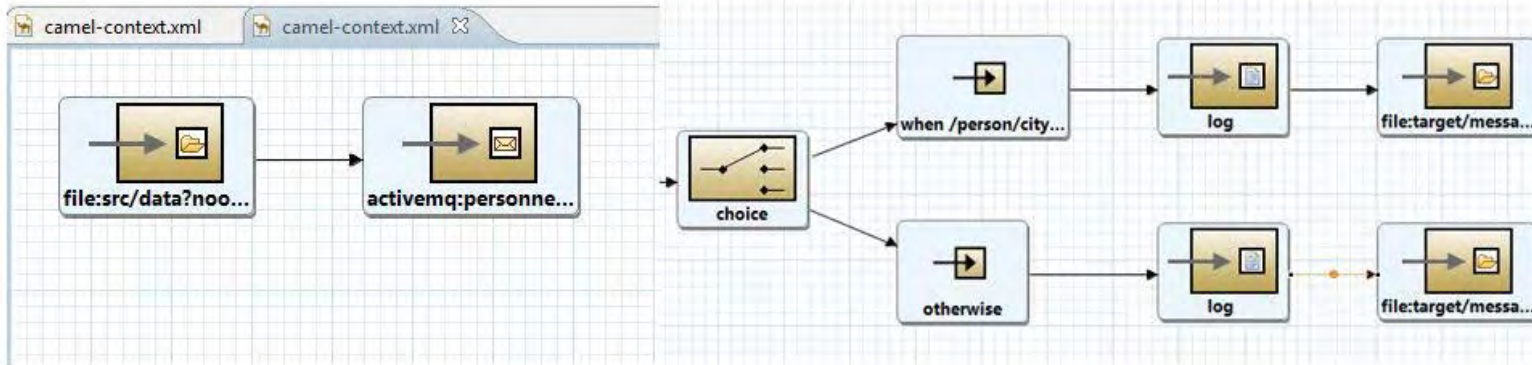


Simple Camel Example

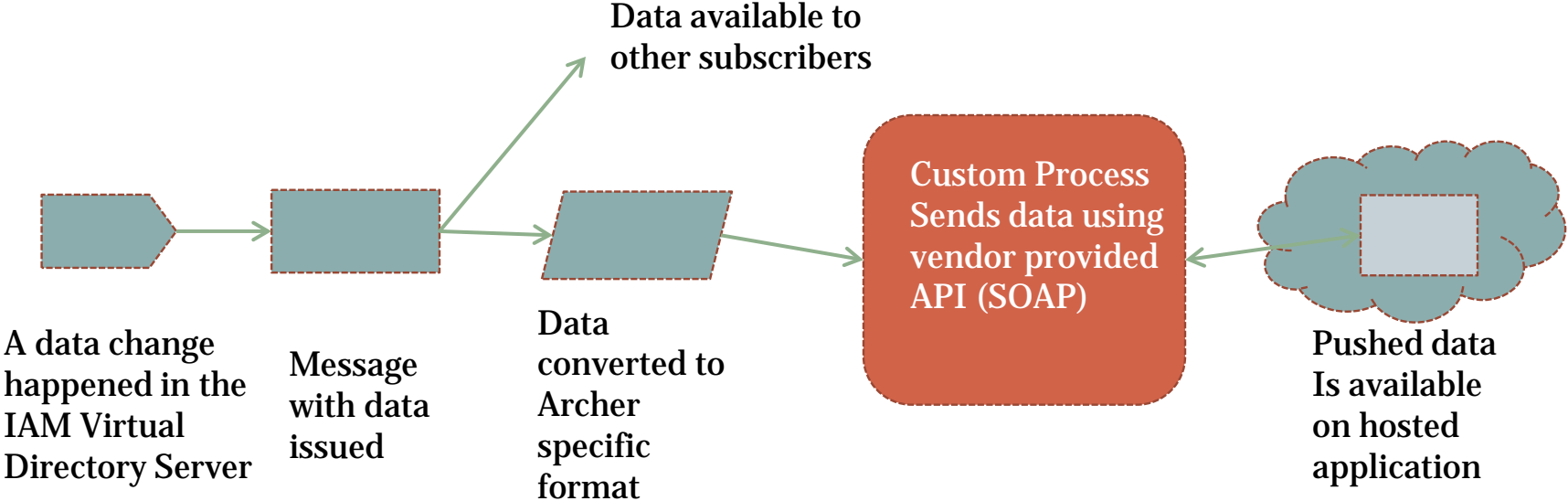


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JMS Q is watched by another route which perform content based routing



Custom Components when Necessary



We are basing our work on..



- An [initial Reference architecture](#) based on
- Recommendations from Jamie Goodyear, a founder and committer to the Apache projects that make up the Fuse suite.