

# HornetQ QuickStart Guide

## Putting the buzz in messaging

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# About HornetQ

What is HornetQ?

- HornetQ is an open source project to build a multi-protocol, embeddable, very high performance, clustered, asynchronous messaging system.
- For answers to more questions about what HornetQ is and what it isn't please visit the [FAQs wiki page](http://www.jboss.org/community/wiki/HornetQGeneralFAQs) [http://www.jboss.org/community/wiki/HornetQGeneralFAQs].

Why use HornetQ? Here are just a few of the reasons:

- 100% open source software. HornetQ is licenced using the Apache Software License v2.0 to minimise barriers to adoption.
- HornetQ is designed with usability in mind.
- Written in Java. Runs on any platform with a Java 6+ runtime, that's everything from Windows desktops to IBM mainframes.
- Amazing performance. Our class beating high performance journal provides persistent messaging performance at rates normally seen for non persistent messaging, our non persistent messaging performance rocks the boat too.
- Full feature set. All the features you'd expect in any serious messaging system, and others you won't find anywhere else.
- Elegant, clean-cut design with minimal third party dependencies. Run HornetQ stand-alone, run it in integrated in your favourite JEE application server, or run it embedded inside your own product. It's up to you.
- Seamless high availability. We provide a HA solution with automatic client failover so you can guarantee zero message loss or duplication in event of server failure.
- Hugely flexible clustering. Create clusters of servers that know how to load balance messages. Link geographically distributed clusters over unreliable connections to form a global network. Configure routing of messages in a highly flexible way.
- For a full list of features, please see the [features wiki page](http://www.jboss.org/community/wiki/HornetQFeatures) [http://www.jboss.org/community/wiki/HornetQFeatures] .





# Getting Started

This short guide explains how to download, install and quickly get started with HornetQ.

After downloading and installing we highly recommend you run the examples to get acquainted with HornetQ. We ship with over 70 examples demonstrating most of the features.

This guide is not intended to be a replacement for the user manual. The user manual goes into much more depth, so please consult that for further information.



# Download

The official HornetQ project page is <http://hornetq.org/>.

## 4.1. Software Download

The software can be download from the Download page: <http://hornetq.org/downloads.html>

## 4.2. Project Information

- Please take a look at our project [wiki](http://www.jboss.org/community/wiki/HornetQ) [<http://www.jboss.org/community/wiki/HornetQ>]
- If you have any user questions please use our [user forum](https://community.jboss.org/en/hornetq) [<https://community.jboss.org/en/hornetq>]
- If you have development related questions, please use our [developer forum](http://www.jboss.org/index.html?module=bb&op=viewforum&f=313) [<http://www.jboss.org/index.html?module=bb&op=viewforum&f=313>]
- Pop in and chat to us in our [IRC channel](irc://irc.freenode.net:6667/hornetq) [<irc://irc.freenode.net:6667/hornetq>]
- Our project [blog](http://hornetq.blogspot.com/) [<http://hornetq.blogspot.com/>]
- Follow us on [twitter](http://twitter.com/hornetq) [<http://twitter.com/hornetq>]
- HornetQ Git repository is <https://github.com/hornetq/hornetq>
- All release tags are available from <https://github.com/hornetq/hornetq/tags>



# Installation

This section describes how to install HornetQ.

## 5.1. Prerequisites



### Note

HornetQ only runs on Java 7 or later.

By default, HornetQ server runs with 1GiB of memory. If your computer has less memory, or you want to run it with more available RAM, modify the value in `bin/run.sh` accordingly.

For persistence, HornetQ uses its own fast journal, which you can configure to use `libaio` (which is the default when running on Linux) or Java NIO. In order to use the `libaio` module on Linux, you'll need to install `libaio`, if it's not already installed.

If you're not running on Linux then you don't need to worry about this.

You can install `libaio` using the following steps as the root user:

Using `yum`, (e.g. on Fedora or Red Hat Enterprise Linux):

```
yum install libaio
```

Using `aptitude`, (e.g. on Ubuntu or Debian system):

```
apt-get install libaio
```

## 5.2. Stand-alone HornetQ Server

After downloading the distribution, unzip it into your chosen directory. At this point it should be possible to [run straight out of the box](#), the following describes the directory structure:

```
|__ bin
|
|__ config
|   |__ jboss-as-4
|   |__ jboss-as-5
|   |__ stand-alone
```

```
|
|__ docs
|   |__ api
|   |__ quickstart-guide
|   |__ user-manual
|
|__ examples
|   |__ core
|   |__ javaee
|   |__ jms
|
|__ lib
|
|__ licenses
|
|__ schemas
```

- `bin` -- binaries and scripts needed to run HornetQ.
- `config` -- configuration files needed to configure HornetQ. This contains configurations to run HornetQ either in stand-alone or inside JBoss AS 4 and 5. Please refer to the reference guide for details on configuration.
- `docs` -- guides and javadocs for HornetQ
- `examples` -- JMS and Java EE examples. Please refer to the 'running examples' chapter for details on how to run them.
- `lib` -- jars and libraries needed to run HornetQ
- `licenses` -- licenses for HornetQ
- `schemas` -- XML Schemas used to validate HornetQ configuration files

# Starting The Server

## 6.1. Standalone HornetQ

To run a stand-alone server, open up a shell or command prompt and navigate into the `bin` directory. Then execute `./run.sh` (or `run.bat` on Windows) and you should see the following output

```
bin$ ./run.sh

15:05:54,108 INFO  @main [HornetQBootstrapServer] Starting HornetQ server
...
15:06:02,566 INFO  @main [HornetQServerImpl] HornetQ Server version
2.0.0.CR3 (yellowjacket, 111) started
```

HornetQ is now running.

Both the run and the stop scripts use the config under `config/stand-alone/non-clustered` by default. The configuration can be changed by running `./run.sh ../config/stand-alone/clustered` or another config of your choosing. This is the same for the stop script and the windows bat files.

## 6.2. HornetQ In Wildfly

HornetQ is the Default Messaging Provider in the [Wildfly Application Server](http://www.wildfly.org/) [http://www.wildfly.org/] To run the server you need to run the `standalone-full.xml` configuration by running the command `./standalone.sh -c standalone-full.xml`. You will see something like:/

```
bin$ ./standalone.sh -c standalone-full.xml

=====

JBoss Bootstrap Environment

                                JBOSS_HOME:    /home/andy/projects/wildfly/build/target/
wildfly-8.0.0.Beta1-SNAPSHOT

                                JAVA:  java
```

```
          JAVA_OPTS:          -server -XX:+UseCompressedOops
-Xms64m -Xmx512m -XX:MaxPermSize=256m -Djava.net.preferIPv4Stack=true -
Djboss.modules.system.pkgs=org.jboss.byteman -Djava.awt.headless=true

=====

14:47:33,642 INFO [org.jboss.modules] (main) JBoss Modules version
1.3.0.Final
14:47:34,780 INFO [org.jboss.msc] (main) JBoss MSC version 1.2.0.Beta2
14:47:34,875 INFO [org.jboss.as] (MSC service thread 1-6) JBAS015899:
WildFly 8.0.0.Beta1-SNAPSHOT "WildFly" starting
14:47:40,382 INFO [org.jboss.as.server] (Controller Boot Thread)
JBAS015888: Creating http management service using socket-binding (management-
http)
14:47:40,383 INFO [org.xnio] (MSC service thread 1-15) XNIO version
3.1.0.CR7
14:47:40,402 INFO [org.xnio.nio] (MSC service thread 1-15) XNIO NIO
Implementation Version 3.1.0.CR7
14:47:40,488 INFO [org.jboss.remoting] (MSC service thread 1-15)
JBoss Remoting version 4.0.0.Beta1
14:47:40,547 INFO [org.jboss.as.clustering.infinispan] (ServerService
Thread Pool -- 36) JBAS010280: Activating Infinispan subsystem.
14:47:40,560 INFO [org.jboss.as.naming] (ServerService Thread Pool
-- 47) JBAS011800: Activating Naming Subsystem
14:47:40,560 INFO [org.jboss.as.security] (ServerService Thread Pool
-- 52) JBAS013171: Activating Security Subsystem
14:47:40,567 INFO [org.jboss.as.jacorb] (ServerService Thread Pool
-- 37) JBAS016300: Activating JacORB Subsystem
14:47:40,571 INFO [org.jboss.as.jsf] (ServerService Thread Pool --
43) JBAS012605: Activated the following JSF Implementations: [main]
14:47:40,574 INFO [org.jboss.as.webservices] (ServerService Thread
Pool -- 56) JBAS015537: Activating WebServices Extension
14:47:40,721 INFO [org.jboss.as.connector.logging] (MSC service thread
1-6) JBAS010408: Starting JCA Subsystem (IronJacamar 1.1.0.Final)
14:47:41,321 INFO [org.jboss.as.naming] (MSC service thread 1-4)
JBAS011802: Starting Naming Service
14:47:41,323 INFO [org.jboss.as.mail.extension] (MSC service thread
1-11) JBAS015400: Bound mail session [java:jboss/mail/Default]
14:47:41,552 INFO [org.wildfly.extension.undertow] (MSC service thread
1-10) JBAS017502: Undertow 1.0.0.Beta16 starting
14:47:41,552 INFO [org.wildfly.extension.undertow] (ServerService
Thread Pool -- 55) JBAS017502: Undertow 1.0.0.Beta16 starting
14:47:41,573 INFO [org.jboss.as.security] (MSC service thread 1-6)
JBAS013170: Current PicketBox version=4.0.17.SP1
14:47:41,775 INFO [org.jboss.as.connector.subsystems.datasources]
(ServerService Thread Pool -- 31) JBAS010403: Deploying JDBC-compliant driver
class org.h2.Driver (version 1.3)
```



```

14:47:41,777 INFO [org.jboss.as.connector.deployers.jdbc] (MSC service
thread 1-16) JBAS010417: Started Driver service with driver-name = h2
14:47:42,085 INFO [org.wildfly.extension.undertow] (ServerService Thread
Pool -- 55) JBAS017527: Creating file handler for path /home/andy/projects/
wildfly/build/target/wildfly-8.0.0.Beta1-SNAPSHOT/welcome-content
14:47:42,086 INFO [org.wildfly.extension.undertow] (MSC service thread
1-2) JBAS017525: Started server default-server.
14:47:42,088 INFO [org.wildfly.extension.undertow] (MSC service thread
1-13) JBAS017531: Host default-host starting
14:47:42,471 INFO [org.wildfly.extension.undertow] (MSC service thread
1-7) JBAS017519: Undertow HTTP listener default listening on /127.0.0.1:8080
14:47:42,823 INFO [org.jboss.as.server.deployment.scanner]
(MSC service thread 1-10) JBAS015012: Started FileSystemDeploymentService
for directory /home/andy/projects/wildfly/build/target/wildfly-8.0.0.Beta1-
SNAPSHOT/standalone/deployments
14:47:42,882 INFO [org.jboss.as.remoting] (MSC service thread 1-16)
JBAS017100: Listening on 127.0.0.1:9999
14:47:43,037
INFO [org.hornetq.core.server] (ServerService Thread Pool
-- 58) HQ221000: live server is starting
with configuration HornetQ Configuration

projects/wildfly/build/target/wildfly-8.0.0.Beta1-SNAPSHOT/standalone/data/
messagingjournal,bindingsDirectory=/home/andy/projects/wildfly/build/target/
wildfly-8.0.0.Beta1-SNAPSHOT/standalone/data/
messagingbindings,largeMessagesDirectory=/home/andy/projects/wildfly/build/
target/wildfly-8.0.0.Beta1-SNAPSHOT/standalone/data/
messaginglargemessages,pagingDirectory=/home/andy/projects/wildfly/build/
target/wildfly-8.0.0.Beta1-SNAPSHOT/standalone/data/messagingpaging)
14:47:43,062 INFO [org.hornetq.core.server] (ServerService Thread
Pool -- 58) HQ221006: Waiting to obtain live lock
14:47:43,103 INFO [org.hornetq.core.server] (ServerService Thread
Pool -- 58) HQ221012: Using AIO Journal
14:47:43,313 INFO [org.hornetq.core.server] (ServerService Thread
Pool -- 58) HQ224067: Adding protocol support CORE
14:47:43,426 INFO [org.jboss.ws.common.management] (MSC service thread
1-3) JBWS022052: Starting JBoss Web Services - Stack CXF Server 4.2.1.Final
14:47:43,448 INFO [org.hornetq.core.server] (ServerService Thread
Pool -- 58) HQ224067: Adding protocol support AMQP
14:47:43,451 INFO [org.hornetq.core.server] (ServerService Thread
Pool -- 58) HQ224067: Adding protocol support STOMP
14:47:43,453 INFO [org.hornetq.core.server] (ServerService Thread
Pool -- 58) HQ224067: Adding protocol support STOMP_WS
14:47:43,567 INFO [org.hornetq.core.server] (ServerService Thread
Pool -- 58) HQ221034: Waiting to obtain live lock
14:47:43,567 INFO [org.hornetq.core.server] (ServerService Thread
Pool -- 58) HQ221035: Live Server Obtained live lock

```

```
14:47:43,777 INFO [org.jboss.as.connector.subsystems.datasources]
(MSC service thread 1-8) JBAS010400: Bound data source [java:jboss/datasources/
ExampleDS]
14:47:43,781 INFO [org.jboss.as.jacorb] (MSC service thread 1-1)
JBAS016330: CORBA ORB Service started
14:47:44,115 INFO [org.jboss.as.jacorb] (MSC service thread 1-13)
JBAS016328: CORBA Naming Service started
14:47:44,345 INFO [org.wildfly.extension.undertow] (MSC service thread
1-3) JBAS018210: Register web context: /hornetq-server
14:47:44,361 INFO [org.hornetq.core.server] (ServerService Thread Pool --
58) HQ221020: Started Netty Acceptor version 3.6.6.Final-90e1eb2 127.0.0.1:5455
for CORE protocol
14:47:44,362 INFO [org.hornetq.core.server] (ServerService Thread Pool --
58) HQ221020: Started Netty Acceptor version 3.6.6.Final-90e1eb2 127.0.0.1:5445
for CORE protocol
14:47:44,364 INFO [org.hornetq.core.server] (ServerService
Thread Pool -- 58) HQ221020: Started Netty Acceptor version 3.6.6.Final-90e1eb2
org.hornetq.default.servlet:5445 for CORE protocol
14:47:44,366 INFO [org.hornetq.core.server] (ServerService Thread
Pool -- 58) HQ221007: Server is now live
14:47:44,366 INFO [org.hornetq.core.server] (ServerService Thread
Pool -- 58) HQ221001: HornetQ Server version 2.4.0.Beta2 (Andromedian Flyer,
123) [bcc1cd10-2bfb-11e3-ad5f-9f88840f9e1a]
14:47:44,435 INFO [org.jboss.as.messaging] (ServerService Thread Pool
-- 58) JBAS011601: Bound messaging object to jndi name java:/ConnectionFactory
14:47:44,437 INFO [org.jboss.as.messaging] (ServerService Thread Pool
-- 59) JBAS011601: Bound messaging object to jndi name java:jboss/exported/jms/
ServletConnectionFactory
14:47:44,439 INFO [org.jboss.as.messaging] (ServerService Thread Pool
-- 60) JBAS011601: Bound messaging object to jndi name java:jboss/exported/jms/
RemoteConnectionFactory
14:47:44,462 INFO [org.jboss.as.connector.deployment] (MSC service
thread 1-3) JBAS010406: Registered connection factory java:/JmsXA
14:47:44,531 INFO [org.hornetq.ra] (MSC service thread 1-3) HornetQ
resource adaptor started
14:47:44,532 INFO
$ResourceAdapterActivator] (MSC service thread 1-3) IJ020002: Deployed: file://
RaActivatorhornetq-ra
14:47:44,535 INFO [org.jboss.as.connector.deployment] (MSC service
thread 1-12) JBAS010401: Bound JCA ConnectionFactory [java:/JmsXA]
14:47:44,536 INFO [org.jboss.as.messaging] (MSC service
thread 1-15) JBAS011601: Bound messaging object to jndi name java:jboss/
DefaultJMSConnectionFactory
14:47:44,719 INFO [org.jboss.as] (Controller Boot Thread) JBAS015961:
Http management interface listening on http://127.0.0.1:9990/management
14:47:44,720 INFO [org.jboss.as] (Controller Boot Thread) JBAS015951:
Admin console listening on http://127.0.0.1:9990
```

```
14:47:44,721 INFO [org.jboss.as] (Controller Boot Thread) JBAS015874:
WildFly 8.0.0.Beta1-SNAPSHOT "WildFly" started in 12184ms - Started 213 of 249
services (73 services are lazy, passive or on-demand)
```



# Running the Examples

In the directory `examples` there are 2 sets of examples, these are

- JMS Examples - these demonstrate functionality while sending and consuming JMS messages.
- Java EE Examples - these demonstrate application server integration, e.g. MDBs, EJBs, Servlets, etc.

## 7.1. The JMS examples

The JMS Examples all follow the same format. Each examples is contained in its own directory which contains the following.

- `pom.xml`

This is the Maven build file used to run the example

- `src` directory

This contains the source code for the example

- `resources/hornetq/server0` configuration directory

This contains the configuration files needed to run the server for the example. There may be multiple configuration directories `server0`, `server1` etc for clustered examples etc.

Each example will start one or more stand-alone servers and stop them after the example has completed.

As a quick start we'll run the queue example. For all other examples refer to the main user manual.

Firstly open a Shell or a Command prompt and navigate to the `examples/jms/queue` directory.

Type the command `mvn verify` and you should see the following output:

```
[INFO] Scanning for projects...
[INFO]
[INFO] -----
[INFO] Building HornetQ JMS Queue Example 2.3.0.BETA-SNAPSHOT
[INFO] -----
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ hornetq-
jms-queue-example ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] Copying 3 resources
[INFO]
```

```
[INFO] --- maven-compiler-plugin:3.0:compile (default-compile) @ hornetq-jms-queue-example ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ hornetq-jms-queue-example ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory /home/andy/projects/hornetq-master/examples/jms/queue/src/test/resources
[INFO]
[INFO] --- maven-compiler-plugin:3.0:testCompile (default-testCompile) @ hornetq-jms-queue-example ---
[INFO] No sources to compile
[INFO]
[INFO] --- maven-surefire-plugin:2.13:test (default-test) @ hornetq-jms-queue-example ---
[INFO]
[INFO] --- maven-jar-plugin:2.4:jar (default-jar) @ hornetq-jms-queue-example ---
[INFO] Building jar: /home/andy/projects/hornetq-master/examples/jms/queue/target/hornetq-jms-queue-example-2.3.0.BETA-SNAPSHOT.jar
[INFO]
[INFO] >>> maven-source-plugin:2.2.1:jar (attach-sources) @ hornetq-jms-queue-example >>>
[INFO]
[INFO] <<< maven-source-plugin:2.2.1:jar (attach-sources) @ hornetq-jms-queue-example <<<
[INFO]
[INFO] --- maven-source-plugin:2.2.1:jar (attach-sources) @ hornetq-jms-queue-example ---
[INFO] Building jar: /home/andy/projects/hornetq-master/examples/jms/queue/target/hornetq-jms-queue-example-2.3.0.BETA-SNAPSHOT-sources.jar
[INFO]
[INFO] >>> maven-source-plugin:2.2.1:jar (default) @ hornetq-jms-queue-example >>>
[INFO]
[INFO] <<< maven-source-plugin:2.2.1:jar (default) @ hornetq-jms-queue-example <<<
[INFO]
[INFO] --- maven-source-plugin:2.2.1:jar (default) @ hornetq-jms-queue-example ---
[WARNING] Artifact org.hornetq.examples.jms:hornetq-jms-queue-example:java-source:sources:2.3.0.BETA-SNAPSHOT already attached to project, ignoring duplicate
[INFO]
[INFO] --- hornetq-maven-plugin:1.1.1-SNAPSHOT:start (start) @ hornetq-jms-queue-example ---
[file:/home/andy/projects/hornetq-master/examples/jms/queue/target/classes/hornetq/server0/]
```

```

Apr 17, 2013 10:51:01 AM org.hornetq.core.deployers.impl.FileConfigurationParser
parseMainConfig
WARN: HQ222018: AIO was not located on this platform, it will fall back to
using pure Java NIO. If your platform is Linux, install LibAIO to enable the
AIO journal
Apr 17, 2013 10:51:01 AM org.hornetq.core.server.impl.HornetQServerImpl start
INFO:      HQ221000:      live      server      is      starting
           with      configuration      HornetQ      Configuration

projects/hornetq-master/examples/jms/queue/target//server0/data/messaging/
journal,bindingsDirectory=/home/andy/projects/hornetq-master/examples/jms/
queue/target//server0/data/messaging/bindings,largeMessagesDirectory=/home/
andy/projects/hornetq-master/examples/jms/queue/target//server0/data/
messaging/largemessages,pagingDirectory=/home/andy/projects/hornetq-master/
examples/jms/queue/target//server0/data/messaging/paging)
Apr 17, 2013 10:51:01 AM org.hornetq.core.server.impl.HornetQServerImpl
$SharedStoreLiveActivation run
INFO: HQ221006: Waiting to obtain live lock
Apr      17,      2013      10:51:01      AM
org.hornetq.core.persistence.impl.journal.JournalStorageManager <init>
INFO: HQ221013: Using NIO Journal
Apr 17, 2013 10:51:01 AM org.hornetq.core.server.impl.HornetQServerImpl
initialisePart1
WARN: HQ222007: Security risk! HornetQ is running with the default cluster admin
user and default password. Please see the HornetQ user guide, cluster chapter,
for instructions on how to change this.
Apr 17, 2013 10:51:01 AM org.hornetq.core.server.impl.FileLockNodeManager
startLiveNode
INFO: HQ221034: Waiting to obtain live lock
Apr 17, 2013 10:51:01 AM org.hornetq.core.server.impl.FileLockNodeManager
startLiveNode
INFO: HQ221035: Live Server Obtained live lock
Apr 17, 2013 10:51:02 AM org.hornetq.core.server.impl.HornetQServerImpl
deployQueue
INFO: HQ221003: trying to deploy queue jms.queue.exampleQueue
Apr 17, 2013 10:51:02 AM org.hornetq.core.remoting.impl.netty.NettyAcceptor
start
INFO: HQ221020: Started Netty Acceptor version 3.6.2.Final-c0d783c localhost:5445
for CORE protocol
Apr 17, 2013 10:51:02 AM org.hornetq.core.server.impl.HornetQServerImpl
$SharedStoreLiveActivation run
INFO: HQ221007: Server is now live
Apr 17, 2013 10:51:02 AM org.hornetq.core.server.impl.HornetQServerImpl start
INFO: HQ221001: HornetQ Server version 2.3.0.SNAPSHOT (black'n'yellow, 123)
[a57893ff-7783-11e2-9787-07ca142fc9f7]
[INFO]
[INFO] --- hornetq-maven-plugin:1.1.1-SNAPSHOT:runClient (runClient) @ hornetq-
jms-queue-example ---
Apr 17, 2013 10:51:02 AM org.hornetq.common.example.HornetQExample getContext

```

```
INFO: using jnp://localhost:1099 for jndi
Sent message: This is a text message
Received message: This is a text message
example complete

#####
###    SUCCESS!    ###
#####

[INFO]
[INFO] --- hornetq-maven-plugin:1.1.1-SNAPSHOT:stop (stop) @ hornetq-jms-queue-
example ---
Apr          17,          2013          10:51:03          AM
  org.hornetq.core.server.management.impl.ManagementServiceImpl stop
WARN: HQ222113: On ManagementService stop, there are 1 unexpected registered
  MBeans: [core.acceptor.netty-acceptor]
Apr 17, 2013 10:51:03 AM org.hornetq.core.server.impl.HornetQServerImpl stop
INFO: HQ221002: HornetQ Server version 2.3.0.SNAPSHOT (black'n'yellow, 123)
  [a57893ff-7783-11e2-9787-07ca142fc9f7] stopped
[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 4.428s
[INFO] Finished at: Wed Apr 17 10:51:03 BST 2013
[INFO] Final Memory: 11M/456M
[INFO] -----
```

Congratulations! You have successfully run your first HornetQ example. Try some of the others.

## 7.2. The Java EE Examples

The Java EE Examples are examples that require a JEE application server to run. They include MDB, Servlet, EJB examples etc. For this you will need the JBoss Application Server 7.1.x installed and uses Arquillian to run the example. How to do this is explained in the previous chapters.

We'll use the MDB example for the purposes of this guide. For the other examples refer to the user guide. Before going any further ensure that the JBoss Application Server is running.

The first thing we need to do is set the `JBOSS_HOME` environment property to the location of the JBoss Application Server, in a Linux shell this would be something like:

```
export JBOSS_HOME=/home/jbossas7.1/build/output/jboss-7.1.0
```

You can then run the example via maven by running `mvn test`

In the shell window you should see something like the following output:



```

[INFO] Scanning for projects...
[INFO]
[INFO] -----
[INFO] Building HornetQ JEE MDB Example 2.3.0.BETA-SNAPSHOT
[INFO] -----
[INFO]
[INFO] --- maven-resources-plugin:2.6:resources (default-resources) @ hornetq-jee-mdb-bmt-example ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] skip non existing resourceDirectory /home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/src/main/resources
[INFO]
[INFO] --- maven-compiler-plugin:3.0:compile (default-compile) @ hornetq-jee-mdb-bmt-example ---
[INFO] Nothing to compile - all classes are up to date
[INFO]
[INFO] --- maven-resources-plugin:2.6:copy-resources (as-node-0) @ hornetq-jee-mdb-bmt-example ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] Copying 1112 resources
[INFO] Copying 5 resources
[INFO]
[INFO] --- maven-resources-plugin:2.6:testResources (default-testResources) @ hornetq-jee-mdb-bmt-example ---
[INFO] Using 'UTF-8' encoding to copy filtered resources.
[INFO] Copying 1 resource
[INFO]
[INFO] --- maven-compiler-plugin:3.0:testCompile (default-testCompile) @ hornetq-jee-mdb-bmt-example ---
[INFO] Changes detected - recompiling the module!
[INFO] Compiling 1 source file to /home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/target/test-classes
[INFO]
[INFO] --- maven-surefire-plugin:2.12:test (default-test) @ hornetq-jee-mdb-bmt-example ---
[INFO] Surefire report directory: /home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/target/surefire-reports

-----
T E S T S
-----

Running org.hornetq.javaee.example.server.ExampleRunnerTest
log4j:WARN No appenders could be found for logger (org.jboss.logging).
log4j:WARN Please initialize the log4j system properly.
log4j:WARN See http://logging.apache.org/log4j/1.2/faq.html#noconfig for more info.
Apr 17, 2013 10:58:04 AM org.jboss.arquillian.container.impl.MapObject populate

```

```
WARNING: Configuration contain properties not supported by the backing object
org.jboss.as.arquillian.container.managed.ManagedContainerConfiguration
Unused property entries: {waitForPortsTimeoutInSeconds=8, waitForPorts=8787
9999}
Supported property names: [jbossHome, outputToConsole, enableAssertions,
password, managementPort, javaHome, javaVmArguments, username, serverConfig,
allowConnectingToRunningServer, managementAddress, startupTimeoutInSeconds,
modulePath]
Apr 17, 2013 10:58:04 AM

startInternal
INFO: Starting container with: [/home/andy/devtools/jdk1.6.0_25//bin/
java, -Djboss.inst=/home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/
target/jbossas-node0, -ea, -Djboss.home.dir=/home/andy/projects/hornetq-master/
examples/javaee/mdb-bmt/target/jbossas-node0, -Dorg.jboss.boot.log.file=/home/
andy/projects/hornetq-master/examples/javaee/mdb-bmt/target/jbossas-node0/
standalone/log/boot.log, -Dlogging.configuration=file:/home/andy/projects/
hornetq-master/examples/javaee/mdb-bmt/target/jbossas-node0/standalone/
configuration/logging.properties, -Djboss.modules.dir=/home/andy/projects/
hornetq-master/examples/javaee/mdb-bmt/target/jbossas-node0/modules, -
Djboss.bundles.dir=/home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/
target/jbossas-node0/bundles, -jar, /home/andy/projects/hornetq-
master/examples/javaee/mdb-bmt/target/jbossas-node0/jboss-modules.jar, -
mp, /home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/target/jbossas-
node0/modules, -jaxpmodule, javax.xml.jaxp-provider, org.jboss.as.standalone, -
server-config, standalone-example.xml]
10:58:04,525 INFO [org.jboss.modules] JBoss Modules version 1.1.1.GA
10:58:04,664 INFO [org.jboss.msc] JBoss MSC version 1.0.2.GA
10:58:04,703 INFO [org.jboss.as] JBAS015899: JBoss AS 7.1.1.Final "Brontes"
starting
10:58:05,492 INFO [org.xnio] XNIO Version 3.0.3.GA
10:58:05,494 INFO [org.jboss.as.server] JBAS015888: Creating http management
service using socket-binding (management-http)
10:58:05,502 INFO [org.xnio.nio] XNIO NIO Implementation Version 3.0.3.GA
10:58:05,509 INFO [org.jboss.remoting] JBoss Remoting version 3.2.3.GA
10:58:05,527 INFO [org.jboss.as.logging] JBAS011502: Removing bootstrap log
handlers
10:58:05,530 INFO [org.jboss.as.configadmin] (ServerService Thread Pool -- 32)
JBAS016200: Activating ConfigAdmin Subsystem
10:58:05,560 INFO [org.jboss.as.clustering.infinispan] (ServerService Thread
Pool -- 37) JBAS010280: Activating Infinispan subsystem.
10:58:05,562 INFO [org.jboss.as.connector.subsystems.datasources]
(ServerService Thread Pool -- 33) JBAS010403: Deploying JDBC-compliant driver
class org.h2.Driver (version 1.3)
10:58:05,573 INFO [org.jboss.as.jacorb] (ServerService Thread Pool -- 38)
JBAS016300: Activating JacORB Subsystem
10:58:05,595 INFO [org.jboss.as.connector] (MSC service thread 1-12) JBAS010408:
Starting JCA Subsystem (JBoss IronJacamar 1.0.9.Final)
```

```

10:58:05,612 INFO    [org.jboss.as.naming] (ServerService Thread Pool -- 48)
JBAS011800: Activating Naming Subsystem
10:58:05,625 INFO    [org.jboss.as.osgi] (ServerService Thread Pool -- 49)
JBAS011940: Activating OSGi Subsystem
10:58:05,649 INFO    [org.jboss.as.security] (ServerService Thread Pool -- 54)
JBAS013101: Activating Security Subsystem
10:58:05,657 INFO    [org.jboss.as.naming] (MSC service thread 1-8) JBAS011802:
Starting Naming Service
10:58:05,663 INFO    [org.jboss.as.mail.extension] (MSC service thread 1-16)
JBAS015400: Bound mail session [java:jboss/mail/Default]
10:58:05,675 INFO    [org.jboss.as.security] (MSC service thread 1-14) JBAS013100:
Current PicketBox version=4.0.7.Final
10:58:05,683 INFO    [org.jboss.as.webservices] (ServerService Thread Pool -- 58)
JBAS015537: Activating WebServices Extension
10:58:05,705 INFO    [org.jboss.jaxr] (MSC service thread 1-8) JBAS014000: Started
JAXR subsystem, binding JAXR connection factory into JNDI as: java:jboss/jaxr/
ConnectionFactory
10:58:05,831 INFO    [org.jboss.ws.common.management.AbstractServerConfig] (MSC
service thread 1-4) JBoss Web Services - Stack CXF Server 4.0.2.GA
10:58:05,943 INFO    [org.apache.coyote.http11.Http11Protocol] (MSC service thread
1-6) Starting Coyote HTTP/1.1 on http-localhost.localdomain-127.0.0.1-8080
10:58:05,966 INFO    [org.jboss.as.jacorb] (MSC service thread 1-2) JBAS016330:
CORBA ORB Service started
10:58:05,988 INFO    [org.hornetq.core.server.impl.HornetQServerImpl] (MSC service
thread 1-11) live server is starting with configuration HornetQ Configuration

projects/hornetq-master/examples/javaee/mdb-bmt/target/jbossas-node0/
standalone/data/messagingjournal,bindingsDirectory=/home/andy/projects/
hornetq-master/examples/javaee/mdb-bmt/target/jbossas-node0/standalone/data/
messagingbindings,largeMessagesDirectory=/home/andy/projects/hornetq-master/
examples/javaee/mdb-bmt/target/jbossas-node0/standalone/data/
messaginglargemessages,pagingDirectory=/home/andy/projects/hornetq-master/
examples/javaee/mdb-bmt/target/jbossas-node0/standalone/data/messagingpaging)
10:58:05,996 INFO    [org.hornetq.core.server.impl.HornetQServerImpl] (MSC service
thread 1-11) Waiting to obtain live lock
10:58:06,037 INFO    [org.hornetq.core.persistence.impl.journal.JournalStorageManager] (MSC service
thread 1-11) Using AIO Journal
10:58:06,122 INFO    [org.jboss.as.jacorb] (MSC service thread 1-14) JBAS016328:
CORBA Naming Service started
10:58:06,184 INFO    [org.jboss.as.connector.subsystems.datasources] (MSC service
thread 1-7) JBAS010400: Bound data source [java:jboss/datasources/ExampleDS]
10:58:06,204 INFO    [org.hornetq.core.server.impl.AIOFileLockNodeManager] (MSC
service thread 1-11) Waiting to obtain live lock
10:58:06,205 INFO    [org.hornetq.core.server.impl.AIOFileLockNodeManager] (MSC
service thread 1-11) Live Server Obtained live lock
10:58:06,434 INFO    [org.jboss.as.remoting] (MSC service thread 1-2) JBAS017100:
Listening on localhost.localdomain/127.0.0.1:4447

```

```
10:58:06,434 INFO [org.jboss.as.remoting] (MSC service thread 1-15) JBAS017100:
Listening on /127.0.0.1:9999
10:58:06,436 INFO [org.jboss.as.server.deployment.scanner] (MSC service
thread 1-16) JBAS015012: Started FileSystemDeploymentService for
directory /home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/target/
jbossas-node0/standalone/deployments
10:58:08,790 INFO [org.hornetq.core.remoting.impl.netty.NettyAcceptor] (MSC
service thread 1-11) Started Netty Acceptor version 3.2.5.Final-a96d88c
localhost.localdomain:5445 for CORE protocol
10:58:08,793 INFO [org.hornetq.core.remoting.impl.netty.NettyAcceptor] (MSC
service thread 1-11) Started Netty Acceptor version 3.2.5.Final-a96d88c
localhost.localdomain:5455 for CORE protocol
10:58:08,795 INFO [org.hornetq.core.server.impl.HornetQServerImpl] (MSC service
thread 1-11) Server is now live
10:58:08,797 INFO [org.hornetq.core.server.impl.HornetQServerImpl] (MSC service
thread 1-11) HornetQ Server version 2.2.13.Final (HQ_2_2_13_FINAL_AS7, 122)
[5c499e88-9c63-11e2-bfa3-fe5400591699]) started
10:58:08,822 INFO [org.jboss.as.messaging] (MSC service thread 1-4)
JBAS011601: Bound messaging object to jndi name java:jboss/exported/jms/
RemoteConnectionFactory
10:58:08,824 INFO [org.jboss.as.messaging] (MSC service thread 1-4) JBAS011601:
Bound messaging object to jndi name java:/RemoteConnectionFactory
10:58:08,825 INFO [org.jboss.as.messaging] (MSC service thread 1-10) JBAS011601:
Bound messaging object to jndi name java:/ConnectionFactory
10:58:08,830 INFO [org.hornetq.core.server.impl.HornetQServerImpl] (MSC service
thread 1-3) trying to deploy queue jms.queue.testQueue
10:58:08,836 INFO [org.jboss.as.messaging] (MSC service thread 1-3) JBAS011601:
Bound messaging object to jndi name java:/queue/test
10:58:08,840 INFO [org.jboss.as.messaging] (MSC service thread 1-3) JBAS011601:
Bound messaging object to jndi name java:jboss/exported/jms/queues/testQueue
10:58:08,859 INFO [org.jboss.as.deployment.connector] (MSC service thread 1-9)
JBAS010406: Registered connection factory java:/JmsXA
10:58:08,866 INFO [org.hornetq.ra.HornetQResourceAdapter] (MSC service thread
1-9) HornetQ resource adaptor started
10:58:08,867 INFO
$ResourceAdapterActivator] (MSC service thread 1-9) IJ020002: Deployed: file://
RaActivatorhornetq-ra
10:58:08,870 INFO [org.jboss.as.deployment.connector] (MSC service thread 1-5)
JBAS010401: Bound JCA ConnectionFactory [java:/JmsXA]
10:58:08,898 INFO [org.jboss.as.server.deployment] (MSC service thread 1-10)
JBAS015876: Starting deployment of "ONT001-1.0.war"
10:58:09,146 INFO [org.jboss.wsf.stack.cxf.metadata.MetadataBuilder] (MSC
service thread 1-1) Add Service
id=com.hpm.webservices.BasicWSImpl
address=http://localhost:8080/hpm/BasicWSservice
implementor=com.hpm.webservices.BasicWSImpl
invoker=org.jboss.wsf.stack.cxf.JBossWSInvoker
serviceName={http://ont001-hpm.rhcloud.com/BasicWS}BasicWSservice
```

```

portName={http://ont001-hpm.rhcloud.com/BasicWS}BasicWS
wsdlLocation=null
mtomEnabled=false
10:58:09,361 INFO
    [org.apache.cxf.service.factory.ReflectionServiceFactoryBean] (MSC service
        thread 1-1) Creating Service {http://ont001-hpm.rhcloud.com/
BasicWS}BasicWS from WSDL: WEB-INF/wsdl/BasicWS.wsdl
10:58:09,517 INFO
    [org.jboss.ws.stack.cxf.transport.AddressRewritingEndpointInfo] (MSC service
        thread 1-1) Setting new service endpoint address in wsdl: http://ONT001-
HPM.rhcloud.com:80/BasicWS
10:58:09,656 INFO
    [org.jboss.ws.stack.cxf.transport.AddressRewritingEndpointInfo] (MSC service
        thread 1-1) Setting new service endpoint address in wsdl: http://localhost:8080/
hpm/BasicWS
10:58:09,688 INFO [org.apache.cxf.endpoint.ServerImpl] (MSC service thread
    1-1) Setting the server's publish address to be http://localhost:8080/hpm/
BasicWS
10:58:09,729 INFO [org.jboss.ws.stack.cxf.deployment.WSDLFilePublisher]
    (MSC service thread 1-1) WSDL published
        to: file:/home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/target/
jbossas-node0/standalone/data/wsdl/ONT001-1.0.war/BasicWS.wsdl
10:58:09,735 INFO [org.jboss.as.webservices] (MSC service thread 1-11)
    JBAS015539: Starting service jboss.ws.port-component-link
10:58:09,748 INFO [org.jboss.as.webservices] (MSC
    service thread 1-10) JBAS015539: Starting service
        jboss.ws.endpoint."ONT001-1.0.war"."com.hpm.webservices.BasicWSImpl"
10:58:09,753 INFO [org.jboss.ws.common.management.DefaultEndpointRegistry]
    (MSC service thread 1-10) register:
        jboss.ws:context=hpm,endpoint=com.hpm.webservices.BasicWSImpl
10:58:09,829 INFO [org.jboss.web] (MSC service thread 1-3) JBAS018210:
    Registering web context: /hpm
10:58:09,834 INFO [org.jboss.as] (MSC service thread 1-7) JBAS015951: Admin
    console listening on http://127.0.0.1:9990
10:58:09,835 INFO [org.jboss.as] (MSC service thread 1-7) JBAS015874: JBoss
    AS 7.1.1.Final "Brontes" started in 5506ms - Started 216 of 296 services (79
    services are passive or on-demand)
10:58:09,979 INFO [org.jboss.as.server] (DeploymentScanner-threads - 2)
    JBAS018559: Deployed "ONT001-1.0.war"
mdb.jar:
/org/
/org/hornetq/
/org/hornetq/javaee/
/org/hornetq/javaee/example/
/org/hornetq/javaee/example/server/
/org/hornetq/javaee/example/server/MDB_BMTExample.class
10:58:11,612 INFO [org.jboss.as.repository] (management-
handler-thread - 2) JBAS014900: Content added at
    location /home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/target/

```

```
jbossas-node0/standalone/data/content/f0/
e2d589ab9490193e109c8bc833f725c87defae/content
10:58:11,620 INFO    [org.jboss.as.server.deployment] (MSC service thread 1-8)
JBAS015876: Starting deployment of "arquillian-service"
10:58:11,811 WARN    [org.jboss.as.dependency.private] (MSC service thread 1-1)
JBAS018567: Deployment "deployment.arquillian-service" is using a private module
("org.jboss.as.jmx:main") which may be changed or removed in future versions
without notice.
10:58:11,812 WARN    [org.jboss.as.dependency.private] (MSC service thread 1-1)
JBAS018567: Deployment "deployment.arquillian-service" is using a private module
("org.jboss.as.server:main") which may be changed or removed in future versions
without notice.
10:58:11,813 WARN    [org.jboss.as.dependency.private] (MSC service thread 1-1)
JBAS018567: Deployment "deployment.arquillian-service" is using a private module
("org.jboss.as.osgi:main") which may be changed or removed in future versions
without notice.
10:58:11,815 WARN    [org.jboss.as.dependency.private] (MSC service thread 1-1)
JBAS018567: Deployment "deployment.arquillian-service" is using a private module
("org.jboss.jandex:main") which may be changed or removed in future versions
without notice.
10:58:11,817 WARN    [org.jboss.as.dependency.private] (MSC service thread 1-1)
JBAS018567: Deployment "deployment.arquillian-service" is using a private module
("org.jboss.osgi.framework:main") which may be changed or removed in future
versions without notice.
10:58:11,953 INFO    [org.jboss.as.server] (management-handler-thread - 2)
JBAS018559: Deployed "arquillian-service"
10:58:12,328 INFO    [org.jboss.as.repository] (management-
handler-thread - 3) JBAS014900: Content added at
location /home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/target/
jbossas-node0/standalone/data/
content/59/7dcdb0f420ed57aea638b2599f7a86eecf6c85/content
10:58:12,333 INFO    [org.jboss.as.server.deployment] (MSC service thread 1-7)
JBAS015876: Starting deployment of "mdb.jar"
10:58:12,401 INFO    [org.jboss.as.arquillian] (MSC
service thread 1-14) Arquillian deployment detected:
ArquillianConfig[service=jboss.arquillian.config."mdb.jar",unit=mdb.jar,tests=[org.hornetq.jav
10:58:12,418 INFO    [org.jboss.as.ejb3] (MSC service thread 1-15) JBAS014142:
Started message driven bean 'MDB_BMTExample' with 'hornetq-ra' resource adapter
10:58:12,562 INFO    [org.jboss.as.server] (management-handler-thread - 3)
JBAS018559: Deployed "mdb.jar"
Sent message: This is a text message
10:58:13,229 INFO    [org.jboss.as.naming] (Remoting "localhost" task-3)
JBAS011806: Channel end notification received, closing channel Channel ID
57be4578 (inbound) of Remoting connection 3ac552d5 to /127.0.0.1:58571
10:58:13,255 INFO    [stdout] (Thread-0 (HornetQ-client-global-
threads-1402019528)) message This is a text message received
10:58:13,257 INFO    [stdout] (Thread-0 (HornetQ-client-global-
threads-1402019528)) we're in the middle of a transaction:
org.jboss.tm.usertx.client.ServerVMClientUserTransaction@6b04d3c8
```

```
10:58:14,292 INFO [org.jboss.as.server.deployment] (MSC service thread 1-5)
JBAS015877: Stopped deployment mdb.jar in 33ms
10:58:14,413 INFO [org.jboss.as.repository] (management-
handler-thread - 1) JBAS014901: Content removed from
location /home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/target/
jbossas-node0/standalone/data/
content/59/7dcd0f420ed57aea638b2599f7a86eecf6c85/content
10:58:14,415 INFO [org.jboss.as.server] (management-handler-thread - 1)
JBAS018558: Undeployed "mdb.jar"
Tests run: 1, Failures: 0, Errors: 0, Skipped: 0, Time elapsed: 10.609 sec
10:58:14,436 INFO [org.jboss.as.server.deployment] (MSC service thread 1-5)
JBAS015877: Stopped deployment arquillian-service in 6ms
10:58:14,530 INFO [org.jboss.as.repository] (management-
handler-thread - 2) JBAS014901: Content removed from
location /home/andy/projects/hornetq-master/examples/javaee/mdb-bmt/target/
jbossas-node0/standalone/data/content/f0/
e2d589ab9490193e109c8bc833f725c87defae/content
10:58:14,532 INFO [org.jboss.as.server] (management-handler-thread - 2)
JBAS018558: Undeployed "arquillian-service"

Results :

Tests run: 1, Failures: 0, Errors: 0, Skipped: 0

[INFO] -----
[INFO] BUILD SUCCESS
[INFO] -----
[INFO] Total time: 23.441s
[INFO] Finished at: Wed Apr 17 10:58:16 BST 2013
[INFO] Final Memory: 19M/361M
[INFO] -----
```

Congratulations! you have successfully deployed and run a Java EE example.

