

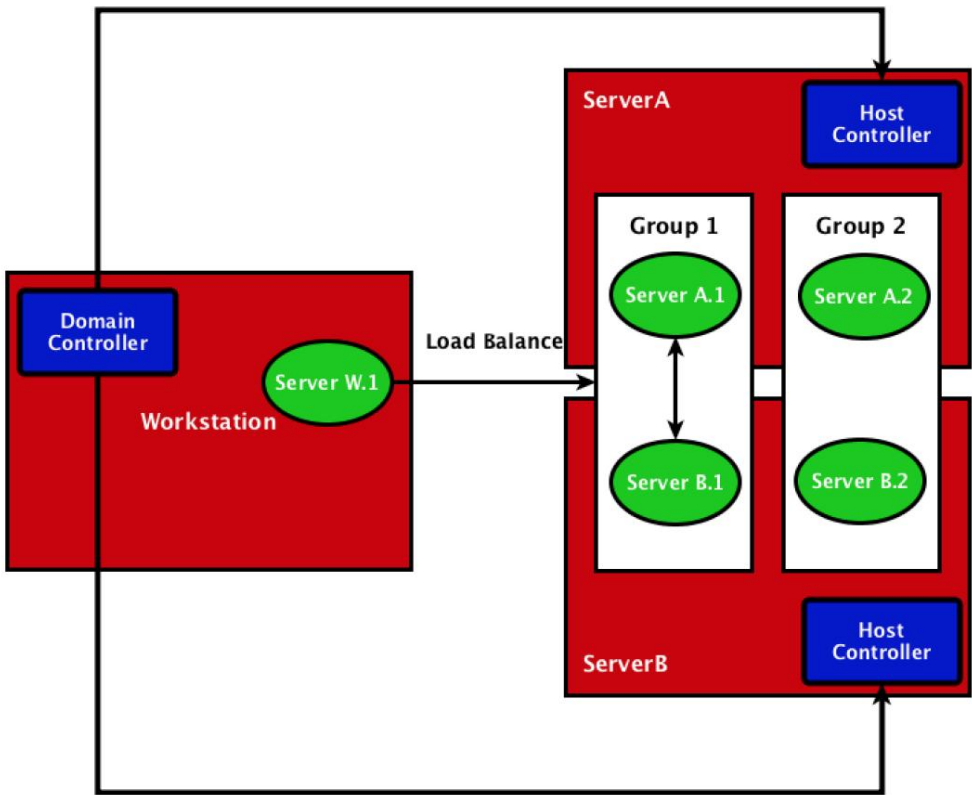
Lab Work: Setting Up JBoss EAP as a managed domain

In this lab assignment, you will create a managed domain.

Resources	
Files	/opt/domain
app url	172.25.250.10:8080 172.25.250.11:8080 172.25.250.254:9990
Resources	N/D

Results

You should be able to start a domain controller on the workstation and run a host controller on server A and server B. The final solution should be in line with the following architecture regarding host controller and domain controller . The servers will be configured in later lab work:



before you start

In this lab assignment, you create a managed domain that consists of a domain controller on workstation, a host controller on server A, and a

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host controller on server B. This lab work lays the foundation for the managed domain for the final course solution.

Verify that servera is accessible using SSH by running the following command from a terminal window on workstation:

```
[student@workstation ~]$ ssh servera hostname
```

The expected result is:

```
servera.lab.example.com
```

If the following output is presented, start servera and run the command again:

```
ssh: connect to host servera.lab.example.com port 22: No route to host
```

Verify that serverb is accessible using SSH by running the following command from a terminal window on workstation:

```
[student@workstation ~]$ ssh serverb hostname
```

The expected result is:

```
serverb.lab.example.com
```

If the following output is presented, start serverb and run the command again:

```
ssh: connect to host serverb.lab.example.com port 22: No route to host
```

Use the following command to download the relevant lab directory, verify the EAP installation on workstation, and install EAP on servera and serverb with the jboss user:

```
[student@workstation ~]$ lab managed-domain-lab setup
```

1. To start creating the domain controller, copy files from JBOSS_HOME/domain in the lab directory under /opt/domain on workstation. Set the owner of the /opt/domain directory to the jboss user.
2. The EAP instance on the workstation is the domain controller, exposing the management interface to an internal network. The network that all servers connect to is the 172.25.250.X network. Other network interfaces should not be exposed to ensure that external host controllers cannot obtain sensitive information from the domain controller.

Update the management interface address so that the domain controller points to the workstation IP address (172.25.250.254) using the host-master.xml configuration file.

3. Because the domain controller will be running an application with high availability capabilities, including the messaging subsystem, some additional requirements are needed. The domain controller is responsible for providing information about

security to allow the server instances to be part of the clustered environment, for all subsystems.

The messaging subsystem requires authentication to exchange data between cluster members, and the credentials are declared in the domain.xml file. Details about the subsystem will be explained later, but for the environment to work properly, the cluster password must be declared in the domain controller's configuration file.

Update domain.xml on workstation so that it has the password for the JBoss@RedHat123 cluster.

- 3.1. As the jboss user, open the /opt/domain/configuration/ domain.xml file on workstation

```
[student@workstation ~]$ sudo -u jboss vi /opt/domain/configuration/domain.xml
```

- 3.2. Inside the messaging-activemq subsystem of the full-ha profile, edit the <cluster> tag (line 1278):

```
<cluster password="$${jboss.messaging.cluster.password:JBoss@RedHat123}" />
```



use

Clustered storage will be described in more detail later in this course.

- 3.3. Save the changes to domain.xml.

4. Start the domain controller on workstation.

- 4.1. In the terminal window, change directories to /opt/jboss-eap-7.0/bin:

```
[student@workstation domain]$ cd /opt/jboss-eap-7.0/bin
```

- 4.2. To start the domain controller with the host-master.xml file on the /opt/domain/ folder, enter the following command:

```
[student@workstation bin]$ sudo -u jboss ./domain.sh \
-Djboss.domain.base.dir=/opt/domain/ \ --host-
config=host-master.xml
```

Look for the following output to confirm that the domain controller is running:

```
[Host Controller] 01:50:11,359 INFO [org.jboss.as] (Controller Boot Thread)
WFLYSRV0060: Http management interface listening on http://172.25.250.254:9990/
management
[Host Controller] 01:50:11,359 INFO [org.jboss.as] (Controller Boot Thread)
WFLYSRV0051: Admin console listening on http://172.25.250.254:9990
```

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5. Access the server A virtual machine using the ssh command:

```
[student@workstation bin]$ ssh server
```

The setup script installed an EAP instance on server A and server B. Copy files from `JBOSS_HOME/domain` to the lab directory in `/opt/domain` on server A and set the owner to `jboss`.

6. Set the hostname as server. Update interface address

administration for the host controller to point to the IP address of server A (172.25.250.10) using the `host-slave.xml` configuration file.

7. Start the host controller on server A with the `/opt/domain/ configuration/host-slave.xml` configuration file and point it to the domain controller running at 172.25.250.254.

8. Access the server B virtual machine using the ssh command:

```
[student@workstation bin]$ ssh serverb
```

Copy the files from `JBOSS_HOME/domain` to the lab directory in `/opt/domain` on server B, and set the owner to `jboss`.

9. Set the hostname to serverb. Update the management interface address so that the host controller points to the IP address of server B (172.25.250.11) using the `host-slave.xml` configuration file and configure the servers so that there is only one server named `server-three` that has no port offset in the `other-server-group` server group.

10. Start the host controller on server B with the `/opt/domain/ configuration/host-slave.xml` configuration file and point to the running domain controller at 172.25.250.254.

11. On workstation, open a web browser and navigate to 172.25.250.254:9990 to access the domain administration console. Verify that both hosts appear in the Runtime section.

11.1. On workstation, open a web browser and navigate to 172.25.250.254:9990.

11.2. At the top of the page, click Runtime, and then select Hosts under the first column.

11.3. Verify that both host servera and host serverb are listed.

12. Stop and remove all servers (server-one, server-two, and server-three).

In the final lab work of the next chapter, you will create new servers to deploy applications to these hosts.

12.1. In a new terminal on workstation, connect to the EAP CLI for the domain controller:

```
[student@workstation bin]$ sudo -u jboss /opt/jboss-eap-7.0/bin/jboss-cli.sh \
--connect --controller=172.25.250.254:9990
```



use

The administrator username is jbossadm and the password is JBoss@RedHat123.

12.2. Use the following command to stop all servers in the managed domain. Servers must be stopped before removing them:

```
[domain@172.25.250.254:9990] :stop-servers
```

12.3. After you have stopped all servers, use the following command to remove server-one:

```
[domain@172.25.250.254:9990] /host=servera/server-config=server-one:remove
```

Run the command again, but navigate to server-two which is located at serve:

```
[domain@172.25.250.254:9990] /host=servera/server-config=server-two:remove
```

Run the command to remove server-three, found in serverb:

```
[domain@172.25.250.254:9990] /host=serverb/server-config=server-three:remove
```

13. Delete the server groups (main-server-group, other-server-group), as these will be configured in the final lab work in the next chapter to align with the final course solution. After deleting the server groups, exit the EAP CLI.

13.1. Run the following command to remove main-server-group on workstation using EAP CLI:

```
[domain@172.25.250.254:9990] /server-group=main-server-group:remove
```

13.2. Run the following command to remove other-server-group on workstation using EAP CLI:

```
[domain@172.25.250.254:9990] /server-group=other-server-group:remove
```

13.3. Exit the EAP CLI.

14. Perform cleaning and grading.

14.1. Press Ctrl+C to stop the domain controller on workstation and both host controllers in servera and serverb.

14.2. Run the following command to grade the assignment:

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```
[student@workstation bin]$ lab managed-domain-lab grade
```

This concludes the lab work.

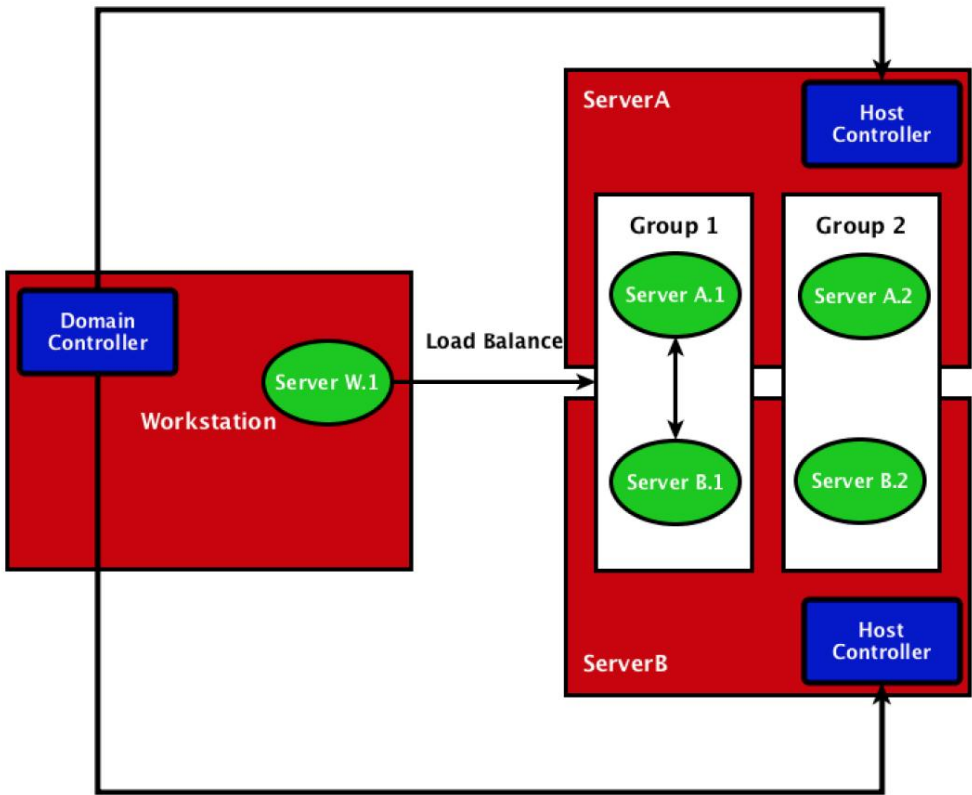
Solution

In this lab assignment, you will create a managed domain.

Resources	
Files	/opt/domain
app url	172.25.250.10:8080 172.25.250.11:8080 172.25.250.254:9990
Resources	N/D

Results

You should be able to start a domain controller on the workstation and run a host controller on server A and server B. The final solution should be consistent with the following architecture for host controller and server controller domain. The servers will be configured in later lab work:



And Before You

Begin In this lab, you create a managed domain that consists of a domain controller on workstation, a host controller on server A, and a host controller on server B. This lab lays the foundation for the managed domain for the final solution of the course.

Verify that servera is accessible using SSH by running the following command from a terminal window on workstation:

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```
[student@workstation ~]$ ssh servera hostname
```

The expected result is:

```
servera.lab.example.com
```

If the following output is presented, start servera and run the command again:

```
ssh: connect to host servera.lab.example.com port 22: No route to host
```

Verify that serverb is accessible using SSH by running the following command from a terminal window on workstation:

```
[student@workstation ~]$ ssh serverb hostname
```

The expected result is:

```
serverb.lab.example.com
```

If the following output is presented, start serverb and run the command again:

```
ssh: connect to host serverb.lab.example.com port 22: No route to host
```

Use the following command to download the relevant lab directory, verify the EAP installation on workstation, and install EAP on servera and serverb with the jboss user:

```
[student@workstation ~]$ lab managed-domain-lab setup
```

1. To start creating the domain controller, copy files from JBOSS_HOME/domain in the lab directory under /opt/domain on workstation. Set the owner of the /opt/domain directory to the jboss user.

1.1. Run the following command to copy the EAP domain configuration to the directorio /opt/domain en workstation.

```
[student@workstation ~]$ sudo cp -r /opt/jboss-eap-7.0/domain /opt/
```

1.2. Use the following command to set the owner of the directory to user jboss:

```
[student@workstation ~]$ sudo chown -R jboss:jboss /opt/domain
```

2. The EAP instance on the workstation is the domain controller, exposing the management interface to an internal network. The network that all servers connect to is the 172.25.250.X network. Other network interfaces should not be exposed to ensure that external host controllers cannot obtain sensitive information from the domain controller.

Update the management interface address so that the domain controller points to the workstation IP address (172.25.250.254) using the host-master.xml configuration file.

2.1. Open the /opt/domain/configuration/host-master.xml file with a text editor as the user jboss.

2.2. Modify the interface sections of the configuration file, as follows manner:

```
<interfaces>
  <interface name="management"> <inet-
    address value="${jboss.bind.address.management:172.25.250.254}"/>
  </interface> </
interfaces>
```

23. Save the changes and exit the editor.

3. Because the domain controller will be running an application with high availability capabilities, including the messaging subsystem, some additional requirements are needed. The domain controller is responsible for providing security information to allow the server instances to be part of the clustered environment, for all subsystems.

The messaging subsystem requires authentication to exchange data between cluster members, and the credentials are declared in the domain.xml file. Details about the subsystem will be explained later, but for the environment to work properly, the cluster password must be declared in the domain controller's configuration file.

Update domain.xml on workstation so that it has the password for the JBoss@RedHat123 cluster.

3.1. As the jboss user, open the /opt/domain/configuration/ domain.xml file on workstation

```
[student@workstation ~]$ sudo -u jboss vi /opt/domain/configuration/domain.xml
```

3.2. Inside the messaging-activemq subsystem of the full-ha profile, edit the <cluster> tag (line 1278):

```
<cluster password="${jboss.messaging.cluster.password:JBoss@RedHat123}" />
```



use

Clustered storage will be described in more detail later in this course.

3.3. Save the changes to domain.xml.

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4. Start the domain controller on workstation.

4.1. In the terminal window, change directories to `/opt/jboss-eap-7.0/bin`:

```
[student@workstation domain]$ cd /opt/jboss-eap-7.0/bin
```

4.2. To start the domain controller with the `host-master.xml` file on the `/opt/domain/` folder, enter the following command:

```
[student@workstation bin]$ sudo -u jboss ./domain.sh \
-Djboss.domain.base.dir=/opt/domain/ \ --host-
config=host-master.xml
```

Look for the following output to confirm that the domain controller is running:

```
[Host Controller] 01:50:11,359 INFO [org.jboss.as] (Controller Boot Thread)
WFLYSRV0060: Http management interface listening on http://172.25.250.254:9990/
management
[Host Controller] 01:50:11,359 INFO [org.jboss.as] (Controller Boot Thread)
WFLYSRV0051: Admin console listening on http://172.25.250.254:9990
```

5. Access the server A virtual machine using the `ssh` command:

```
[student@workstation bin]$ ssh server
```

The setup script installed an EAP instance on server A and server B. Copy files from `JBOSS_HOME/domain` to the `lab` directory in `/opt/domain` on server A and set the owner to `jboss`.

```
[student@servera ~]$ sudo cp -r /opt/jboss-eap-7.0/domain /opt/ [student@servera ~]
$ sudo chown -R jboss:jboss /opt/domain
```

6. Set the hostname as `server`. Update interface address

administration for the host controller to point to the IP address of server A (172.25.250.10) using the `host-slave.xml` configuration file.

6.1. Open the `/opt/domain/configuration/host-slave.xml` file on server A with a text editor as user `jboss`.

6.2. Update the hostname to `servera` by adding the `name` property to the tag `<host>`:

```
<host name="servera" xmlns="urn:jboss:domain:4.1">
```

6.3. Update the public IP address as follows:

```
<interface name="public"> <inet-
address value="${jboss.bind.address:172.25.250.10}"/> </interface>
```

6.4. Update the management IP address as follows:

```
<interface name="management">
  <inet-address value="${jboss.bind.address.management:172.25.250.10}"/> </interface>
```

6.5. Save the file and exit the editor.**7. Start the host controller on server A with the /opt/domain/ configuration/host-slave.xml configuration file and point it to the domain controller running at 172.25.250.254.****7.1. Run the following command to start the host controller and connect to the domain controller:**

```
[student@servera ~]$ cd /opt/jboss-eap-7.0/bin [student@servera
bin]$ sudo -u jboss ./domain.sh \ -Djboss.domain.base.dir=/opt/
domain/ \ --host-config=host-slave.xml \
-Djboss.domain.master.address=172.25.250.254
```

7.2. Observe the terminal window of the host controller on servera. Check Look closely at the log output and you should see the host controller connecting to the master host, as well as server-one and server-two starting.

```
[Host Controller] 16:42:57,307 INFO [org.jboss.as.host.controller]
(Controller Boot Thread) WFLYHC0148: Connected to master host controller at remote://172.25.250.254:9999

[Host Controller] 16:42:57,367 INFO [org.jboss.as.host.controller] (Controller Boot Thread) WFLYHC0023:
Starting server server-one
```

7.3. Observe the terminal window of the domain controller on the workstation. Must see a log entry showing the connecting slave host:

```
[Host Controller] 11:42:16,348 INFO [org.jboss.as.domain.controller] (Host Controller Service Threads -
36) WFLYHC0019: Registered remote slave host "servera", JBoss JBoss EAP 7.0.0.GA (WildFly
2.1.2.Final-redhat-1)
```

8. Access the server B virtual machine using the ssh command:

```
[student@workstation bin]$ ssh serverb
```

Copy the files from JBOSS_HOME/domain to the lab directory in /opt/domain on server B, and set the owner to jboss.

```
[student@serverb ~]$ sudo cp -r /opt/jboss-eap-7.0/domain /opt/ [student@serverb ~]
$ sudo chown -R jboss:jboss /opt/domain
```

9. Set the hostname to serverb. Update the management interface address so that the host controller points to the IP address of server B

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(172.25.250.11) using the host-slave.xml configuration file and configure the servers so that there is only one server named server-three that has no port forwarding in the other-server-group server group.

9.1. Open the /opt/domain/configuration/host-slave.xml file on server B with a text editor as user jboss.

9.2. Update the hostname to servera by adding the name property to the tag <host>:

```
<host name="serverb" xmlns="urn:jboss:domain:4.1">
```

9.3. Update the public IP address as follows:

```
<interface name="public"> <inet-  
  address value="${jboss.bind.address:172.25.250.11}"/> </interface>
```

9.4. Update the management IP address as follows:

```
<interface name="management">  
  <inet-address value="${jboss.bind.address.management:172.25.250.11}"/> </interface>
```

9.5. Update the servers tag to match the following:

```
<servers>  
  <server name="server-three" group="other-server-group"/>  
</servers>
```

9.6. Save the file and exit the editor.

10. Start the host controller on server B with the /opt/domain/ configuration/host-slave.xml configuration file and point it to the domain controller running at 172.25.250.254.

10.1. Run the following command to start the host controller and connect to the domain controller:

```
[student@serverb ~]$ cd /opt/jboss-eap-7.0/bin [student@serverb  
bin]$ sudo -u jboss ./domain.sh \ -Djboss.domain.base.dir=/opt/  
domain/ \ --host-config=host-slave.xml \  
-Djboss.domain.master.address=172.25.250.254
```

10.2. Observe the terminal window of the serverb host controller. Check Look closely at the log output and you should see the host controller connecting to the master host, as well as server-three starting.

```
[Host Controller] 16:42:57,307 INFO [org.jboss.as.host.controller]  
(Controller Boot Thread) WFLYHC0148: Connected to master host controller at remote://172.25.250.254:9999
```

```
[Host Controller] 16:42:57,367 INFO [org.jboss.as.host.controller] (Controller Boot Thread) WFLYHC0023:
Starting server server-three
```

10.3.Observe the terminal window of the domain controller on workstation. You should see a log entry showing the connecting slave host:

```
[Host Controller] 11:42:16,348 INFO [org.jboss.as.domain.controller] (Host Controller Service Threads -
36) WFLYHC0019: Registered remote slave host "serverb", JBoss JBoss EAP 7.0.0.GA (WildFly
2.1.2.Final-redhat-1)
```

11. On workstation, open a web browser and navigate to 172.25.250.254:9990 to access the domain administration console. Verify that both hosts appear in the Runtime section.

11.1.On workstation, open a web browser and navigate to 172.25.250.254:9990.

11.2.At the top of the page, click Runtime, and then select Hosts under the first column.

11.3.Verify that both host servera and host serverb are listed.

12. Stop and remove all servers (server-one, server-two, and server-three). In the final lab work of the next chapter, you will create new servers to deploy applications to these hosts.

12.1.In a new terminal on workstation, connect to the EAP CLI for the domain controller:

```
[student@workstation bin]$ sudo -u jboss /opt/jboss-eap-7.0/bin/jboss-cli.sh \ --connect --
controller=172.25.250.254:9990
```



use

The administrator username is jbossadm and the password is JBoss@RedHat123.

12.2.Use the following command to stop all servers in the managed domain. Servers must be stopped before removing them:

```
[domain@172.25.250.254:9990] :stop-servers
```

12.3.After you have stopped all servers, use the following command to remove server-one:

```
[domain@172.25.250.254:9990] /host=servera/server-config=server-one:remove
```

Run the command again, but navigate to server-two which is located at serve:

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```
[domain@172.25.250.254:9990] /host=servera/server-config=server-two:remove
```

Run the command to remove server-three, found in serverb:

```
[domain@172.25.250.254:9990] /host=serverb/server-config=server-three:remove
```

- 13. Delete the server groups (main-server-group, other-server-group), as these will be configured in the final lab work in the next chapter to align with the final course solution. After deleting the server groups, exit the EAP CLI.**

- 13.1.Run the following command to remove main-server-group on workstation using EAP CLI:**

```
[domain@172.25.250.254:9990] /server-group=main-server-group:remove
```

- 13.2.Run the following command to remove other-server-group on workstation using EAP CLI:**

```
[domain@172.25.250.254:9990] /server-group=other-server-group:remove
```

- 13.3.Exit the EAP CLI.**

- 14. Perform cleaning and grading.**

- 14.1.Press Ctrl+C to stop the domain controller on workstation and both host controllers in servera and serverb.**

- 14.2.Run the following command to grade the assignment:**

```
[student@workstation bin]$ lab managed-domain-lab grade
```

This concludes the lab work.

Summary

In this chapter, you learned the following:

- Each computer hosting server instances runs a host controller process, which acts as a slave to the domain controller. The master is also a host controller.
- The host configuration file, `host.xml`, configures a host controller, including defining its role as master or slave, its IP addresses, and its server instances.
- Host controllers require a native management interface for master/slave communication, but only the master must have an active HTTP management interface.
- Host controllers are started by the `domain.sh` script. The script invocation typically defines system properties so that IP addresses are assigned to the host controller's network interfaces, the master IP address if it is a slave, and the configuration file folder.
- To deploy applications in a managed domain, there are three steps:
 1. Upload the application package to the domain controller repository.
 2. Assign the application to one or more server groups.
 3. Allow the application on each of its assigned server groups. This is when the application is implemented from the point of view of the user and the developer.

