AMQ RFC012
AMQP/Fast Semantics for JMS

version 0.1

James Strachan <jstrachan@protique.com>

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1.1 State of this Document

This document is a request for comments. Distribution of this document is currently limited to iMatix and JPMorgan internal use.

This document is a provisional proposal. This document is a formal standard.

1.2 Copyright Notice

1.3 Authors

This document was written by James Strachan <jstrachan@protique.com>.

1.4 Abstract

This proposal defines a mapping of the JMS specification onto the AMQ protocol.

2 Design Proposal

2.1 Detailed Proposal

We map the message-oriented semantics of JMS onto AMQP/Fast as follows:

1. JMS connection and sessions are mapped cleanly onto AMQP connections and channels.
2. JMS MessageConsumers will each use a single AMQP handle.
3. JMS MessageProducers will each use at least one AMQP handle. For a MessageProducer created with a specific Destination, then a single AMQP handle will be used; though JMS supports other destinations to be used and so other handles will be used.
4. There is nothing in JMS which naturally maps to HANDLE REQUEST though a provider may wish to use this mechanism, outside of the JMS specification such as to implement a remote JMX protocol.
5. The MIME type for the request field in CHANNEL SUBSCRIBE commands will be "Application/JMS".
6. The JMS destination types are mapped to the AMQP 'path' somehow (TBD)

2.2 destinationType Semantics

JMS supports the following destinationType values and associated semantics.

/topic/durable A durable topic; messages must be persisted to disk before ACKs and subscriptions do not terminate when the channel closes. Messages are never removed unless consumed or some administrator deletes them.

/queue/durable A durable queue; messages must be persisted to disk before ACKs. Messages are never removed unless consumed or some administrator deletes them.

/topic/transient A transient topic; messages may be buffered to disk/in RAM for a period of time and if a client disconnects and reconnects some form of recovery/replay may be used but this is provider dependent

/transient/queue a transient queue; messages may be buffered to disk/in RAM up for a period of time and if a client disconnects and reconnects some form of recovery/replay may be used but this is provider dependent

/tmp/queue a temporary queue which survives only as long as the current connection. On reconnection, the queue no longer exists.

/topic/tmp a temporary topic which survives only as long as the current connection. On reconnection, the topic no longer exists.

2.3 MessageProducer mapping

A handle in AMQP is bound to a single destinationType (such as /queue/durable or /topic/tmp). However in the JMS API a MessageProducer can send/receive to any destination and can use both temporary destinations or permanent ones as well as using topics and queues.

So to map to AMQP a MessageProducer must remember the current destinationType of the AMQP channel and if a new destination or delivery mode is different, explicitly open a new HANDLE for the new destination.

Some providers may find this inefficient and may wish to create, lazily, up to 6 different AMQP channels for each JMS MessageProducer and use the correct one each time to avoid the rebind.

2.4 TBD

We need to come up with MIME types for the standard 5 JMS message body types

- Java serialized object
- text (application/text?)
- binary (BytesMessage and StreamMessage)
- MapMessage (key-value pairs of primitive types)

2.5 Future Considerations

If multiple MessageConsumer instances are consuming on a similar topics with overlapping selectors then a single message could be delivered to several MessageConsumers. Currently there is no optimisation in the AMQP protocol to cater for this scenario.

There could be, in future AMQP versions, a custom header used to indicate all other matching handle subscriptions that a given message matches; allowing a JMS client to map a single message to multiple channels.

Currently this is only an issue for multiple consumers on overlapping topics. Its advisable to use a single MessageConsumer channel in the JMS client to minimise the redundant use of the network in this particular case.

2.6 Security Considerations

This proposal does not have any specific security considerations.

3 Appendices

[For other information you want to include with this document. If you do not have any appendices, you can delete this heading.]

4 Comments on this Document

Comments by readers; these comments may be edited, incoporated, or removed by the author(s) of the document at any time.

4.1 Date, name

No comments at present.