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CHICAGO 2009

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JBoss WORLD CHICAGO 2009

What's all the buzz about?

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Messaging Lead
JBoss
03 Sep 2009

Change of plan

- This presentation was scheduled to be about JBoss messaging
- This presentation is actually about **“HornetQ”** **http://jboss.org/hornetq**

HornetQ

Putting the buzz in messaging

- HornetQ is the new name for JBoss Messaging 2
- HornetQ is an open source community project to build a multi-protocol asynchronous messaging system
- HornetQ is designed for performance
- HornetQ is designed with usability in mind
- HornetQ is full featured
- See the wiki for more information: http://www.jboss.org/community/wiki/HornetQGeneralFAQs

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How does HornetQ relate to JBoss Messaging?

- We decided to rename JBoss Messaging 2 to HornetQ
- JBM 1.x and 2.x code bases 95%+ different.
- HornetQ is a different beast to JBM 1.x
- HornetQ is not tightly coupled to JBoss Application Server

How is HornetQ licenced?

- Most of HornetQ is licenced using ASL 2.0
- A few files still under LGPL
- Why ASL, not LGPL?

Usability is critical!

- Key design goal of HornetQ is ease of use
- Simple API
- Clear and simple to configure
- Great docs
- Ships with over 65 fully runnable examples out of the box
- Minimal third party dependencies

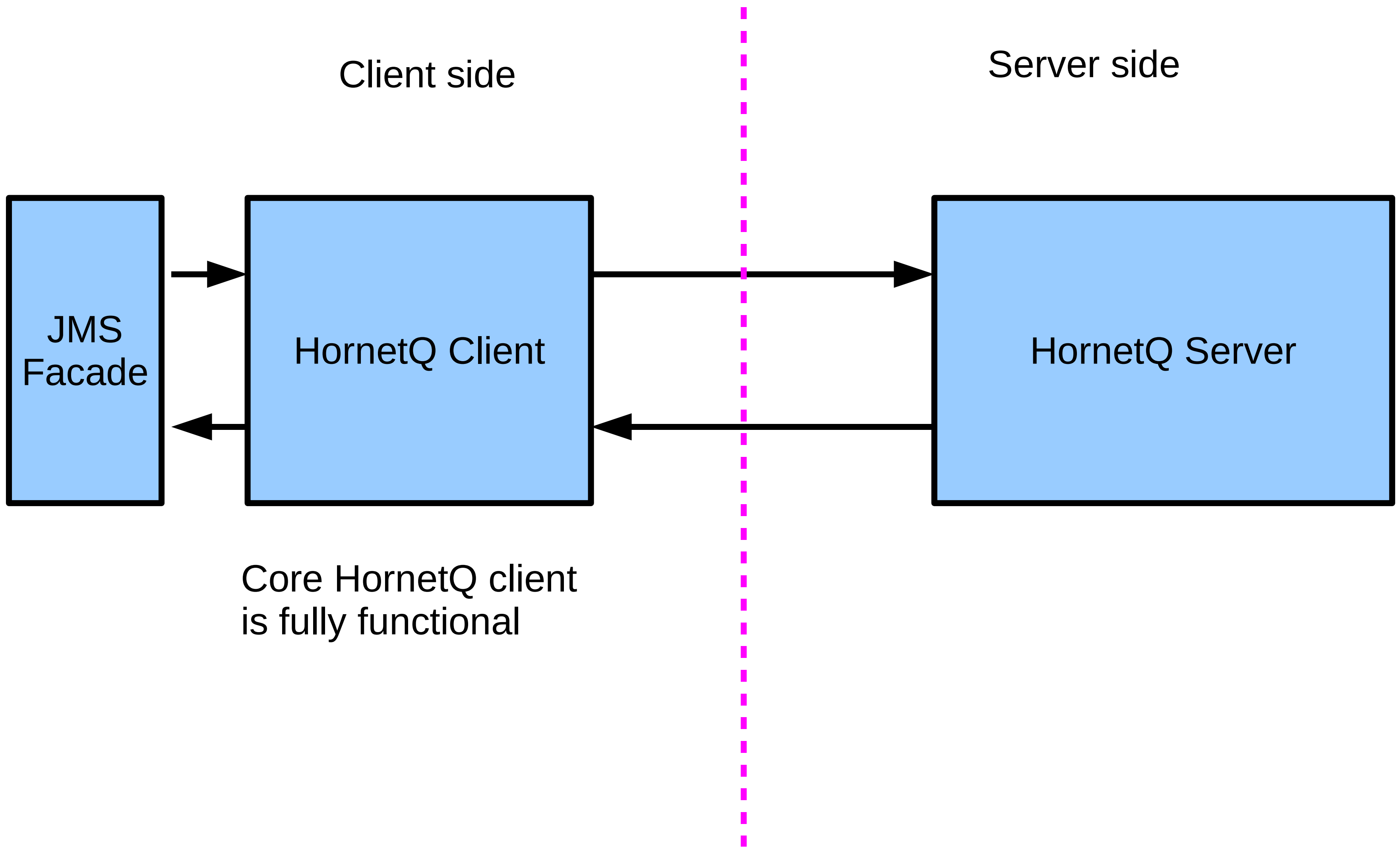
Both standalone and JEE messaging

- HornetQ is a fully functional stand-alone messaging server – if you don't want an app server, don't use an app server
- HornetQ can also be integrated with any JEE application server, e.g. JBoss Application Server 5.0, using its JCA adaptor
- HornetQ can also be used with any dependency injection framework, e.g. JBoss MC, Spring, Google Guice

Elegant generic architecture

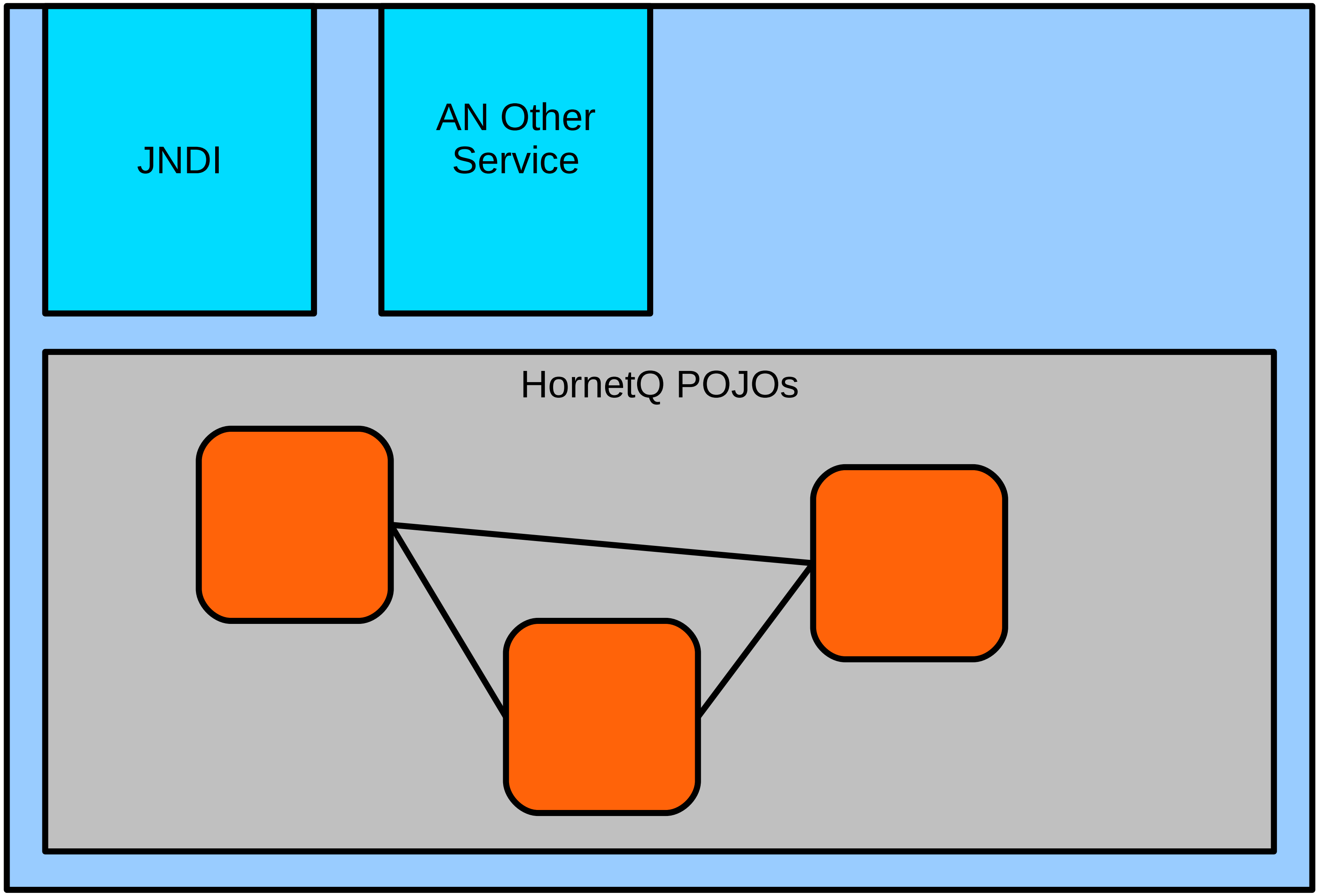
- Fully functional JMS agnostic messaging system
- No dependencies on JMX, JNDI, JCA, etc.
- Just a set of simple POJOs
- JMS functionality applied as thin facade on the client side
- Much, much more than just JMS!
- Can be embedded in an application that requires messaging internally.

Generic core and JMS facade

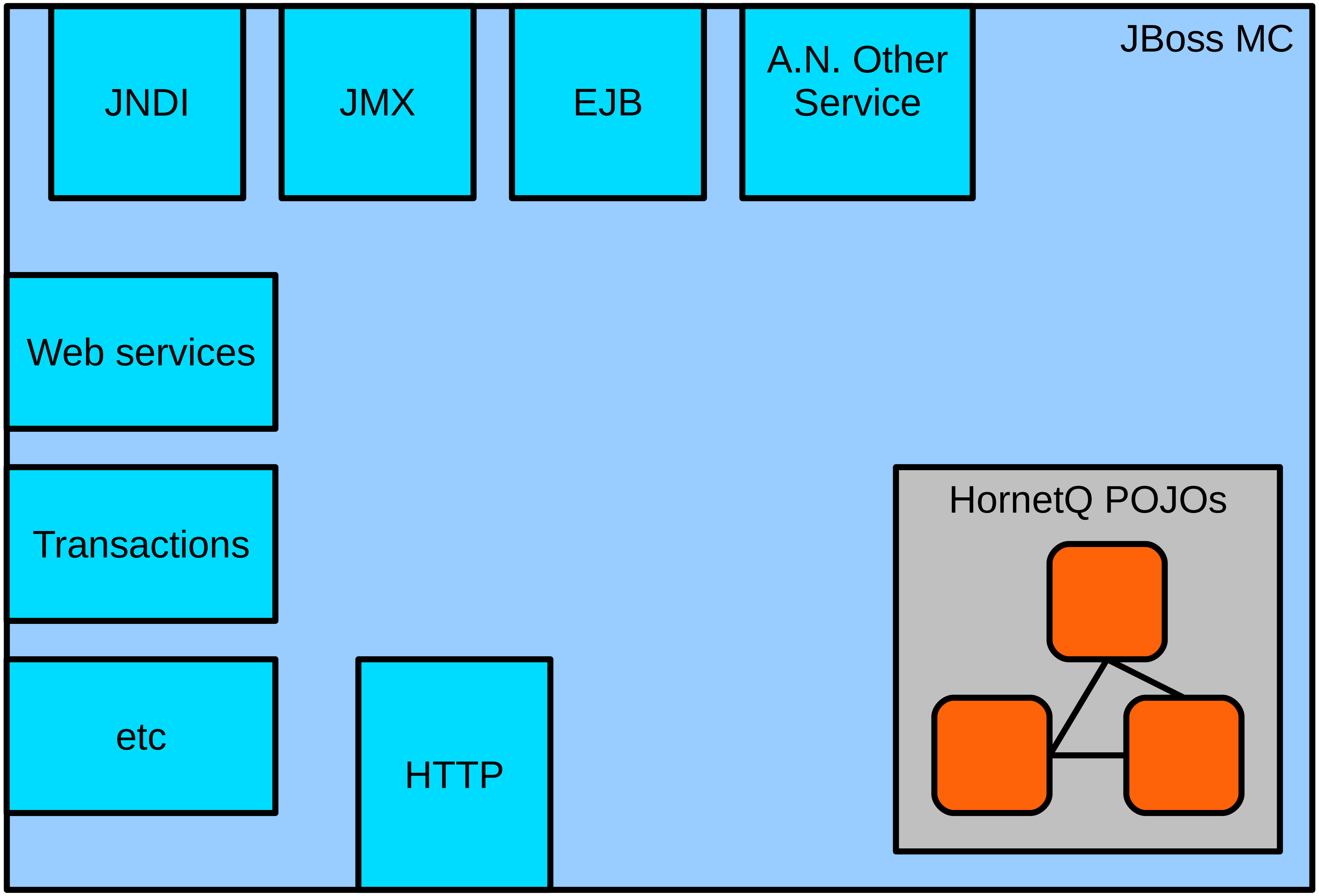


Core HornetQ client
is fully functional

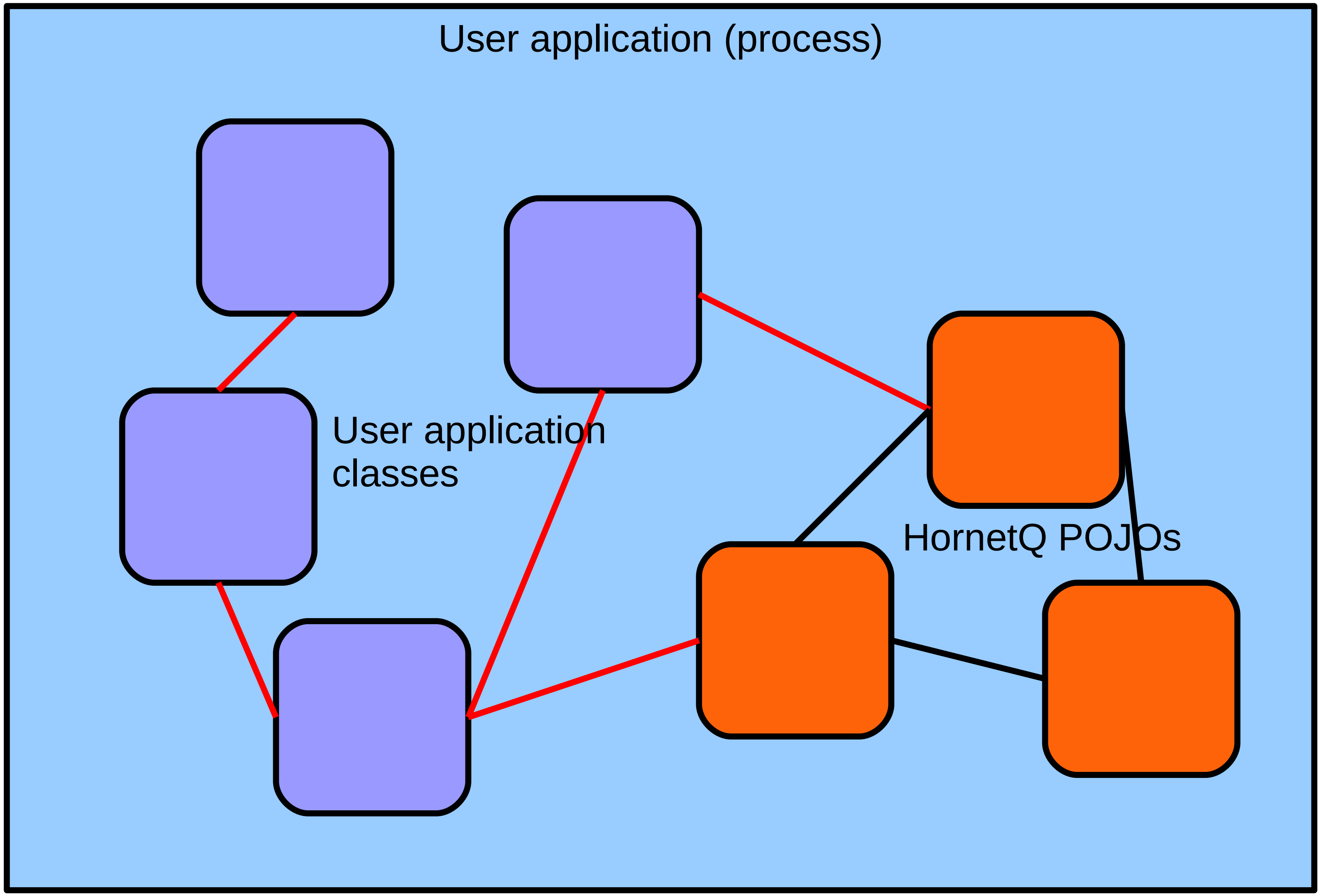
Stand-alone deployment using JBoss Micro-container



HornetQ inside JBoss AS 5.x



HornetQ embedded in 3rd party application



HornetQ embedded code example

```
MessagingServer server = new MessagingServerImpl();
server.start();
ClientSessionFactory sf = new ClientSessionFactoryImpl(...);
ClientSession sess = sf.createSession();
sess.createQueue("address1", "queue1");
sess.start();
ClientProducer prod = sess.createProducer("address1");
Message message = new ClientMessageImpl(false);
message.getBody().writeString("hello world");
prod.send(message);
ClientConsumer cons = sess.createConsumer("queue1");
Message received = cons.receive();
System.out.println("Got message " + received.getBody().readString());
sess.close();
server.stop();
```

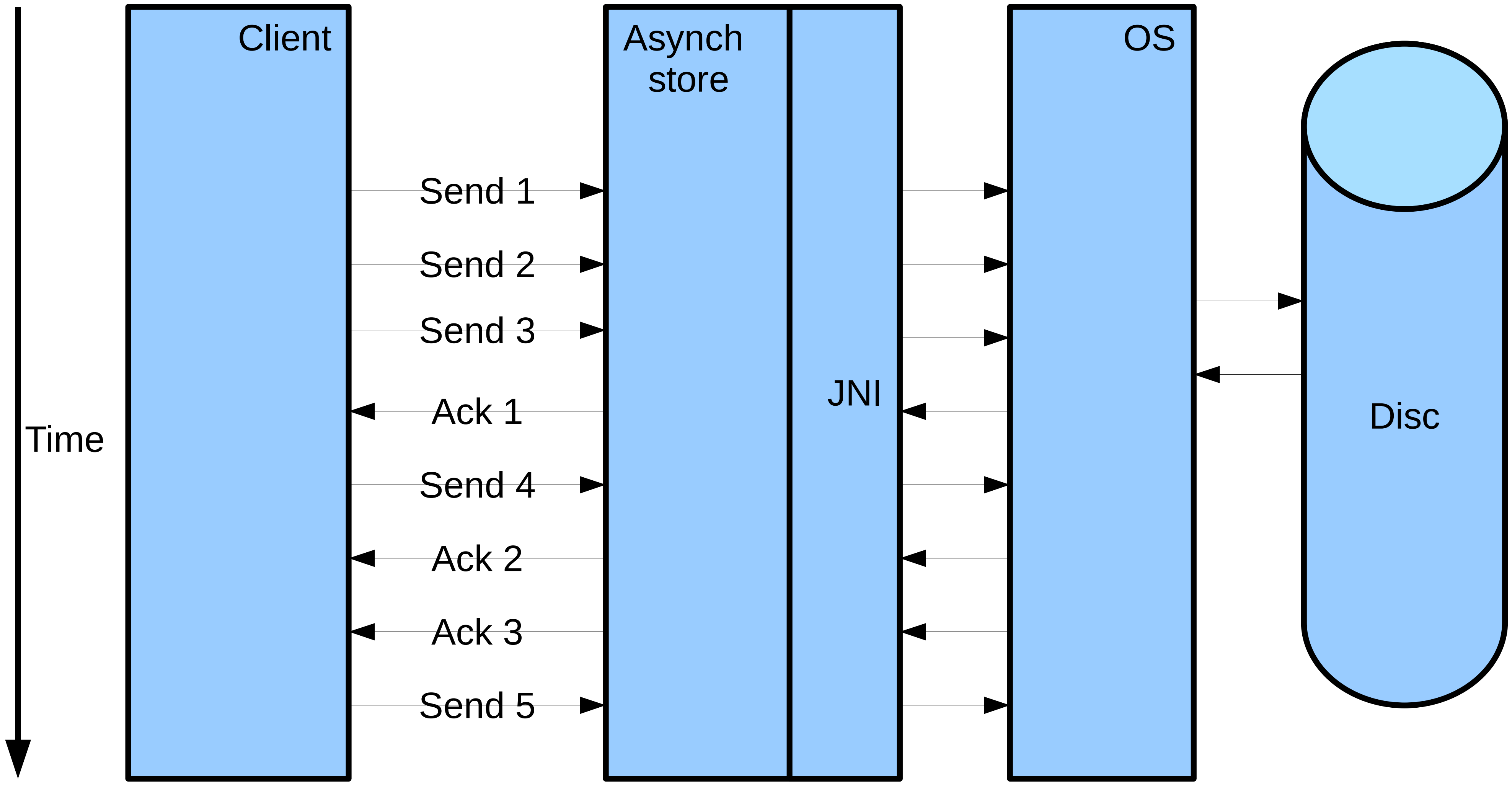
HornetQ features

- Very high performance journal
- Support for huge queues and huge messages with small server and client footprint
- Pluggable transport system
- Seamless High Availability (HA)
- Massively flexible clustering
- Extensive management API
- Lots, lots, more, but no time here! See the wiki for a full list: http://www.jboss.org/community/wiki/HornetQFeatures

Ultra high performance journal

- HornetQ persistence is very fast
- Very fast store using Linux asynchronous IO.
- Up to 100+ MiB/s on a single node!
- JNI interface to aio library (libaio), encapsulated in Java package.
- Automatic switches to Java NIO when not running on Linux

Asynchronous IO on Linux



Huge queues and messages

- HornetQ supports huge queues – far bigger than can fit in available RAM
- Run Terabyte queues while the server is only running in 50MiB of RAM!
- Send and receive huge multi-gigabyte messages with all the normal transactional semantics
- Effectively, only limit to message size is available disk space. We have tested messages up to 8 GiB in size.

Configurable Transport system

- Fully pluggable transport
- Ships with default implementation using JBoss Netty http://jboss.org/netty/
- TCP transport
- SSL transport
- HTTP transport
- Servlet transport
- In-VM transport

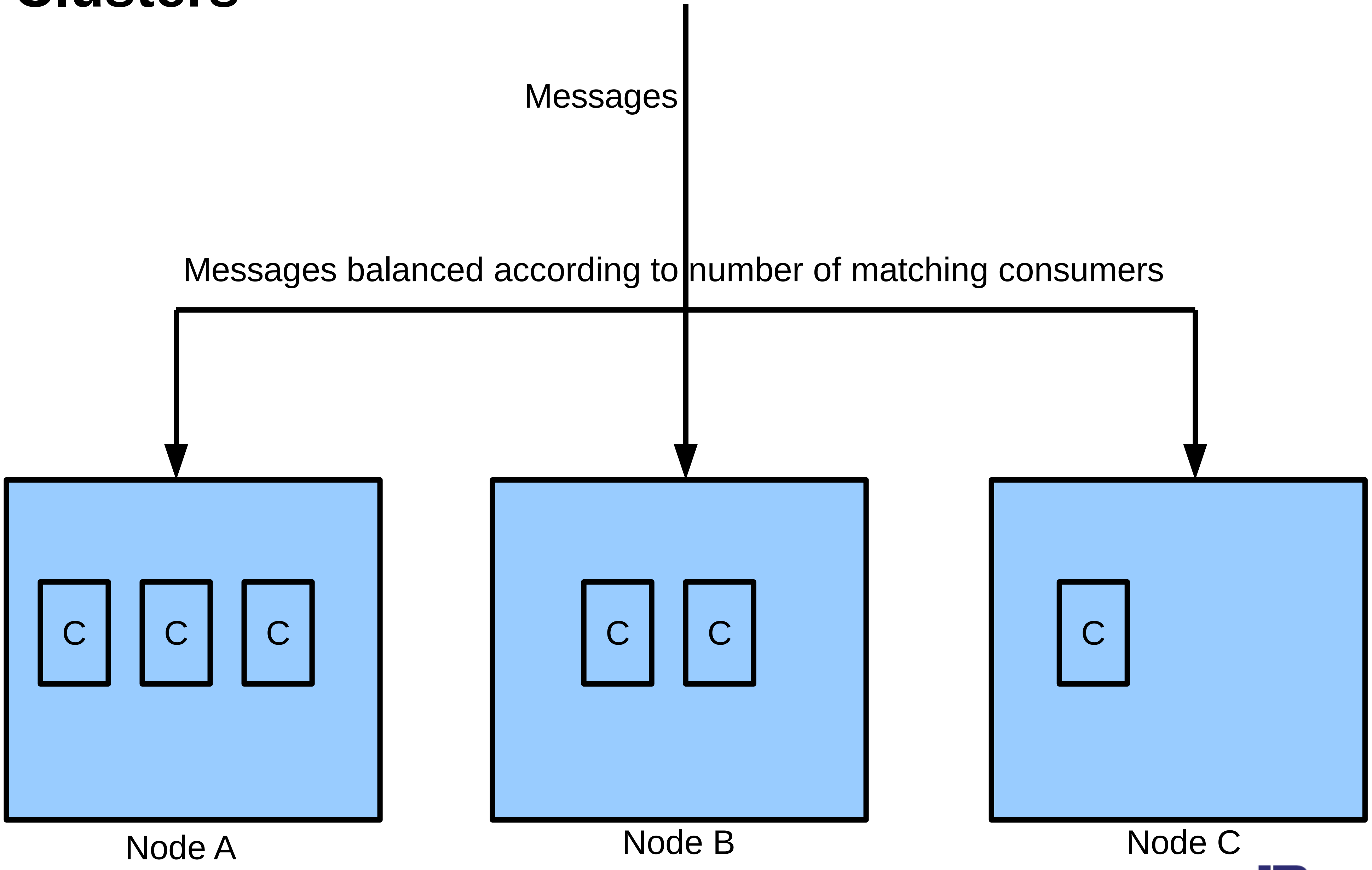
HornetQ High Availability

- Transparent reconnection on failure
- 100% guaranteed no loss or duplication of messages
- Fail-over via store on SAN
- Replicated journal (Shared nothing approach)

HornetQ Clusters

- HornetQ servers can be grouped into clusters
- Clusters are a way of balancing message processing across several nodes.
- Messages arriving on cluster are balanced to different nodes to spread the load – default balancing is round robin.
- Balancing takes into account selectors and consumers on each node

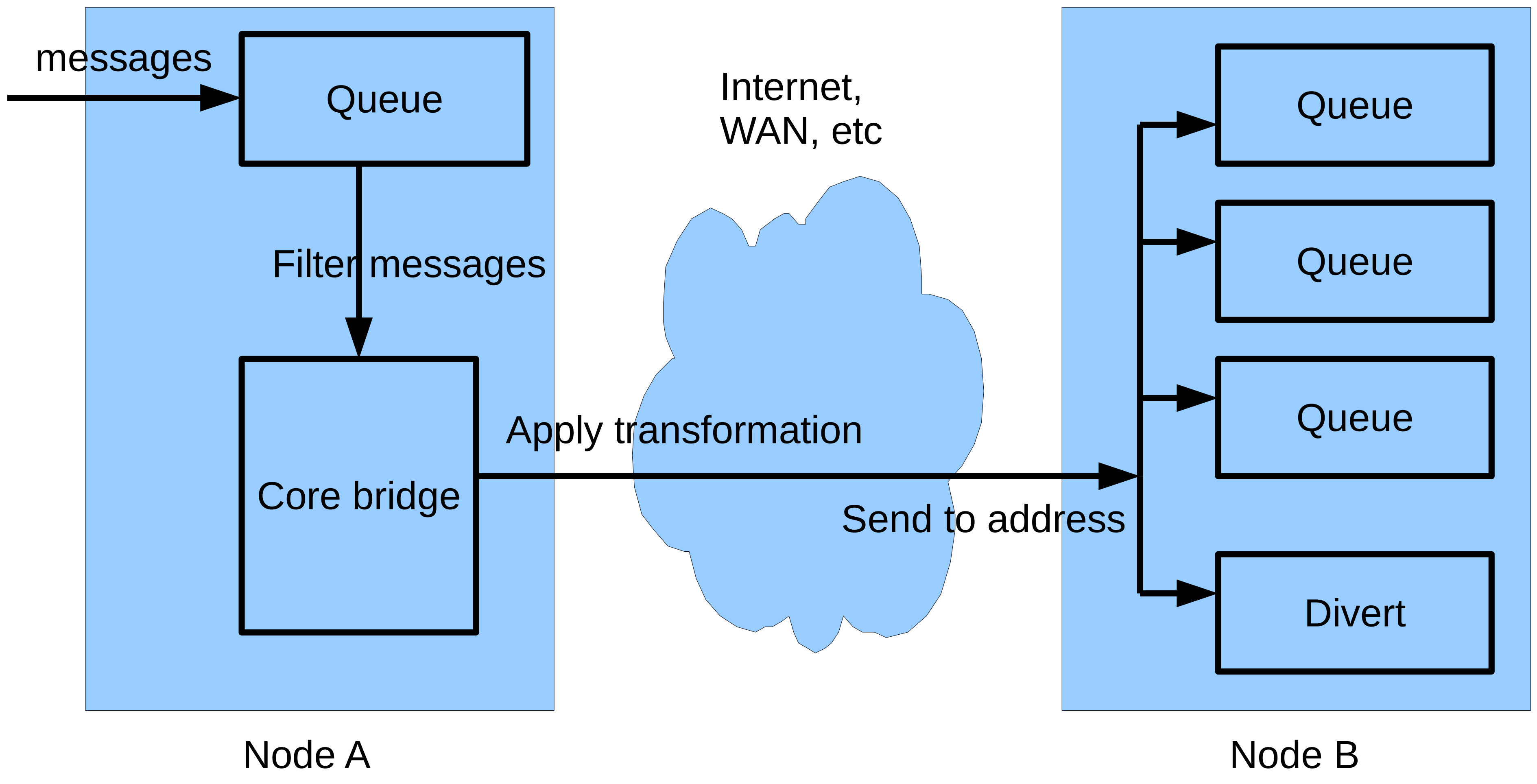
Clusters


Messages
Messages balanced according to number of matching consumers
C
C
C
C
C
C
Node A
Node B
Node C

HornetQ Core Bridges

- Core bridges take messages from one queue and forward them to another remote address
- Core bridges can use filters to select only certain messages
- Core bridges can apply transformations
- Core bridges are high performance
- Core bridges can work with unreliable connections
- Core bridges are not JMS bridges

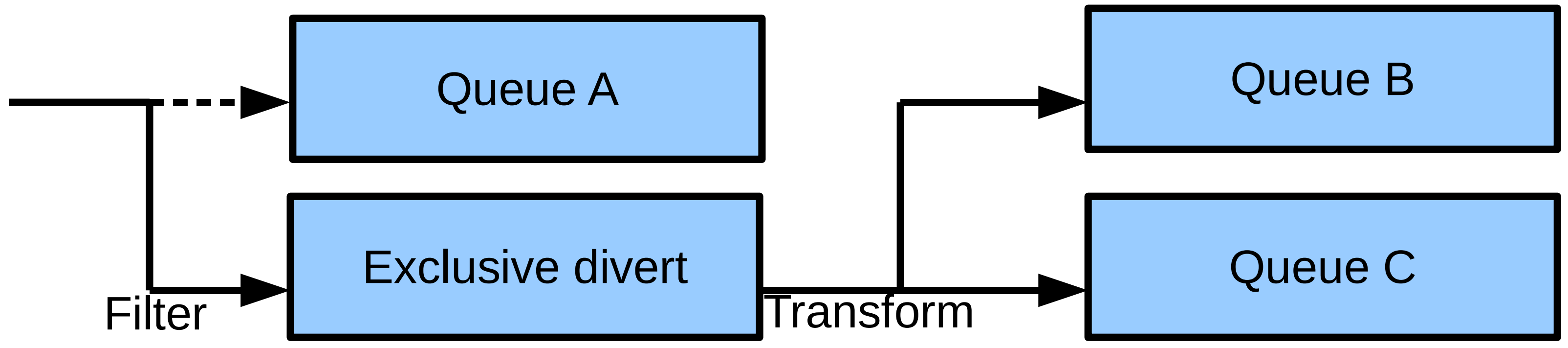
Core bridges



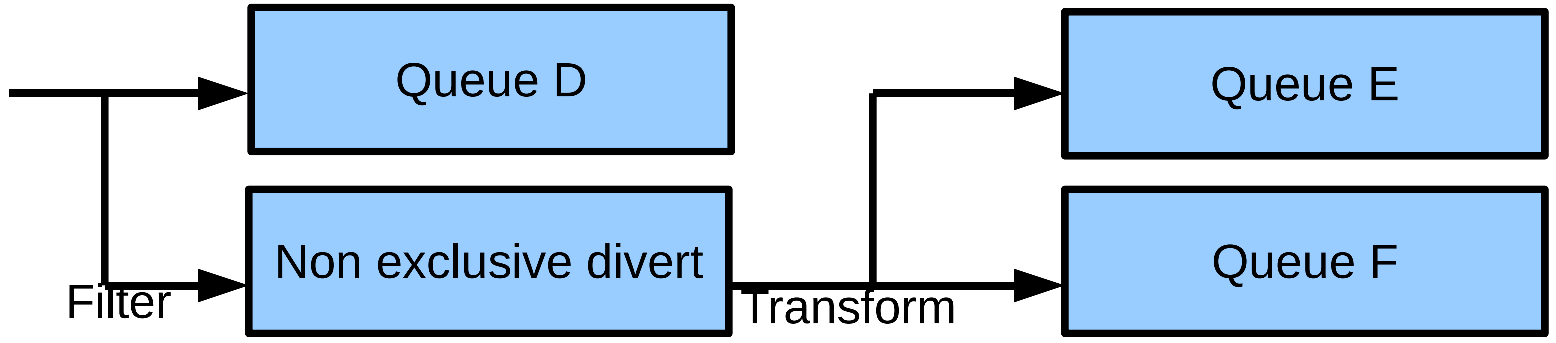
HornetQ diverts

- Diverts are a ***routing table*** *for messaging*
- Diverts take messages destined for one address and divert them to another address
- Diverts can be exclusive or not. Non exclusive diverts copy messages.
- Diverts can apply transformations
- Diverts can use filters to only select certain messages
- Diverts are high performance

Diverts



Exclusive diverts can be used to “divert”



Non exclusive diverts can be used to “siphon” or “snoop”

Global scale messaging fabric

• Combine clusters, bridges and diverts and you can create a massively configurable global messaging fabric to run your business. All with zero message loss and zero message duplication guarantee.

• Add HA to provide unbroken up-time.

• Use HornetQ as the messaging fabric together with JBoss ESB, and benefit from all the 3rd party connectors provided by JBoss ESB.

Going ahead

- Interoperability – REST, AMQP, STOMP, XMPP, Ajax/Comet
- Server-less mode
- Performance bench-marks
- See the road map here: http://www.jboss.org/community/wiki/Roadmap

Interoperability

- REST
  Provide a simple RESTful interface for HornetQ over HTTP.
  See REST-* project
- AMQP – HornetQ will implement the AMQP protocol
- STOMP
  Native STOMP support provides access to HornetQ by many STOMP clients written in different languages
- XMPP
- Async web support (Ajax/comet/bayeaux)

Join us!

- HornetQ is a community project - come and get involved!
- We are always looking for new developers to help out – there is a lot of cool new stuff to implement.
- Find us on irc: irc://freenode.net:6667#hornetq

QUESTIONS?

TELL US WHAT YOU THINK: REDHAT.COM/JBOSSWORLD-SURVEY

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http://jboss.org/hornetq

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