**Exercise 8: Master/Slave - Shared Store**

A-MQ 7.12 has the ability to run in a master/slave (ie, active/passive) configuration so that if an active node goes down, another can immediately take its place and continue serving clients and processing messages. There are a few different options that can be used to achieve this:

* Shared store
* Replicated store (ie, "shared nothing")
* Co-located

For the purpose of this lab, we will focus on the "Shared store" option for persistence, and use the "Static" option for clustering.

**Prerequisites**

Download and install the A-MQ 7.12 broker package.

**Creating the brokers**

$ $AMQ\_HOME/bin/artemis create brokers/master --name master --user admin --password admin --allow-anonymous

$ $AMQ\_HOME/bin/artemis create brokers/slave --name slave --user admin --password admin --allow-anonymous --port-offset 1

*Note: We could have passed in some extra arguments to configure our master/slave pair with some defaults, but instead we're going to manually configure them via the broker.xml file so we can become familiar with the available options.*

**Editing the configuration**

**Master**

1. Open up the brokers/master/etc/broker.xml file in your favorite text editor.
2. Modify the existing paging-directory, bindings-directory, journal-directory, and large-messages-directory elements to point to a shared mount. In the real world, this would likely point to a directory on a SAN that is mounted on both the master and slave machines.

<paging-directory>../sharedstore/data/paging</paging-directory>

<bindings-directory>../sharedstore/data/bindings</bindings-directory>

<journal-directory>../sharedstore/data/journal</journal-directory>

<large-messages-directory>../sharedstore/data/large-messages</large-messages-directory>

1. Add the following elements anywhere under the <core> element:

<connectors>

<connector name="master-connector">tcp://localhost:61616</connector>

<connector name="slave-connector">tcp://localhost:61617</connector>

</connectors>

<cluster-user>admin</cluster-user>

<cluster-password>admin</cluster-password>

<cluster-connections>

<cluster-connection name="static-cluster">

<connector-ref>master-connector</connector-ref>

<static-connectors>

<connector-ref>slave-connector</connector-ref>

</static-connectors>

</cluster-connection>

</cluster-connections>

<ha-policy>

<shared-store>

<master>

<failover-on-shutdown>true</failover-on-shutdown>

</master>

</shared-store>

</ha-policy>

1. Start the broker:

$ ./brokers/node1/bin/artemis run

**Slave**

1. Open up the brokers/slave/etc/broker.xml file in your favorite text editor.
2. Modify the existing paging-directory, bindings-directory, journal-directory, and large-messages-directory elements to point to a shared mount. In the real world, this would likely point to a directory on a SAN that is mounted on both the master and slave machines.

<paging-directory>../sharedstore/data/paging</paging-directory>

<bindings-directory>../sharedstore/data/bindings</bindings-directory>

<journal-directory>../sharedstore/data/journal</journal-directory>

<large-messages-directory>../sharedstore/data/large-messages</large-messages-directory>

1. Add the following elements anywhere under the <core> element:

<connectors>

<connector name="master-connector">tcp://localhost:61616</connector>

<connector name="slave-connector">tcp://localhost:61617</connector>

</connectors>

<cluster-user>admin</cluster-user>

<cluster-password>admin</cluster-password>

<cluster-connections>

<cluster-connection name="static-cluster">

<connector-ref>slave-connector</connector-ref>

<static-connectors>

<connector-ref>master-connector</connector-ref>

</static-connectors>

</cluster-connection>

</cluster-connections>

<ha-policy>

<shared-store>

<slave>

<failover-on-shutdown>true</failover-on-shutdown>

<allow-failback>true</allow-failback>

</slave>

</shared-store>

</ha-policy>

1. Start the broker:

$ ./brokers/node2/bin/artemis run

**Testing**

1. Open up a new terminal window and run the following command:

$ $AMQ\_HOME/bin/artemis producer --verbose --user admin --password admin --message-count 100 --url 'tcp://localhost:61616'

1. Shut down the master broker (ie, by hitting ctrl-c on its terminal). You should see the slave broker log a few messages indicating that it has come online (this might take a couple of seconds).
2. In the same terminal window that you ran the producer command, run the following command:

$ $AMQ\_HOME/bin/artemis consumer --verbose --user admin --password admin --message-count 100 --url 'tcp://localhost:61617'

All of the messages that you produced to the master broker in step 1 should be consumed from the slave broker.

1. (optional) Restart the master broker and you should see that it will take over and the slave will shut down/go back into slave mode (this might take a couple of seconds).