Getting Started with ActiveMQ

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Agenda

- Who’s FuseSource?
- ActiveMQ Overview
    - Core capabilities
    - Managing client connections
    - Managing persistence
    - High availability
    - Network of brokers
- Demo
    - Walk through install
    - Start/Stop with alternative configuration
    - Management through JMX
    - High availability: failover and back

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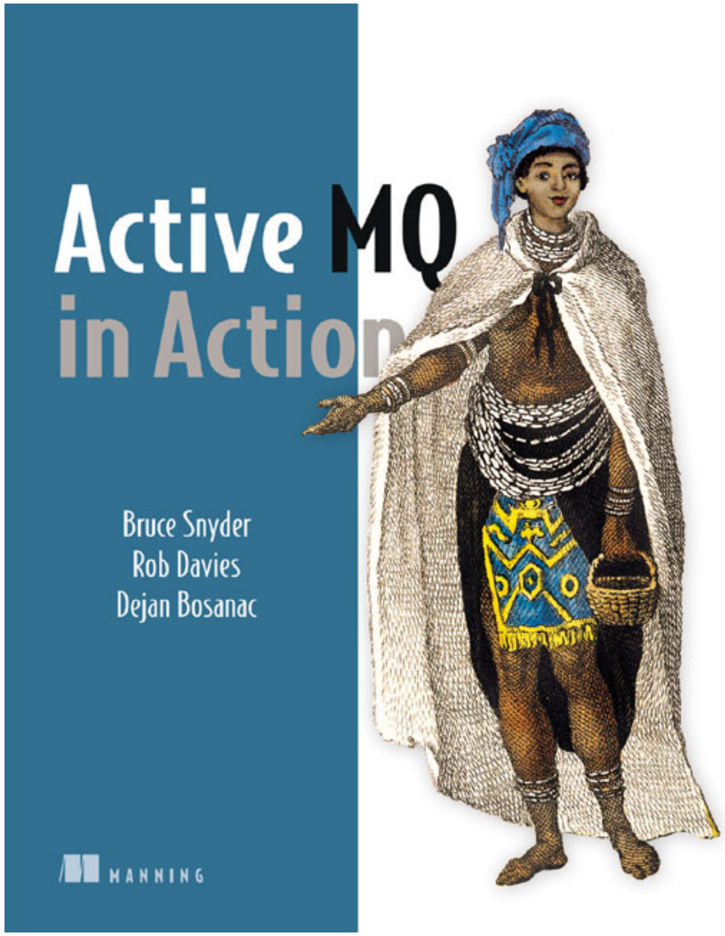
Book Giveaway: ActiveMQ in Action



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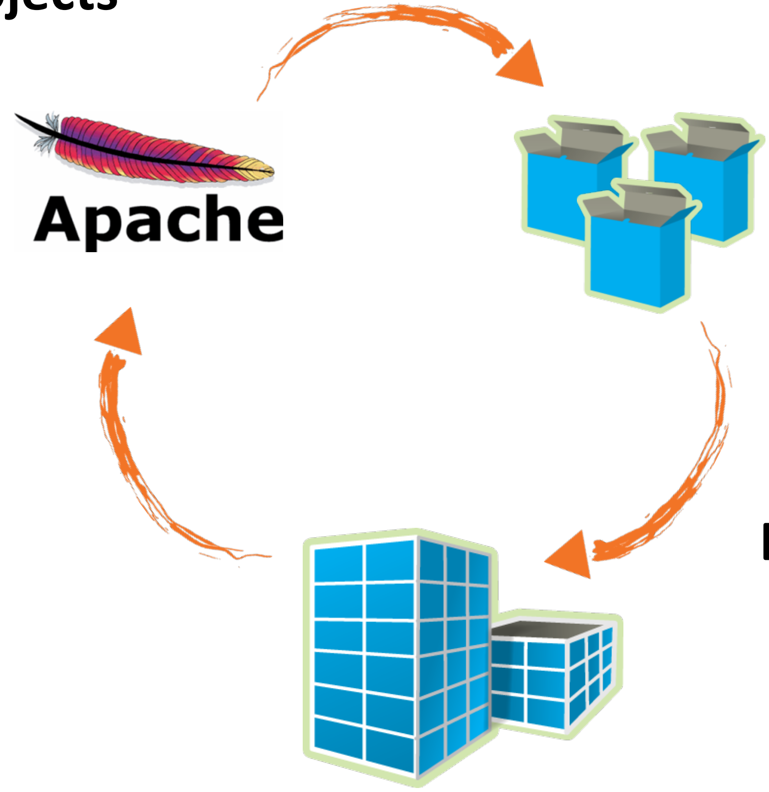
FuseSource Corporation

The Leaders in Open Source Integration and Messaging

Team behind the projects

- Leaders at Apache
- Product roadmaps
- Code contributions



Productized distributions

- Integrated
- Tested
- Tooling

Enterprise support

- Subscriptions
- Training
- Consulting

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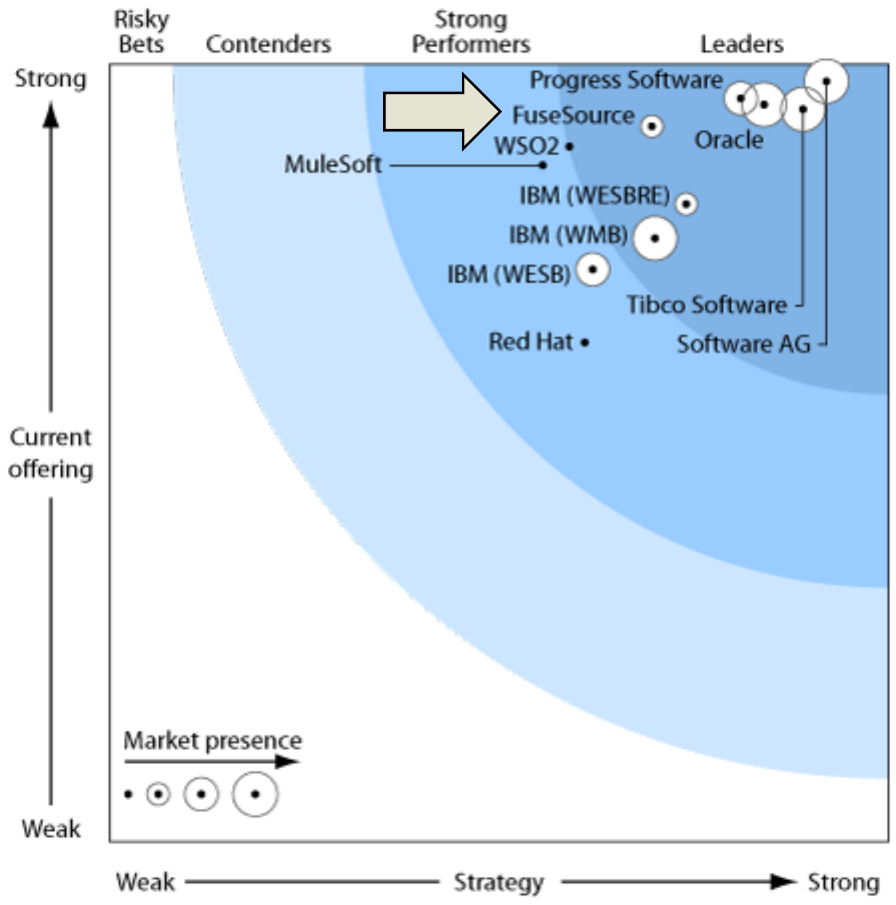
Forrester Wave Report Q2 2011: Fuse ESB is a "Leader"

- FuseSource placed in "Leader" category in company with large, established vendors
- One of few open source solutions considered for this report
- Highest ranked open source solution



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FuseSource : Open Source Integration for the Enterprise

Cost-effective, Proven, Enterprise-class Solutions

- Same Apache code, but tested, productized and supported
- Business-friendly, open source (Apache) license
- Over 25 active Apache committers on staff

Apache Project	FuseSource Product
Apache ServiceMix	Fuse ESB ESB with OSGi and JBI
Apache ActiveMQ	Fuse Message Broker Reliable messaging: Java JMS, C++ and .NET
Apache CXF	Fuse Services Framework SOAP, XML, and REST web services
Apache Camel	Fuse Mediation Router Enterprise integration Patterns

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FuseSource : Team that Wrote the Code

No one knows the code, or influences the projects at Apache more than FuseSource:

- Co-founders and PMC members of ServiceMix, ActiveMQ, Camel, …
- Over 25 active committers on 11 Apache projects

Guillaume Nodet

James Strachan

Rob Davis

Hiram Chirino

Jon Anstey

Gary Tully

Dejan Bosanac

Gert Vanthienen

Willem Jiang

Claus Ibsen

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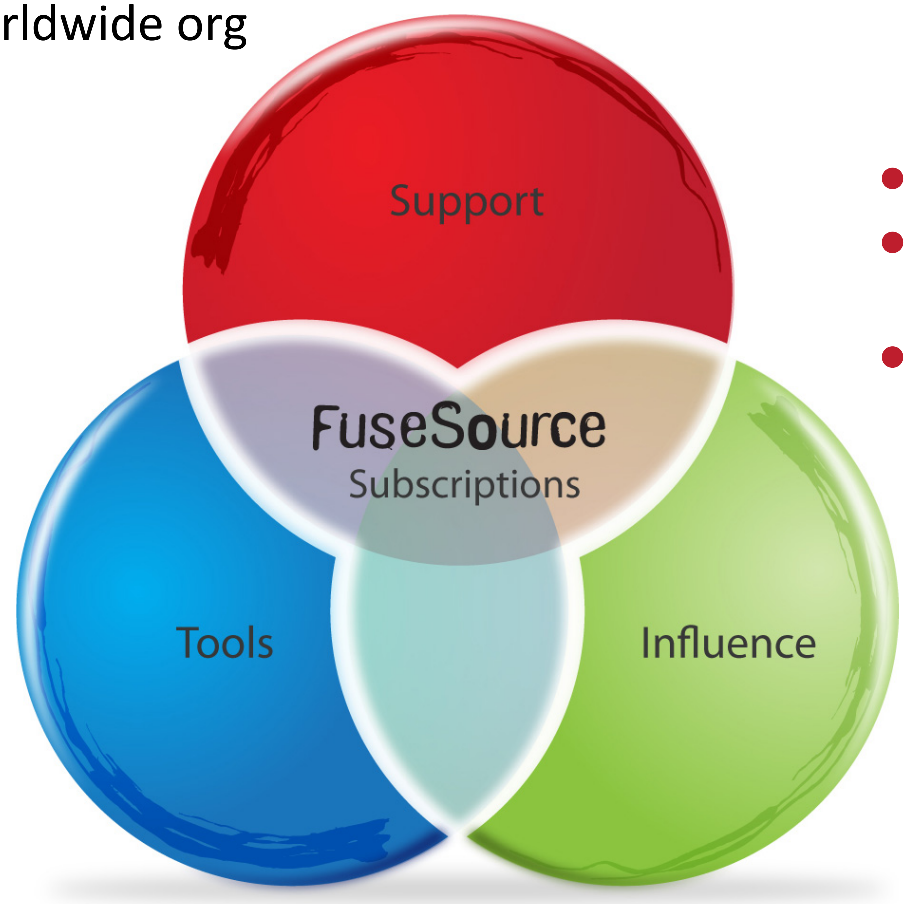
FuseSource Subscription = Long Term Success

Support
- From the project leaders
- Enterprise-class
- Worldwide org

Influence
- Product knowledge
- Effect product direction
- Partner with the developers

Tools
- Pilot projects
- Development
- Deployment



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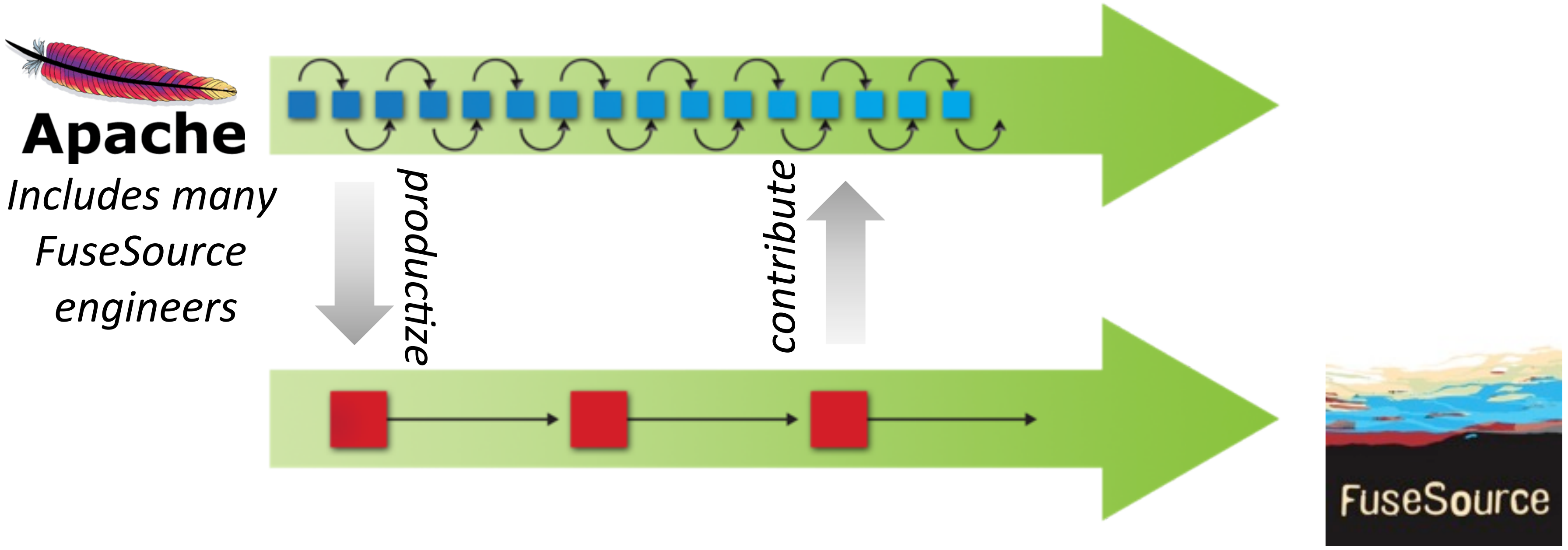
FuseSource Subscription : Alignment with Apache

FuseSource includes the leaders & founders who drive the projects

- No one knows the internals of the projects better
- FuseSource has access to product road maps
- Customer patches are contributed to Apache
- Customer feedback drives project direction



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What is Apache ActiveMQ?

- Top level Apache Software Foundation project
- Wildly popular, high performance, reliable message broker
  - Supports JMS 1.1; adding support for AMQP 1.0 and JMS 2.0
  - Clustering and Fault Tolerance
  - Supports publish/subscribe, point to point, message groups, out of band messaging and streaming, distributed transactions, …
- Myriad of connectivity options
  - Native Java, C/C++, and .NET
  - STOMP protocol enables Ruby, JS, Perl, Python, PHP, ActionScript, ...
- Embedded and standalone deployment options
  - Pre-integrated with open source integration and application frameworks
  - Deep integration with Spring Framework and Java EE

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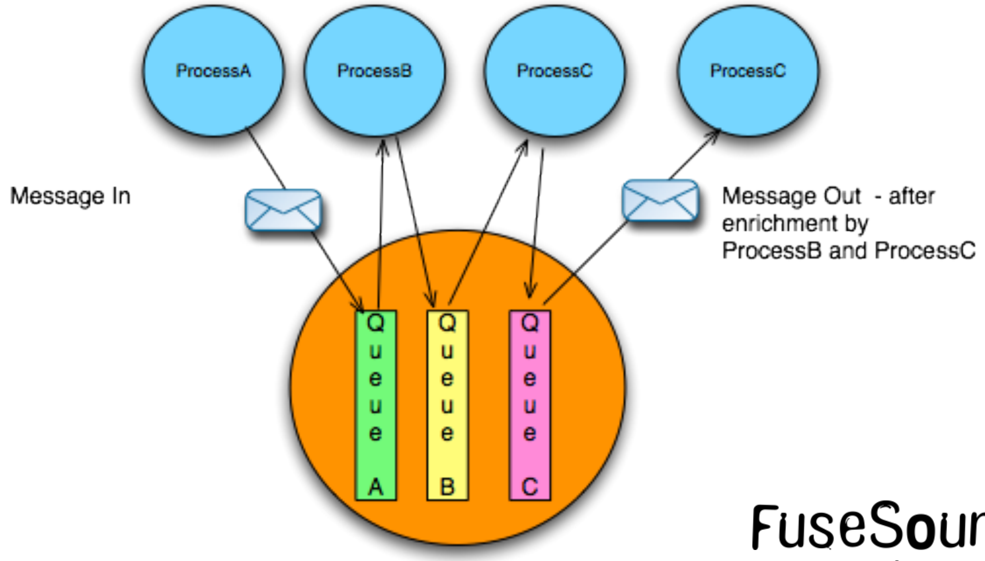
Why use Messaging?

- Reliable remote communication between applications
- Asynchronous communication
  - De-couple producer and consumer (loose coupling)
- Platform and language integration
- Fault tolerant - processing can survive Processor outage
- Scalable - multiple consumers of each queue
  - Distributes processing



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Message Channels and Routing

- Message Channels
  - Named communication between interested parties
  - JMS calls them ‘Destinations’
- Can fine-tune message consumption with selectors
- Can route a message based on content

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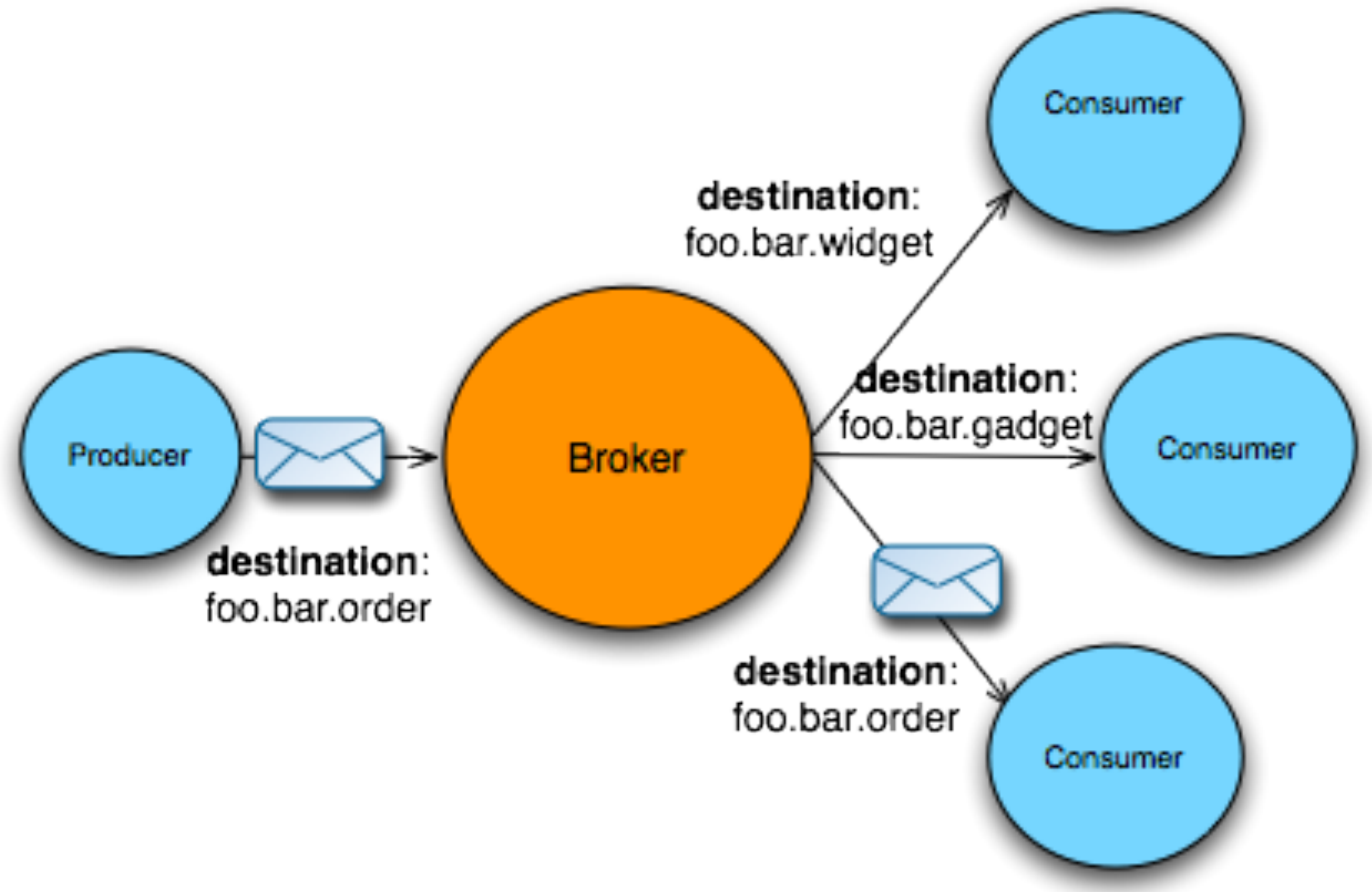
Message Channels = JMS Destinations



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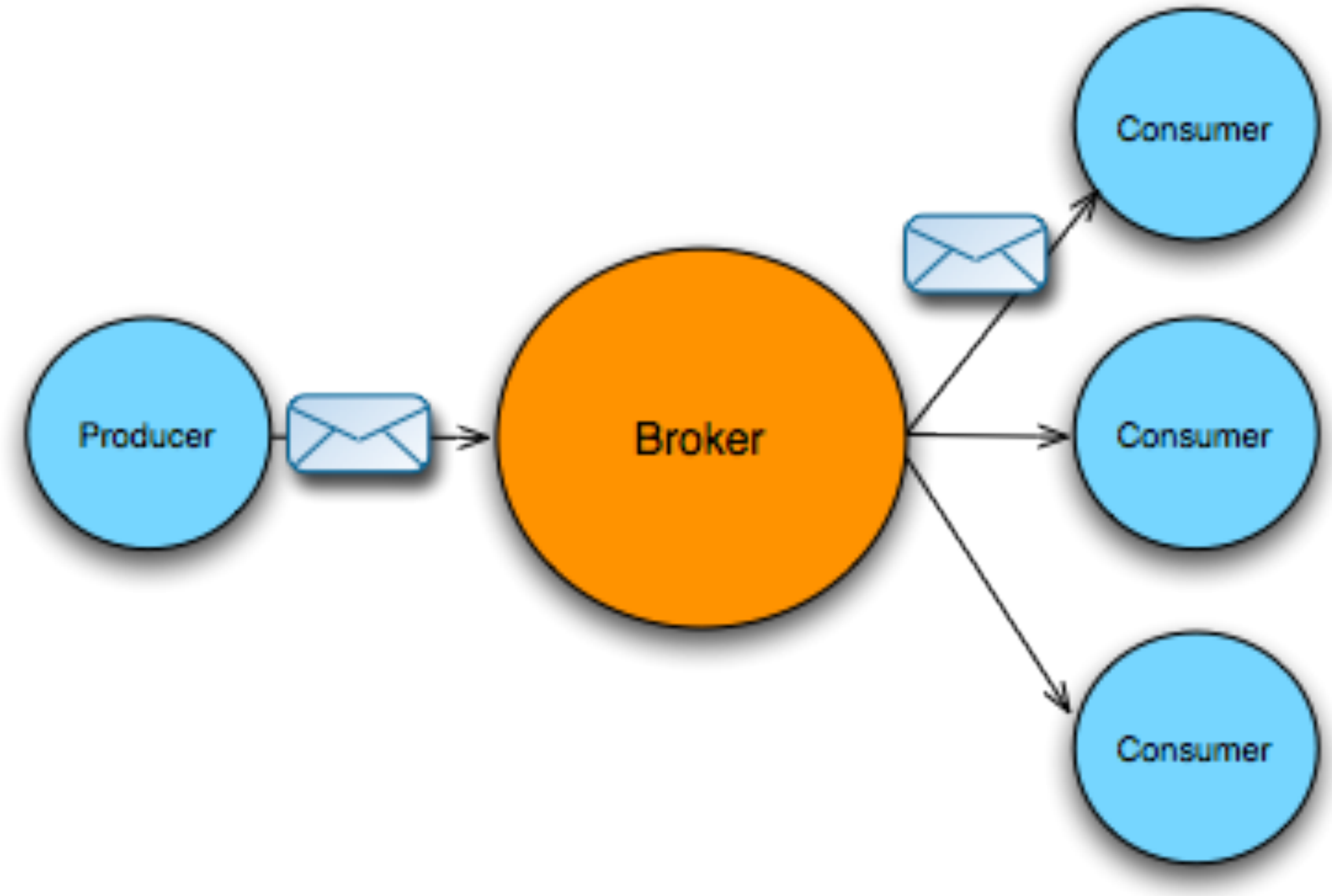
Point-to-Point Channel : JMS Queues



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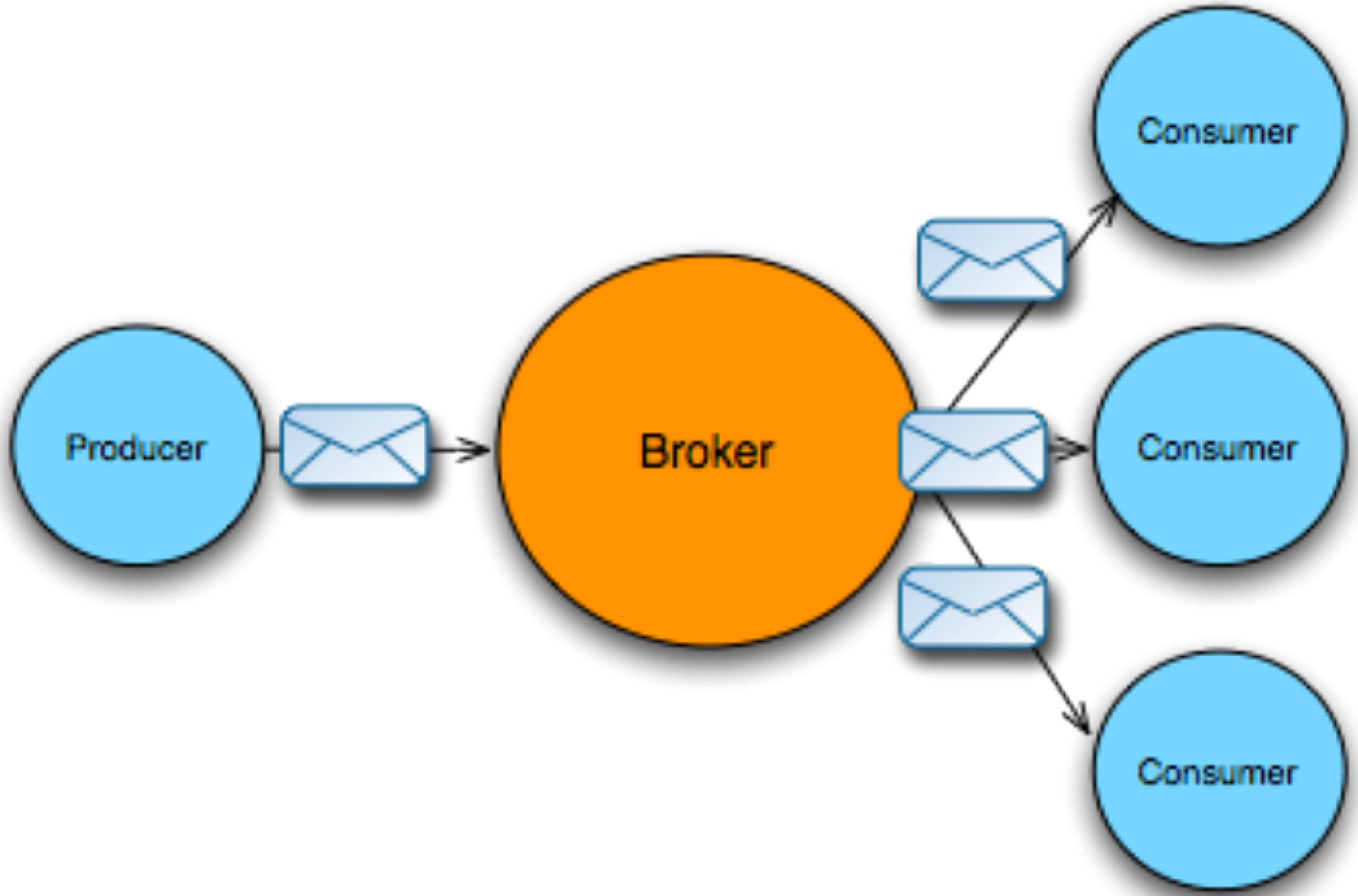
Publish/Subscribe Channel : JMS Topics



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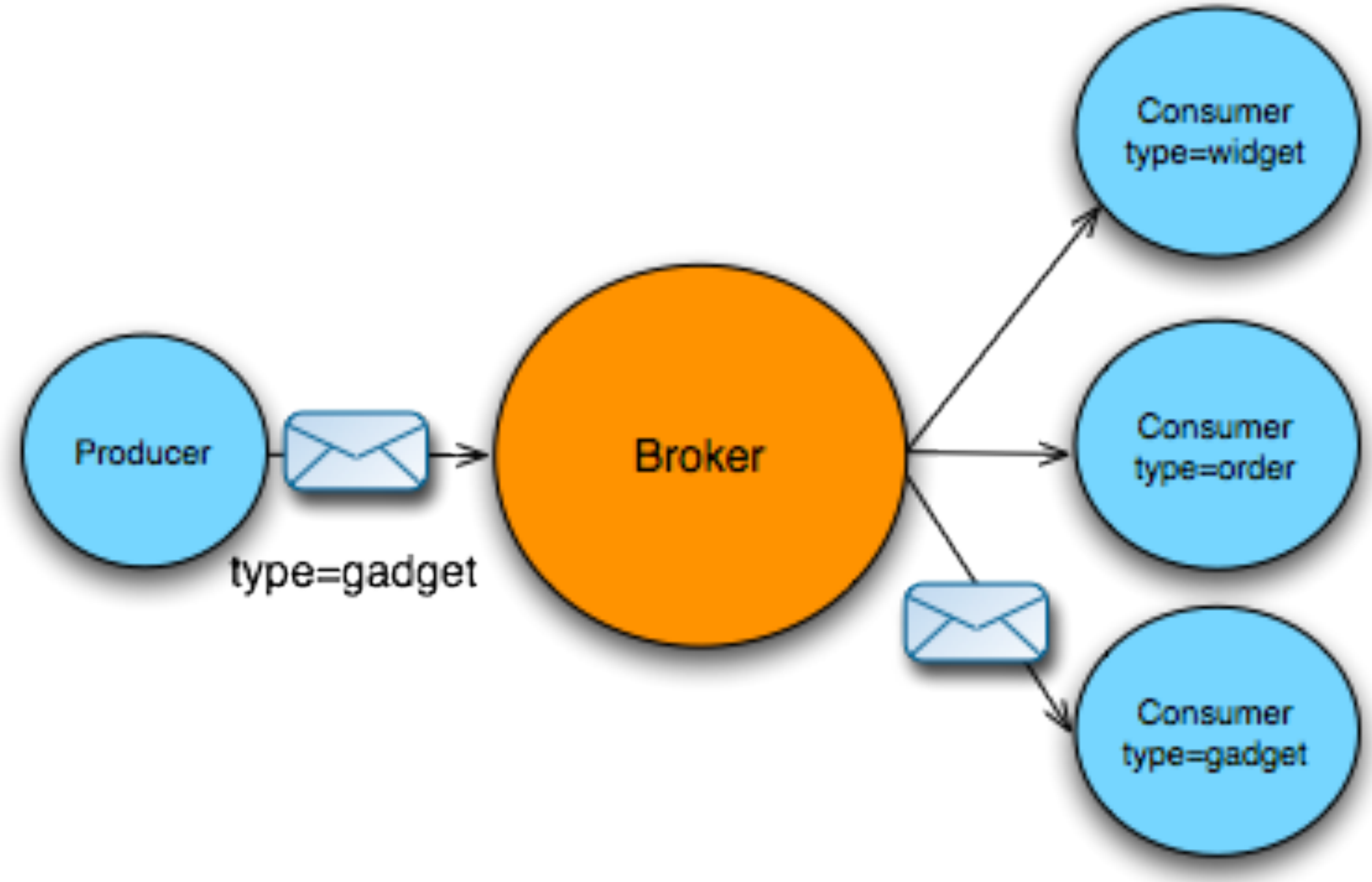
Message Routing : Selectors



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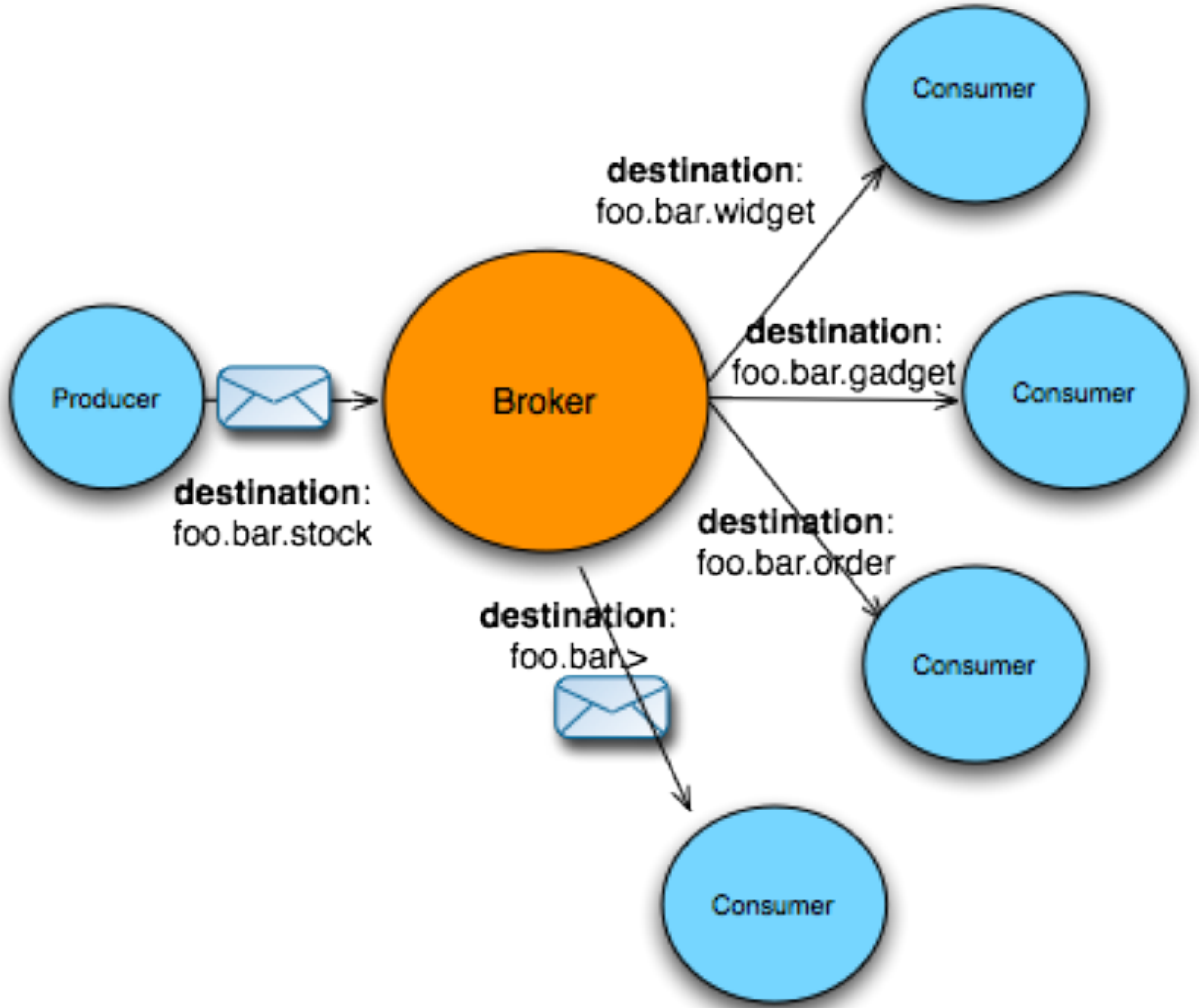
Message Routing : Destination Wildcards



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Managing Client Connections : Transport Connectors

- Configured in broker for client connections

- TCP – most used; socket connections using binary Openwire protocol
- NIO – like TCP, excepts uses Java NIO to reduce number of threads managing all connections
- SSL – secure TCP connection
- STOMP – text based protocol; facilitates multiple language integration
- VM – enables efficient in-process connections for embedded broker

- Examples
  - <transportConnector uri=“tcp://0.0.0.0:61616”/>
  - <transportConnector uri=“nio://0.0.0.0:61616”/>
  - <transportConnector uri=“stomp://0.0.0.0:61617”/>
  - <transportConnector uri=“stomp+nio://0.0.0.0:61617”/>

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Managing Client Connections : Wrapper Transports

- Augment / wrap client side connections

- Failover – automatic reconnection from connection failures
- Fanout – simultaneously replicate commands and message to multiple brokers

- Example – client connection URI
  - tcp://master:61616
  - failover:(tcp://master:61616,tcp://slave:61616)
  - failover:(tcp://virtualIp:61616)
  - fanout:(static:(tcp://host1:61616,tcp://host2:61616))

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Managing Client Connections : Configuring Transports

- tcp://hostname:port?key=value

- Examples
  - tcp://myhost:61616? trace=false&soTimeout=60000
  - failover:(tcp://master:61616?soTimeout=60000,tcp://slave:61616)?randomize=false

- Lot more details at
  - http://fusesource.com/documentation/fuse-message-broker-documentation/
  - http://activemq.apache.org/configuring-transports.html

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Managing Persistence : Persistence Adapters

- File system based
  - kahaDB – recommended; improved scalability and quick recovery
  - amqPersistenceAdapter – legacy; fast, but slow recovery
- RDBMS based
  - jdbcPersistenceAdapter – quick and easy to setup
  - journaledJDBC – faster than pure JDBC; file journaling with long term JDBC storage
- Memory based
  - memoryPersistenceAdapter – testing only; same as
    - <broker persistent=“false”>

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High Availability

- Two complementary approaches:
  - Master/Slave – access to persistent messages after broker failure
  - Network of Brokers – Scale out message processes - next slides…

- Master/Slave Context
  - A given message is in one and only one broker (persistence store)
  - If a broker instance fails, all persistent messages are recoverable upon broker restart
  - Master/Slave allows a 2nd broker instance (slave) to be ready to process persistent messages upon master (1st broker) failure
  - Clients should use Failover transport for automatic connect to slave
    - failover:(tcp://master:61616,tcp://slave:61616)?randomize=false

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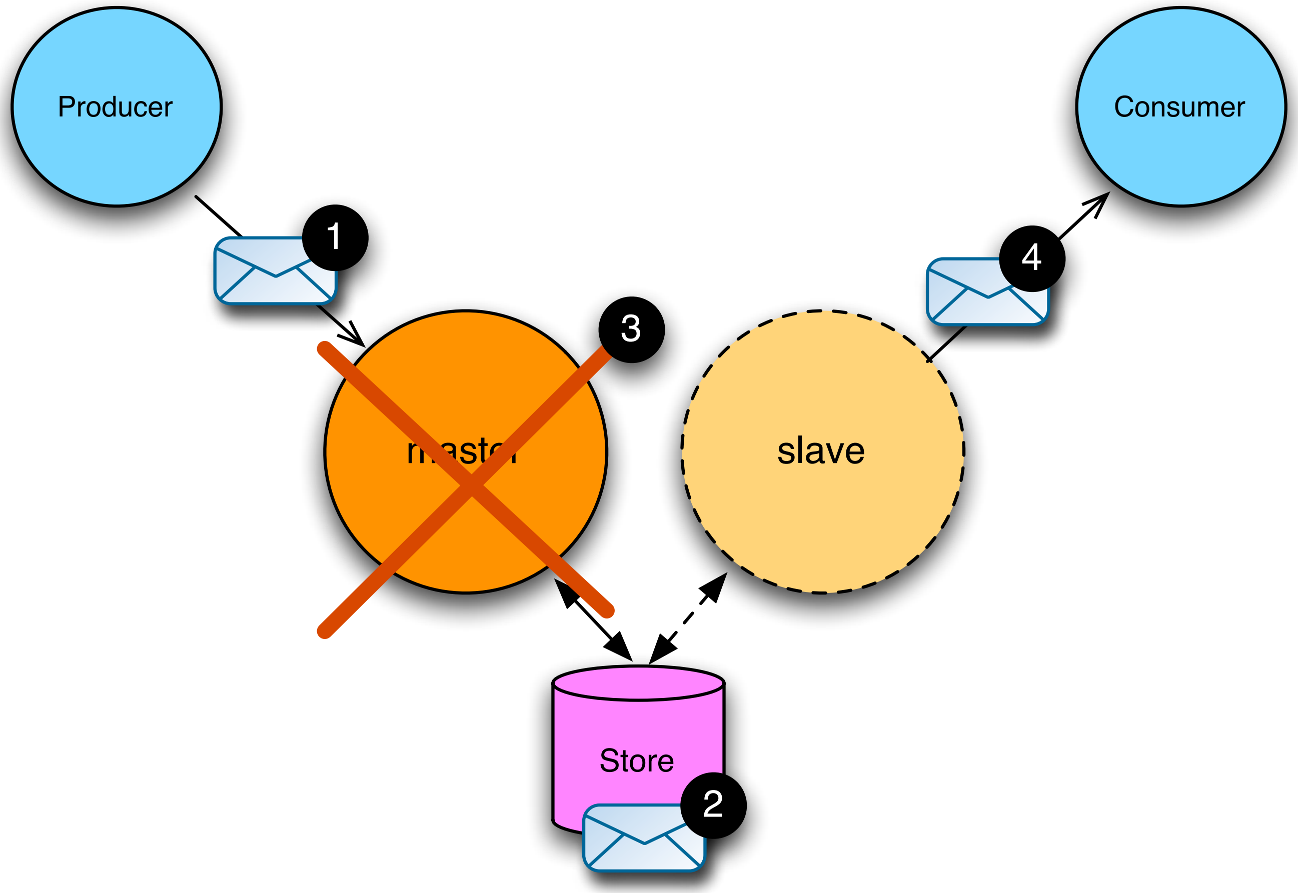
High Availability : Master/Slave



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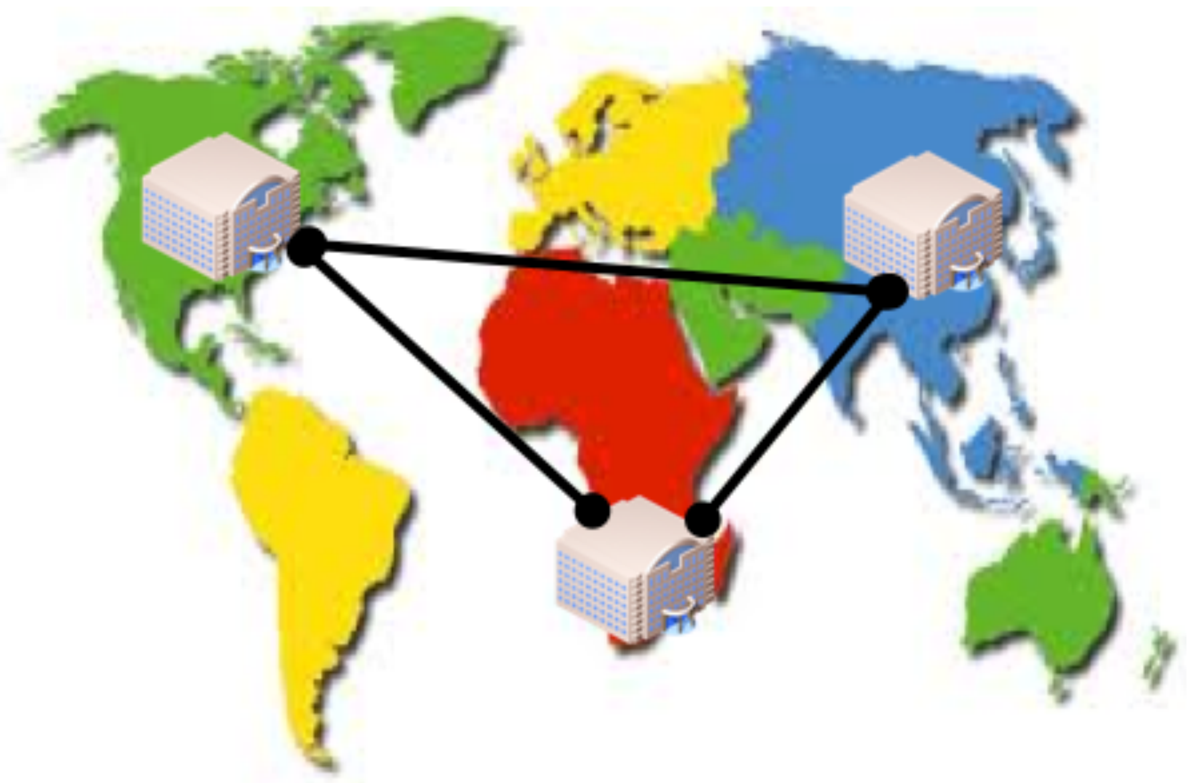
Network of Brokers : Geographically Dispersed



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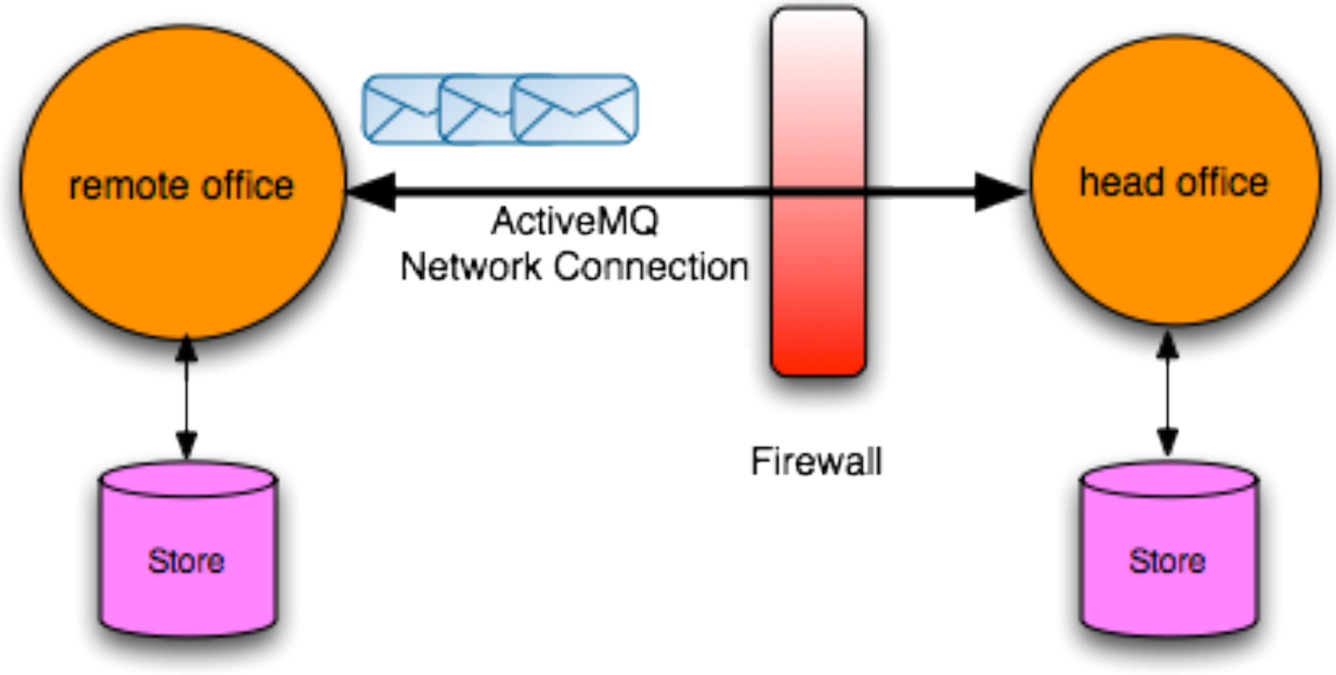
Network of Brokers : Geographically Dispersed



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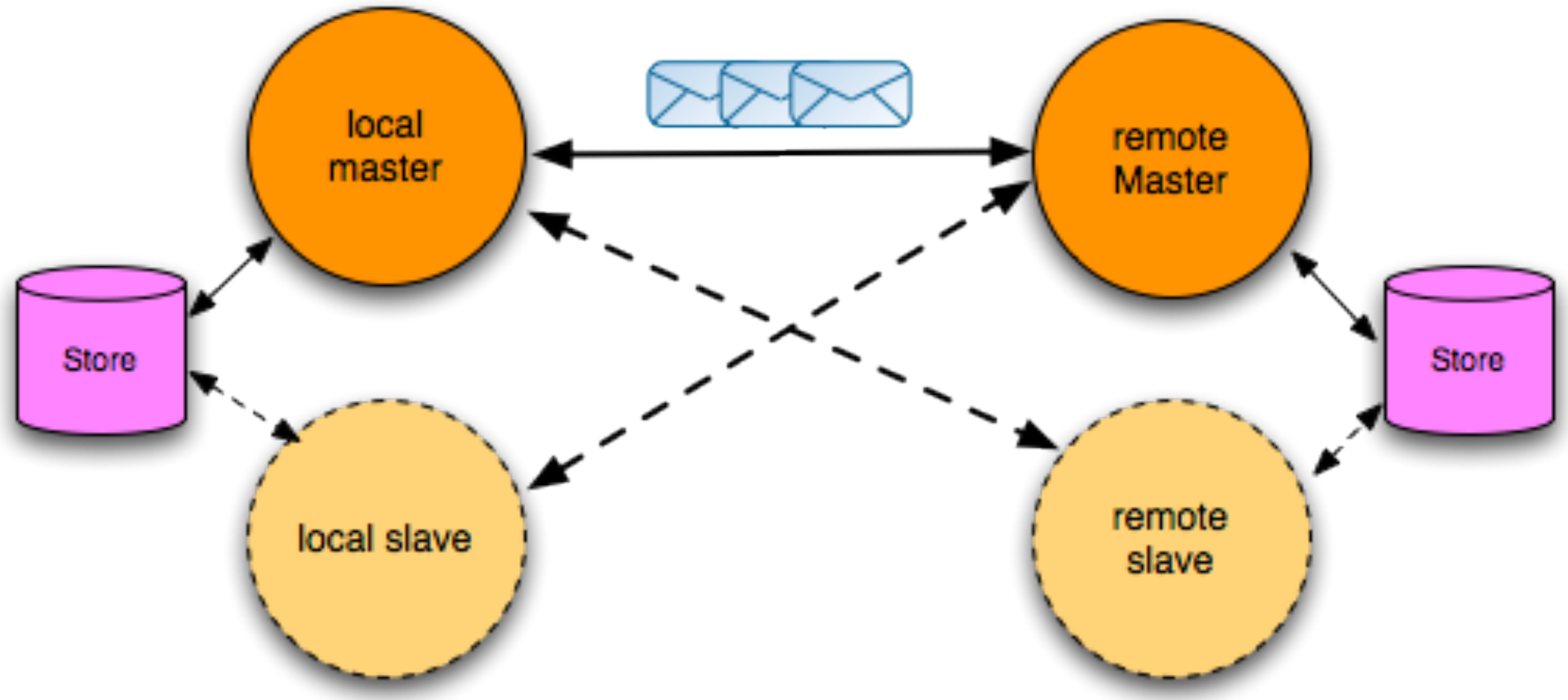
Network of Brokers : Network with Master/Slave



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Code Time

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