Example:

Create simple web application

JBoss 7.1

network setup for mod\_cluster

- Need at least 2 network interfaces

- for local testing, use two loopbacks

How do you create a loopback interface?

<http://www.windowsreference.com/windows-7/how-to-install-a-loopback-adapter-in-windows-7/>

## Install 2 instances of JBOSS 7

Set JBOSS\_HOME for each instance

Setting up JBoss for high-availability

Add loopback adapter for second standalone jboss instance and for ip-based virtual server on httpd.

${JBOSS\_HOME}/standalone/configuration/standalone-preview-ha.xml

Add interface

<interfaces>

<interface name="management">

<inet-address value="${jboss.bind.address.management:127.0.0.1}"/>

</interface>

<interface name="public">

<inet-address value="${jboss.bind.address:127.0.0.1}"/>

</interface>

<interface name="specific-ip-interface">

<inet-address value="${jboss.bind.address:10.10.10.1}"/>

</interface>

</interfaces>

Associate socket-binding-group with interface

<socket-binding-group name="standard-sockets" default-interface="specific-ip-interface">

Start jboss

${JBOSS\_HOME}/bin/standalone.sh -server-config standalone-preview-ha.xml –Djboss.node.name=node1

${JBOSS\_HOME}/bin/standalone.sh -server-config standalone-ha.xml Djboss.node.name=node2

Vertical cluster

Horizontal cluster

## Install mod\_cluster

Advertise mechanism

### Apache setup

Copy .so’s to modules dir

Apache virtual-host

<http://httpd.apache.org/docs/2.2/howto/access.html>

Setup manager listener

Listen 11.11.11.1:6666

<VirtualHost 11.11.11.1:6666>

<Directory />

Order deny,allow

Deny from all

Allow from 127.0.0.1

Allow from 10.10.10.1

</Directory>

KeepAliveTimeout 60

MaxKeepAliveRequests 0

ManagerBalancerName mycluster

AdvertiseFrequency 5

</VirtualHost>

<Location /mod\_cluster-manager>

SetHandler mod\_cluster-manager

Order deny,allow

Deny from all

Allow from 127.0.0.1

</Location>

What is the purpose of the Listen directive?

Opens a port on specified interface and waits for requests

What is the purpose of the ManagerBalancerName directive?

How do you access the mod\_cluster\_manager app?

<http://node1.cluster.com:6666/mod_cluster_manager>

22:41:30,017 ERROR [org.jboss.modcluster.mcmp.impl.DefaultMCMPHandler] (Containe

rBackgroundProcessor[StandardEngine[jboss.web]]) Error [MEM: MEM: Can't read nod

e: {4}] sending command STATUS to proxy node1.cluster.com/127.0.0.1:6666, config

uration will be reset

TODO

22:53:02,789 WARN [org.hornetq.core.cluster.impl.DiscoveryGroupImpl] (hornetq-d

iscovery-group-thread-dg-group1) There are more than one servers on the network

broadcasting the same node id. You will see this message exactly once (per node)

if a node is restarted, in which case it can be safely ignored. But if it is lo

gged continuously it means you really do have more than one node on the same net

work active concurrently with the same node id. This could occur if you have a b

ackup node active at the same time as its live node. nodeID=c1ce8147-a14f-11e1-b

f53-964a20524153

TODO

\*\*\*

proxyList address1:port1

doskey startjb=start C:\dev\jboss\jboss-as-7.1.1.Final\bin\standalone.bat -Djboss.server.config.dir=C:\dev\jboss\jboss-as-7.1.1.Final\standalone\configuration --server-config=standalone-full-ha.xml

set JBOSS\_HOME=c:\dev\jboss\jboss-as-7.1.1.Final\_1

standalone.bat -Djboss.server.config.dir=%JBOSS\_HOME%\standalone\configuration --server-config=standalone-full-ha.xml

domain or standalone?

domain

Is a jboss\_cluster required mod\_cluster?

don't think so

2 httpd instances

httpd\_a

127.0.0.1:80

httpd.exe

http://node1.cluster.com/

httpd\_b

127.0.0.2:80

http://node2.cluster.com/

2 jboss instances

jboss\_1

proxyList=127.0.0.1:80,127.0.0.2:80

jboss\_2

proxyList=127.0.0.1:80,127.0.0.2:80

\*\*\*

### JBoss setup

Modcluster subsystem

ModClusterListener  bean

TODO

mod-cluster-config?

How do you turn off advertising?

TODO

What role does ajp play in mod\_cluster?

TODO

How do application nodes become aware of the proxies?

Either via 1) static configuration defined in the proxyList definition property in the modcluster system or 2) Via http advertising via the advertise mechanism.

How is httpd advertise functionality implemented?

Via the advertise configuration property in the modcluster subsystem.

What is a jvmRoute?

Caused by: java.lang.IllegalStateException: JBAS010281: Found member mike\_ibm\_laptop/web in current view that duplicates us (mike\_ibm\_laptop/web). This node cannot join partition until duplicate member has been removed at org.jboss.as.clustering.CoreGroupCommunicationService.verifyNodeIsUnique(CoreGroupCommunicationService.java:1197)

20:05:06,031 INFO [org.hornetq.core.server.impl.HornetQServerImpl] (MSC service thread 1-1) HornetQ Server version

2.2.7.Final (HQ\_2\_2\_7\_FINAL\_AS7, 121) [4e91b7cd-1e13-11e1-ac9b-02004c4f4f50] started

20:05:06,296 WARN [jacorb.orb.iiop] (MSC service thread 1-1) could not create server socket port: 3528 host: MIKE\_

IBM\_LAPTOP/10.10.10.3: java.net.BindException: Address already in use: JVM\_Bind

at java.net.PlainSocketImpl.socketBind(Native Method) [:1.6.0\_19]

at java.net.PlainSocketImpl.bind(PlainSocketImpl.java:365) [:1.6.0\_19]

at java.net.ServerSocket.bind(ServerSocket.java:319) [:1.6.0\_19]

at java.net.ServerSocket.<init>(ServerSocket.java:185) [:1.6.0\_19]

at org.jacorb.orb.factory.DefaultServerSocketFactory.createServerSocket(Unknown Source) [jacorb-2.3.1jboss.

patch01-brew.jar:]

at org.jacorb.orb.iiop.IIOPListener$Acceptor.createServerSocket(Unknown Source) [jacorb-2.3.1jboss.patch01-

brew.jar:]

at org.jacorb.orb.iiop.IIOPListener$Acceptor.init(Unknown Source) [jacorb-2.3.1jboss.patch01-brew.jar:]

at org.jacorb.orb.iiop.IIOPListener.configure(Unknown Source) [jacorb-2.3.1jboss.patch01-brew.jar:]

at org.jacorb.orb.etf.FactoriesBase.newInstance(Unknown Source) [jacorb-2.3.1jboss.patch01-brew.jar:]

at org.jacorb.orb.etf.FactoriesBase.create\_listener(Unknown Source) [jacorb-2.3.1jboss.patch01-brew.jar:]

at org.jacorb.orb.BasicAdapter.configure(Unknown Source) [jacorb-2.3.1jboss.patch01-brew.jar:]

at org.jacorb.orb.ORB.getRootPOA(Unknown Source) [jacorb-2.3.1jboss.patch01-brew.jar:]

at org.jacorb.orb.ORB.resolve\_initial\_references(Unknown Source) [jacorb-2.3.1jboss.patch01-brew.jar:]

at org.jboss.as.jacorb.service.CorbaPOAService.start(CorbaPOAService.java:153) [jboss-as-jacorb-7.1.0.Beta1

b.jar:]

at org.jboss.msc.service.ServiceControllerImpl$StartTask.startService(ServiceControllerImpl.java:1824) [jbo

ss-msc-1.0.1.GA.jar:]

at org.jboss.msc.service.ServiceControllerImpl$StartTask.run(ServiceControllerImpl.java:1759) [jboss-msc-1.

0.1.GA.jar:]

at java.util.concurrent.ThreadPoolExecutor$Worker.runTask(ThreadPoolExecutor.java:886) [:1.6.0\_19]

at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:908) [:1.6.0\_19]

at java.lang.Thread.run(Thread.java:619) [:1.6.0\_19]

20:05:06,296 ERROR [org.jboss.msc.service.fail] (MSC service thread 1-1) MSC00001: Failed to start service jboss.jacorb.poa-service.rootpoa: org.jboss.msc.service.StartException in service jboss.jacorb.poa-service.rootpoa: Failed

to resolve initial reference RootPOA

at org.jboss.as.jacorb.service.CorbaPOAService.start(CorbaPOAService.java:155)

at org.jboss.msc.service.ServiceControllerImpl$StartTask.startService(ServiceControllerImpl.java:1824) [jboss-msc-1.0.1.GA.jar:]

at org.jboss.msc.service.ServiceControllerImpl$StartTask.run(ServiceControllerImpl.java:1759) [jboss-msc-1.0.1.GA.jar:]

at java.util.concurrent.ThreadPoolExecutor$Worker.runTask(ThreadPoolExecutor.java:886) [:1.6.0\_19]

at java.util.concurrent.ThreadPoolExecutor$Worker.run(ThreadPoolExecutor.java:908) [:1.6.0\_19]

at java.lang.Thread.run(Thread.java:619) [:1.6.0\_19]

Caused by: org.omg.CORBA.INITIALIZE: Could not create server socket (3528): java.net.BindException: Address already

in use: JVM\_Bind

at org.jacorb.orb.iiop.IIOPListener$Acceptor.createServerSocket(Unknown Source)

at org.jacorb.orb.iiop.IIOPListener$Acceptor.init(Unknown Source)

at org.jacorb.orb.iiop.IIOPListener.configure(Unknown Source)

at org.jacorb.orb.etf.FactoriesBase.newInstance(Unknown Source)

at org.jacorb.orb.etf.FactoriesBase.create\_listener(Unknown Source)

at org.jacorb.orb.BasicAdapter.configure(Unknown Source)

at org.jacorb.orb.ORB.getRootPOA(Unknown Source)

at org.jacorb.orb.ORB.resolve\_initial\_references(Unknown Source)

at org.jboss.as.jacorb.service.CorbaPOAService.start(CorbaPOAService.java:153)

... 5 more

MCMP messages

Mod Cluster Management Protocol

What is MCMP used for?

Server nodes send server-side load balance factors and lifecycle events to httpd proxies.

What is meant by failover?

The automatic switching to a redundant or standby system in the event the previously active system fails.

What is the difference between failover and switchover?

Failover is automatic

Switchover requires manual intervention

What is a failover policy?

What is a load-balancing policy?

What is meant by load balancing?

What is a “JVM Route”?

A Tomcat concept

Identifier which must be used in load balancing scenarios to enable session affinity.

What is dynamic proxy discovery?

Where application server nodes can be added / removed dynamically and registered / deregistered from load balancers in the network.

Terms

Virtual host – Practice of running more than one web-site on a single machine

Ip-based virtual host - different ip for every web-site

Name-based virtual host- multiple names for each ip

Httpd proxy – the component in httpd which manages traffic between httpd and application-server nodes

Mod\_manager –

AJP – Apache Jserv Protocol – protocol that can proxy inbound requests from a web-server through to an application server

Connector – A channel through which httpd forwards requests from a web server to an application server

IP address – unique identifier for a node or host-connection on an IP network, in IP4, a 32 bit binary number

Subnet mask – routing prefix, one part of an IP address

Subnetting – process of dividing a network into subnetworks. All computers belonging to the same subnet are addressed with the same most-significant bit-group

Given an ip-address of 192.168.5.130, and a subnet mask of 255.255.255.0, the network prefix (network field) is 192.168.5 and the host-part (host-field) is 0.0.0.130

Each IP address consists of two parts; 1) the network part, 2) the node part.

The class of the address and the

Address class –

Addresses beginning with 127 are reserved for loopback addresses

* **Class A** addresses begin with **0xxx**, or **1 to 126** decimal.
* **Class B** addresses begin with **10xx**, or **128 to 191** decimal.
* **Class C** addresses begin with **110x**, or **192 to 223** decimal.
* **Class D** addresses begin with **1110**, or **224 to 239** decimal.
* **Class E** addresses begin with **1111**, or **240 to 254** decimal

Class D addresses are reserved for multicasting

Class E addresses are reserved for future use

In class A addresses, the first 8 bits is the network address

In class B addresses, the first 16 bits is the network address

In class C addresses, the first 24 bits is the network address

Network addresses are specified by the network part of the ip address followed by 0’s

A network part followed by all 1’s in the node partspecifies a broadcast sent to all nodes on the network.

Segment – a subset of a larger physical IP network

A subnet cannot function across multiple segments

Why subnets?

Organization

Control network traffic

In an Ethernet network, all nodes in a segment see all the packets transmitted by all the other nodes on that segment.

Routers are used to connect ip networks to minimize the amount of traffic each segment must receive.

sticky sessions

load balancer in front of 2 httpd instances

round-robin

Will requests sent through a load balancer fronting 2 httpd instances fronting a jboss cluster end up at the correct appserver node, such as to support sticky sessions?

Yes...<https://community.jboss.org/wiki/QuestionsAndAnswersOnModclusterWebinar>

<http://community.jboss.org/wiki/MultipleInstancesOfJBossAS7OnTheSameMachine>

<http://www.jboss.org/mod_cluster>

<http://www.mastertheboss.com/jboss-server/257-clustering-with-jboss-modcluster.html>

<http://httpd.apache.org/docs/2.2/>

<https://docs.jboss.org/author/display/AS7/mod_cluster+in+AS7>

<http://seamspace.blogspot.com/2011/09/clustering-with-jboss-modcluster-and-as.html>

<https://docs.jboss.org/author/display/AS7/High+Availability+Guide>

<https://issues.jboss.org/browse/AS7-2493>

<http://apache.sys-con.com/node/1542268/mobile>

<https://www.jboss.org/dms/AS7/as7webinar/AS7-clustering-webinar.pdf>

<http://docs.jboss.org/mod_cluster/1.2.0/html_single/>