

- » BOOST PERFORMANCE
- » REDUCE COST
- » INCREASE AGILITY
- » ENHANCE CRM
- » SHORTEN TIME TO MARKET
- » DRIVE INNOVATION
- » IMPROVE EFFICIENCY
- » INCREASE ADAPTIVITY
- » ENABLE BUSINESS TRANSPARENCY
- » ENSURE REGULATORY COMPLIANCE



CONSULTING > SOLUTIONS > OUTSOURCING

Open Source Enterprise Integration with Mule



Jos Dirksen and Tijs Rademakers

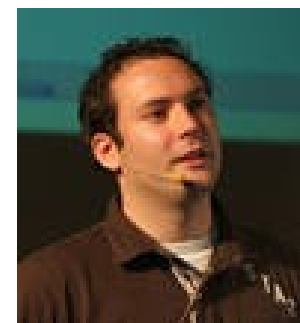
JavaZone, Oslo, September 13th 2007

Who are we?

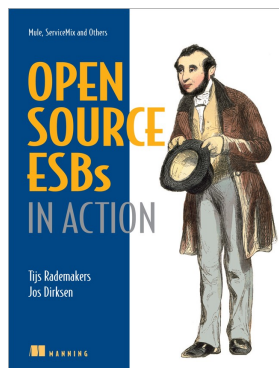
- Software Architects for Atos Origin
- Focus on:
 - Open Source
 - Enterprise Integration
- Co-authoring book that will be published by Manning:
 - Open Source ESBs in Action
 - Estimated release date: first months of 2008
 - <http://www.manning.com/rademakers>



Jos Dirksen

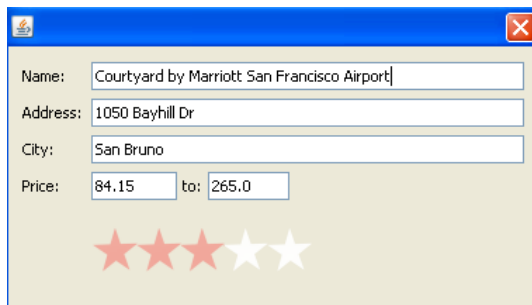


Tijs Rademakers

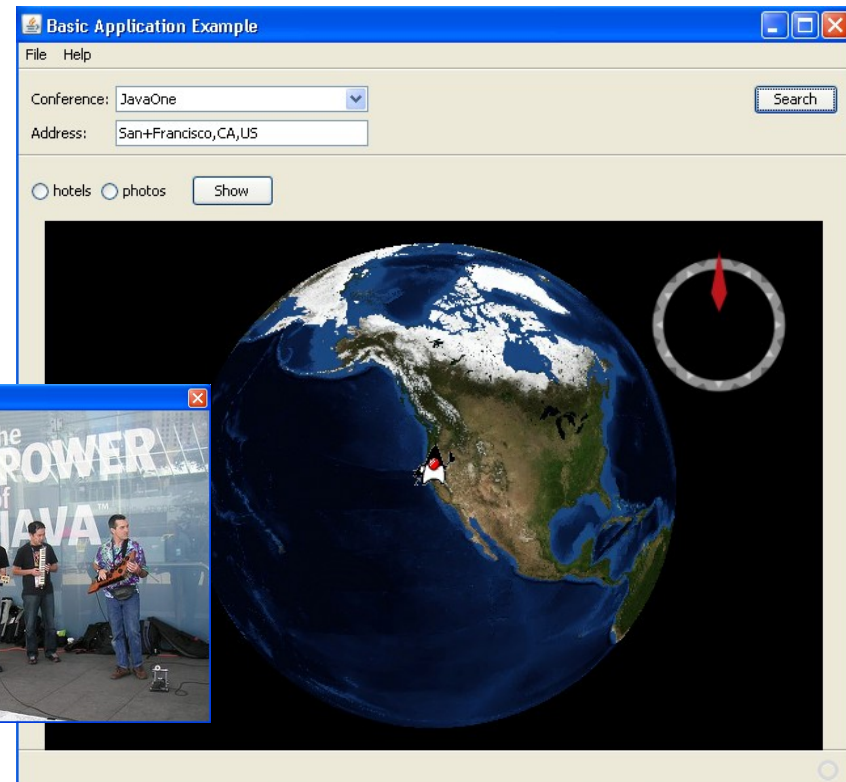


What are we going to show

- Short introduction to enterprise integration
- Agile approach to solve integration problems
- Implement EAI patterns
 - Based on a simple case study
 - Live implementation using Mule 2.0 (TP)
 - ActiveMQ, JBoss



Name: Courtyard by Marriott San Francisco Airport
Address: 1050 Bayhill Dr
City: San Bruno
Price: 84.15 to: 265.0
★★★★★

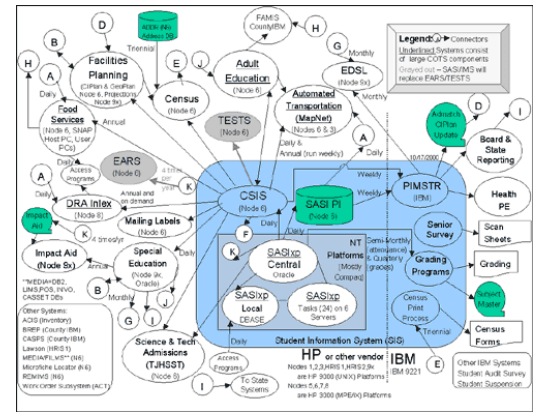


Agenda

- Introduction
- **Agile approach to enterprise integration**
- What is Mule 2.0
- Case study
- Summary
- Q & A

Why do we need enterprise integration?

- Enterprises usually have more than one application
 - Custom build applications
 - Mergers
 - Legacy systems
 - ERP systems like SAP etc.
- Applications need to be integrated to:
 - Support business processes spanning multiple departments
 - Promote reuse of information and services



Open source enterprise integration

- Enterprise integration doesn't have to be expensive and complex
 - You don't always need a full blown SOA suite
 - IBM Websphere, Oracle Fusion, Tibco BusinessWorks
 - Often KISS approach is more than enough
- Open source agile approach using:
 - ESB: Mule or ServiceMix
 - Message broker: ActiveMQ or JORAM
 - Spring (Mule 2.0 and ServiceMix have Spring integrated automatically)
 - XML serialization: XStream or JiBX
 - Web Services support: XFire or Axis2

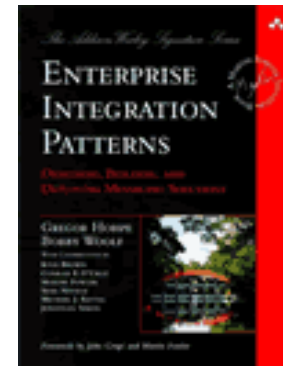
We also need a common approach!

“Anyone who claims that integration is easy must be incredibly smart, incredibly ignorant or have a financial interest in making you believe that integration is easy”

Hohpe, Woolf

➤ Use Enterprise integration patterns:

- Standard proven solutions
 - Learned by “trial and error”
- Fills the gap between vision and implementation
- No “shrink-wrapped” solutions
- Common dictionary



Agenda

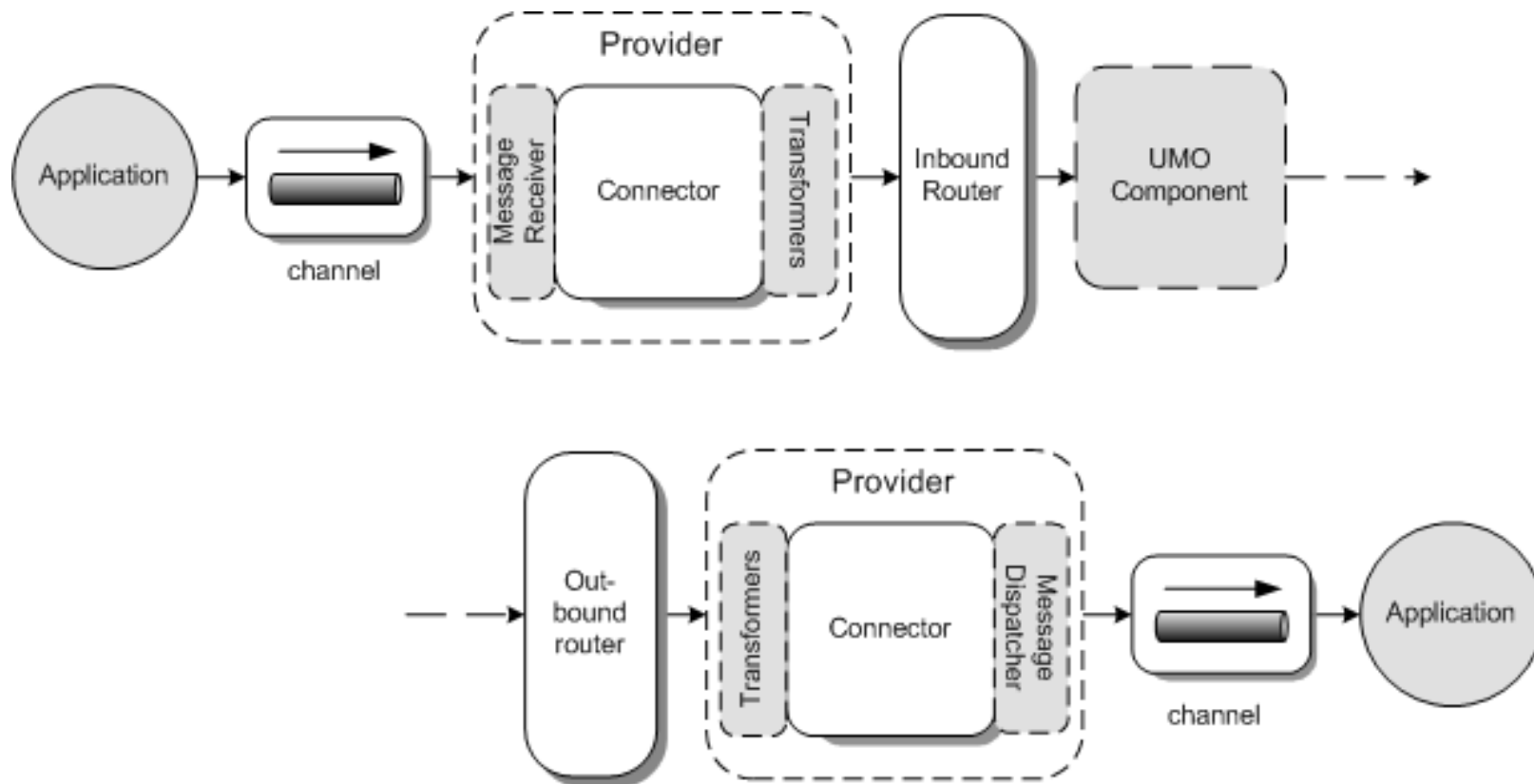
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What is Mule?

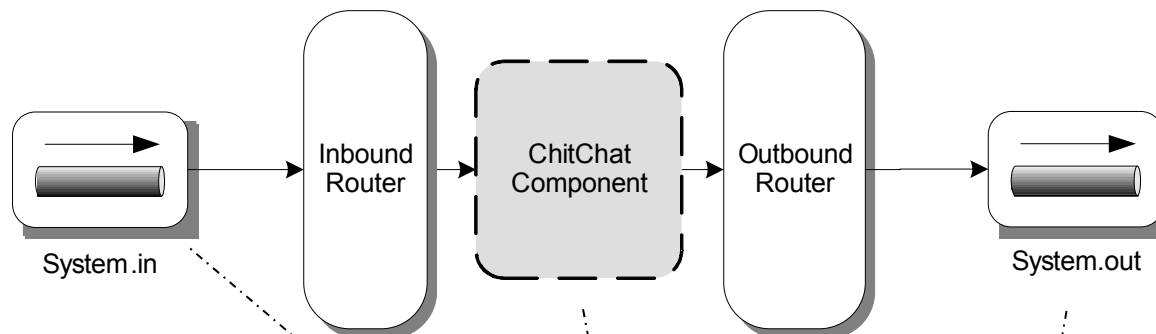


- Open Source Enterprise Service Bus (ESB):
 - Routing, transformation, security, WS support, logging.
- Support for many technologies and transport protocols:
 - JMS, VM, JDBC, TCP, UDP, Multicast, HTTP, Servlet, Email, File, XMPP, FTP, EJB, VFS and more...
- And also support for :
 - jBPM, BPEL, xFire, Spring, JSR-223 Scripting, JBoss

What is Mule 2.0



Mule 2.0 concepts



```

<service name="ChitChat">
  <inbound-router>
    <endpoint address="stdio://System.in?promptMessage=What?" />
  </inbound-router>
  <component class="javazone.ChitChatComponent" />
  <outbound-router>
    <pass-through-router>
      <endpoint address="stdio://System.out" />
    </pass-through-router>
  </outbound-router>
</service>

```

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Open Session LOficator (OSLO ©)

- Swing application to search for Java conference.
 - Show locations of Java conferences on the Map
 - Retrieve schedules for these conferences from a SessionInfo service
 - Search for hotels in the vicinity of the conference
 - Show images of the exciting things that happened at the conference
- Integration middleware
 - Calls Geocoder API to translate location address to coordinates
 - Use EJB call to retrieve conference information
 - Use Kayak API to search for hotels
 - Calls Flickr API to search for images taken at the conference
 - And of course Mule 2.0 glues everything together...

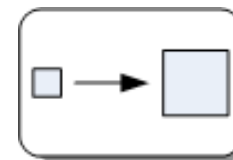
- Demo code can be found at <http://oslodemo.googlecode.com> -

OSLO part 1

- Retrieve longitude and latitude for Java conference of choice
- Apply the following patterns:

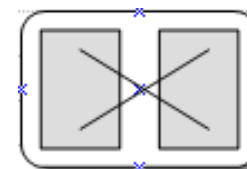
- Content enricher pattern:

- Message originator doesn't have all the information
- Content enricher adds extra data to the message

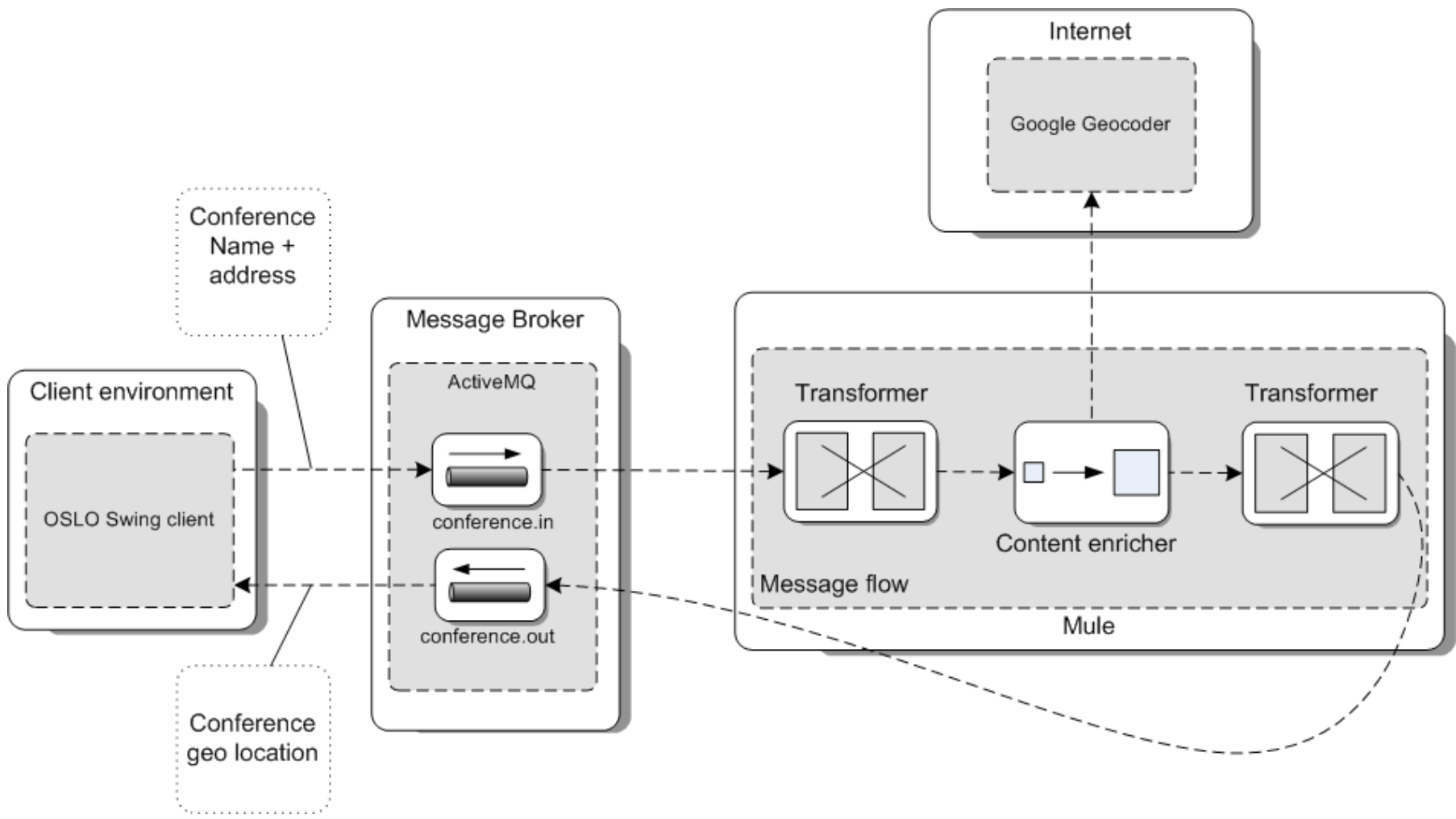


- Message translator pattern:

- Sender and receiver don't use the same data structure
- Can be used for functional and technical transformation



OSLO part 1: design

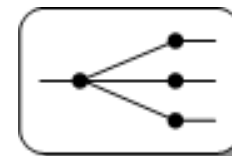


OSLO part 2

- Extend part 1 with session information for chosen Java conference
- Apply the following patterns:

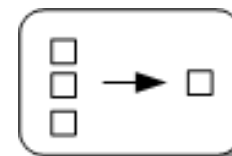
- Recipient list or multicast

- List of endpoints
- Message is sent to all the endpoints

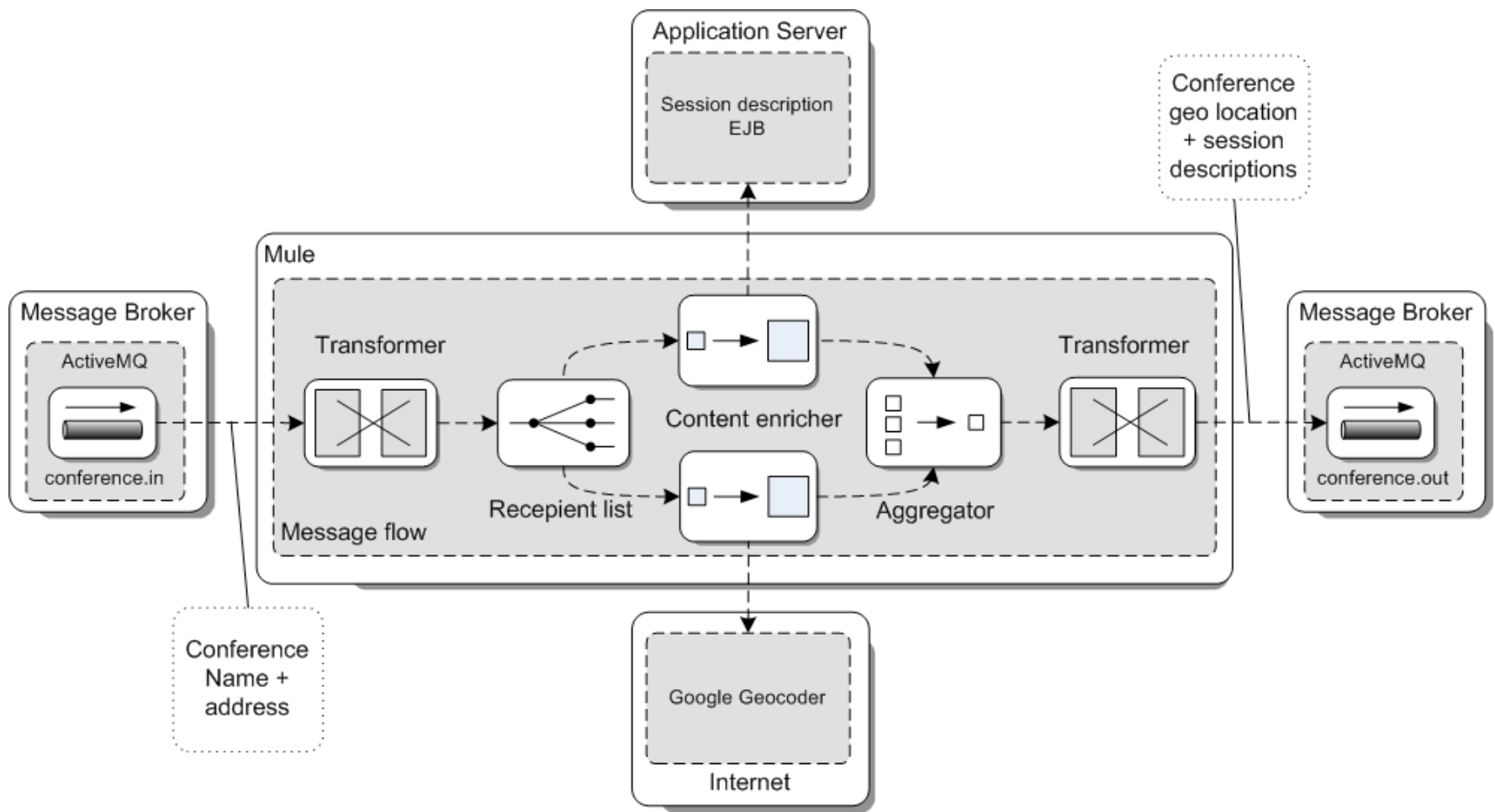


- Aggregator

- Group multiple messages together
- Based on one or more correlation attributes
- Doesn't always have to be used together with a splitter



OSLO part 2: design



Case part 3

- Additional functionality to be able to:
 - Search for hotels nearby the conference site using Kayak
 - Search for Flickr pictures of the conference
- Apply the following patterns:

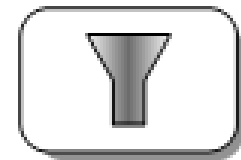
- Message router: route message based on:

- Type, content, size
- Or something else

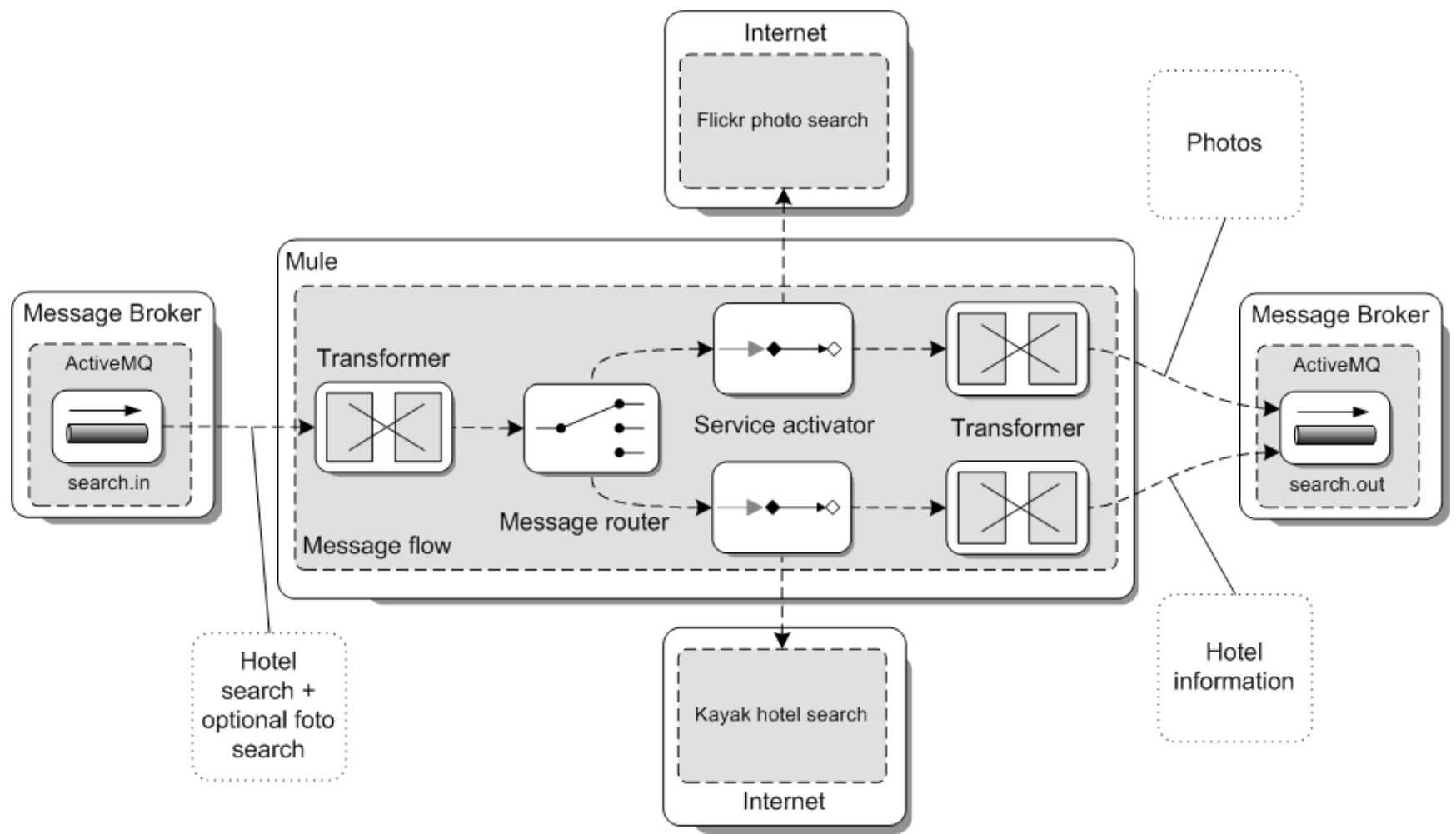


- Alternative solution: message filters

- Determine whether a message should be sent to an endpoint
- or received by a component



Case part 3: diagram



Case study overview

- Simple example, but shows challenges of enterprise integration
 - Many different technologies: JMS, REST, EJB, HTTP
 - Message channel, Message Translator, Content enricher, Content-based router, Recipient list, Aggregator
- Mule supports a lot of enterprise integration patterns
- We implemented a lot of functionality in less than 30 minutes (with some preparation)
- Other common patterns that are applicable:
 - Canonical data model
 - Dead letter channel
 - Wire tap

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Summary

- Enterprise integration is not always that hard
 - Avoid “Taking a sledgehammer to crack a nut”
- Patterns make your life easier:
 - Patterns provide a common visual and verbal language
 - Patterns provide best practices
 - But this is no 'silver bullet'
- Open Source ESBs provide a lightweight, easy to use, integration environment
 - Mule
 - ServiceMix
 - OpenESB
- Demo is not a real world scenario, but shows same kind of challenges

Q&A

- Questions?
- More information:
 - Source is available at: <http://oslodemo.googlecode.com>
 - Contact us at:
 - jos.dirksen@gmail.com
 - tij@apache.org

