

8

Configuring Node Managers

Objectives

After completing this lesson, you should be able to:

- Define the Oracle WebLogic Server machine
- Configure a machine and assign servers to it by using the console and WebLogic Scripting Tool (WLST)
- Explain the Node Manager architecture
- Describe the organization and contents of a Node Manager directory structure
- Configure, start, and stop Node Managers
- Describe how to start and stop procedures

Road Map

- Node Managers
- Machines
- Configuring a Node Manager



What Node Managers Can Do

- You can use Node Managers to:
 - Start, shut down, and restart an administration server
 - Start, shut down, suspend, and restart managed servers
 - Automatically restart the administration and managed servers on failure
 - Monitor servers and collect log data
- Node Managers:
 - Run on the same computers as the managed servers
 - Can be run automatically in the background, as Windows services or UNIX daemons
 - Are available as either Java-based or (for UNIX only) script-based processes

Road Map

- Node Managers
- Machines
- Configuring a Node Manager

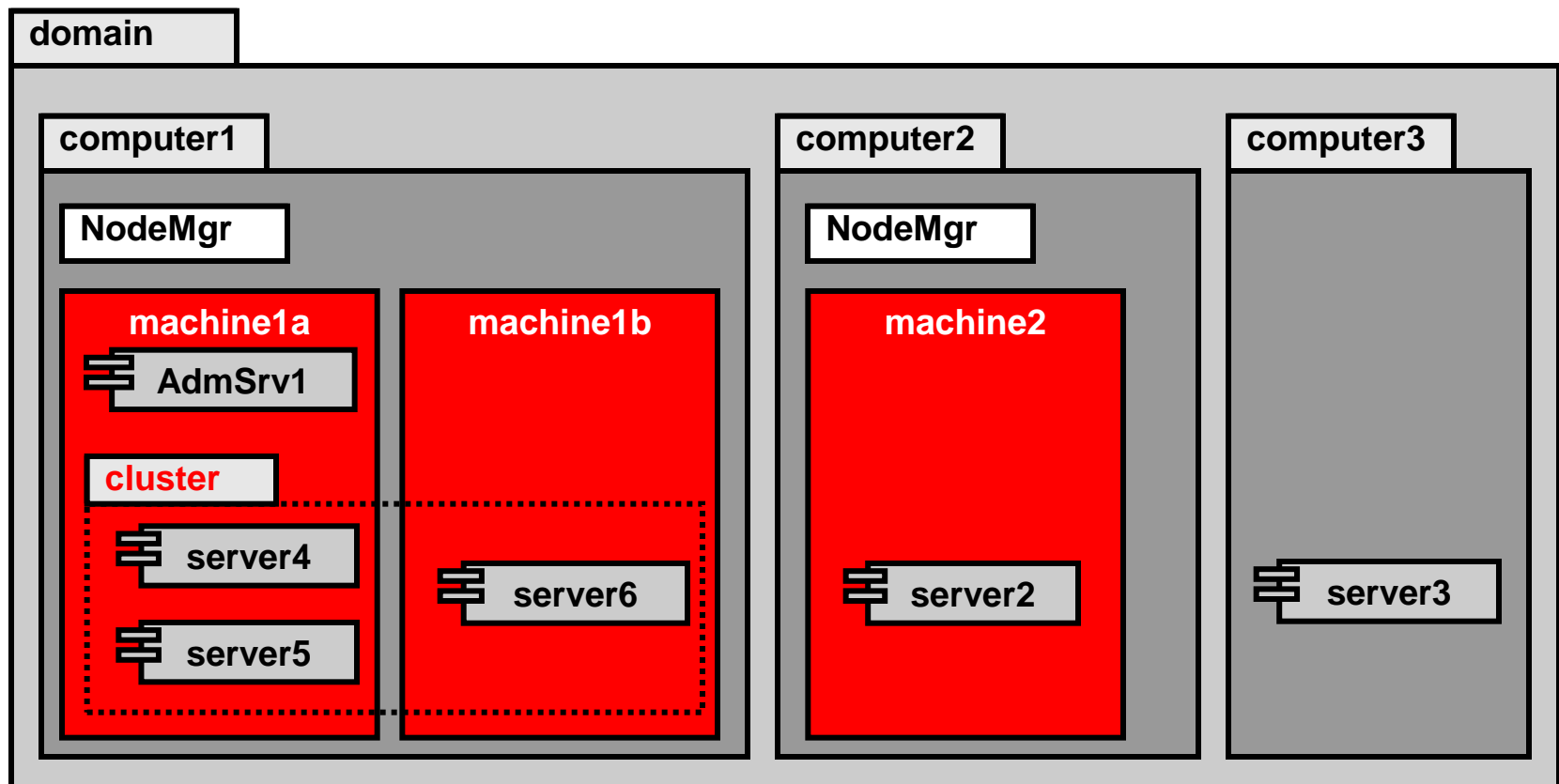


What Is a Machine?

- The main purpose of a machine is to administratively manage servers.
- A machine is required by a Node Manager.
- Machines are optionally used by clusters (described later in the course).
- A machine is a logical description, not a physical entity.

Relationship of Machines to Other Components

A typical topology for WebLogic environments contains several components.



Creating a Machine

The screenshot shows the WebLogic Server Administration Console. On the left, the 'Domain Structure' tree is visible, with 'Machines' highlighted under 'MedRecDomain'. The main area displays the 'Summary of Machines' page, which includes a description of a machine and a table to manage machines. The table is currently empty, showing 'Showing 0 to 0 of 0' items.

Domain Structure

- MedRecDomain
 - Environment
 - Servers
 - Clusters
 - Virtual Hosts
 - Migratable Targets
 - Machines**
 - Work Managers
 - Startup & Shutdown Classes
 - Deployments
 - Services
 - Security Realms
 - Interoperability
 - Diagnostics

Summary of Machines

A machine is the logical representation of the computer that hosts one or more WebLogic Server instances (servers). WebLogic Server uses configured machine names to determine the optimum server in a cluster to which certain tasks, such as HTTP session replication, are delegated. The Administration Server uses the machine definition in conjunction with Node Manager to start remote servers.

This page displays key information about each machine that has been configured in the current WebLogic Server domain.

[Customize this table](#)

Machines

New Clone Delete Showing 0 to 0 of 0 Previous | Next

<input type="checkbox"/>	Name ^	Type
There are no items to display		

New Clone Delete Showing 0 to 0 of 0 Previous | Next

```
wls:/mydomain/edit> startEdit()  
wls:/mydomain/edit !> create('MedRecMch3', 'Machine')  
wls:/mydomain/edit !> save()
```


Defining Names and OS of Machines

Create a New Machine 1

OK Cancel

Machine Properties

The following properties will be used to identify your new Machine.



* Indicates required fields

What would you like to name your new Machine?

* **Name:**

Specify the type of machine operating system.

Machine OS:


Other 
Unix 
Other

OK Cancel

Windows is "Other."

Machines 2

New Clone Delete Showing 1 to 2 of 2 Previous | Next

<input type="checkbox"/>	Name 	Type
<input type="checkbox"/>	MedRecMch1	UnixMachine
<input type="checkbox"/>	MedRecMch2	UnixMachine

New Clone Delete Showing 1 to 2 of 2 Previous | Next

Assigning Servers to a Machine

Settings for MedRecMch1

Configuration | Monitoring | Notes

General | Node Manager | **Servers**

This page displays the servers that have been assigned to this Machine. You can select a server to configure from the list of available servers.

[Customize this table](#)

Servers(Filtered - More Columns Exist)

Showing 0 to 0 of 0 Previous

<input type="checkbox"/>	Name	Cluster	Machine	State	Health	Listener
There are no items to display						

Showing 0 to 0 of 0 Previous

1

Add a Server to Machine

Identify Server

Identify the server to be added

How would you like to proceed?

☒ **Select an existing server, and associate it with this machine**

Select a server:

- MedRecAdmSvr
- MedRecAdmSvr
- MedRecSvr1**
- MedRecSvr2
- MedRecSvr3

☐ Create a new server for this machine

2

Monitoring Machines and Servers

Settings for MedRecMch2

Configuration Monitoring Notes

General Node Manager **Servers**

Servers(Filtered - More Columns Exist)

<input type="checkbox"/>	Name ^	Cluster	Machine	State	Health	Listen Port	SSL Listen Port	SSL Enabled
<input type="checkbox"/>	MedRecSvr2	MedRecClust1	MedRecMch2	SHUTDOWN		7023	7002	false
<input type="checkbox"/>	MedRecSvr3		MedRecMch2	SHUTDOWN		7025	7002	false

Add Remove

Showing 1 to 2 of 2 Previous | Next

Two different ways
to see the same
servers and
machines:

Summary of Servers

Configuration Control

Servers (Filtered - More Columns Exist)

<input type="checkbox"/>	Name ^	Cluster	Machine	State	Health	Listen Port	SSL Listen Port
<input type="checkbox"/>	MedRecAdmSvr(admin)			RUNNING	✓ OK	7020	7002
<input type="checkbox"/>	MedRecSvr1	MedRecClust1	MedRecMch1	SHUTDOWN		7021	7002
<input type="checkbox"/>	MedRecSvr2	MedRecClust1	MedRecMch2	SHUTDOWN		7023	7002
<input type="checkbox"/>	MedRecSvr3		MedRecMch2	SHUTDOWN		7025	7002

New Clone Delete

Showing 1 to 4 of 4 Previous | Next

Configuring a Machine to Use a Node Manager

Settings for MedRecMch1

Configuration Monitoring Notes

General **Node Manager** Servers

Save

This page allows you to define the Node Manager for

Type: ▼

Listen Address:

Listen Port:

Node Manager Home:

Shell Command:

☐ Debug Enabled

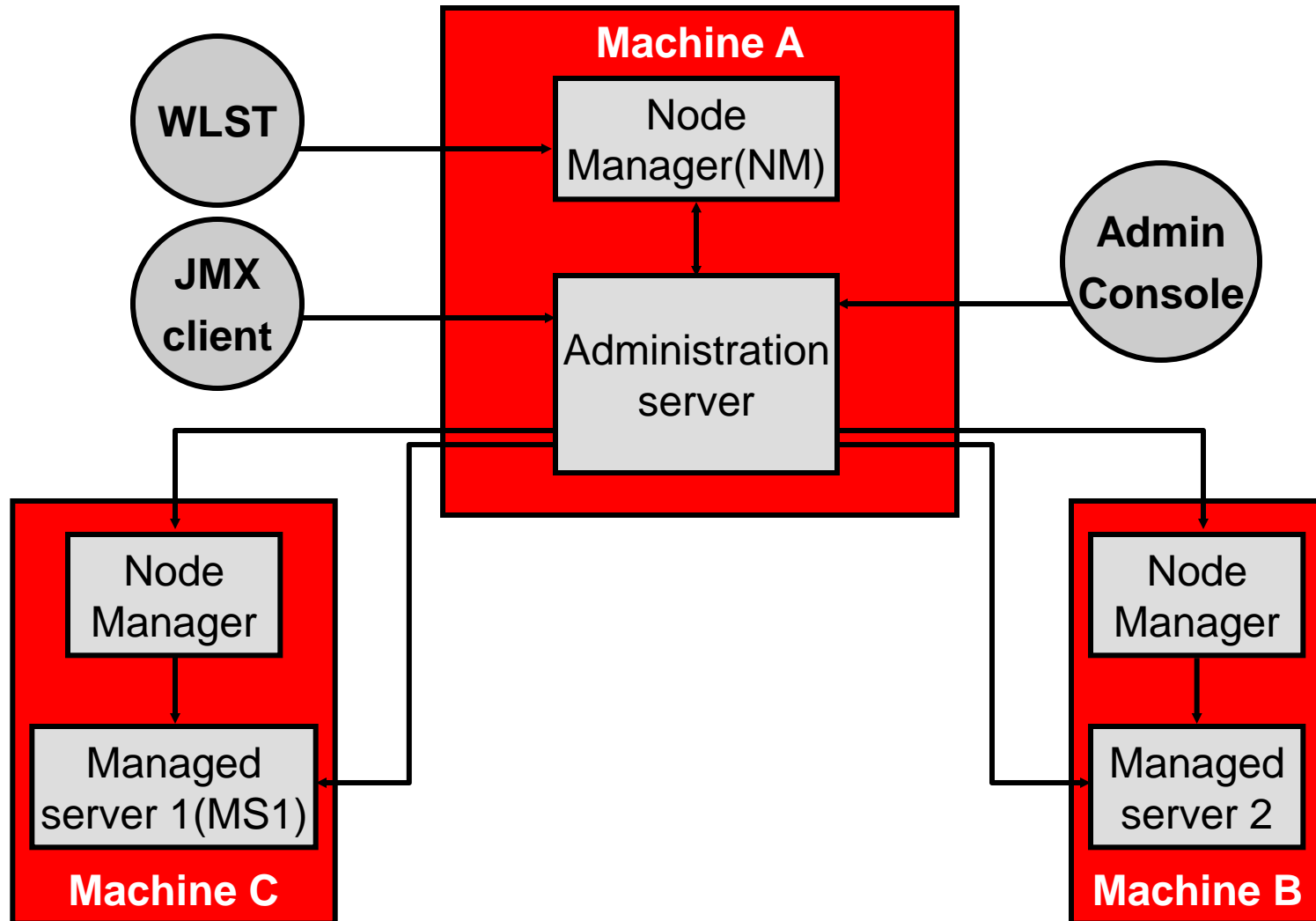
Save

A WLS machine resource maps a machine with the server instances that it hosts.

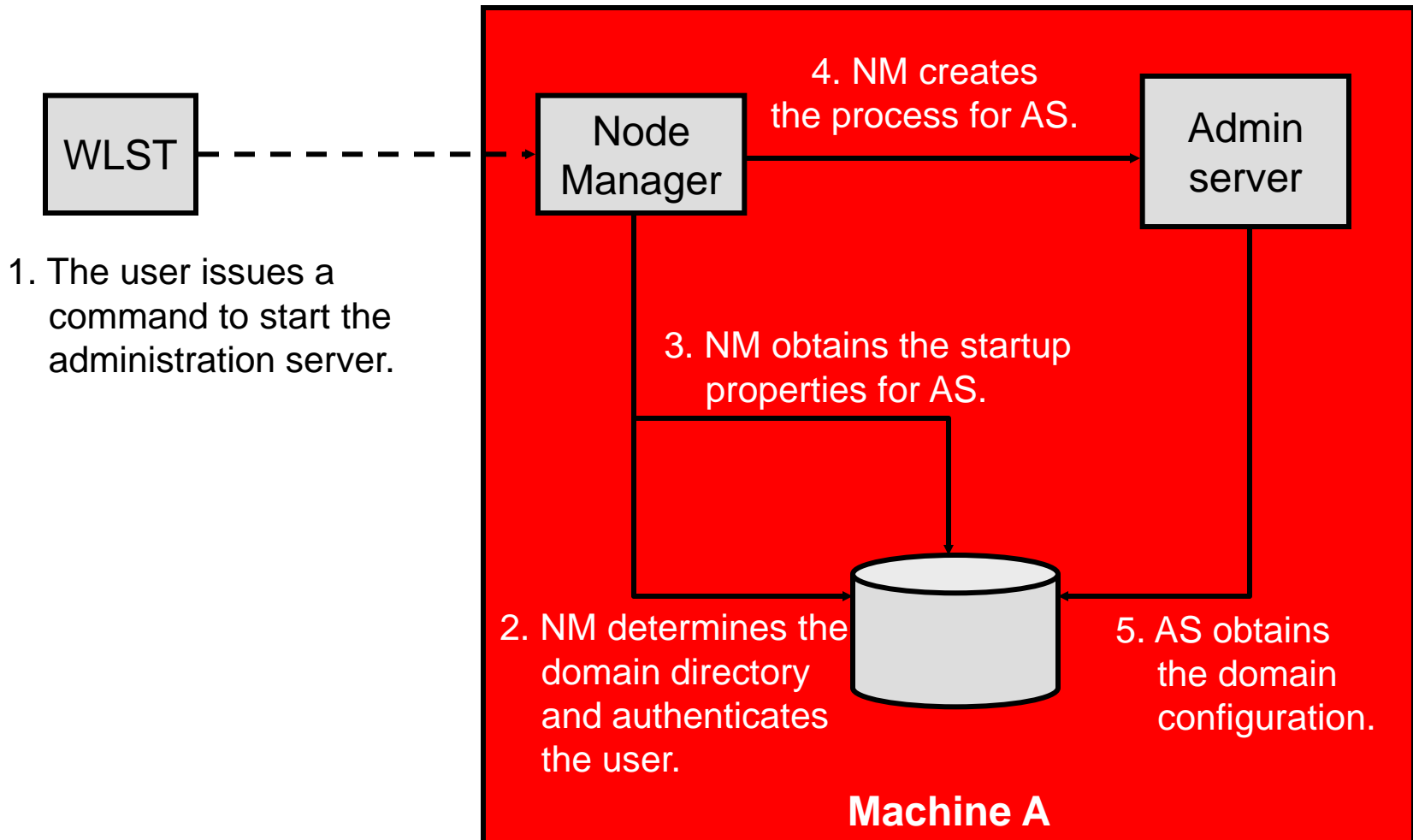
Choices for Type:

- Secure
 - SSH (`wlscontrol.sh`)
 - SSL (calls Java)
- Unsecure
 - Plain
 - `startNodeManager.sh`
 - Calls Java
 - RSH

Node Manager Architecture

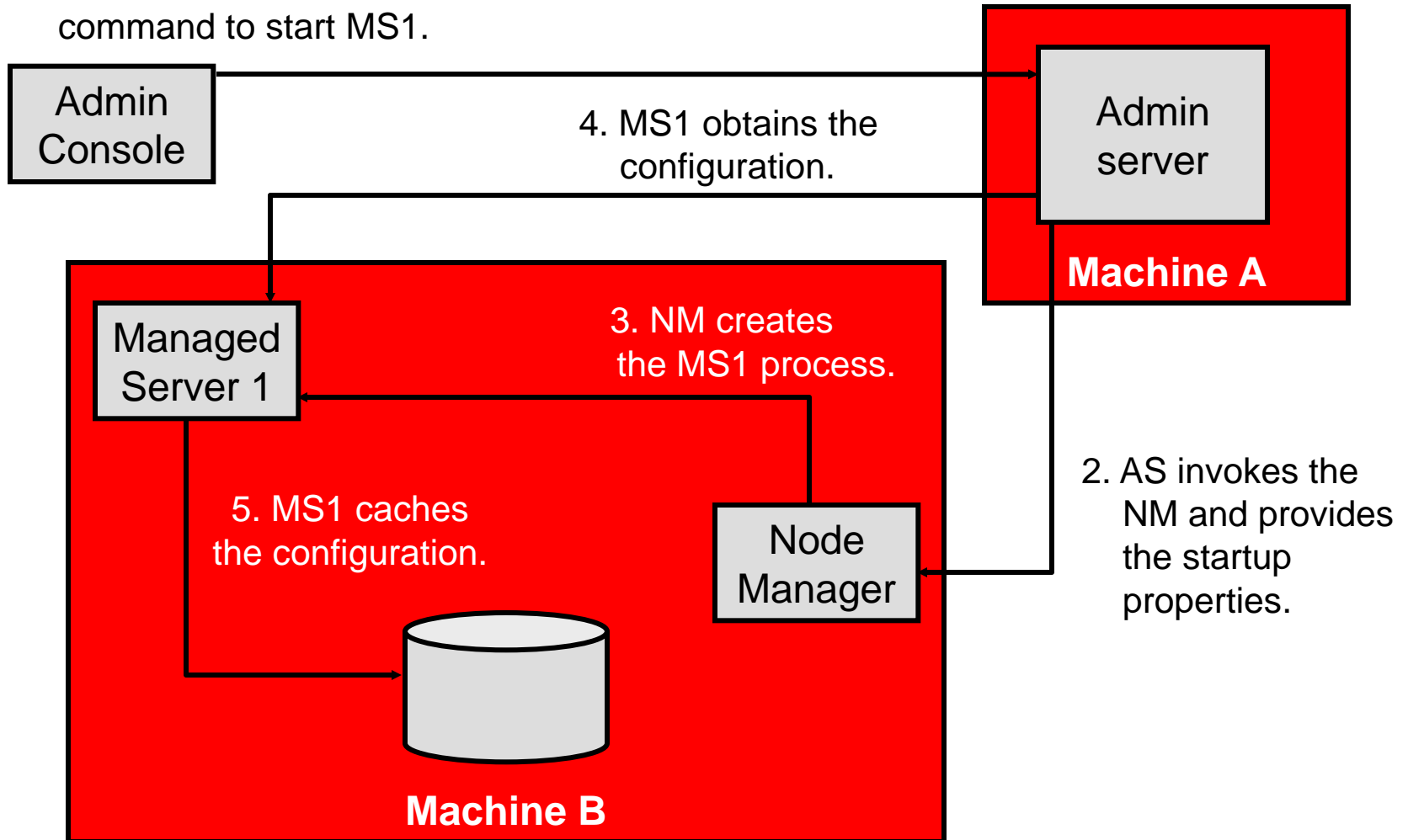


How a Node Manager Starts an Administration Server

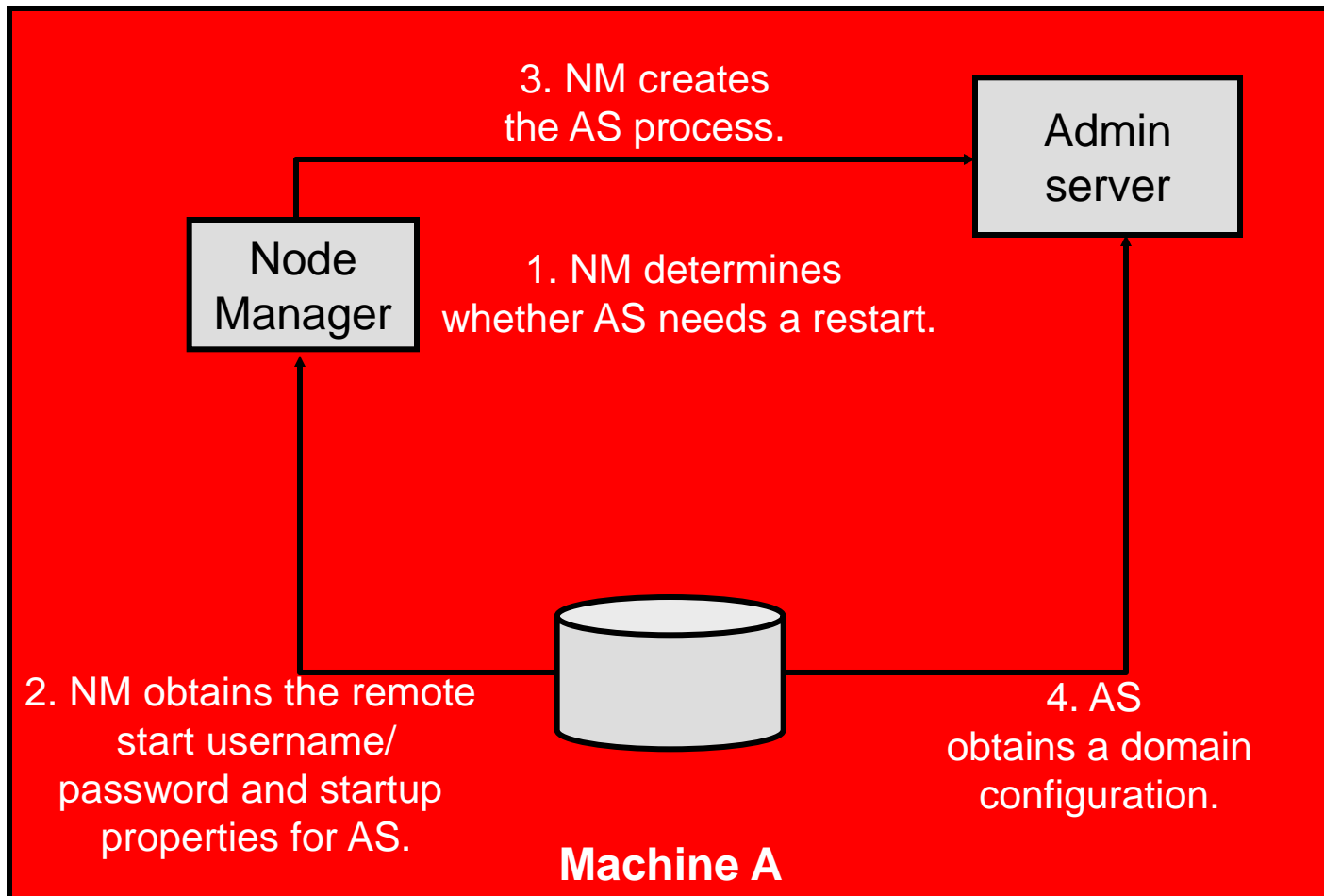


How a Node Manager Starts a Managed Server

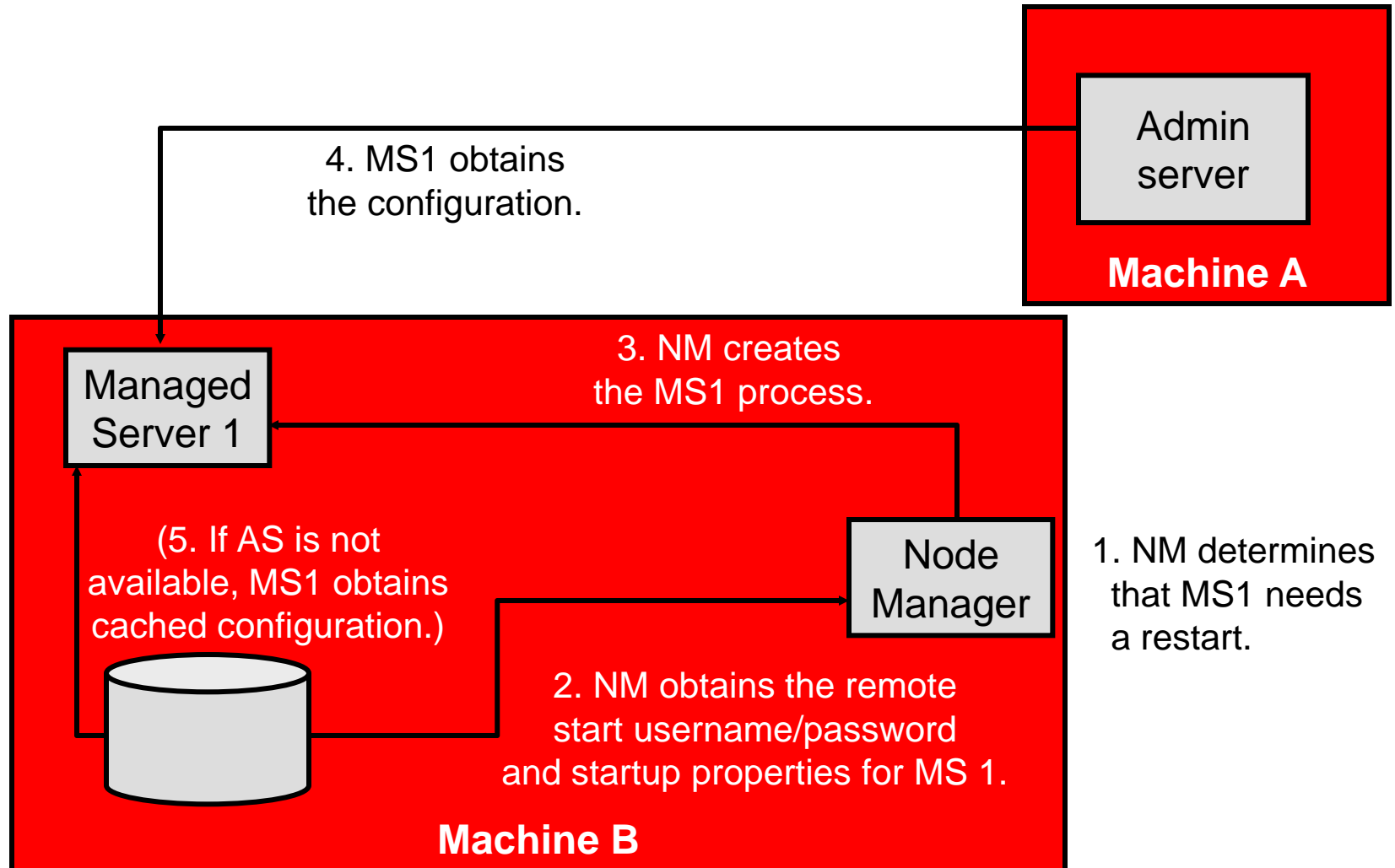
1. The user issues a command to start MS1.



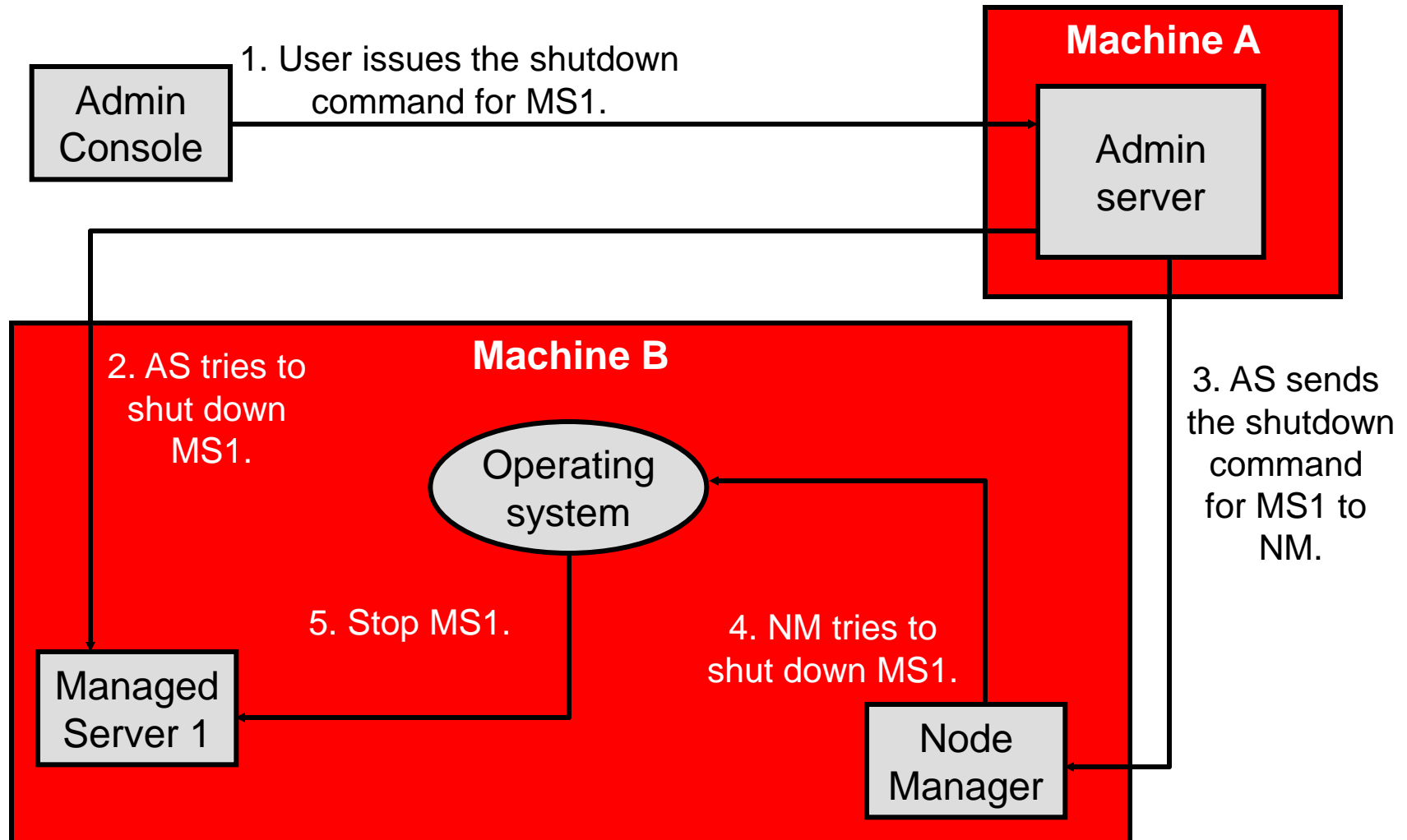
How a Node Manager Restarts an Administration Server



How a Node Manager Restarts a Managed Server



How a Node Manager Shuts Down a Server Instance



Versions of Node Managers

- There are two versions of Node Managers:
 - Java-based Node Managers
 - Script-based Node Managers
- Java-based Node Managers run within a Java Virtual Machine (JVM) process.
- Script-based Node Managers (used only for UNIX systems) do not have as much security, but provides the ability to remotely manage servers over a network using Secure Shell (SSH).
- Node Managers are required for:
 - Whole server migration
 - Some configurations of automatic server migration

Road Map

- Node Managers
- Machines
- Configuring a Node Manager



Node Manager Default Behaviors

- After Oracle WebLogic Server is installed, the Node Manager is “ready-to-run” if the Node Manager and the administration server are on the same machine.
- By default, the following behaviors are configured:
 - The Administration Console can use Node Manager to start the managed servers.
 - The Node Manager monitors the managed servers that it started.
 - The automatic restart of managed servers is enabled.

Configuring a Java-Based Node Manager

The configuration tasks for the Java-based Node Manager include:

- Reconfiguring the startup service for a Windows installation
- Daemonizing the Node Manager for UNIX systems
- Configuring the Java-based Node Manager security
- Reviewing `nodemanager.properties`
- Configuring the Node Manager on multiple machines

Reconfiguring the Startup Service for a Windows Installation

1. Delete the Node Manager service using `uninstallNodeMgrSvc.cmd`.
2. Edit `installNodeMgrSvc.cmd` to specify the listen address and the listen port of the Node Manager.
3. Run `installNodeMgrSvc.cmd` to reinstall the Node Manager as a service, listening on the updated address and port.

Node Manager as a UNIX Daemon

- Reinstall the Node Manager daemon.
- Configure the Node Manager using `nodemanager.properties`.
 - Reinstall the Node Manager daemon.

Reviewing `nodemanager.properties`

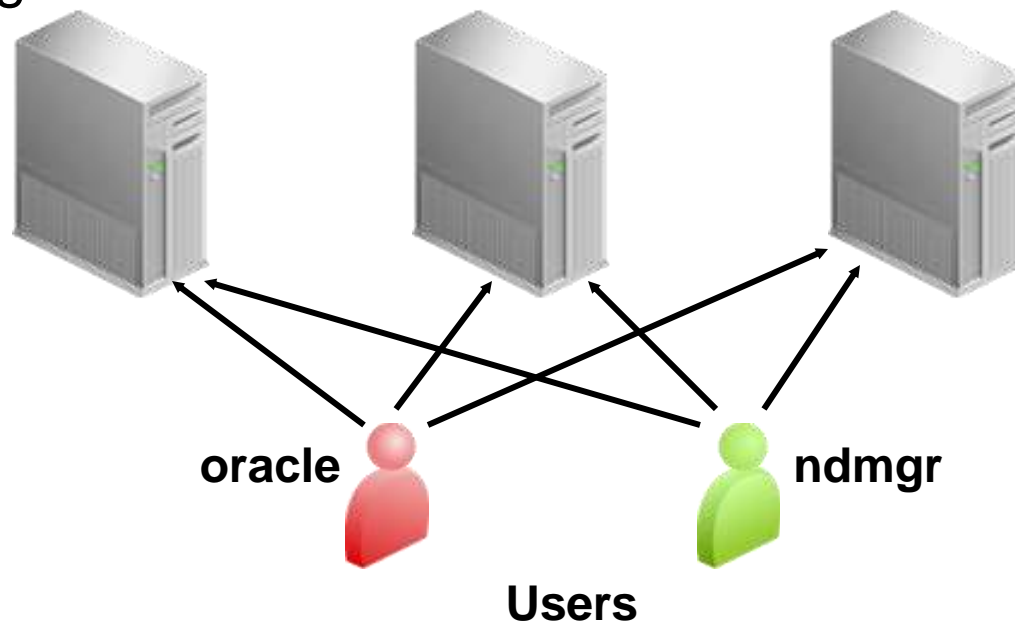
- You can specify the properties for a Java-based Node Manager process either at the command line or in the `nodemanager.properties` file.
- Values supplied on the command line take precedence over those in the `nodemanager.properties` file.
- To configure a Node Manager to use a start script, in the `nodemanager.properties` file:
 - Set the `StartScriptEnabled` property to `True` (default is `false`)
 - Set the `StartScriptName` property to the name of your script (default is `startWebLogic.sh`)

Configuring a Script-Based Node Manager

- The SSH Node Manager is a shell script, `wlscontrol.sh`, located in `NM_HOME/common/bin`.
- An executable SSH client must reside on each machine where the Node Manager or the Node Manager client runs.
 - An SSH client is typically a standard part of a UNIX or Linux installation.
- The configuration tasks for a script-based Node Manager include:
 - Using SSH with the script-based Node Manager
 - Creating a Node Manager user
 - Configuring the script-based Node Manager security

Creating Management OS Users

- Unless otherwise specified, the Node Manager runs as the user that started the domain.
- Before you run a Node Manager, you should create a dedicated UNIX user account for performing Node Manager functions.



Additional Configuration Information

Other Node Manager configuration tasks include:

- Configuring a machine to use a Node Manager
- Configuring the `nodemanager.domains` file
- Ensuring that the administration server address is defined
- Setting the Node Manager environment variables

Configuring the `nodemanager.domains` File

- The `nodemanager.domains` file specifies the domains that a Node Manager instance controls.
- When a user issues a command for a domain, the Node Manager looks up the domain directory from this file.
- `nodemanager.domains` provides additional security by restricting the Node Manager client access to the domains listed in this file.

Defining the Administration Server Address

Settings for MedRecSvr1

Configuration Protocols Logging Debug Monitoring Control

General Cluster Services Keystores SSL Federation Services

Save

Use this page to configure general features of this server such as default net

Name: MedRecSvr1

Machine: MedRecMch1

Cluster: MedRecClust1

Listen Address: 127.0.0.1

☒ Listen Port Enabled

Listen Port: 7021

☐ SSL Listen Port Enabled

SSL Listen Port: 7002

You must define a listen address for each administration server that connects to the Node Manager process.

Setting Node Manager Environment Variables

Environment Variable	Description
JAVA_HOME	This is the root directory of the JDK that you are using for Node Managers. For example: <code>set JAVA_HOME=c:\oracle\jdk1.6.0_05</code> The Node Manager has the same JDK version requirements as Oracle WebLogic Server.
WL_HOME	This is the Oracle WebLogic Server installation directory. For example: <code>set WL_HOME=c:\oracle\wlserver_10.3</code>
PATH	You must include the Oracle WebLogic Server <code>bin</code> directory and path to your Java executable. For example: <code>set PATH=%WL_HOME%\server\bin;%JAVA_HOME%\bin;%PATH%</code>
LD_LIBRARY_PATH or SHLIB_PATH (UNIX only)	For UNIX systems, you must include the path to the native Node Manager libraries. Linux and Solaris example: <code>LD_LIBRARY_PATH:\$WL_HOME/server/native/solaris:\$WL_HOME/server/lib/solaris/oci816_8</code> AIX and HP-UX example: <code>SHLIB_PATH=\$SHLIB_PATH:\$WL_HOME/server/native/hpux11:\$WL_HOME/server/lib/hpux11/oci816_8</code>
CLASSPATH	You can set the Node Manager <code>CLASSPATH</code> either as an option on the Java command line that is used to start the Node Manager or as an environment variable. Windows example: <code>set CLASSPATH=.;%WL_HOME%\server\lib\weblogic_sp.jar;%WL_HOME%\server\lib\weblogic.jar</code>

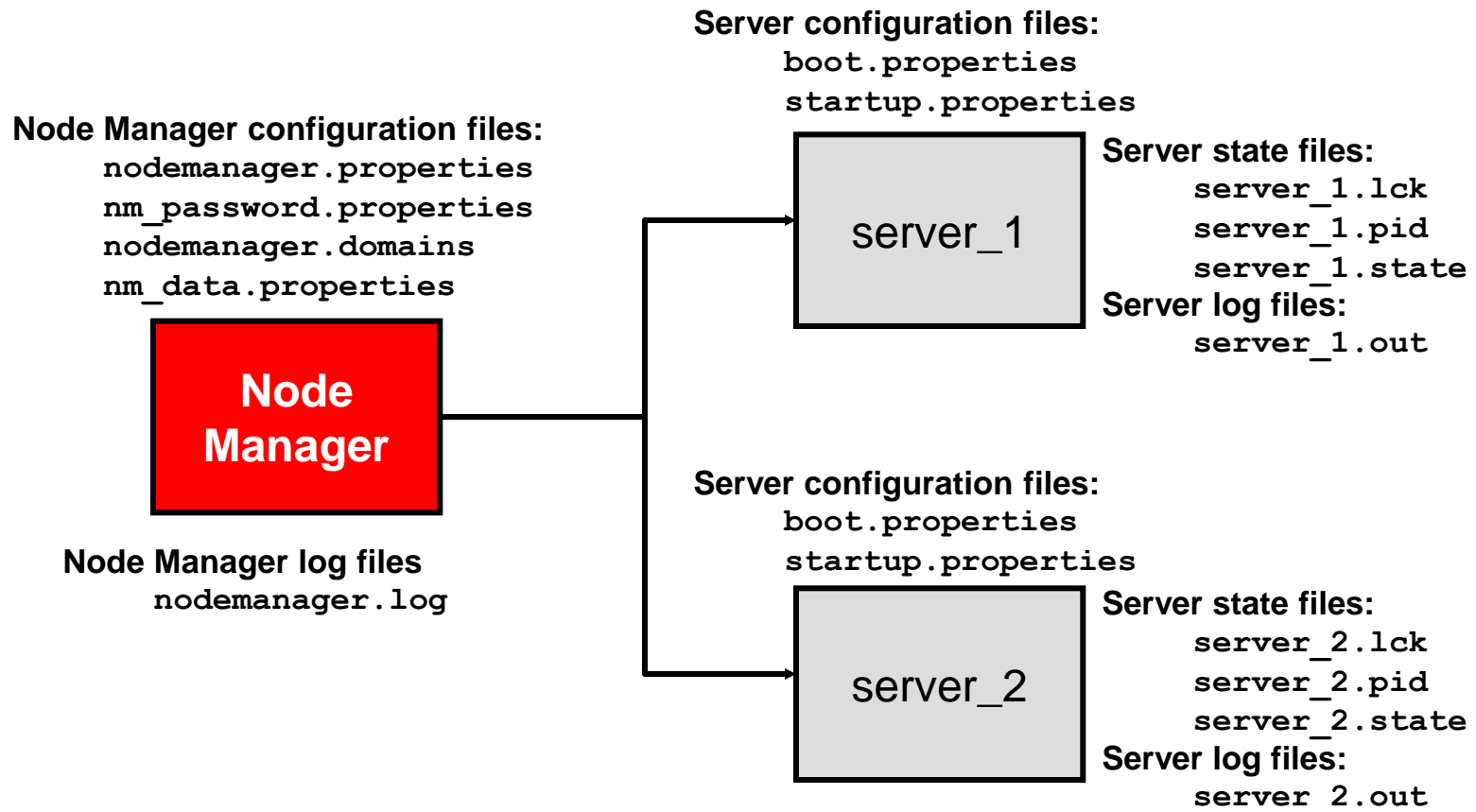
Node Manager Configuration and Log Files

Two sets of files:

- The Node Manager `config` files, located in `DOMAIN_HOME/servers/server_name/data/nodemanager`
- The Node Manager `log` files, located in `DOMAIN_HOME/servers/server_name/logs` **and** `<WL_HOME>/common/nodemanager`



Node Manager Configuration and Log Files



Quiz

You can start a managed server using WLST and without using a Node Manager.

1. True
2. False

Quiz

Which of the following statements is true?

1. There is one Node Manager for each machine.
2. There is one Node Manager for each domain.
3. There is one Node Manager for each cluster.

Quiz

To start a managed server using the Administration Console, a Node Manager must be configured on the machine where the managed server resides.

1. True
2. False

Summary

In this lesson, you should have learned how to:

- Configure machines
- Use a Node Manager
- Monitor domains and servers

Practice 8 Overview: Configuring Machines and Node Managers

This practice covers the following topics:

- Configuring and running Node Managers
- Creating a WebLogic machine using the Administration Console
- Configuring a machine
- Assigning managed servers to machines using the Administration Console
- Starting and stopping managed servers using the Administration Console and WLST