17

Backing Up a Domain and Upgrading WebLogic Server

Objectives

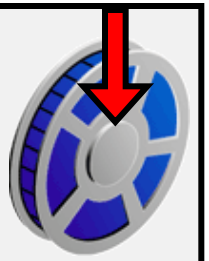
After completing this lesson, you should be able to:

- Back up a WebLogic Server domain
- Restore a WebLogic Server domain
- Describe the WebLogic Server upgrade process

Backup and Recovery

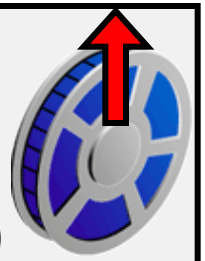
Backup

- **Scheduled**
- **At least weekly**
- **Uses different tools for different components**



Recovery

- **Unscheduled (usually)**
- **At least annually (if only to test procedures)**
- **Not necessarily the reverse of backup; it may use other tools**



Backup and recovery:

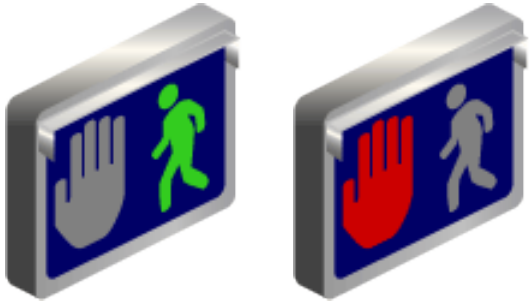
- Protect against failures of hardware or software, and accidental or malicious changes to the environment
- Guarantee a point of recovery and minimize loss of business availability
- May impact system availability (the system must be offline for an offline backup)
- May include hardware and software

Backup Solution

- Artifacts that need to be backed up include the database, installed products, configured WebLogic domains, WebLogic Server instances, and persistence stores for WebLogic Server TLogs (transaction logs) and JMS resources.
- Use Oracle Recovery Manager (RMAN) to back up database artifacts.
- Use file copy to back up product installations and configured domains, WebLogic Server instances, and persistent stores.
- You can also use the pack utility to back up managed servers.

Types of Backups

- Online:
  - Non-disruptive
  - Possibly inconsistent
    - If backing up takes one hour, the changes made during that hour will not be within the backup and must be tracked
- Offline:
  - Requires all processes to be stopped
  - Relatively easy
- Full:
  - Easier to recover, slower to create
- Incremental:
  - Harder to recover, faster to create



When to Back Up

- Offline backup after the initial domain is created
- Online backups at scheduled intervals
- Online backup after a component changes or the cluster configuration changes
- Online backup before application deployment
- Offline backup before and after patches or upgrades
- Online “database” backups for:
  - LDAP
  - Persistent stores
  - SOA repository

Limitations and Restrictions for Online Backups

- Online backups of WebLogic Server persistent stores are likely to be inconsistent (changes can occur while you are backing up).
  - Database backups can more easily accommodate inconsistencies.
  - File-based stores and OS copies cannot easily accommodate online backup.

Performing Full Offline Backup

1. Shut down all the processes.
2. Back up <MW_HOME>.
3. Back up the domain.
4. Back up directories from which applications are deployed.
5. Back up the managed server domains on other machines or re-create their domains with the pack/unpack utilities.
6. Back up the instance home for configured system components (like OHS).
7. Back up the database using RMAN.
8. Back up Oracle Inventory.
9. Back up the `oraInst.loc` and `oratab` files (in `/etc`).

Performing Full Online Backup

1. Lock the WebLogic Server configuration.
2. Back up the domain. For example:

```
$> tar -zcpf domain_backup_04-12-2013.tarz /domain_dir/*
```

3. Back up the application directories.

```
$> tar -zcpf app_backup_04-12-2013.tarz /app_dir/*
```

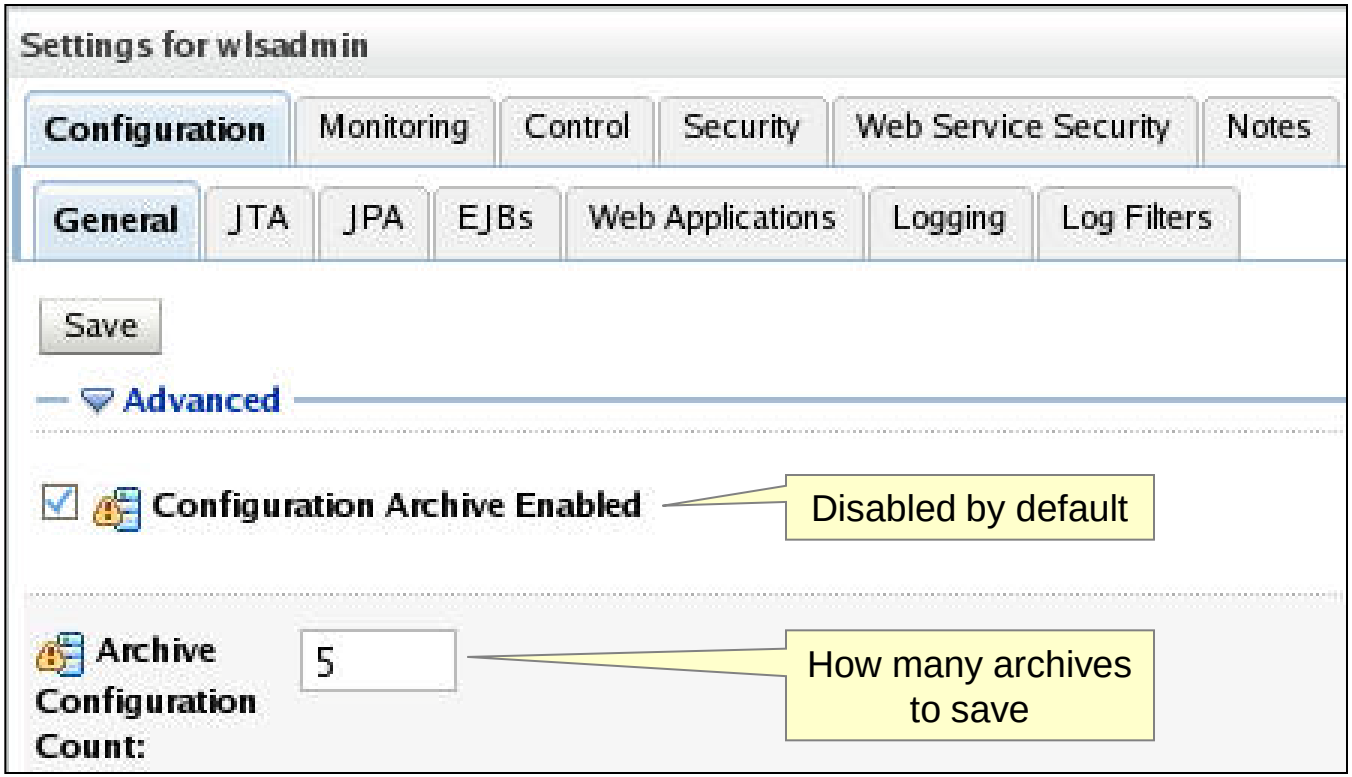
4. If the managed servers are in another location, back up those domain directories.
5. Back up the Oracle instance home.
6. Back up the database with RMAN.

Impact of Administration Server Failure

- Failure of the administration server:
  - Prevents configuration changes in the domain
  - Prevents application deployments
  - Does not affect running managed servers
  - Prevents starting never-started-before managed servers
  - Allows starting previously-started managed servers if Managed Server Independence (MSI) mode is enabled
    - MSI is enabled by default
- Periodically, the managed servers attempt to synchronize configuration data with the administration server.
- When the administration server becomes available, the managed servers get the latest configuration data from the administration server.

Automatically Backing Up a Domain Configuration

Enabling this attribute causes a JAR file of the entire `config` directory to be created each time a configuration change is activated.



Recovery Operations

Some of the common recovery operations include restoring:

- A Middleware home
- An Oracle home
- An Oracle WebLogic Server domain
- The administration server configuration
- A managed server
- An Oracle instance
- Fusion Middleware system component configurations and data

Directories to Restore

- Binaries (installation directories)
  - Be mindful of preserving group ownership and permissions.
    - These should be read-only for most users.
- Configurations
  - If the last configuration *caused* the problem, recover to a point in time prior to that.
- Log files are:
  - Not required for recovery
  - Created if they do not exist
- Data
  - Database restores data within tablespaces, not directories.
  - RMAN *restore* brings data up to the last backup, then *recover* brings data up to a later point in time.

Recovery After Disaster

- Possible causes of failure:
  - Data loss
  - User error
  - Malicious attack
  - Corruption of data
  - Media failure
  - Application failure
- Recovery depends on the cause:
  - Repair
  - Replace
  - Relocate

Recovery of Homes

This applies to recovering a Middleware home, an Oracle home, or an Oracle instance home after data loss or corruption:

1. Stop all processes.
2. Make a new full offline backup as a checkpoint (which can be reused).
3. Change directory to the affected home.
4. Use the OS `copy`, `tar -x`, or `unzip` command for the directories affected.
5. Make a new full offline backup (especially if you have been performing incremental backups up until this point).
6. Restart all processes: A. Database listener B. Database C. Oracle instances (OHS, OID) D. Node Manager E. Administration server F. Managed servers

Recovery of a Managed Server

- If the managed server fails, Node Manager will automatically restart it (if it started it).
- If the files are damaged, you can recover the files in their original places and restart the managed server.
- If the computer is damaged, perform either of the following:
  - Restore the files on a new host with the old computer name by using the OS commands, for example, `copy`, `cp`, `tar`, or `unzip`. (If you backed up by using pack, restore by using unpack.)
  - Restore the files on another host with a different host name by using pack and unpack.

If you used a virtual host name on the old computer, then even if the new computer has a different name, you can still use OS commands to restore the files. Just assign the new computer the same virtual host name.

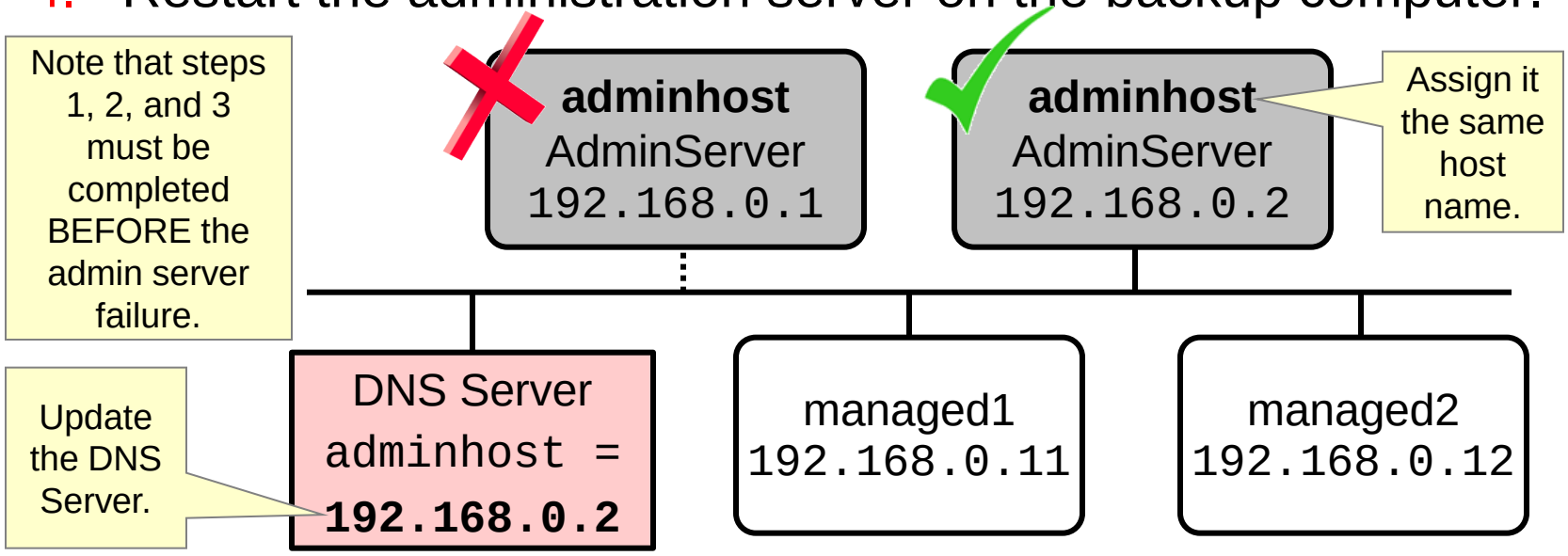
Recovery of the Administration Server

- If the administration server fails, and it was started by using Node Manager (through a WLST script), then Node Manager automatically restarts it.
- If the files are damaged, you can recover the files in their original places and restart the administration server.
- If the computer is damaged, restart the administration server on a new computer.

Restarting the Administration Server on a New Computer

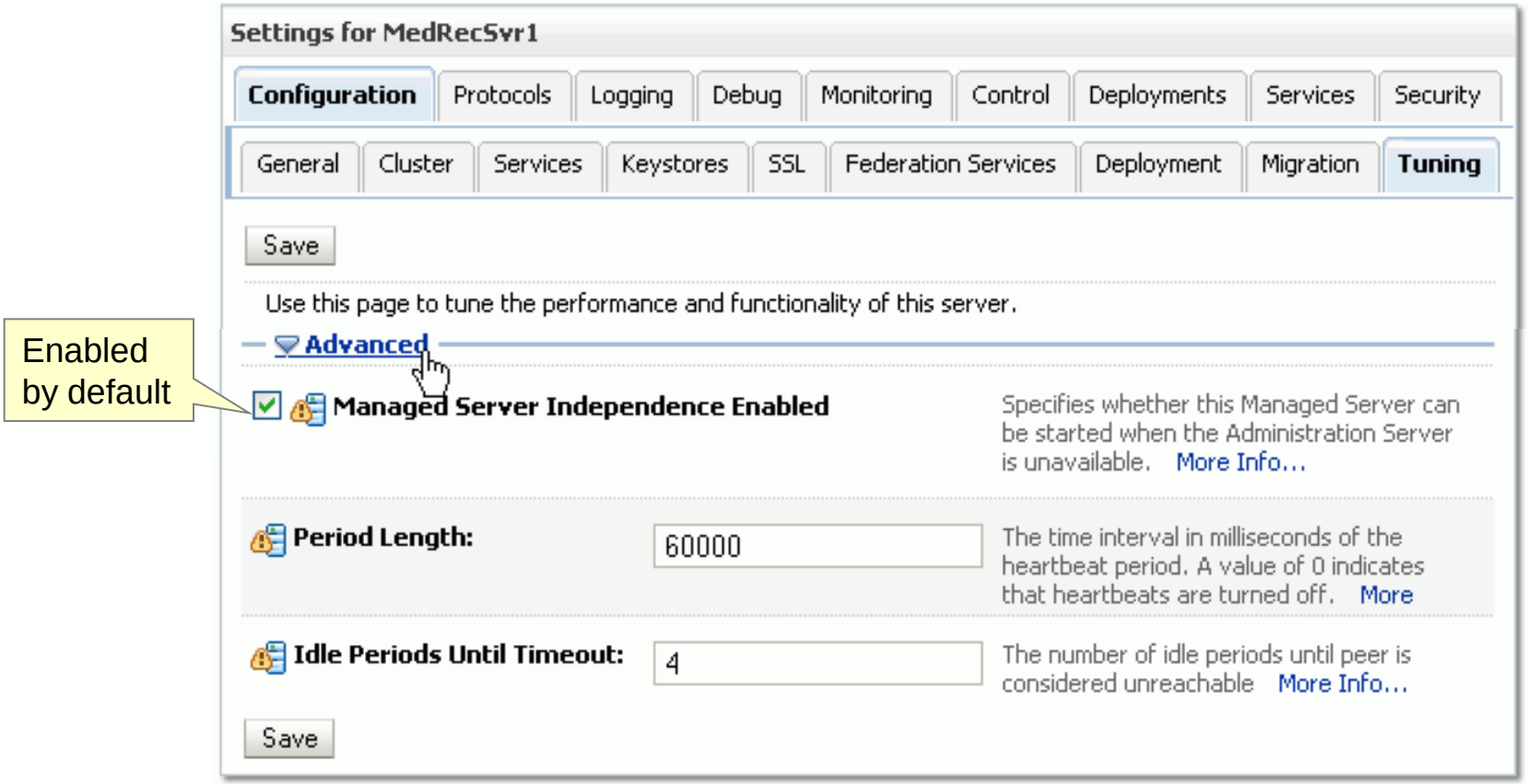
To create a backup of the administration server:

1. Install Oracle WebLogic Server on the backup computer.
2. Copy the application files to the backup computer.
3. Copy the configuration files (or the domain) to the backup computer.
4. Restart the administration server on the backup computer.



Managed Server Independence

Managed Server Independence (MSI) mode reduces the urgency to restart a failed admin server.

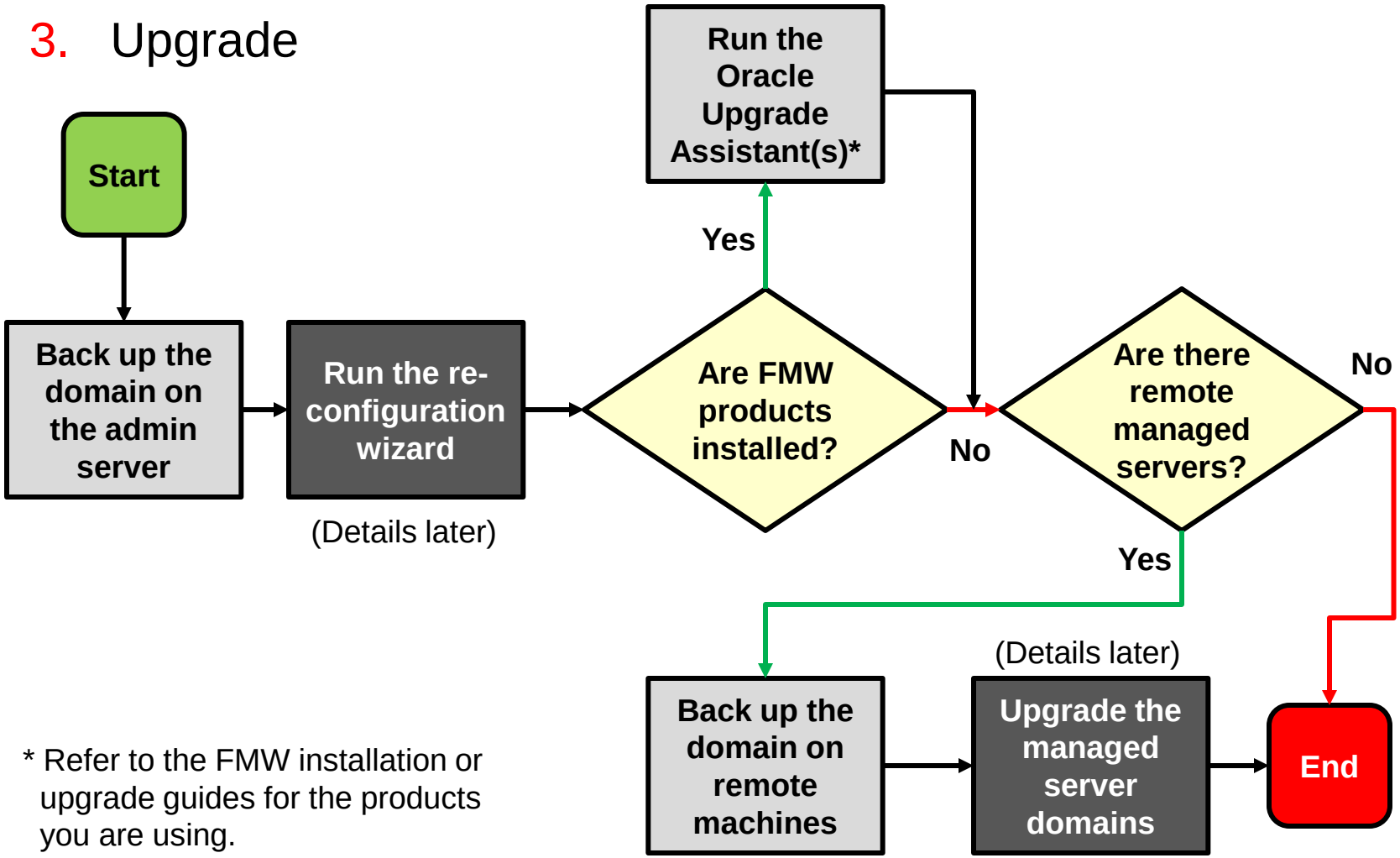


Upgrading WebLogic Server 11*g* to 12*c*

1. Plan the upgrade.
   A. Inventory the environment (admin server, managed servers, applications, external resources, scripts/templates).
   B. Verify that all hardware and software components are supported.
   C. Verify the compatibility of your applications.
   D. Create an upgrade plan.
2. Prepare to upgrade
   A. Undeploy incompatible applications.
   B. Shut down servers.
   C. Back up the environment.
   D. Install new Oracle products.
   E. Prepare remote managed server domains.
   F. Set up environment variables.

Upgrading WebLogic Server 11*g* to 12*c*

3. Upgrade



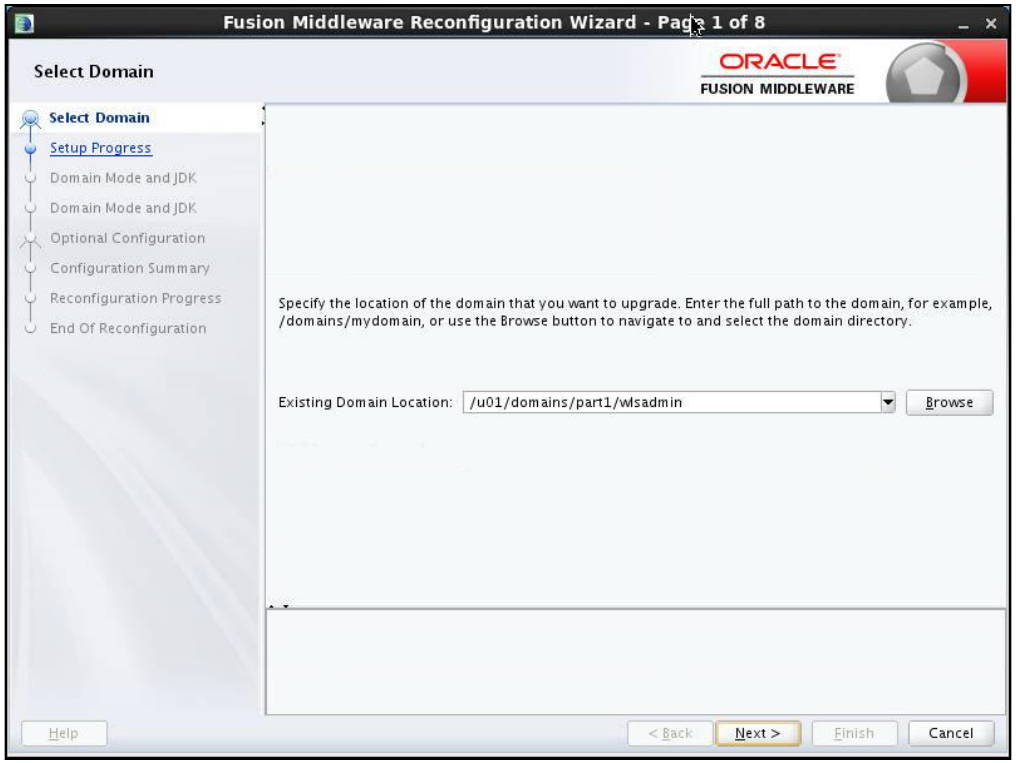
* Refer to the FMW installation or upgrade guides for the products you are using.

Run the Reconfiguration Wizard

A. In the terminal window, run `<MW_HOME>/oracle_common/common/bin/reconfig.sh`.

B. Go through the wizard screens.

C. Manually finish the Node Manager configuration.



Upgrade the Managed Server Domains

A. Ensure that during the preparation phase, you copied these files from the pre-upgraded admin server domain directory to the managed server domain's "root directory:" `/config/config.xml` and `/security/SerializedSystemIni.dat`.
B. Port the reconfigured domain from the admin server computer to the managed server computers with `pack` and `unpack`.

Upgrading WebLogic Server 11*g* to 12*c*

4. Complete post-upgrade procedures:
   A. Re-apply any customizations you had in server start scripts.
   B. Verify and reset file permissions (in Linux, file ownership goes to the user that did the upgrade).
   C. Verify server start options (for example, `JAVA_HOME` and `CLASSPATH` may need to be updated for servers started via Node Manager).
   D. After the environment has been tested, move it to production.

Quiz

The administration server of the domain has failed. Can a managed server currently not running be started?

a. Yes, if Managed Server Independence Mode is enabled and the server has been started before.

b. No, a managed server must always contact its admin server when it comes up.

Summary

In this lesson, you should have learned how to:

- Back up a WebLogic Server domain
- Restore a WebLogic Server domain
- Describe the WebLogic Server upgrade process

Practice 17-1 Overview: Backing Up and Restoring a Domain

This practice covers the following topics:

- Backing up a domain
- Restoring a domain