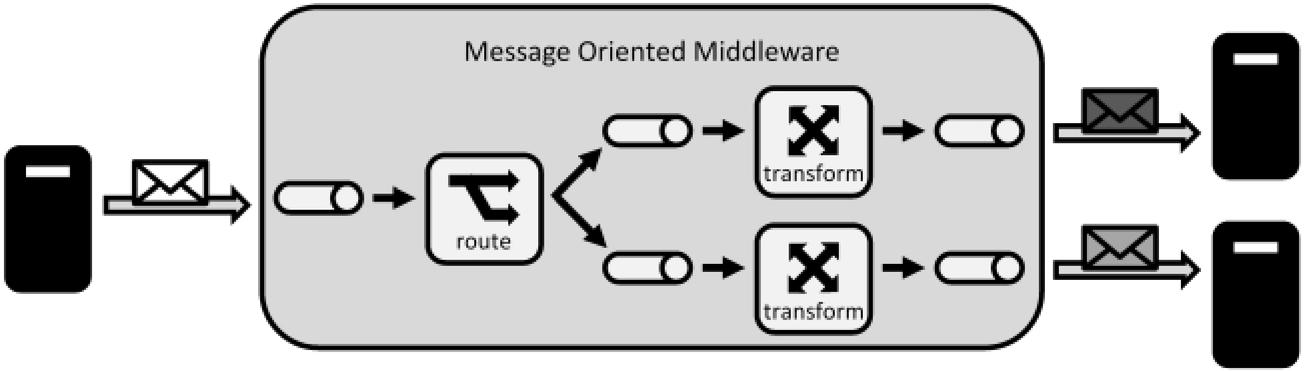


Message Oriented Middleware

سید مجید عظیمی

Message Oriented Middleware

- MOM Is a software/hardware infrastructure supporting sending and receiving messages between nodes in a distributed system

- What is a message?

  Standalone unit of data that can be processed

Example of Messaging Systems

- Remote Procedure Call
- XML-RPC
- Web Services(SOAP/Rest)
- Object Request Broker(CORBA)

Common feature:

Synchronous Processing

Challenge

Biggest challenge in distributed computing?

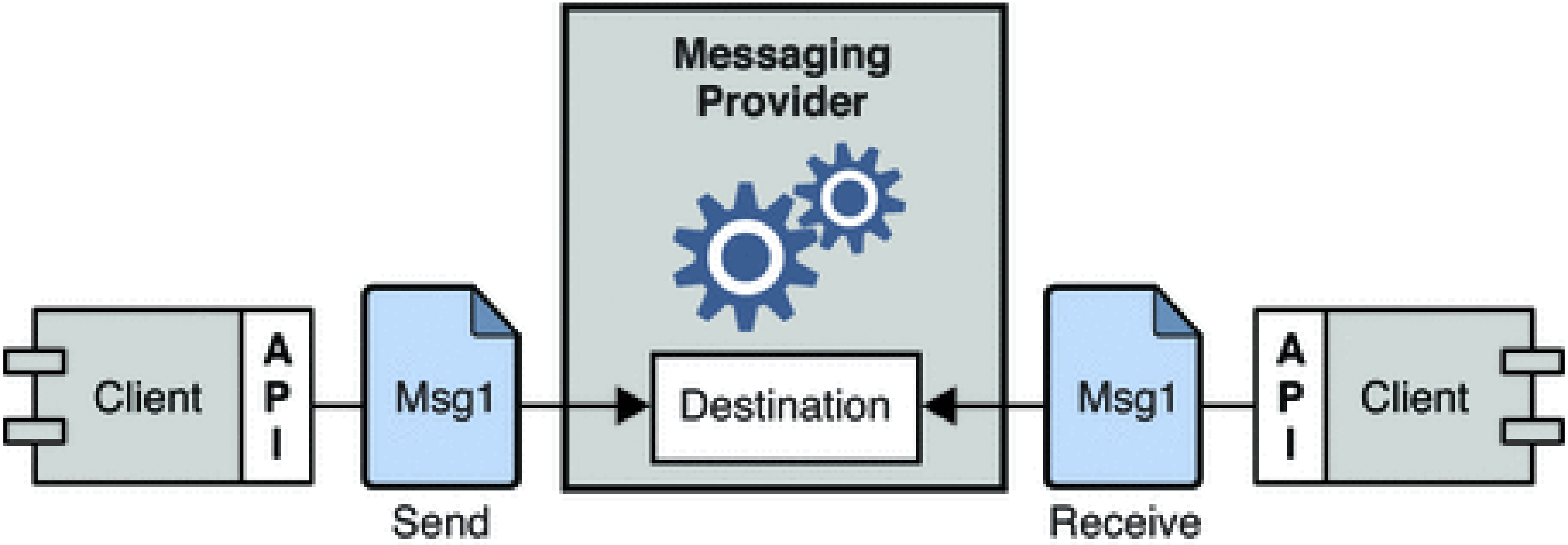
Scale

Then how to scale?

Asynchronous Processing

Event Driven Programming

MOM and Asynchronous Processing

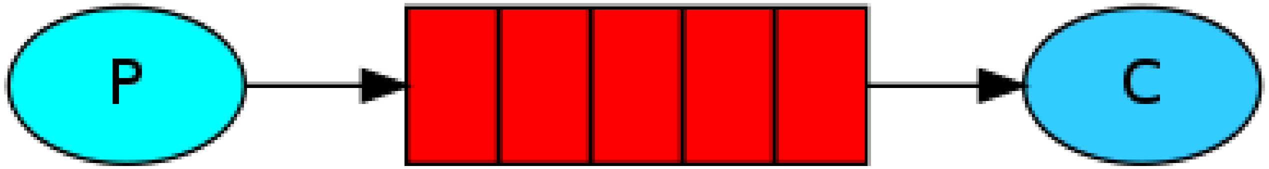


Topologies

- Point to Point
  - Pipeline (PUSH/PULL)
  - Job Queue
  - Routing
  - Request / Reply
- Publish / Subscribe

Point to Point: Pipeline

One way messaging

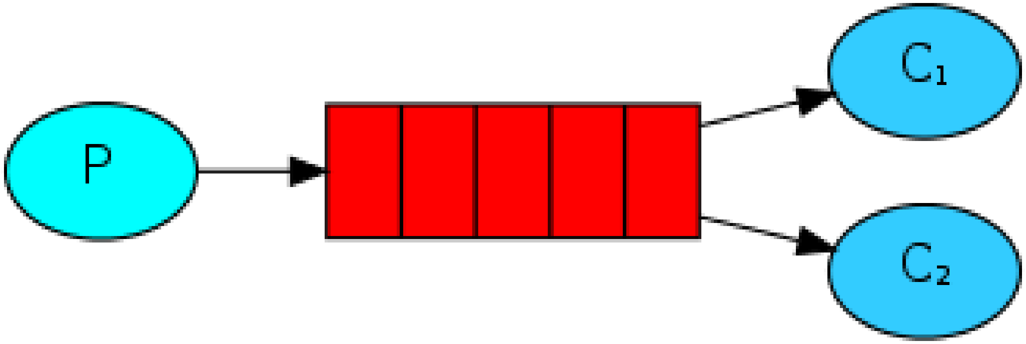


Usage:

- Logging
- Producer / Consumer

Point to Point: Job Queue

Distribute jobs to multiple nodes

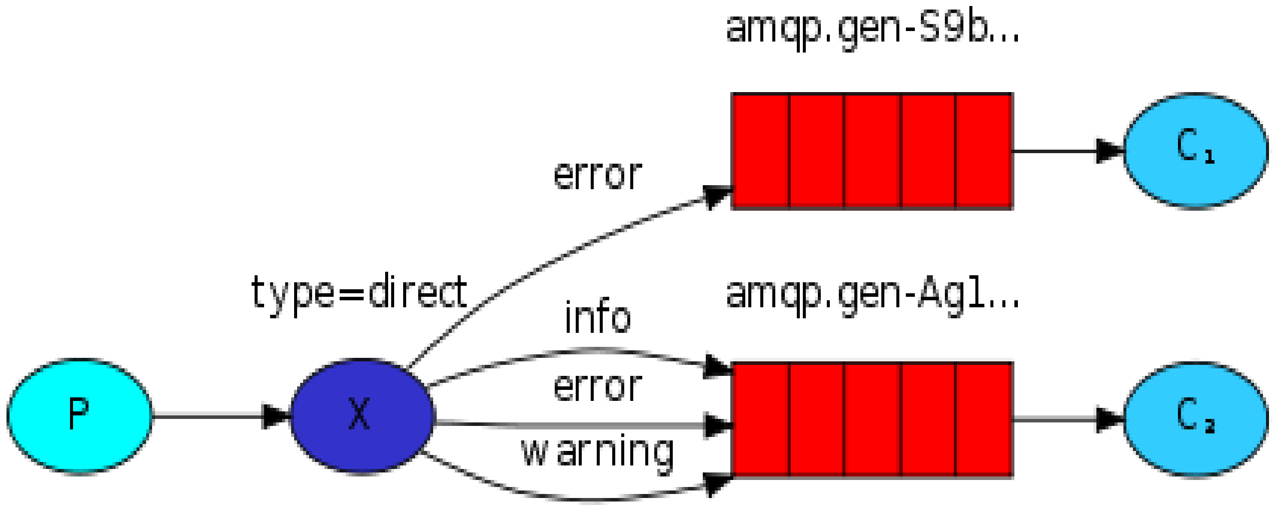


Strategies:

- Round Rubin dispatching
- Weighted dispatching

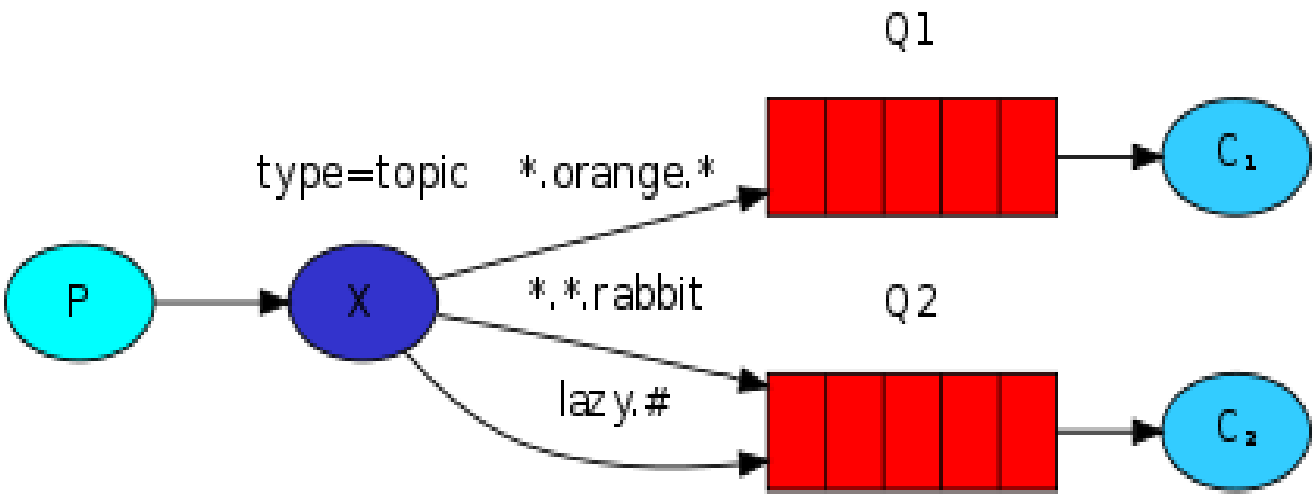
Point to Point: Routing

Route messages based on a routing key



Point to Point: Routing

Route messages based on a routing key



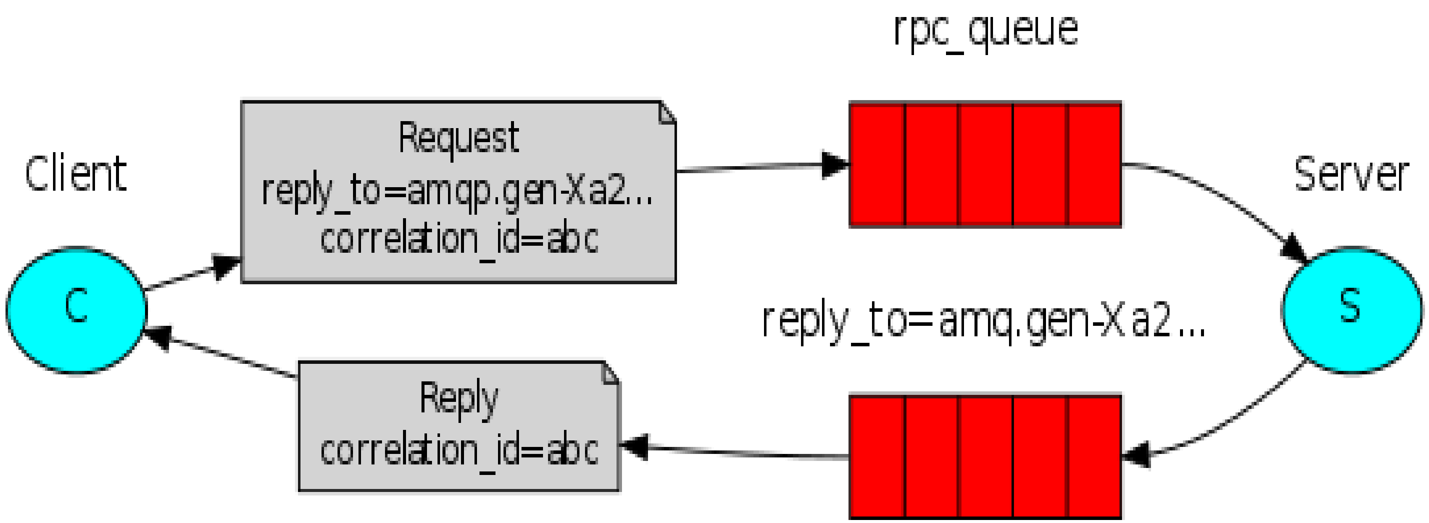
key pattern: service.level.IP

example key:

httpd.*.192.168.1.2, *.error.192.168.1.2, httpd.*.*

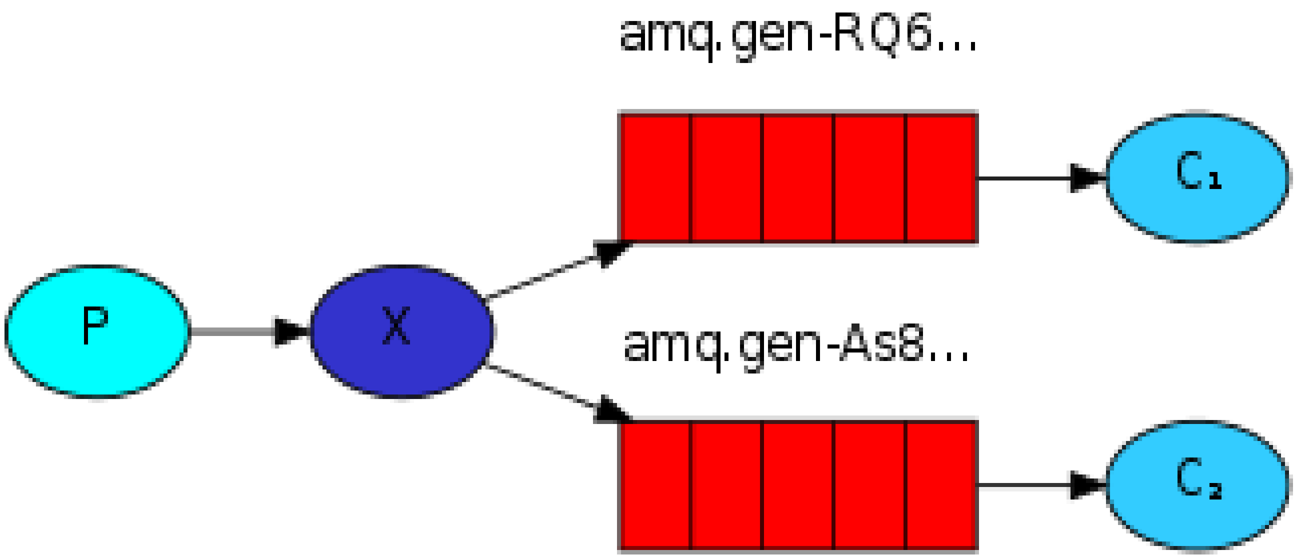
Point to Point: Request / Reply

Create temporary queue for reply



JMS has message selectors too

Publish / Subscribe



Usage:

Social networking

Enterprise Extensions

- Persistence
- Transactions
- Group Delivery
- XA
- Dead Letter Queue
- Bridge Queue
- Guaranteed Message Delivery

Technologies – Enterprise

- JMS
  - JBoss HornetQ
  - Glassfish OpenAMQ
  - Apache ActiveMQ
- AMQP
  - VMware RabbitMQ
  - Apache Qpid
  - OpenMQ

Technologies - Custom

- Beanstalkd → Very fast queue
- Kafka → Distributed Publish / Subscribe
- ZeroMQ → Messaging library
- Java Chronicle → Interprocess messaging
- Ejabberd → XMPP implementation
- MPI → mostly used in scientific applications

?