2

WebLogic Server: Overview

Objectives

After completing this lesson, you should be able to:

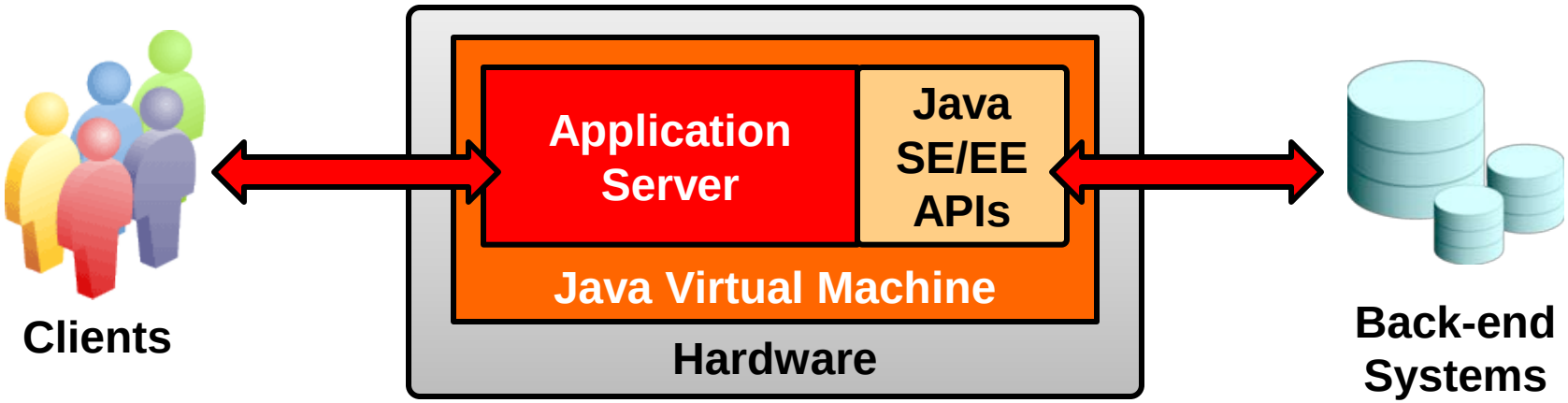
- Define the WebLogic Server terms: domain, server, and cluster
- Describe the difference between the administration server and managed servers
- List WebLogic Server tools

Distributed Systems

- Distributed systems divide their work across similar modules.
- As demand increases, more modules can be added to the system. This makes the system more *scalable*.
- The failure of a single module has less impact on the overall system, which makes the system more *available.*

Java Platform Enterprise Edition

- Java Platform Enterprise Edition (Java EE) is the Java standard for distributed, enterprise computing.
- The Java EE platform consists of:
  - A Java Virtual Machine (JVM)
  - Java Platform Standard Edition (Java SE)
  - A Java EE application server
  - Java EE Application Programming Interfaces (APIs)



Oracle WebLogic Server

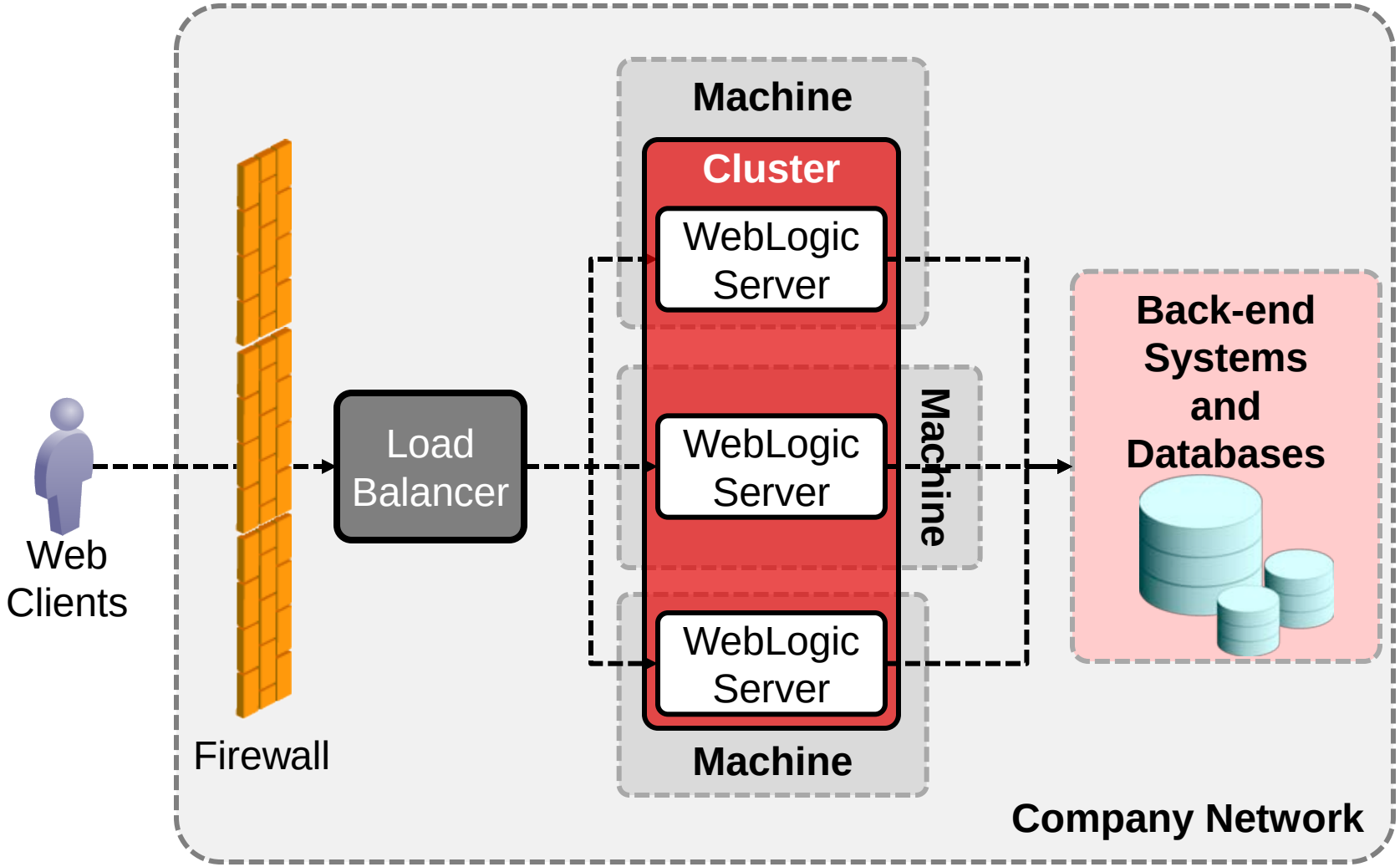
Oracle WebLogic Server (WLS):

- Is a Java EE application server hosting Java EE applications (WLS 12*c* implements Java EE 6.0)
- Provides clustering for load balancing and high availability
- Offers an extensible security realm for authentication, authorization, and so on
- Runs the “Java components” of Oracle Fusion Middleware (FMW). These include Oracle SOA Suite, Oracle Service Bus, Oracle WebCenter Suite, and some Oracle Identity Management components.
  - “System components” of FMW are managed by the Oracle Process Manager and Notification (OPMN) server. Examples are Oracle HTTP Server (OHS) and Oracle Web Cache.

JVM

- WebLogic Server, as Java code itself, runs within a JVM.
- The JVM and its settings can significantly affect WebLogic Server performance.
  - For example, the memory available to WebLogic Server and its applications is contained within the memory assigned to the JVM.
- The JVMs available from Oracle are:
  - Oracle JRockit JVM
  - Oracle Hotspot JVM
- JVM configuration options are set when the JVM starts.
  - This can be done by updating the scripts used to start WebLogic Server.

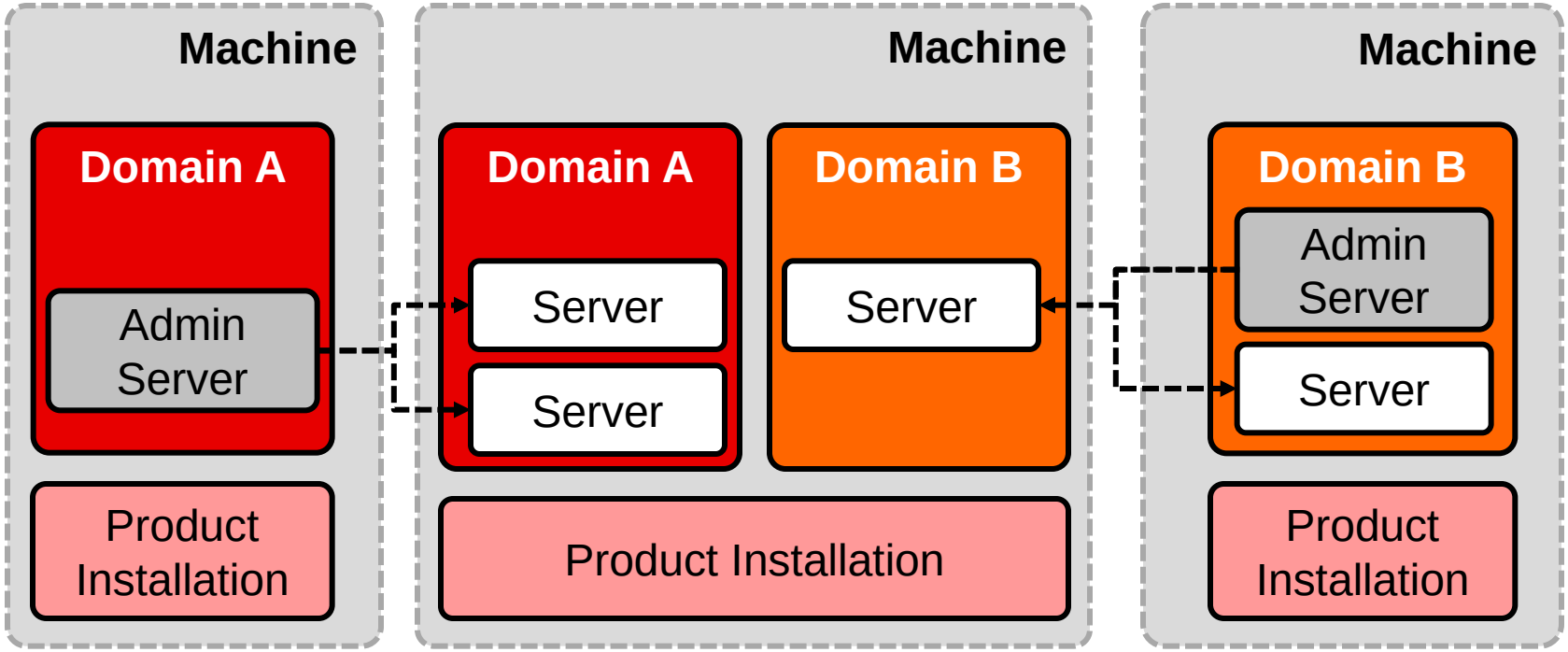
(Possible) System Architecture



WebLogic Server Domain

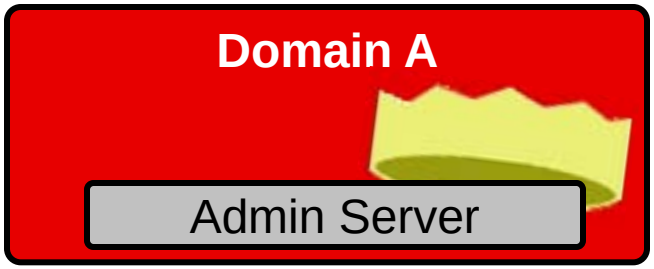
A *domain* is a collection of WebLogic Server resources.

- How many domains there are and how they are organized is completely up to you.



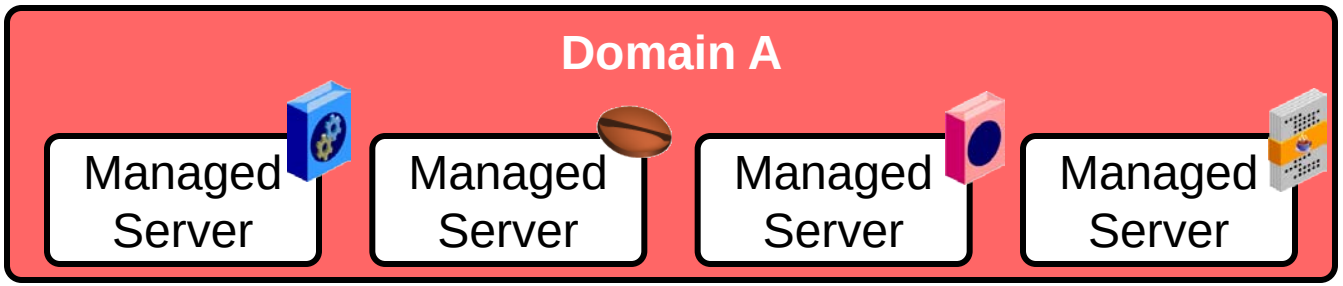
Administration Server

- A domain must have exactly one instance of WebLogic Server acting as the *administration server.* An administration server is part of exactly one domain.
- The administration server is:
  - The central point through which you configure and manage all domain resources
  - Solely in charge of the domain's configuration. It distributes configuration changes to other servers in the domain.
  - An instance of WebLogic Server and, therefore, a fully functional Java Enterprise Edition application server



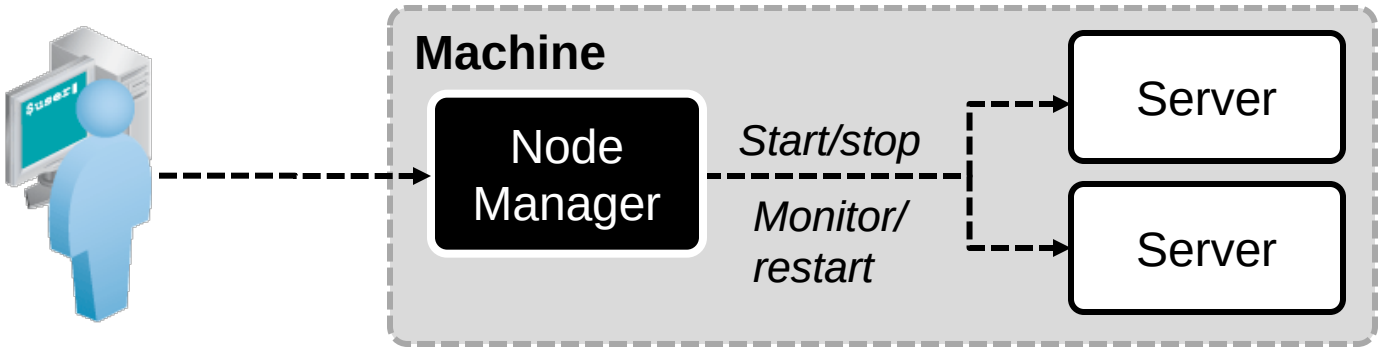
Managed Servers

- A domain can have zero or more *managed servers*.
- A managed server:
  - Is managed by the administration server
  - Is an instance of WebLogic Server and, therefore, a fully functional Java Enterprise Edition application server
  - Is where your Java Enterprise Edition applications run
    - Web applications, EJBs, web services, enterprise applications
  - Can be clustered with other cooperating managed servers for availability, scalability, and automatic failover



Node Manager

- Is a separate process that accepts remote commands to start, stop, or suspend servers on its machine
- Monitors server availability and can restart failed servers
- Can be used to migrate servers on a failed machine to another machine



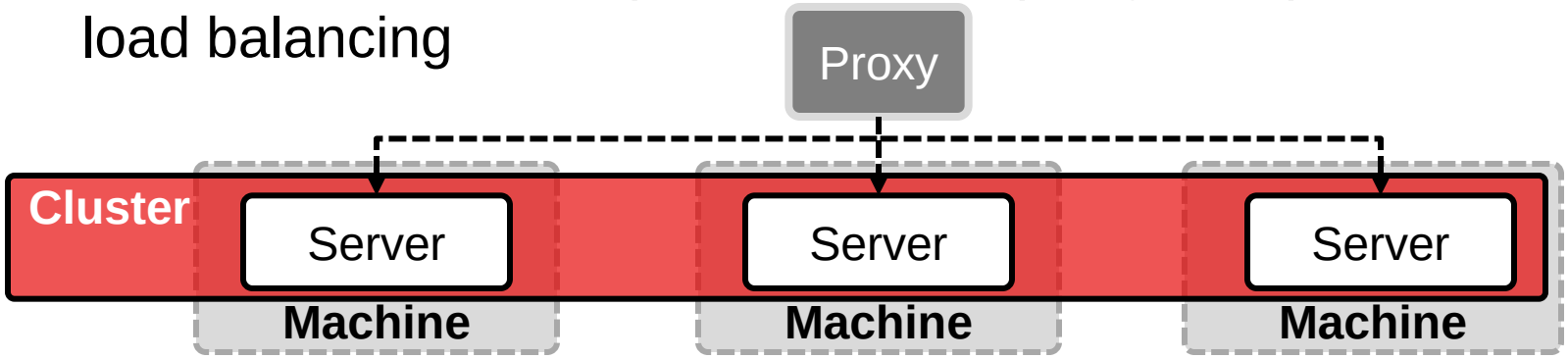
Machines and Clusters

A *machine*:

- Is defined within a domain to represent physical hardware
- Is required by Node Manager and used by clusters
- Has managed servers assigned to it

A *cluster*:

- Has multiple managed servers running cooperatively in it, which provides for failover
- With HTTP clients requires a cluster proxy that provides load balancing



WebLogic Server Application Services

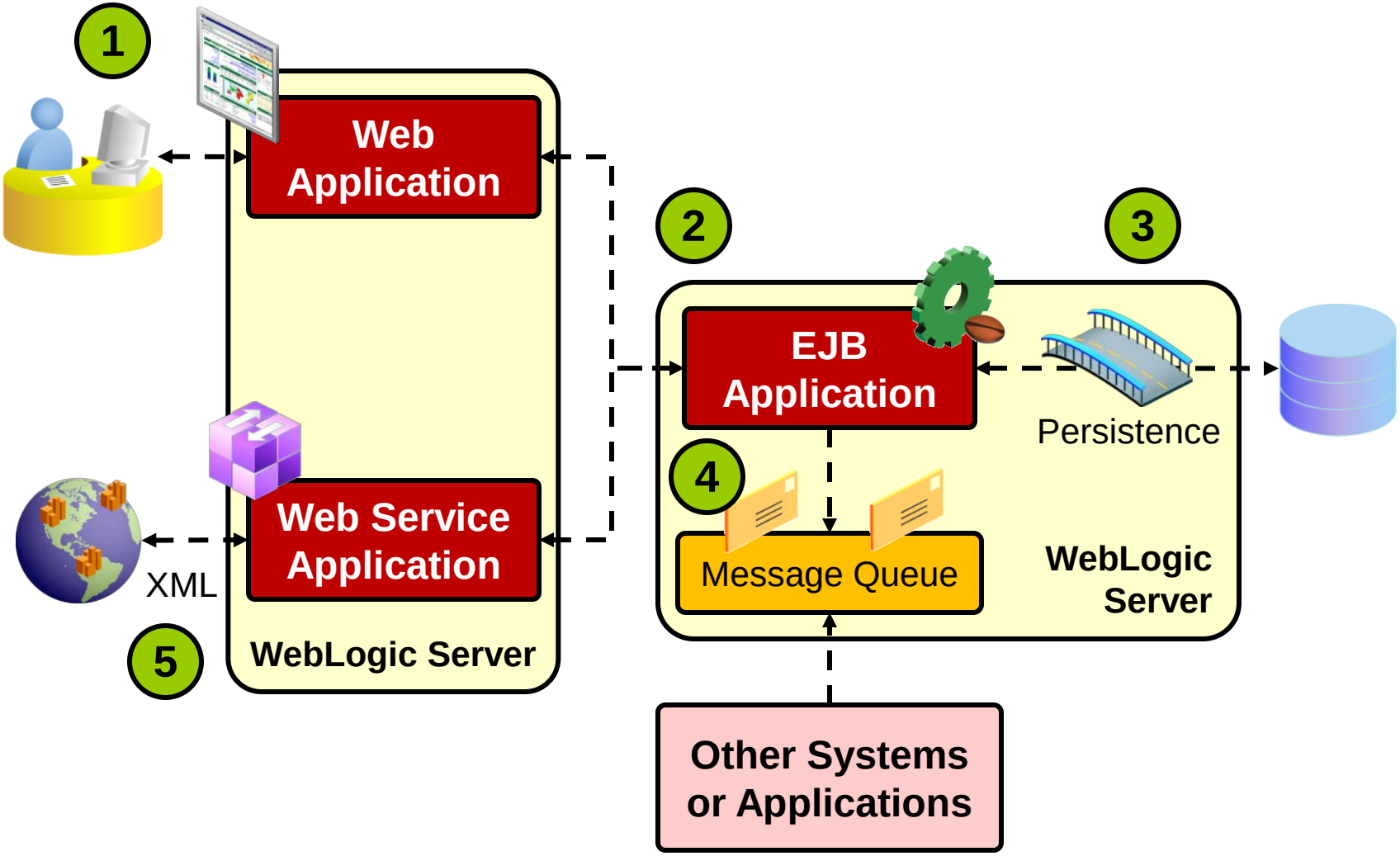
- Java Database Connectivity (JDBC)

  - The API for accessing relational databases
  - Data source objects are configured to provide database access.
- Java Message Service (JMS)

  - The API for and implementation of an enterprise messaging system
  - Multiple resources must be configured in WebLogic Server for JMS.
- Java Transaction API (JTA)

  - When transactions need to span resources, WebLogic Server can act as the transaction manager.

WebLogic Server Application: Example



WebLogic Server Administrative Tools

WebLogic Server can be administered and monitored by using:

- The WebLogic Server administration console
- The WebLogic Scripting Tool (WLST)
- The WebLogic Diagnostic Framework (WLDF)
- The WLDF Monitoring Dashboard
- Enterprise Manager Cloud Control

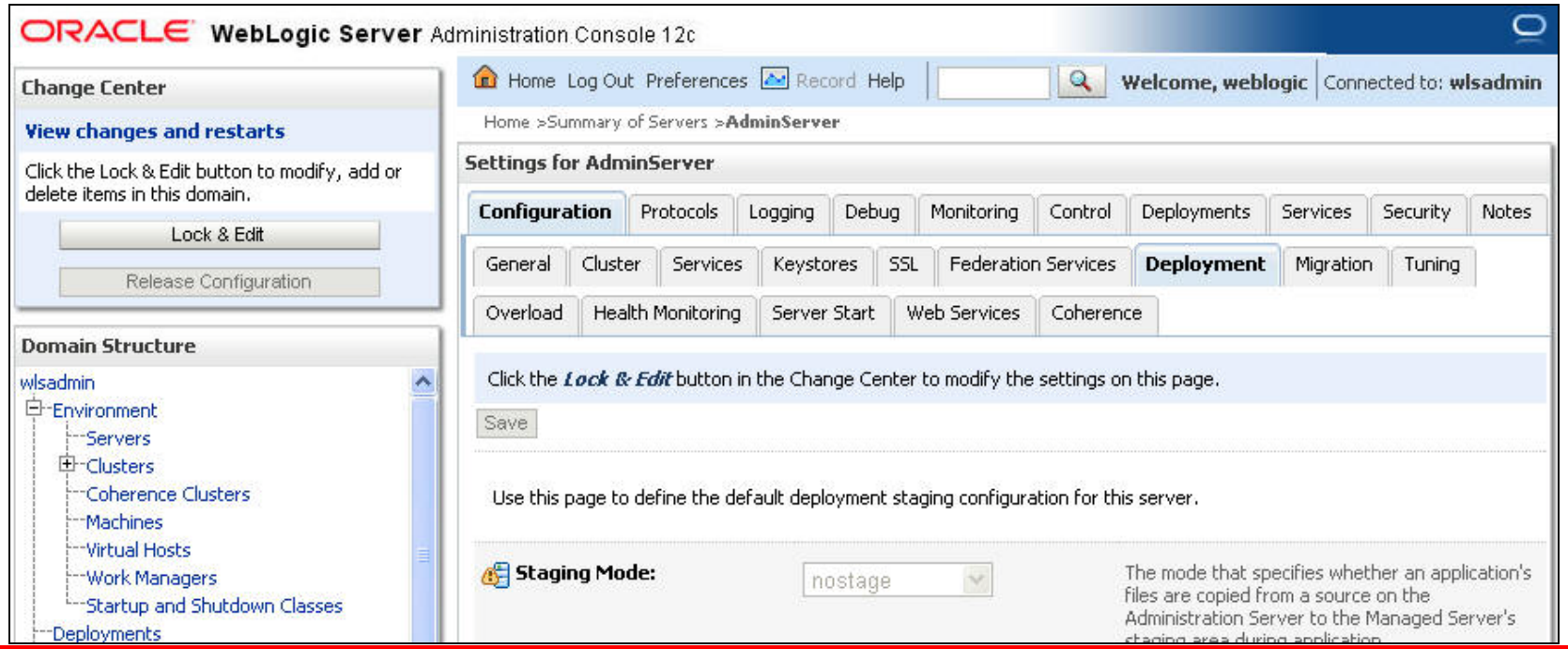
WebLogic Server Administrative Tools

WebLogic Server can be administered and monitored by using:

- The Java Management Extensions (JMX) API
  - WebLogic Server provides a large set of JMX managed beans (MBeans) for the resources that it manages.
    - These objects are used by the tools provided with the product.
    - These objects can also be used by your own custom JMX code to create, configure, manage, and monitor WebLogic Server resources.

WebLogic Server Administration Console

- The Oracle WebLogic Server administration console is a web browser–based tool for configuring, administering, and monitoring the resources of a domain.
- The console application runs on the administration server.
- It is part of the normal installation of WebLogic Server.



WLST

The WebLogic Scripting Tool (WLST) is:

- A scripting tool for creating, configuring, administering, and monitoring the resources of a WebLogic Server domain
- Part of the normal installation of WebLogic Server
- Capable of performing all the tasks available in the administration console, and more
- Based on the Jython programming language (the Java implementation of Python)
  - Python is an object-oriented, interpreted programming language.

WLST

- WLST can run commands one at a time (interactive mode) or from files (script mode).
- To run WLST, set environment variables by running the `setWLSEnv.sh` script in `<WL_HOME>/server/bin`, and then call the Java Virtual Machine with the `WLST` class:

```
$> source /u01/app/fmw/wlserver/server/bin/setWLSEnv.sh
$> java weblogic.WLST
Initializing WebLogic Scripting Tool (WLST) ...
Welcome to the WebLogic Server Administration Scripting
   Shell
Type help() for help on available command

wls:offline>
```

WLST

- To run a WLST script, after setting the environment variables, call the Java Virtual Machine with the `weblogic.WLST` class, followed by the name of the script:

```
...
$> java weblogic.WLST myscript.py
```

myscript.py

```
# Modify these values as necessary
username = "weblogic"
password = "Welcome1"
url = "t3://myadminhost:7001“
# Connect to the admin server
connect(username, password, url)
```

WLDF

The WLDF is used to gather and analyze WebLogic Server runtime data:

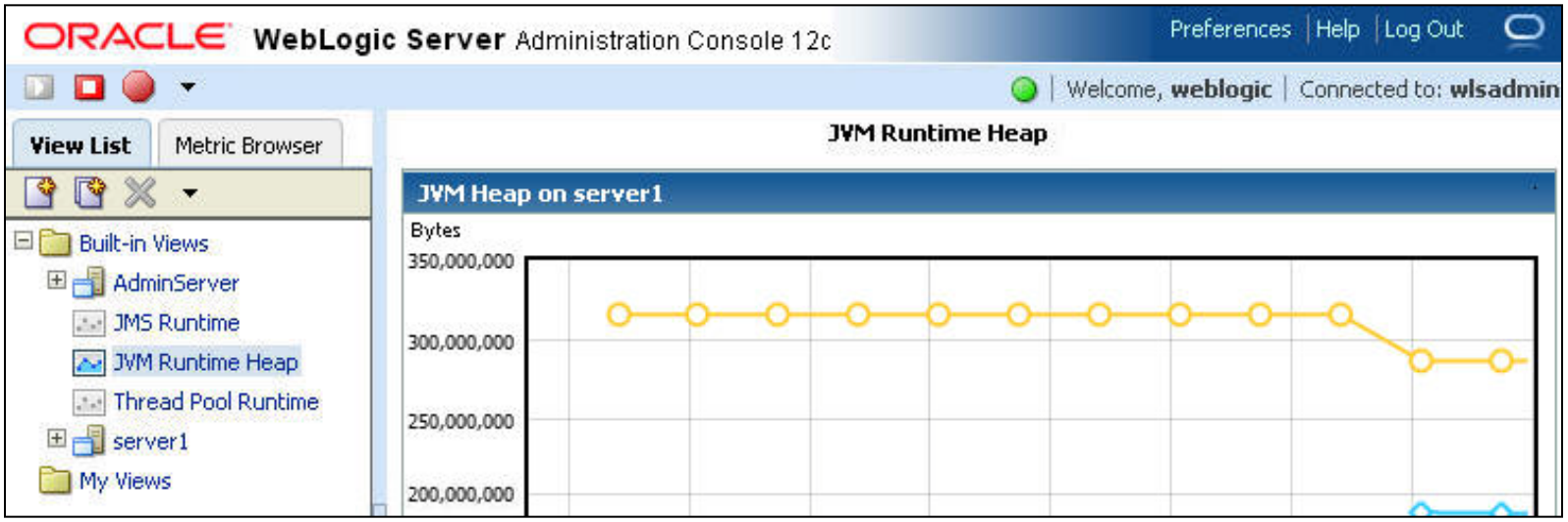
- **Diagnostic images:** It creates snapshots of the server's configuration and runtime metrics.
- **Harvesters:** Metric collectors can be set to periodically collect and record data.
- **Watches and notifications:** Watches compare data to conditions you set, and when triggered, they can send out notifications.

WLDF is part of the normal installation of WebLogic Server and can be configured and used through the administration console or WLST.

WLDF Monitoring Dashboard

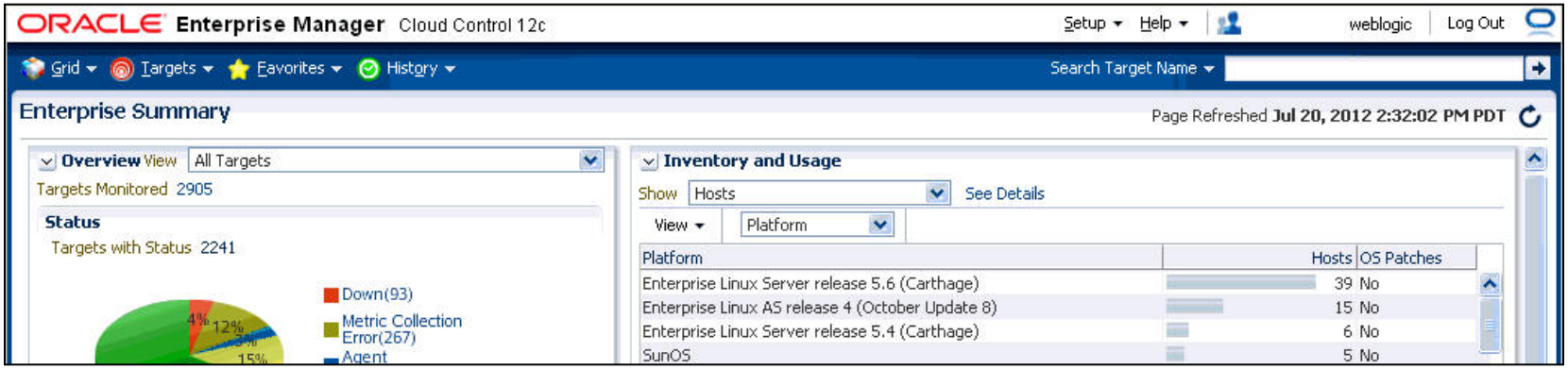
The Monitoring Dashboard presents WLDF data graphically. It:

- Is part of the administration console application
- Can be launched from the administration console or with its own URL
- Can graphically display active runtime data or archived data



Enterprise Manager Cloud Control

- Is a tool for administering and monitoring your entire Oracle IT infrastructure, including WebLogic Server
  - Unlike other WebLogic tools, Cloud Control enables you to administer multiple domains.
- Requires its own installation (It is not installed as part of some other component.)
- Supplies a web browser–based user interface



Quiz

The number of administration servers in a domain:

a. 0
b. 1
c. 2
d. 3 or more

Quiz

The minimum number of managed servers in a domain:

a. 0
b. 1
c. 2
d. 3

Summary

In this lesson, you should have learned how to:

- Define the WebLogic Server terms: domain, server, and cluster
- Describe the difference between the administration server and managed servers
- List WebLogic Server tools