RabbitMQ / Bunny

RubyFTW
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Real Time Bidding Lead
simpli.fi

About Simpli.fi

- Simpli.fi is a real-time bidding (RTB) platform
  - ~500,000 queries per second
  - < 50 msec latency
  - C++ bidder, Ruby infrastructure, Erlang services
- We use RabbitMQ at Simpli.fi
  - Relatively new to us
  - Distribute thousands of messages per second across multiple data centers

Why use RabbitMQ?

- Message-based architecture is magical
    - Not the same way that Rails is “magical”
- Asynchronous request processing with built-in routing and queueing
- Trivially share data across multiple applications (pub/sub)
    - Potentially written in multiple languages
- Trivially scale up the number of workers
- Fault tolerance!
- No polling

Outline

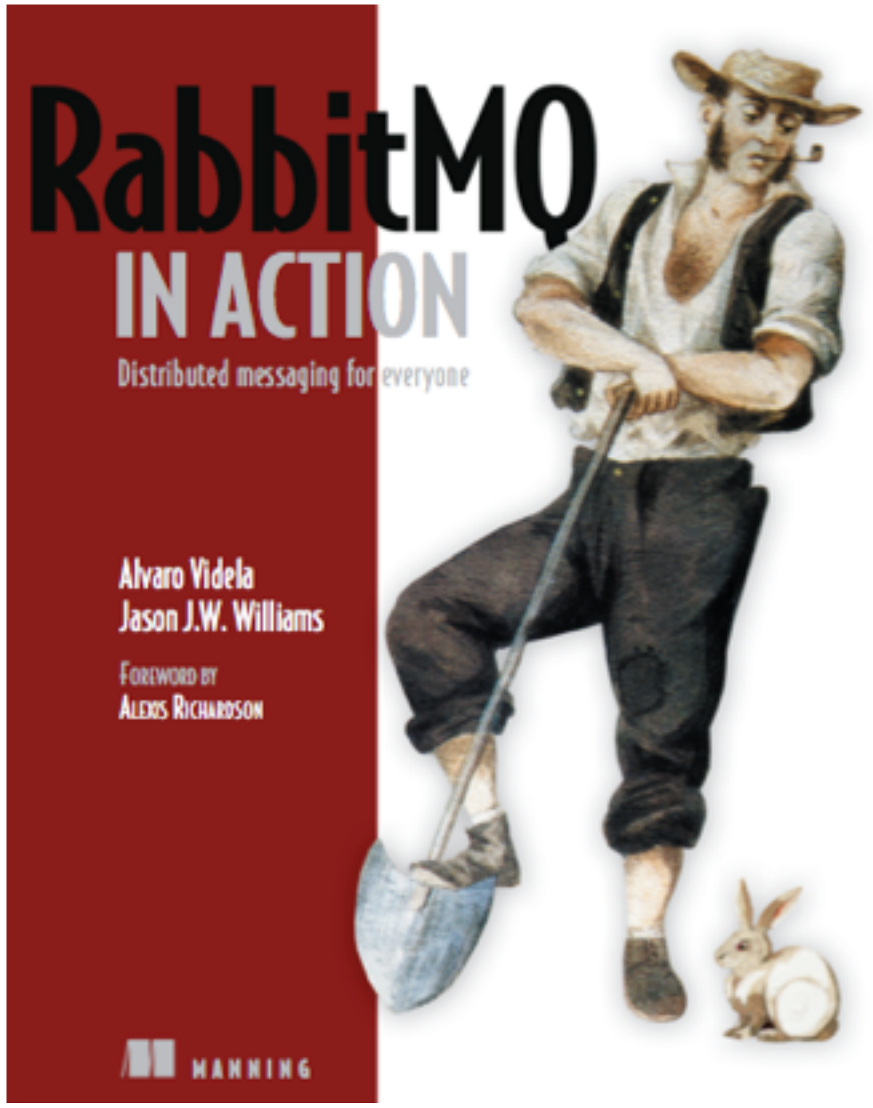
- RabbitMQ concepts
- Ruby Bunny
- Example

AMQP
Advanced Message Queuing Protocol

- Advanced Message Queue Protocol
  - JP Morgan Chase, 2003
- Implementations of AMQP 1.0
  - SwiftMQ - Java (JMS)
  - Windows Azure Service Bus
  - Apache - Qpid, ActiveMQ, Apollo
  - IBM MQ Light
  - **RabbitMQ**

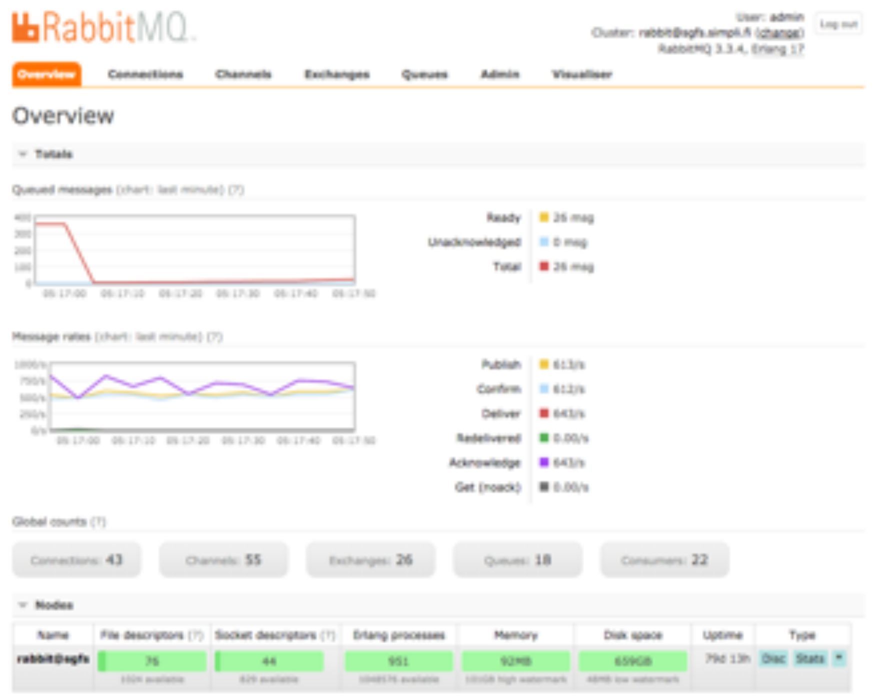
RabbitMQ™

- Rabbit Technologies, 2007 -> VMWare, 2010 -> Pivotal, 2013
- Open Source, written in Erlang
- Current - 3.3.5
- Also supports ZeroMQ
- Scalable by clustering*
- Failover support
- RabbitMQ In Action - Videla, Williams (Manning)



RabbitMQ™

- brew install rabbitmq / apt-get install rabbitmq-server
- rabbitmq-server -detached / rabbitmqctl stop
- Management Plugin - HTTP / REST - VERY useful -
  - rabbitmq-plugins enable rabbitmq_management
  - http://localhost:15672 - guest/guest
- rabbitmqadmin - Python script controls via REST
- Default username/password is guest/guest
  - Only works via 127.0.0.1



Overview

Totals

Queued messages (chart: last minute) (?)

Ready	26 msg
Unacknowledged	0 msg
Total	26 msg

Message rates (chart: last minute) (?)

Publish	613/s
Confirm	612/s
Deliver	643/s
Redelivered	0.00/s
Acknowledge	643/s
Get (noack)	0.00/s

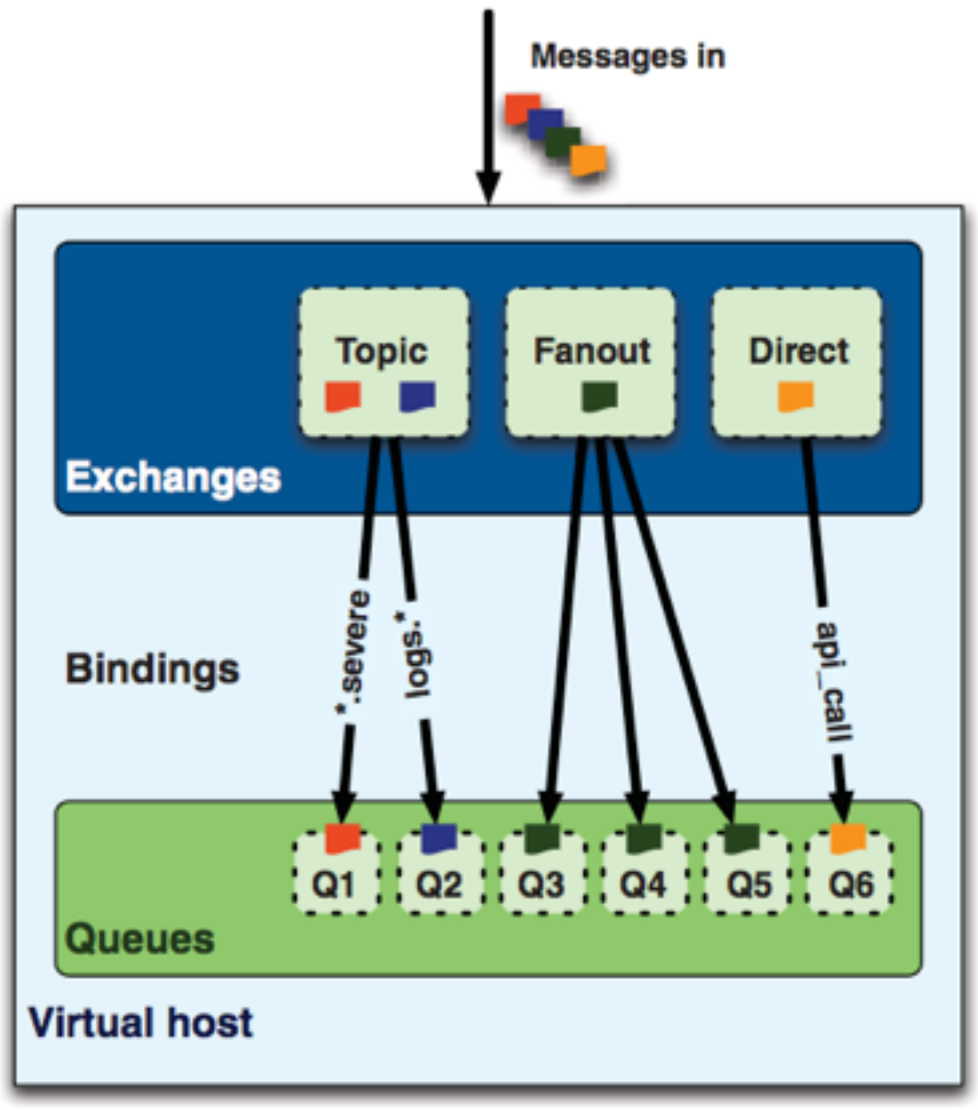
Global counts (?)

Connections: 43 Channels: 55 Exchanges: 26 Queues: 18 Consumers: 22

Nodes

Name	File descriptors (?)	Socket descriptors (?)	Erlang processes	Memory	Disk space	Uptime	Type
rabbit@sgfs	76 1024 available	44 829 available	951 1048576 available	92MB 10GB high watermark	659GB 48MB low watermark	79d 13h	Disc Stats *

RabbitMQ



- Exchanges
  - Publish to exchanges
  - Routing logic
- Queues
  - Subscribe to queues
  - **Bind** queues to Exchanges
- Exchange Types: Direct, Fanout, Topic
- Queues and messages can be durable
- Virtual hosts - separate concerns

amqp uri
amqp://user:password@host/vhost
amqp://user:password@host <- default vhost = “/“

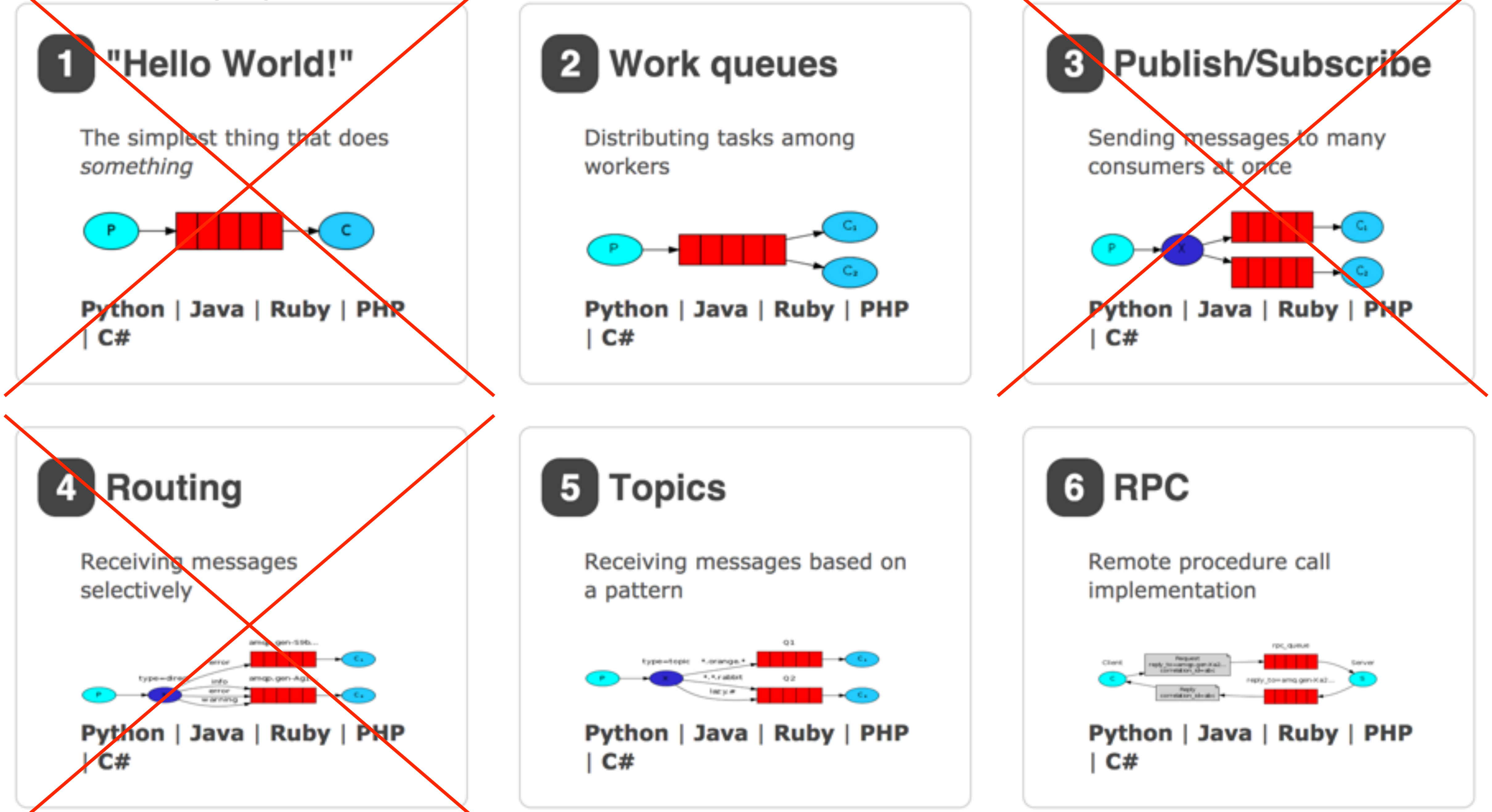
Distributing the rabbits

- Clustering intended for same-data center usage
- Two options: Shovels and Federation
- Shovels
  - More manual
  - More flexible
- Federation
  - More automated
  - Exchange has the appearance of existing on each broker
- github.com:dantswain/rabbitmq-federation-example

Rubying the rabbits: Bunny

- gem install bunny
- http://rubybunny.info - https://github.com/ruby-amqp/bunny
- rubybunny.info - “Guides”
- “Real” API doc site: http://reference.rubybunny.info/
- Official RabbitMQ tutorials using Bunny:
  http://www.rabbitmq.com/tutorials/tutorial-one-ruby.html

Design patterns



Pedagogical

~~1 "Hello World!"~~

~~The simplest thing that does *something*~~

~~Python | Java | Ruby | PHP | C#~~

(Use Topics)

2 Work queues

Distributing tasks among workers

Python | Java | Ruby | PHP | C#

Use Topics

~~3 Publish/Subscribe~~

~~Sending messages to many consumers at once~~

~~Python | Java | Ruby | PHP | C#~~

~~4 Routing~~

~~Receiving messages selectively~~

~~Python | Java | Ruby | PHP | C#~~

Use Topics

5 Topics

Receiving messages based on a pattern

Python | Java | Ruby | PHP | C#

6 RPC

Remote procedure call implementation

Python | Java | Ruby | PHP | C#

Good luck…

Lessons so far

- Everything looks like topics. It’s OK.
- Let consumers ensure the queue/binding exist.
- Federation was tricky to figure out, but works great.
  - Caveat: If a node goes down, prepare for big queues.
- “Redeliver” doesn’t necessarily mean what you think it means. Re-publishing always works.
- When queues get big, RabbitMQ gets slower, and can take the box with it.
- Give yourself an easy way to spawn extra workers.
- Use monit (or god, bluepill, whatever) to make sure workers come back up without intervention, but check that they are ACTUALLY coming back up (Groundhog Day suicide effect).