Enterprise Messaging with Apache ActiveMQ

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http://macstrac.blogspot.com/

http://open.iona.com/
What is messaging?
Messaging 101
Topics
Queues
What is Apache ActiveMQ?
What is Apache ActiveMQ

http://activemq.apache.org/
<table>
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<tr>
<th>Clients</th>
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<tr>
<td>C</td>
<td>Java</td>
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<tr>
<td>C++</td>
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<td>C#/.NET</td>
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<td>Flash</td>
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Selectors

- Provide content based filtering on messages using SQL 92 syntax
  - Customer = ‘gold’ and product in (1, 2, 3) and JMSPriority > 5
- Supports XPath on the message body for XML messages
Wildcards

• Products.Books.Computing.EIP
• Products.>
Broker Architecture
Message Persistence
Security
Transports

ActiveMQ Supported Transports

- TCP
- XMPP
- UDP
- Zeroconf
- JXTA
- Discovery
- Peer
- SSL
- HTTP/S
- multicast
URIs

<protocol>://<host>:<port>?<transport-options>

Examples

tcp://localhost:61616

vm://localhost?broker.persistent=false
Failover

failover:(tcp://host1:61616,tcp://host2:61616)?initialReconnectDelay=100
Wire Formats

- OpenWire
- STOMP
- HTTP / REST
Wire Formats: OpenWire

• binary

• small and fast

• code generated marshalling in C, C++, C# and Java

• a fair amount of work to port to other languages
Wire Formats: STOMP

- text based for the headers like HTTP
- very easy to create a client in any language
- tons of clients in most popular programming languages
Stomp: Connecting

CONNECT

login:<username>

passcode:<passcode>

^@
Stomp : Sending

SEND
destination:/queue/orders.books
reply-to:/temporaryQueue/James
correlation-id:4324234
amazonSecurityToken:abc234
amazonCustomerRating:gold

<order id="123" customer="jstrachan">
  <book isin="1234"/>
  <book isin="456"/>
</order>
^@
Stomp: Subscribe

SUBSCRIBE
destination:/queue/orders.books

^@
Stomp : Receive messages

MESSAGE
destination:/queue/orders.books
Message-id:abc123
reply-to:/temporaryQueue/james134

This is the message
^@
Broker Architecture
Types of connectors
Kinds of topology
Kinds of topology
Kinds of topology
Clustering with Master / Slave

- Pure
- Shared File System
- Shared Database
Cool Stuff!
Monitoring
Easy Unit Testing of JMS code

```java
ConnectionFactory factory =
    new ActiveMQConnectionFactory("vm://localhost?broker.persistent=false");
```
Visualisation

Client: ID:macstrac.local-59822-1143567869845-3:1
  
Producer: 1-1
  
Queue: Orders.MSFT

Subscription: 2-1
Selector: price > 200

Subscription: 1-2
Selector: price > 100

Queue: Orders.IBM

Subscription: 1-1

Client: ID:macstrac.local-59822-1143567869845-4:0

ActiveMQ Broker: ID:macstrac.local-59822-1143567869845-0:0
new ActiveMQQueue("TEST.QUEUE?consumer.prefetchSize=10");
Exclusive Consumers
Message Groups

JMSXGroupID = customer.orders
Total Ordering
new ActiveMQQueue("TEST.QUEUE?consumer.priority=10");
Virtual Destinations
Mirrored Queues
Enterprise Integration Patterns via Camel

http://activemq.apache.org/camel/
## Bridge to other protocols

http://activemq.apache.org/camel/components.html

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Example

```xml
<camelContext xmlns="http://activemq.apache.org/camel/schema/spring">
  <route>
    <from uri="file://quotes"/>
    <filter>
      <xpath>/quote/product = 'widget'</xpath>
      <to uri="activemq:WidgetQuotes"/>
    </filter>
  </route>
</camelContext>
```
Where do I get more info?

http://activemq.apache.org/
Questions?