Oracle® Fusion Middleware

Patching with OPatch

12*c* (12.2.1)

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Documentation for administrators that describes how to use OPatch in an Oracle Fusion Middleware environment.

ORACLE

Oracle Fusion Middleware Patching with OPatch, 12c (12.2.1)

E58098_02

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Preface

This document describes how to use OPatch to patch an Oracle Fusion Middleware environment.

Audience

This document is intended for administrators who are responsible for patching Oracle Fusion Middleware.

Conventions

The following text conventions are used in this document:

Convention	Meaning
boldface	Boldface type indicates graphical user interface elements associated with an action, or terms defined in text or the glossary.
italic	Italic type indicates book titles, emphasis, or placeholder variables for which you supply particular values.
`monospace`	Monospace type indicates commands within a paragraph, URLs, code in examples, text that appears on the screen, or text that you enter.

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Patching Your Environment Using OPatch

The OPatch utility provides several commands that you can use to apply and roll back patches to Oracle software in your Oracle Fusion Middleware environment.

For more information about using OPatch commands in an Oracle Fusion Middleware environment, see the following topics:

See Also:

About OPatch
: OPatch is a Java-based utility that runs on all supported operating systems and requires installation of the Oracle Universal Installer. It is used to apply patches to Oracle software.

Preparing to Use OPatch
: To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatch, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the Oracle home.

Using OPatch to Patch Oracle Fusion Middleware
: Use OPatch to perform the necessary steps for applying a patch to an Oracle home.

1.1 About OPatch

OPatch is a Java-based utility that runs on all supported operating systems and requires installation of the Oracle Universal Installer. It is used to apply patches to Oracle software.

The following topics provide more information about OPatch for Oracle Fusion Middleware:

See Also:

Patching Your Environment Using OPatch

Type of Patches Used with OPatch
: Oracle provides several types of patches that you can use to patch your Oracle software with OPatch.

Information for Oracle WebLogic Server Smart Update Users
: Smart Update is a standalone Java application that you use to upgrade the software installations quickly and easily with maintenance patches

and maintenance packs. For Oracle Fusion Middleware 12*c*, Smart Update is no longer supported.

1.1.1 Type of Patches Used with OPatch

Oracle provides several types of patches that you can use to patch your Oracle software with OPatch.

Note:

Oracle has recently implemented a new patch nomenclature for Oracle products. The new patch names, as well as the previous Oracle Fusion Middleware 11*g* names, are provided for reference.

Table 1-1 Patches that can be used with OPatch

New Name	Previously Used Name(s)	Description
Interim Patch	PSE MLR Exception release One-Off x-fix Hotfix Security One-Off	A patch containing one or more fixes made available to customers who cannot wait until the next patch set or new product release to get a fix.
Bundle Patch	Maintenance Pack Service Pack MLRs Cumulative Patch Update Release Bundle Patch	An iterative, cumulative patch that is issued between patch sets. Bundle patches usually include only fixes, but some products may include minor enhancements. Examples are the Database Windows Bundles and SOA Bundle Patches.
Security Patch Update (SPU)	Critical Patch Updates CPUs	An iterative, cumulative patch consisting of security fixes. Formerly known as Critical Patch Update. **Note**: The program name which delivers SPUs will still be called Critical Patch Update, as defined below: Critical Patch Update: Oracle's program for quarterly release of security fixes. Patches released as part of this program may be Patch Set Updates, Security Patch Updates, and Bundle Patches. Regardless of the patch type, the patches are cumulative.

Table 1-1 (Cont.) Patches that can be used with OPatch

New Name	Previously Used Name(s)	Description
Patch Set Updates (PSU)		Patch Set Updates are used to **patch Oracle WebLogic Server only.** Patch Set Updates are released on a quarterly basis, following the same schedule as the Critical Patch Updates (CPUs). These come out the closest Tuesday to the 15th of the months of January, April, July and October. Patch Set Update content is intended to address the top fifty critical bugs affecting the broad customer base.

See Also:

About OPatch

OPatch is a Java-based utility that runs on all supported operating systems and requires installation of the Oracle Universal Installer. It is used to apply patches to Oracle software.

1.1.2 Information for Oracle WebLogic Server Smart Update Users

Smart Update is a standalone Java application that you use to upgrade the software installations quickly and easily with maintenance patches and maintenance packs. For Oracle Fusion Middleware 12*c*, Smart Update is no longer supported.

In previous releases of Oracle WebLogic Server, you could patch your Oracle WebLogic Server software using a utility called Smart Update. In Oracle Fusion Middleware 12*c*, Oracle WebLogic Server users can use OPatch to apply patches for both Oracle WebLogic Server and for Oracle Fusion Middleware.

OPatch offers many of the same features as Smart Update, but it has a different set of commands and command options. Oracle WebLogic Server users who are familiar with Smart Update should use this guide to get familiar with OPatch.

See Also:

About OPatch

OPatch is a Java-based utility that runs on all supported operating systems and requires installation of the Oracle Universal Installer. It is used to apply patches to Oracle software.

1.2 Preparing to Use OPatch

To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatch, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the Oracle home.

For more information on preparing your environment, see the following topics:

See Also:

Patching Your Environment Using OPatch

Locating and Obtaining the Latest Version of OPatch
: Before you run OPatch, find the OPatch utility in the Oracle home, and verify that you have the latest version.

Obtaining Patches Required for Your Installation
: You can search for and download the patches required for your installation from My Oracle Support.

OPatch Environment Variables for Fusion Middleware
: Before you run OPatch, ensure that you set the ORACLE_HOME environment variable.

Backup and Recovery Considerations for Patching
: It is highly recommended that you back up the Oracle home before any patch operation. You can back up the Oracle home using your preferred method.

1.2.1 Locating and Obtaining the Latest Version of OPatch

Before you run OPatch, find the OPatch utility in the Oracle home, and verify that you have the latest version.

For more information, see the following topics:

See Also:

Preparing to Use OPatch
: To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatch, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the Oracle home.

Locating and Running OPatch in the Oracle Fusion Middleware Oracle Home
: You can find and run the OPatch utility in the *ORACLE_HOME*/OPatch directory after you install any Oracle Fusion Middleware product.

Identifying the Version of OPatch Included with Oracle Fusion Middleware 12c
: Oracle Fusion Middleware 12*c* (12.2.1) includes OPatch version 13.3.0.0.0. This version includes new features and capabilities that are designed to improve the experience of patching an Oracle Fusion Middleware 12*c* Oracle home.

1.2.1.1 Locating and Running OPatch in the Oracle Fusion Middleware Oracle Home

You can find and run the OPatch utility in the *ORACLE_HOME*/OPatch directory after you install any Oracle Fusion Middleware product.

To run OPatch, simply run the `opatch` command in this directory.

For example, to view the list of commands available for OPatch on a Unix system, enter the following:

```
./opatch -help
```

On Windows systems, use the following command:

```
opatch.bat -help
```

See Also:

Locating and Obtaining the Latest Version of OPatch
Before you run OPatch, find the OPatch utility in the Oracle home, and verify that you have the latest version.

1.2.1.2 Identifying the Version of OPatch Included with Oracle Fusion Middleware 12*c*

Oracle Fusion Middleware 12*c* (12.2.1) includes OPatch version 13.3.0.0.0. This version includes new features and capabilities that are designed to improve the experience of patching an Oracle Fusion Middleware 12*c* Oracle home.

In general, there is a version of OPatch available for each version of the Oracle Universal Installer software.

To identify the version of OPatch:

1. Change directory to the following directory:

   ```
   cd ORACLE_HOME/OPatch/
   ```

2. Run the following command:

   ```
   ./opatch version
   ```

   For example:

   ```
   ./opatch version
   OPatch Version: 13.3.0.0.0

   OPatch succeeded.
   ```

See Also:

Locating and Obtaining the Latest Version of OPatch
Before you run OPatch, find the OPatch utility in the Oracle home, and verify that you have the latest version.

1.2.2 Obtaining Patches Required for Your Installation

You can search for and download the patches required for your installation from My Oracle Support.

You can check for the latest patches available for your Oracle Fusion Middleware product or component by registering and logging in to My Oracle Support at:

http://support.oracle.com

After you log in to My Oracle Support, click the **Patches and Updates** tab, which provides various tools that allow you to quickly locate the patches most important to your Oracle software installation.

Note:

It important that you review the README file that is included with each patch. The README file includes important information about the requirements and procedures for applying the patch.

See Also:

Preparing to Use OPatch
To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatch, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the Oracle home.

1.2.3 OPatch Environment Variables for Fusion Middleware

Before you run OPatch, ensure that you set the ORACLE_HOME environment variable.

OPatch uses the ORACLE_HOME environment variable to identify the Oracle home you are planning to patch.

See Also:

Preparing to Use OPatch
To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatch, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the Oracle home.

1.2.4 Backup and Recovery Considerations for Patching

It is highly recommended that you back up the Oracle home before any patch operation. You can back up the Oracle home using your preferred method.

You can use any method such as `zip`, `cp -r`, `tar`, and `cpio` to compress the Oracle home.

If the Oracle home does not appear when you execute the `opatch lsinventory -detail` command, the Oracle home might be missing from the Central Inventory, or the Central Inventory itself could be missing or corrupted.

If the Oracle home is listed when you execute the `opatch lsinventory -detail` command, but the products and components within the Oracle home are not listed, the inventory within the Oracle home (local inventory) might be missing or corrupted.

If the local inventory is corrupted or lost for some reason, you must restore the entire Oracle home if it was backed up. If a backup does not exist, you may have to reinstall the software.

See Also:

Preparing to Use OPatch
To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatch, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the Oracle home.

1.3 Using OPatch to Patch Oracle Fusion Middleware

Use OPatch to perform the necessary steps for applying a patch to an Oracle home.

The following topics describe how to use OPatch to patch Oracle Fusion Middleware:

See Also:

Patching Your Environment Using OPatch

Summary of the Steps For Using OPatch in a Fusion Middleware Environment
: Applying a patch with OPatch involves a series of steps that must be performed to ensure successful patching.

Common OPatch Commands When Patching an Oracle Fusion Middleware Oracle Home
: OPatch provides several commands that you can use to apply a patch, roll back a patch, and verify the application of patch in an Oracle home. You can use OPatch to apply and roll back a single patch or apply and roll back multiple patches.

Examples of Applying and Rolling Back Patches Using OPatch
: After you obtain the patches required for your installation, use the appropriate OPatch commands to verify any patch prerequisites, apply a patch to an Oracle home, and if necessary, roll back the application of a patch.

Troubleshooting a Patch by Viewing the OPatch Log File
: To understand how a patch is applied and to troubleshoot any problems with the application of a patch, you should review the log file for the OPatch session.

Using the OPatch lsinventory Command to Verify the Patches Applied to an Oracle Home
: To verify what patches have been applied to an Oracle home, or to find out additional information about the Oracle home, use the `opatch lsinventory` command.

Verifying Your Installation After Applying a Patch
: After you apply one or more patches successfully, use the WebLogic Administration Console, Fusion Middleware Control, and your organization's application testing to verify that your system is currently running successfully.

1.3.1 Summary of the Steps For Using OPatch in a Fusion Middleware Environment

Applying a patch with OPatch involves a series of steps that must be performed to ensure successful patching.

The following table summarizes the typical steps required to patch your existing Fusion Middleware environment using OPatch.

Table 1-2 Using OPatch with Oracle Fusion Middleware

Task	Description	Documentation
Acquire patches required for your installation	Log in, search for, and download the patches required for your specific installation.	Obtaining Patches Required for Your Installation
Review the README.txt file for the patch.	Each patch archive includes a README file that contains important information and instructions that must be followed prior to applying your patch. It is important to review the README file because it provides any unique steps or other information specific to the patch.	The README.txt file that is packaged within the patch archive

Table 1-2 (Cont.) Using OPatch with Oracle Fusion Middleware

Task	Description	Documentation
Check for patch prerequisites.	The OPatch `apply -report` command will identify that the prerequisites for the patch have been met.	Verifying the Prerequisites for a Patch
Apply the patch.	After you determine the Oracle home to which you need to apply the patch, and you have read the README file, then you should apply the patch with the `opatch apply` command.	Examples of Applying and Rolling Back Patches Using OPatch
Verify the patch was applied to the Oracle home successfully.	The OPatch lsinventory command will show what patches have been applied to the Oracle home. Use this command to verify the application of the patch.	Using the OPatch lsinventory Command to Verify the Patches Applied to an Oracle Home
Verify that your software runs properly after you apply the patch.	After the patching is complete and your servers are restarted, you should check your product software to verify that the issue has been resolved.	Verifying Your Installation After Applying a Patch
Troubleshoot the application of a patch.	If there are problems applying a patch, your first troubleshooting task is to review the log file for the OPatch session.	Troubleshooting a Patch by Viewing the OPatch Log File
Roll back the application of a patch.	If for some reason the result is not satisfactory, you can use the `opatch rollback` command to remove the patch from the Oracle home. If additional assistance is required, go to My Oracle Support (formerly OracleMeta*Link*).	Rolling Back a Patch You Have Applied

See Also:

Using OPatch to Patch Oracle Fusion Middleware
Use OPatch to perform the necessary steps for applying a patch to an Oracle home.

1.3.2 Common OPatch Commands When Patching an Oracle Fusion Middleware Oracle Home

OPatch provides several commands that you can use to apply a patch, roll back a patch, and verify the application of patch in an Oracle home. You can use OPatch to apply and roll back a single patch or apply and roll back multiple patches.

Table 1-3 Common OPatch Commands Used When Patching an Oracle Fusion Middleware Environment

Table 1-3 (Cont.) Common OPatch Commands Used When Patching an Oracle Fusion Middleware Environment

Command	Description	Example
opatch apply	This command applies an interim patch to an Oracle home from the current directory. The ORACLE_HOME environment variable must be set to the Oracle home to be patched.	Verifying the Prerequisites for a Patch Applying a Single Patch Using the Apply Command
opatch napply	This command applies multiple patches.	Applying Multiple Patches Using the OPatch napply Command
opatch lsinventory	This command lists the inventory for a particular Oracle home, or displays all installations that can be found. This command does not have any required options.	Using the OPatch lsinventory Command to Verify the Patches Applied to an Oracle Home
opatch rollback	This command removes an existing one-off patch from the appropriate Oracle home directory indicated by the reference ID.	Rolling Back a Patch You Have Applied
opatch nrollback	This command rolls back multiple interim patches at the same time.	Rolling Back Multiple Patches You Have Applied

See Also:

Using OPatch to Patch Oracle Fusion Middleware
: Use OPatch to perform the necessary steps for applying a patch to an Oracle home.

1.3.3 Examples of Applying and Rolling Back Patches Using OPatch

After you obtain the patches required for your installation, use the appropriate OPatch commands to verify any patch prerequisites, apply a patch to an Oracle home, and if necessary, roll back the application of a patch.

The following topics provide some examples of using OPatch to patch an Oracle Fusion Middleware installation:

See Also:

Using OPatch to Patch Oracle Fusion Middleware
: Use OPatch to perform the necessary steps for applying a patch to an Oracle home.

Verifying the Prerequisites for a Patch
: To verify that a patch can be applied to a specific Oracle home, use the –`report` argument to the `opatch apply` command.

Applying a Single Patch Using the Apply Command
: To apply a single patch to an Oracle Fusion Middleware Oracle home, use the `opatch apply` command.

Applying Multiple Patches Using the OPatch napply Command
: To apply multiple patches to an Oracle Fusion Middleware Oracle home, use the `opatch napply` command.

Rolling Back a Patch You Have Applied
: To roll back a patch that was applied to an Oracle Fusion Middleware Oracle home, use the `opatch rollback` command.

Rolling Back Multiple Patches You Have Applied
: To roll back multiple patches that were previously applied to an Oracle Fusion Middleware Oracle home, use the `opatch nrollback` command.

1.3.3.1 Verifying the Prerequisites for a Patch

To verify that a patch can be applied to a specific Oracle home, use the –`report` argument to the `opatch apply` command.

For example:

```
opatch apply <path_to_patch_directory> -report
```

This command displays the actions that will be taken by the patch, but does not actually apply the patch. As a result, it allows you to verify that the prerequisites for the patch have been met.

See Also:

Examples of Applying and Rolling Back Patches Using OPatch
: After you obtain the patches required for your installation, use the appropriate OPatch commands to verify any patch prerequisites, apply a patch to an Oracle home, and if necessary, roll back the application of a patch.

1.3.3.2 Applying a Single Patch Using the Apply Command

To apply a single patch to an Oracle Fusion Middleware Oracle home, use the `opatch apply` command.

Example 1-1 shows how to use the `opatch apply` command to apply a patch to an Oracle Fusion Middleware Oracle home.

This example assumes that:

- The patch you have downloaded has been saved to a directory that is named for the patch number in My Oracle Support. In this case, the patch number is 15941858.

- The user changes directory to the patch directory and then runs the OPatch apply command. Alternatively, you can run the OPatch command from the *ORACLE_HOME*/OPatch directory and include the location of the patch as an argument to the command. For example:

  ```
  opatch apply /opt/patches/15941858/
  ```

- The OPatch directory is already included in the PATH variable on the host computer.

Example 1-1 Using the OPatch apply Command to Apply a Patch to an Oracle Fusion Middleware Oracle Home

```
> cd /opt/patches/15941858
> opatch apply
Oracle Interim Patch Installer version 13.3.0.0.0
Copyright (c) 2013, Oracle Corporation.  All rights reserved.

Oracle Home       : /opt/Oracle/products/fmw12c
Central Inventory : /opt/Oracle/oraInventory
   from           : /var/opt/Oracle/oraInst.loc
OPatch version    : 13.3.0.0.0
OUI version       : 13.3.0.0.0
Log file location : /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
15941858_Jun_10_2013_12_35_24/apply2013-06-10_12-35-15PM_1.log

OPatch detects the Middleware Home as "/opt/Oracle/products/fmw12c"

Applying interim patch '15941858' to OH '/opt/Oracle/products/fmw12c'
Verifying environment and performing prerequisite checks...
All checks passed.

Please shutdown Oracle instances running out of this ORACLE_HOME on the local system.
(Oracle Home = '/opt/Oracle/products/fmw12c')

Is the local system ready for patching? [y|n] y
User Responded with: Y
Backing up files...

Patching component oracle.wls.core.app.server, 12.2.1.0.0...

Verifying the update...
Patch 15941858 successfully applied
Log file location: /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
15941858_Jun_10_2013_12_35_24/apply2013-06-10_12-35-15PM_1.log


--------------------------------------------------------------------------------

There are no Interim patches installed in this Oracle Home.

--------------------------------------------------------------------------------

OPatch succeeded.
```

See Also:

Examples of Applying and Rolling Back Patches Using OPatch

After you obtain the patches required for your installation, use the appropriate OPatch commands to verify any patch prerequisites, apply a

patch to an Oracle home, and if necessary, roll back the application of a patch.

1.3.3.3 Applying Multiple Patches Using the OPatch napply Command

To apply multiple patches to an Oracle Fusion Middleware Oracle home, use the `opatch napply` command.

Example 1-2 shows how to use the `opatch napply` command to apply multiple patches to an Oracle Fusion Middleware Oracle home.

This example assumes that the patches you have downloaded have been saved to a staging directory, such as:

```
/opt/patches
```

It also assumes you have changed directory to the staging directory and the staging directory contains a directory for each patch. For example:

```
/opt/patches/15941858
/opt/patches/15955138
```

Example 1-2 Using the OPatch napply Command to Apply Multiple Patches to an Oracle Fusion Middleware Oracle Home

```
> /opt/Oracle/products/fmw12c/OPatch/opatch napply -id 15941858,15955138
Oracle Interim Patch Installer version 13.3.0.0.0
Copyright (c) 2013, Oracle Corporation.  All rights reserved.

Oracle Home       : /opt/Oracle/products/fmw12c
Central Inventory : /opt/Oracle/oraInventory
   from           : /var/opt/Oracle/oraInst.loc
OPatch version    : 13.3.0.0.0
OUI version       : 13.3.0.0.0
Log file location : /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
opatch2013-06-11_07-36-40AM_1.log

OPatch detects the Middleware Home as "/opt/Oracle/products/fmw12c"

Verifying environment and performing prerequisite checks...
OPatch continues with these patches:   15941858  15955138

Do you want to proceed? [y|n]
y
User Responded with: Y
All checks passed.

Please shutdown Oracle instances running out of this ORACLE_HOME on the local system.
(Oracle Home = '/opt/Oracle/products/fmw12c')

Is the local system ready for patching? [y|n]
y
User Responded with: Y
Backing up files...
Applying interim patch '15941858' to OH '/opt/Oracle/products/fmw12c'

Patching component oracle.wls.core.app.server, 12.2.1.0.0...

Verifying the update...
Applying interim patch '15955138' to OH '/opt/Oracle/products/fmw12c'

Patching component oracle.wls.core.app.server, 12.2.1.0.0...
```

```
Verifying the update...
Patches 15941858,15955138 successfully applied.
Log file location: /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
opatch2013-06-11_07-36-40AM_1.log

OPatch succeeded.
```

See Also:

Examples of Applying and Rolling Back Patches Using OPatch
: After you obtain the patches required for your installation, use the appropriate OPatch commands to verify any patch prerequisites, apply a patch to an Oracle home, and if necessary, roll back the application of a patch.

1.3.3.4 Rolling Back a Patch You Have Applied

To roll back a patch that was applied to an Oracle Fusion Middleware Oracle home, use the `opatch rollback` command.

Example 1-3 shows how to use the `opatch rollback` command to roll back a patch that was applied to an Oracle Fusion Middleware Oracle home.

This example assumes that the OPatch directory is already included in the PATH variable on the host computer.

Example 1-3 Using the OPatch rollback Command to Roll Back a Patch

```
> opatch rollback -id 15941858
Oracle Interim Patch Installer version 13.3.0.0.0
Copyright (c) 2013, Oracle Corporation.  All rights reserved.

Oracle Home       : /opt/Oracle/products/fmw12c
Central Inventory : /opt/Oracle/oraInventory
   from           : /var/opt/Oracle/oraInst.loc
OPatch version    : 13.3.0.0.0
OUI version       : 13.3.0.0.0
Log file location : /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
15941858_Jun_10_2013_13_12_20/rollback2013-06-10_13-12-10PM_1.log

OPatch detects the Middleware Home as "/opt/Oracle/products/fmw12c"

RollbackSession rolling back interim patch '15941858' from OH '/opt/Oracle/products/
fmw12c'

Please shutdown Oracle instances running out of this ORACLE_HOME on the local system.
(Oracle Home = '/opt/Oracle/products/fmw12c')

Is the local system ready for patching? [y|n]
y
User Responded with: Y

Patching component oracle.wls.core.app.server, 12.2.1.0.0...
RollbackSession removing interim patch '15941858' from inventory
Log file location: /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
15941858_Jun_10_2013_13_12_20/rollback2013-06-10_13-12-10PM_1.log

OPatch succeeded.
```

See Also:

Examples of Applying and Rolling Back Patches Using OPatch
: After you obtain the patches required for your installation, use the appropriate OPatch commands to verify any patch prerequisites, apply a patch to an Oracle home, and if necessary, roll back the application of a patch.

1.3.3.5 Rolling Back Multiple Patches You Have Applied

To roll back multiple patches that were previously applied to an Oracle Fusion Middleware Oracle home, use the `opatch nrollback` command.

Example 1-4 shows how to use the `opatch nrollback` command to roll back multiple patches that were previously applied to an Oracle Fusion Middleware Oracle home.

This example assumes that the patches you applied were patch numbers 15941858 and 15955138.

Example 1-4 Using the OPatch nrollback Command to Roll Back Multiple Patches

```
> /opt/Oracle/products/fmw12c/OPatch/opatch nrollback -id 15941858,15955138
Oracle Interim Patch Installer version 13.3.0.0.0Copyright (c) 2013, Oracle
Corporation.  All rights reserved.

Oracle Home       : /opt/Oracle/products/fmw12c
Central Inventory : /opt/Oracle/oraInventory
   from           : /var/opt/Oracle/oraInst.loc
OPatch version    : 13.3.0.0.0
OUI version       : 13.3.0.0.0
Log file location : /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
opatch2013-06-10_14-24-54PM_1.log

OPatch detects the Middleware Home as "/opt/Oracle/products/fmw12c"

Patches will be rolled back in the following order:
   15941858   15955138
The following patch(es) will be rolled back: 15941858  15955138

Please shutdown Oracle instances running out of this ORACLE_HOME on the local system.
(Oracle Home = '/opt/Oracle/products/fmw12c')

Is the local system ready for patching? [y|n]
y
User Responded with: Y

Rolling back patch 15941858...

RollbackSession rolling back interim patch '15941858' from OH '/opt/Oracle/products/
fmw12c'

Patching component oracle.wls.core.app.server, 12.2.1.0.0...
RollbackSession removing interim patch '15941858' from inventory

Rolling back patch 15955138...

RollbackSession rolling back interim patch '15955138' from OH '/opt/Oracle/products/
fmw12c'

Patching component oracle.wls.core.app.server, 12.2.1.0.0...
```

```
RollbackSession removing interim patch '15955138' from inventory
Log file location: /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
opatch2013-06-10_14-24-54PM_1.log

OPatch succeeded.
```

See Also:

Examples of Applying and Rolling Back Patches Using OPatch
: After you obtain the patches required for your installation, use the appropriate OPatch commands to verify any patch prerequisites, apply a patch to an Oracle home, and if necessary, roll back the application of a patch.

1.3.4 Troubleshooting a Patch by Viewing the OPatch Log File

To understand how a patch is applied and to troubleshoot any problems with the application of a patch, you should review the log file for the OPatch session.

The log file location is usually saved to the following directory or a subdirectory within this location:

```
ORACLE_HOME/cfgtoollogs/opatch/
```

Subdirectories within this location are identified by the patch number or by the command you ran (such as lsinv).

The file name for each log file identifies the date and time it was executed. For example:

```
opatch2013-06-10_14-24-54PM_1.log
```

You can also locate the log file by viewing the output of the opatch command. The log file name and location is included in the output of the command. For example:

```
Log file location: /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
opatch2013-06-10_14-24-54PM_1.log
```

See Also:

Using OPatch to Patch Oracle Fusion Middleware
: Use OPatch to perform the necessary steps for applying a patch to an Oracle home.

1.3.5 Using the OPatch lsinventory Command to Verify the Patches Applied to an Oracle Home

To verify what patches have been applied to an Oracle home, or to find out additional information about the Oracle home, use the `opatch lsinventory` command.

The following example shows sample output of the `lsinventory` command, which indicates that a specific interim patch has been applied.

Example 1-5 Running the opatch lsinventory Command to Obtain the Oracle Home Information

```
> opatch lsinventory
Oracle Interim Patch Installer version 13.3.0.0.0
Copyright (c) 2013, Oracle Corporation.  All rights reserved.
```

```
Oracle Home       : /opt/Oracle/products/fmw12c
Central Inventory : /opt/Oracle/oraInventory
   from           : /var/opt/Oracle/oraInst.loc
OPatch version    : 13.3.0.0.0
OUI version       : 13.3.0.0.0
Log file location : /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
opatch2013-06-10_12-32-37PM_1.log

OPatch detects the Middleware Home as "/opt/Oracle/products/fmw12c"

Lsinventory Output file location :
/opt/Oracle/products/fmw12c/cfgtoollogs/opatch/lsinv/
lsinventory2013-06-10_12-32-37PM.txt

--------------------------------------------------------------------------------

Interim patches (1) :

Patch  15941858     : applied on Mon Jun 10 12:39:07 PDT 2013
Unique Patch ID:  150220
Patch description:  "TEST PATCH FOR WLS 12.2.1.0 - JAVA CLASSES PATCH"
   Created on 17 May 2013, 11:54:20 hrs PST8PDT
   Bugs fixed:
     783169, 15941850

--------------------------------------------------------------------------------

OPatch succeeded.
```

See Also:

Using OPatch to Patch Oracle Fusion Middleware
: Use OPatch to perform the necessary steps for applying a patch to an Oracle home.

1.3.6 Verifying Your Installation After Applying a Patch

After you apply one or more patches successfully, use the WebLogic Administration Console, Fusion Middleware Control, and your organization's application testing to verify that your system is currently running successfully.

To verify your installations in an Oracle Fusion Middleware 12*c* environment:

1. Start all the servers in all the domains associated with the Oracle home you just patched.
2. Open the WebLogic Server Administration Console for each domain to verify the Administration Server and to view the status of the components in the domain.

   - Also, in any Oracle Fusion Middleware domain (where the Oracle Fusion Middleware Infrastructure is installed), open the Oracle Enterprise Manager Fusion Middleware Control console to view the status of the components in the domain.

   From either console, you can verify that the servers and applications are up and running correctly. For more information, see the following topics in *Administering Oracle Fusion Middleware*:

   - Starting and Stopping Oracle Fusion Middleware

- Overview of Oracle Fusion Middleware Administration Tools

If the software does not work as expected, follow the roll back instructions in Rolling Back a Patch You Have Applied.

See Also:

Using OPatch to Patch Oracle Fusion Middleware
: Use OPatch to perform the necessary steps for applying a patch to an Oracle home.

2

Patching Your Environment Using OPatchAuto

OPatchAuto is installed with the OPatch utility as a part of your installation. OPatchAuto provides several commands that you can use to automate the application and roll back of a patch in a single host or multi-host environment.

For more information about patching with OPatchAuto, see the following topics:

See Also:

Preparing to Use OPatchAuto
: To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatchAuto, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the environment.

Using OPatchAuto to Patch Oracle Fusion Middleware
: Use OPatchAuto to automate the necessary steps for applying a patch on a single host or multi-host environment.

Building A Topology Using Fusion Middleware Composer
: For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

Patching Your Environment Using OPatch

2.1 Preparing to Use OPatchAuto

To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatchAuto, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the environment.

For more information on preparing your environment, see the following topics:

See Also:

Patching Your Environment Using OPatchAuto
: OPatchAuto is installed with the OPatch utility as a part of your installation. OPatchAuto provides several commands that you can use to

automate the application and roll back of a patch in a single host or multi-host environment.

Locating and Obtaining the Latest Version of OPatch and OPatchAuto
: Before you run OPatchAuto, find the OPatchAuto utility in the Oracle home and verify that you have the latest version. If you have the latest version of OPatchAuto, you have the latest version of OPatch.

Obtaining Patches Required For Your Installation
: You can search for and download the latest patches for your installation from My Oracle Support.

OPatchAuto Environment Variables for Fusion Middleware
: Before you run OPatchAuto, ensure that you set the required environment variables.

Creating a Wallet to Store Passwords
: To successfully run OPatchAuto, you must provide a wallet on the command line that contains the necessary password credentials for connecting to the environment.

Configuring Node Manager to Support Start and Stop Operations
: To ensure that OPatchAuto can properly stop and start your system during patching, you must configure the Node Manager(s) to support the start and stop operations.

Remote Host Patching on Windows
: For patching on Windows machines, ensure that Cygwin SSH server is installed and set up. OPatchAuto does not support other SSH servers at this time.

Backup and Recovery Considerations for Patching
: It is highly recommended that you back up the Oracle home before any patch operation. You can back up the Oracle home using your preferred method.

2.1.1 Locating and Obtaining the Latest Version of OPatch and OPatchAuto

Before you run OPatchAuto, find the OPatchAuto utility in the Oracle home and verify that you have the latest version. If you have the latest version of OPatchAuto, you have the latest version of OPatch.

For more information, see the following topics:

See Also:

Preparing to Use OPatchAuto
: To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatchAuto, such as

obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the environment.

Locating and Running OPatchAuto in the Oracle Fusion Middleware Oracle Home

You can find and run the OPatchAuto utility in the *ORACLE_HOME*/OPatch directory after you install any Oracle Fusion Middleware product.

Identifying the Version of OPatchAuto Included with Oracle Fusion Middleware 12c

Oracle Fusion Middleware 12*c* (12.2.1) includes OPatchAuto version 13.3.0.0.0. Use the `opatchauto version` command to verify that you have this version.

2.1.1.1 Locating and Running OPatchAuto in the Oracle Fusion Middleware Oracle Home

You can find and run the OPatchAuto utility in the *ORACLE_HOME*/OPatch directory after you install any Oracle Fusion Middleware product.

To run OPatchAuto, simply run the `opatchauto` command in this directory.

For example, to view the list of commands available for OPatchAuto on a Unix system, enter the following:

```
./opatchauto -help
```

See Also:

Locating and Obtaining the Latest Version of OPatch and OPatchAuto

Before you run OPatchAuto, find the OPatchAuto utility in the Oracle home and verify that you have the latest version. If you have the latest version of OPatchAuto, you have the latest version of OPatch.

2.1.1.2 Identifying the Version of OPatchAuto Included with Oracle Fusion Middleware 12*c*

Oracle Fusion Middleware 12*c* (12.2.1) includes OPatchAuto version 13.3.0.0.0. Use the `opatchauto version` command to verify that you have this version.

In general, there is a version of OPatch and OPatchAuto available for each version of the Oracle Universal Installer software.

To identify the version of OPatchAuto:

1. Change directory to the following directory:

   ```
   cd ORACLE_HOME/OPatch/
   ```

2. Run the following command:

   ```
   ./opatchauto version
   ```

   For example:

   ```
   ./opatchauto version
   Oracle OPatchAuto Version 13.3.0.0.0
   Copyright (c) 2015, Oracle Corporation.  All rights reserved.

   1. OPatchAuto version 13.3.0.0.0
   ```

If you have the latest version of OPatchAuto, you have the latest version of OPatch. If you do not have the latest version, OPatch can be downloaded using patch 6880880. You should always use the latest download designated for your installation. For Oracle Fusion Middleware 12*c* (12.2.1), select **OUI NextGen 13.3** for the version and platform, and then click **Download** to download OUI NextGen OPatch 13.3.

See Also:

Locating and Obtaining the Latest Version of OPatch and OPatchAuto
: Before you run OPatchAuto, find the OPatchAuto utility in the Oracle home and verify that you have the latest version. If you have the latest version of OPatchAuto, you have the latest version of OPatch.

Identifying the Version of OPatch Included with Oracle Fusion Middleware 12*c*
: Oracle Fusion Middleware 12*c* (12.2.1) includes OPatch version 13.3.0.0.0. This version includes new features and capabilities that are designed to improve the experience of patching an Oracle Fusion Middleware 12*c* Oracle home.

2.1.2 Obtaining Patches Required For Your Installation

You can search for and download the latest patches for your installation from My Oracle Support.

You can check for the latest patches available for your Oracle Fusion Middleware product or component by registering and logging in to My Oracle Support at:

http://support.oracle.com

After you log in to My Oracle Support, click the **Patches and Updates** tab, which provides various tools that allow you to quickly locate the patches most important to your Oracle software installation.

Note:

It is important that you review the README file that is included with each patch. The README file includes important information about the requirements and procedures for applying the patch.

See Also:

Preparing to Use OPatchAuto
: To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatchAuto, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the environment.

2.1.3 OPatchAuto Environment Variables for Fusion Middleware

Before you run OPatchAuto, ensure that you set the required environment variables.

OPatchAuto uses the following environment variables:

- The ORACLE_HOME environment variable is used to identify the Oracle home you are planning to patch.

- The JAVA_HOME environment variable is used to identify the location of the JDK software you will be using to patch your environment.
- The PATCH_HOME environment variable is used to identify the location of the patch directory that contains the patches to be applied to the Oracle home.

See Also:

Preparing to Use OPatchAuto
To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatchAuto, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the environment.

2.1.4 Creating a Wallet to Store Passwords

To successfully run OPatchAuto, you must provide a wallet on the command line that contains the necessary password credentials for connecting to the environment.

The wallet should contain SSH credentials for each host in your environment, as well as the credentials for accessing the WebLogic Administration Server. To create a wallet, use the `patchingWallet.sh` tool in the *`ORACLE_HOME`*`/OPatch/auto/core/bin` directory, as shown in the following example:

```
./patchingWallet.sh -create -walletDir wallet_location "user:adminhost:ssh"
"user:host1:ssh" "user:host2:ssh" "adminuser:adminhost:wls"
```

For example:

```
./patchingWallet.sh -create -walletDir /tmp/samplewallet "oracle:adminhost:ssh"
"oracle:host1:ssh"
"oracle:host2:ssh" "weblogic:adminhost:wls"
```

The tool will prompt you to enter and confirm the password for each credential:

```
oracle:adminhost:ssh:
Confirm oracle:adminhost:ssh:
oracle:host1:ssh:
Confirm oracle:host1:ssh:
oracle:host2:ssh:
Confirm oracle:host2:ssh:
weblogic:adminhost:wls:
Confirm weblogic:adminhost:wls:
```

See Also:

Preparing to Use OPatchAuto
To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatchAuto, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the environment.

2.1.5 Configuring Node Manager to Support Start and Stop Operations

To ensure that OPatchAuto can properly stop and start your system during patching, you must configure the Node Manager(s) to support the start and stop operations.

To do this, set the `QuitEnabled` and `CrashRecoveryEnabled` properties in the `nodemanager.properties` file as follows:

```
QuitEnabled=true
CrashRecoveryEnabled=false
```

By default, this file is created in the Node Manager home directory, where the Node Manager home is typically *DOMAIN_HOME*/nodemanager.

After updating these properties, restart the Node Manager(s).

For more information about the `nodemanager.properties` file, see Reviewing nodemanager.properties in *Administering Node Manager for Oracle WebLogic Server*

See Also:

Preparing to Use OPatchAuto
To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatchAuto, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the environment.

2.1.6 Remote Host Patching on Windows

For patching on Windows machines, ensure that Cygwin SSH server is installed and set up. OPatchAuto does not support other SSH servers at this time.

For more information, see Remote Host Execution Using SSH in the *Oracle OPatch User's Guide for Windows and UNIX*.

See Also:

Preparing to Use OPatchAuto
To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatchAuto, such as obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the environment.

2.1.7 Backup and Recovery Considerations for Patching

It is highly recommended that you back up the Oracle home before any patch operation. You can back up the Oracle home using your preferred method.

You can use any method such as `zip`, `cp -r`, `tar`, and `cpio` to compress the Oracle home.

If the Oracle home does not appear when you execute the `opatch lsinventory -detail` command, the Oracle home might be missing from the Central Inventory, or the Central Inventory itself could be missing or corrupted.

If the Oracle home is listed when you execute the `opatch lsinventory -detail` command, but the products and components within the Oracle home are not listed, the inventory within the Oracle home (local inventory) might be missing or corrupted.

If the local inventory is corrupted or lost for some reason, you must restore the entire Oracle home if it was backed up. If a backup does not exist, you may have to reinstall the software.

See Also:

Preparing to Use OPatchAuto
To ensure successful patching, there are several prerequisites you should complete to prepare your environment for running OPatchAuto, such as

obtaining the latest version of OPatch, obtaining required patches from My Oracle Support, and backing up the environment.

2.2 Using OPatchAuto to Patch Oracle Fusion Middleware

Use OPatchAuto to automate the necessary steps for applying a patch on a single host or multi-host environment.

The following topics describe how to use OPatchAuto to patch Oracle Fusion Middleware.

See Also:

Patching Your Environment Using OPatchAuto
: OPatchAuto is installed with the OPatch utility as a part of your installation. OPatchAuto provides several commands that you can use to automate the application and roll back of a patch in a single host or multi-host environment.

Summary of the Steps For Using OPatchAuto in a Fusion Middleware Environment
: Applying a patch with OPatchAuto involves a series of steps that must be performed to ensure successful patching.

Applying a Patch on a Single Host Using OPatchAuto
: After you obtain the patches required for your installation, use the `opatchauto apply –analyze` command to verify prerequisites, and then use `opatchauto apply –instance` to apply a patch on a single host. If needed, you can use `opatchauto rollback` to roll back the application of a patch.

Applying a Patch on Multiple Hosts Using OPatchAuto
: After you obtain the necessary patches, use the `opatchauto apply –analyze` command to verify prerequisites, and then use `opatchauto apply –topology` to apply a patch on multiple hosts. If needed, you can use `opatchauto rollback` to roll back the application of a patch.

Troubleshooting a Patch by Viewing the OPatchAuto Log File
: To understand how a patch is applied and to troubleshoot any problems with the application of a patch, you should review the log file for the OPatchAuto session.

Using the OPatch lsinventory Command to Verify the Patches Applied to an Oracle Home
: To verify what patches have been applied to an Oracle home, or to find out additional information about the Oracle home, use the `opatch lsinventory` command.

Using the listDomainPatchInventory.sh Command to Verify the Patches Applied to a Domain
: To verify what patches have been applied to a domain, use the `listDomainPatchInventory.sh` command. Use this command with the OPatch `lsinventory` command to verify that the patch has been applied successfully.

Verifying Your Installation After Applying a Patch
: After you apply one or more patches successfully, use the WebLogic Administration Console, Fusion Middleware Control, and your

organization's application testing to verify that your system is currently running successfully.

2.2.1 Summary of the Steps For Using OPatchAuto in a Fusion Middleware Environment

Applying a patch with OPatchAuto involves a series of steps that must be performed to ensure successful patching.

The following table summarizes the typical steps required to patch your existing Fusion Middleware environment using OPatchAuto.

Table 2-1 Using OPatchAuto with Oracle Fusion Middleware

Task	Description	Documentation
Acquire patches required for your installation	Log in, search for, and download the patches required for your specific installation. You do not need to worry about whether OPatchAuto supports a particular patch type. If OPatchAuto does not support a particular patch type, you will be notified when you run the tool.	Obtaining Patches Required For Your Installation
Review the README.txt file for the patch.	Each patch archive includes a README file that contains important information and instructions that must be followed prior to applying your patch. It is important to review the README file because it provides any unique steps or other information specific to the patch.	The README.txt file that is packaged within the patch archive
For a multi-host environment, define your topology (configuration) using Fusion Middleware Composer.	To apply a patch on multiple hosts, you must create a topology file using Fusion Middleware Composer. This file contains information about your configuration. The topology file provides a way for OPatchAuto to obtain information from your environment so it can automate the application of the patch.	Building A Topology Using Fusion Middleware Composer
Check for patch prerequisites.	The OPatchAuto `apply -analyze` command will identify that the prerequisites for the patch have been met.	If you are patching a single host environment, see Verifying the Prerequisites for Applying a Patch on a Single Host. If you are patching a multi-host environment, see Verifying the Prerequisites for Applying a Patch on Multiple Hosts.
Apply the patch.	After you determine the Oracle home to which you need to apply the patch, and you have read the README file, then you should apply the patch with the `opatchauto apply` command.	If you are patching a single host environment, see Applying a Patch on a Single Host Using the Apply Command If you are patching a multi-host environment, see Applying a Patch on Multiple Hosts Using the Apply Command

Table 2-1 (Cont.) Using OPatchAuto with Oracle Fusion Middleware

Task	Description	Documentation
Verify the patch was applied to the Oracle home successfully.	The OPatch `lsinventory` command will show what patches have been applied to the Oracle home. The `listDomainPatchInventory.sh` command will show the patches applied to the domain. Use these commands together to verify the application of the patch.	Using the OPatch lsinventory Command to Verify the Patches Applied to an Oracle Home Using the listDomainPatchInventory.sh Command to Verify the Patches Applied to a Domain
Verify that your software runs properly after you apply the patch.	After the patching is complete and your servers are restarted, you should check your product software to verify that the issue has been resolved.	Verifying Your Installation After Applying a Patch
Troubleshoot the application of a patch.	If there are problems applying a patch, your first troubleshooting task is to review the log file for the OPatchAuto session.	Troubleshooting a Patch by Viewing the OPatchAuto Log File
Roll back the application of a patch.	If for some reason the result is not satisfactory, you can use the `opatchauto rollback` command to remove the patch from the Oracle home. If additional assistance is required, go to My Oracle Support (formerly OracleMeta*Link*).	For a single host environment, see Rolling Back a Patch You Have Applied on a Single Host. For a multi-host environment, see Rolling Back a Patch You Have Applied on Multiple Hosts.

See Also:

Using OPatchAuto to Patch Oracle Fusion Middleware
Use OPatchAuto to automate the necessary steps for applying a patch on a single host or multi-host environment.

2.2.2 Applying a Patch on a Single Host Using OPatchAuto

After you obtain the patches required for your installation, use the `opatchauto apply –analyze` command to verify prerequisites, and then use `opatchauto apply –instance` to apply a patch on a single host. If needed, you can use `opatchauto rollback` to roll back the application of a patch.

Patching a single host environment with OPatchAuto involves the following tasks:

See Also:

Using OPatchAuto to Patch Oracle Fusion Middleware
Use OPatchAuto to automate the necessary steps for applying a patch on a single host or multi-host environment.

Verifying the Prerequisites for Applying a Patch on a Single Host
To verify that a patch can be applied on a single host, use the `–analyze` argument to the OPatchAuto `apply` command. For single host patching, you must also provide the domain location using the `–instance` argument.

Applying a Patch on a Single Host Using the Apply Command
To apply a patch on a single host, use the `opatchauto apply` command. This is the same command as `opatchauto apply –`

`analyze`, except you remove the –`analyze` argument when you are ready to apply the patch.

Rolling Back a Patch You Have Applied on a Single Host
: If you apply a patch and the results are not satisfactory, use the `opatchauto rollback` command to roll back the application of the patch. This is the same command as `opatchauto rollback –analyze`, except you remove the `-analyze` argument when you are ready to roll back the patch.

2.2.2.1 Verifying the Prerequisites for Applying a Patch on a Single Host

To verify that a patch can be applied on a single host, use the –`analyze` argument to the OPatchAuto `apply` command. For single host patching, you must also provide the domain location using the –`instance` argument.

The following command shows how to verify the prerequisites for applying a patch on a single host:

```
opatchauto apply PATCH_HOME -analyze -instance DOMAIN_HOME -wallet wallet_location -
walletPassword password_ifneeded
-wls-admin-host weblogic_adminserver_host:port
```

For example:

```
opatchauto apply /home/oracle/patches/15941858 -analyze -instance /home/oracle/
config/domains/exampledomain -wallet /tmp/samplewallet
-wls-admin-host examplehost.exampledomain.com:7001
```

If you want to apply multiple patches in one session, use the `-phBaseDir` option.

This command analyzes and displays the actions that will be taken by the patch, but does not actually apply the patch. As a result, it allows you to verify that the prerequisites for the patch have been met.

If any prerequisite checks fail, refer to the output and log file to fix the issues before continuing. For example, a common failure is the detection of patch conflicts. If any patch conflicts occur, follow the instructions in the log file for how to obtain a merge patch from Oracle Support.

See Also:

Applying a Patch on a Single Host Using OPatchAuto
: After you obtain the patches required for your installation, use the `opatchauto apply –analyze` command to verify prerequisites, and then use `opatchauto apply –instance` to apply a patch on a single host. If needed, you can use `opatchauto rollback` to roll back the application of a patch.

2.2.2.2 Applying a Patch on a Single Host Using the Apply Command

To apply a patch on a single host, use the `opatchauto apply` command. This is the same command as `opatchauto apply –analyze`, except you remove the –`analyze` argument when you are ready to apply the patch.

This topic shows an example of using the `opatchauto apply` command to apply a patch to an Oracle Fusion Middleware environment on a single host.

This example assumes that:

- The patch you have downloaded has been saved to a directory that is named for the patch number in My Oracle Support. In this case, the patch number is 15941858.
- The user runs the OPatchAuto command from the *ORACLE_HOME*/OPatch directory and includes the location of the patch (PATCH_HOME) as an argument to the command.

> **Note:**
>
> When you run the `opatchauto apply` command, make a note of the session id (for example, EKZR) in the command output. This will simplify the rollback process if you decide to roll back the patch later.

```
opatchauto apply PATCH_HOME -instance DOMAIN_HOME -wallet wallet_location -
walletPassword password_ifneeded -wls-admin-host weblogic_adminserver_host:port
```

For example:

```
opatchauto apply /home/oracle/patches/15941858 -instance /home/oracle/config/domains/
exampledomain -wallet /tmp/samplewallet
-walletPassword password -wls-admin-host examplehost.exampledomain.com:7001
```

See Also:

Applying a Patch on a Single Host Using OPatchAuto

After you obtain the patches required for your installation, use the `opatchauto apply –analyze` command to verify prerequisites, and then use `opatchauto apply –instance` to apply a patch on a single host. If needed, you can use `opatchauto rollback` to roll back the application of a patch.

2.2.2.3 Rolling Back a Patch You Have Applied on a Single Host

If you apply a patch and the results are not satisfactory, use the `opatchauto rollback` command to roll back the application of the patch. This is the same command as `opatchauto rollback –analyze`, except you remove the `-analyze` argument when you are ready to roll back the patch.

This topic shows an example of using the `opatchauto rollback` command to roll back a patch that was applied to an Oracle Fusion Middleware environment on a single host.

To do a roll back, you follow the same process for when you applied the patch. That is, you first do a test run of the `opatchauto rollback` command:

> **Note:**
>
> You can simplify the command if you provide the session id (for example, EKZR) that was used to apply the patch. Then, OPatchAuto can derive all the necessary command line parameters.

```
opatchauto rollback –session session_id -analyze –wallet wallet_location -
walletPassword password_ifneeded -wls-admin-host weblogic_adminserver_host:port
```

For example:

```
opatchauto rollback –session EKZR -analyze –wallet /tmp/samplewallet -walletPassword
password -wls-admin-host examplehost.exampledomain.com:7001
```

When the test run successfully passes, perform the actual roll back of the patch:

```
opatchauto rollback –session session_id –wallet wallet_location -walletPassword
password_ifneeded -wls-admin-host weblogic_adminserver_host:port
```

For example:

```
opatchauto rollback –session EKZR –wallet /tmp/samplewallet -walletPassword password
-wls-admin-host examplehost.exampledomain.com:7001
```

Alternatively, if you do not remember your session id when you applied the pach, you can roll back the patch by pointing OPatchAuto to a copy of the unzipped patch as follows:

```
opatchauto rollback unzipped_patch_location -instance DOMAIN_HOME –wallet
wallet_location -walletPassword password_ifneeded
-wls-admin-host weblogic_adminserver_host:port
```

See Also:

Applying a Patch on a Single Host Using OPatchAuto
: After you obtain the patches required for your installation, use the `opatchauto apply –analyze` command to verify prerequisites, and then use `opatchauto apply –instance` to apply a patch on a single host. If needed, you can use `opatchauto rollback` to roll back the application of a patch.

2.2.3 Applying a Patch on Multiple Hosts Using OPatchAuto

After you obtain the necessary patches, use the `opatchauto apply –analyze` command to verify prerequisites, and then use `opatchauto apply –topology` to apply a patch on multiple hosts. If needed, you can use `opatchauto rollback` to roll back the application of a patch.

Note:

Before applying a patch on multiple hosts, ensure that you have created a topology file using Fusion Middleware Composer. You must supply this file on the command line using the `-topology` option when you run OPatchAuto. OPatchAuto uses this file to obtain information from your environment to identify the configuration that you want to patch. For an example on how to create a topology file, see Building A Topology Using Fusion Middleware Composer.

Patching a multi-host environment with OPatchAuto involves the following tasks:

See Also:

Using OPatchAuto to Patch Oracle Fusion Middleware
: Use OPatchAuto to automate the necessary steps for applying a patch on a single host or multi-host environment.

Verifying the Prerequisites for Applying a Patch on Multiple Hosts
: To ensure successful patching, use the `opatchauto apply –analyze` command to check for any prerequisites. For multi-host patching, you

must provide the Fusion Middleware Composer topology file using the `-topology` argument.

Applying a Patch on Multiple Hosts Using the Apply Command
: To apply a patch on multiple hosts, use the `opatchauto apply` command. This is the same command as `opatchauto apply –analyze`, except you remove the `-analyze` argument when you are ready to apply the patch.

Rolling Back a Patch You Have Applied on Multiple Hosts
: If you apply a patch and the results are not satisfactory, use the `opatchauto rollback` command to roll back the application of a patch. This is the same command as `opatchauto rollback –analyze`, except you remove the `-analyze` argument when you are ready to roll back the patch.

2.2.3.1 Verifying the Prerequisites for Applying a Patch on Multiple Hosts

To ensure successful patching, use the `opatchauto apply –analyze` command to check for any prerequisites. For multi-host patching, you must provide the Fusion Middleware Composer topology file using the `-topology` argument.

To verify that a patch can be applied to a specific Oracle home (ORACLE_HOME) and domain location (DOMAIN_HOME) on multiple hosts, use the `–analyze` argument to the OPatchAuto `apply` command.

```
opatchauto apply PATCH_HOME -analyze -topology fmwcomposer_topology_file -wallet
wallet_location -walletPassword password_ifneeded
```

For example:

```
opatchauto apply /home/oracle/patches/15941858 -analyze -topology /tmp/topology.xml -
wallet /tmp/samplewallet -walletPassword password
```

If you want to apply multiple patches in one session, use the `–phBaseDir` option.

This command displays the actions that will be taken by the patch, but does not actually apply the patch. As a result, it allows you to verify that the prerequisites for the patch have been met.

If any prerequisite checks fail, refer to the command output and log file to fix any issues before continuing. For example, a common failure is the detection of patch conflicts. If any patch conflicts occur, follow the instructions in the log file for how to obtain a merge patch from Oracle Support.

See Also:

Applying a Patch on Multiple Hosts Using OPatchAuto
: After you obtain the necessary patches, use the `opatchauto apply –analyze` command to verify prerequisites, and then use `opatchauto apply –topology` to apply a patch on multiple hosts. If needed, you can use `opatchauto rollback` to roll back the application of a patch.

2.2.3.2 Applying a Patch on Multiple Hosts Using the Apply Command

To apply a patch on multiple hosts, use the `opatchauto apply` command. This is the same command as `opatchauto apply –analyze`, except you remove the `-analyze` argument when you are ready to apply the patch.

This topic shows an example of using the `opatchauto apply` command to apply a patch to an Oracle Fusion Middleware environment on multiple hosts.

This example assumes that:

- The patch you have downloaded has been saved to a directory that is named for the patch number in My Oracle Support. In this case, the patch number is 15941858.
- The user runs the OPatchAuto command from the *ORACLE_HOME*/OPatch directory and includes the location of the patch (PATCH_HOME) as an argument to the command.

> **Note:**
>
> When you run the `opatchauto apply` command, make a note of the session id (for example, EKZR) in the command output. This will simplify the rollback process if you decide to roll back the patch later.

```
opatchauto apply PATCH_HOME -topology fmwcomposer_topology_file -wallet
wallet_location -walletPassword password_ifneeded
```

For example:

```
opatchauto apply /home/oracle/patches/15941858 -topology /tmp/topology.xml -
wallet /tmp/samplewallet -walletPassword password
```

See Also:

Applying a Patch on Multiple Hosts Using OPatchAuto
After you obtain the necessary patches, use the `opatchauto apply –analyze` command to verify prerequisites, and then use `opatchauto apply –topology` to apply a patch on multiple hosts. If needed, you can use `opatchauto rollback` to roll back the application of a patch.

2.2.3.3 Rolling Back a Patch You Have Applied on Multiple Hosts

If you apply a patch and the results are not satisfactory, use the `opatchauto rollback` command to roll back the application of a patch. This is the same command as `opatchauto rollback –analyze`, except you remove the `-analyze` argument when you are ready to roll back the patch.

This topic shows an example of using the `opatchauto rollback` command to roll back a patch that was applied to an Oracle Fusion Middleware environment on multiple hosts.

To do a roll back, you follow the same process for when you applied the patch. That is, you first do a test run of the `opatchauto rollback` command:

> **Note:**
>
> You can simplify the command if you provide the session id (for example, EKZR) that was used to apply the patch. Then, OPatchAuto can derive all the necessary command line parameters.

```
opatchauto rollback –session session_id -analyze –wallet wallet_location -
walletPassword password_ifneeded
```

For example:

```
opatchauto rollback –session EKZR -analyze –wallet /tmp/samplewallet -walletPassword
password
```

When the test run successfully passes, perform the actual roll back of the patch:

```
opatchauto rollback –session session_id –wallet wallet_location -walletPassword
password_ifneeded
```

For example:

```
opatchauto rollback –session EKZR –wallet /tmp/samplewallet -walletPassword password
```

Alternatively, if you do not remember your session id when you applied the pach, you can roll back the patch by pointing OPatchAuto to a copy of the unzipped patch as follows:

```
opatchauto rollback unzipped_patch_location -topology fmwcomposer_topology_file –
wallet wallet_location -walletPassword password_ifneeded
```

See Also:

Applying a Patch on Multiple Hosts Using OPatchAuto

After you obtain the necessary patches, use the `opatchauto apply –analyze` command to verify prerequisites, and then use `opatchauto apply –topology` to apply a patch on multiple hosts. If needed, you can use `opatchauto rollback` to roll back the application of a patch.

2.2.4 Troubleshooting a Patch by Viewing the OPatchAuto Log File

To understand how a patch is applied and to troubleshoot any problems with the application of a patch, you should review the log file for the OPatchAuto session.

The log file location is usually saved to the following directory or a subdirectory within this location:

```
ORACLE_HOME/cfgtoollogs/opatchauto/
```

Subdirectories within this location are identified by the patch number or by the command you ran.

The file name for each log file identifies the date and time it was executed. For example:

```
opatchauto2015-09-28_11-47-13AM.log
```

You can also locate the log file by viewing the output of the `opatchauto` command. The log file name and location is included in the output of the command. For example:

```
Session log file is /home/Oracle/products/fmw12c/cfgtoollogs/opatchauto/
opatchauto2015-09-28_11-47-13AM.log
```

See Also:

Using OPatchAuto to Patch Oracle Fusion Middleware
: Use OPatchAuto to automate the necessary steps for applying a patch on a single host or multi-host environment.

2.2.5 Using the OPatch lsinventory Command to Verify the Patches Applied to an Oracle Home

To verify what patches have been applied to an Oracle home, or to find out additional information about the Oracle home, use the `opatch lsinventory` command.

The following example shows sample output of the `lsinventory` command, which indicates that a specific interim patch has been applied.

Example 2-1 Running the opatch lsinventory Command to Obtain the Oracle Home Information

```
> opatch lsinventory
Oracle Interim Patch Installer version 13.3.0.0.0
Copyright (c) 2013, Oracle Corporation.  All rights reserved.

Oracle Home       : /opt/Oracle/products/fmw12c
Central Inventory : /opt/Oracle/oraInventory
   from           : /var/opt/Oracle/oraInst.loc
OPatch version    : 13.3.0.0.0
OUI version       : 13.3.0.0.0
Log file location : /opt/Oracle/products/fmw12c/cfgtoollogs/opatch/
opatch2013-06-10_12-32-37PM_1.log

OPatch detects the Middleware Home as "/opt/Oracle/products/fmw12c"

Lsinventory Output file location :
/opt/Oracle/products/fmw12c/cfgtoollogs/opatch/lsinv/
lsinventory2013-06-10_12-32-37PM.txt

--------------------------------------------------------------------------------

Interim patches (1) :

Patch  15941858     : applied on Mon Jun 10 12:39:07 PDT 2013
Unique Patch ID:  150220
Patch description:  "TEST PATCH FOR WLS 12.2.1.0 - JAVA CLASSES PATCH"
   Created on 17 May 2013, 11:54:20 hrs PST8PDT
   Bugs fixed:
     783169, 15941850

--------------------------------------------------------------------------------

OPatch succeeded.
```

See Also:

Using OPatchAuto to Patch Oracle Fusion Middleware
: Use OPatchAuto to automate the necessary steps for applying a patch on a single host or multi-host environment.

2.2.6 Using the listDomainPatchInventory.sh Command to Verify the Patches Applied to a Domain

To verify what patches have been applied to a domain, use the `listDomainPatchInventory.sh` command. Use this command with the OPatch `lsinventory` command to verify that the patch has been applied successfully.

For example:

```
cd ORACLE_HOME/OPatch/bin
./listDomainPatchInventory.sh DOMAIN_HOME
```

This command indicates that a specific interim patch has been applied.

You should see the same list of patches in both the domain inventory and in the inventory for each Oracle home. If not, re-apply the patch. When you re-apply the patch, only the missing steps will be executed. The tasks that have already been performed will be skipped.

See Also:

Using OPatchAuto to Patch Oracle Fusion Middleware
: Use OPatchAuto to automate the necessary steps for applying a patch on a single host or multi-host environment.

Using the OPatch lsinventory Command to Verify the Patches Applied to an Oracle Home
: To verify what patches have been applied to an Oracle home, or to find out additional information about the Oracle home, use the `opatch lsinventory` command.

2.2.7 Verifying Your Installation After Applying a Patch

After you apply one or more patches successfully, use the WebLogic Administration Console, Fusion Middleware Control, and your organization's application testing to verify that your system is currently running successfully.

To verify your installations in an Oracle Fusion Middleware 12*c* environment:

1. Ensure that all the servers in all the domains associated with the Oracle home you just patched are up and running.

   Note:

   If the servers were up and running before patching, it is not necessary to manually restart the servers. OPatchAuto will restart the servers for you once patching is complete.

2. Open the WebLogic Server Administration Console for each domain to verify the Administration Server and to view the status of the components in the domain.

- Also, in any Oracle Fusion Middleware domain (where the Oracle Fusion Middleware Infrastructure is installed), open the Oracle Enterprise Manager Fusion Middleware Control console to view the status of the components in the domain.

From either console, you can verify that the servers and applications are up and running correctly. For more information, see the following topics in *Administering Oracle Fusion Middleware*:

- Starting and Stopping Oracle Fusion Middleware
- Overview of Oracle Fusion Middleware Administration Tools

If the software does not work as expected, follow the rollback instructions to roll back the application of the patch.

See Also:

Using OPatchAuto to Patch Oracle Fusion Middleware
: Use OPatchAuto to automate the necessary steps for applying a patch on a single host or multi-host environment.

Rolling Back a Patch You Have Applied on a Single Host
: If you apply a patch and the results are not satisfactory, use the `opatchauto rollback` command to roll back the application of the patch. This is the same command as `opatchauto rollback -analyze`, except you remove the `-analyze` argument when you are ready to roll back the patch.

Rolling Back a Patch You Have Applied on Multiple Hosts
: If you apply a patch and the results are not satisfactory, use the `opatchauto rollback` command to roll back the application of a patch. This is the same command as `opatchauto rollback -analyze`, except you remove the `-analyze` argument when you are ready to roll back the patch.

2.3 Building A Topology Using Fusion Middleware Composer

For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

The following topics provide an overview of how to use Fusion Middleware Composer, as well as an example for how to build a topology file that you can provide to OPatchAuto:

See Also:

Patching Your Environment Using OPatchAuto
: OPatchAuto is installed with the OPatch utility as a part of your installation. OPatchAuto provides several commands that you can use to

automate the application and roll back of a patch in a single host or multi-host environment.

Starting Fusion Middleware Composer

You can start and access Fusion Middleware Composer from the *ORACLE_HOME*/oracle_common/bin directory.

Getting Started with Fusion Middleware Composer

Fusion Middleware Composer provides several graphical interface tools. Use these tools to complete tasks in Fusion Middleware Composer, such as adding and defining items in the workspace, to build a topology file.

Example of Building a Topology File

To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

Creating a New Topology

To start adding and defining items in the workspace, create a new topology file where you will save configuration information about your environment. Every time you make changes in the workspace, make sure to save your work to this file.

Loading a Wallet File

Credentials that are used to connect to the environment and required to run OPatchAuto, such as the credentials for connecting to the domain's Administration Server, must be stored and available in a separate wallet file. In Fusion Middleware Composer, use the Settings page to load and edit an existing wallet file or to create a new wallet.

Adding the Hosts

Building a topology in Fusion Middleware Composer starts with creating a host, which is a physical or virtual machine that can be associated with an Oracle home and domain. A host is defined in the topology by its IP address.

Adding the Oracle Home

After you create and define the hosts, add and define the Oracle home(s) available in the environment. To define an Oracle home, you must provide the absolute path to the Oracle home directory.

Building the WebLogic Domain

For a multi-host environment, you need to build and define a WebLogic domain, which typically includes an Administration Server and a cluster of Managed Servers.

Adding the Node Managers

If you have Node Managers being used in the environment, each Node Manager has to be defined in the topology file.

Assigning Components to Hosts

After all the components in the environment have been defined, map the components on the right side of the Fusion Middleware Composer

workspace to the appropriate hosts on the left to finish building the topology.

2.3.1 Starting Fusion Middleware Composer

You can start and access Fusion Middleware Composer from the *ORACLE_HOME*/oracle_common/bin directory.

To start Fusion Middleware Composer:

1. Set the JAVA_HOME environment variable so it references the location of the JDK software you will be using to run Fusion Middleware Composer.
2. Change directory to the *ORACLE_HOME*/oracle_common/bin directory.

   For example:

   ```
   cd ORACLE_HOME/oracle_common/bin
   ```

3. Launch Fusion Middleware Composer (fmw-composer.sh), as shown in the following example:

   ```
   ./fmw-composer.sh
   ```

See Also:

Building A Topology Using Fusion Middleware Composer
: For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

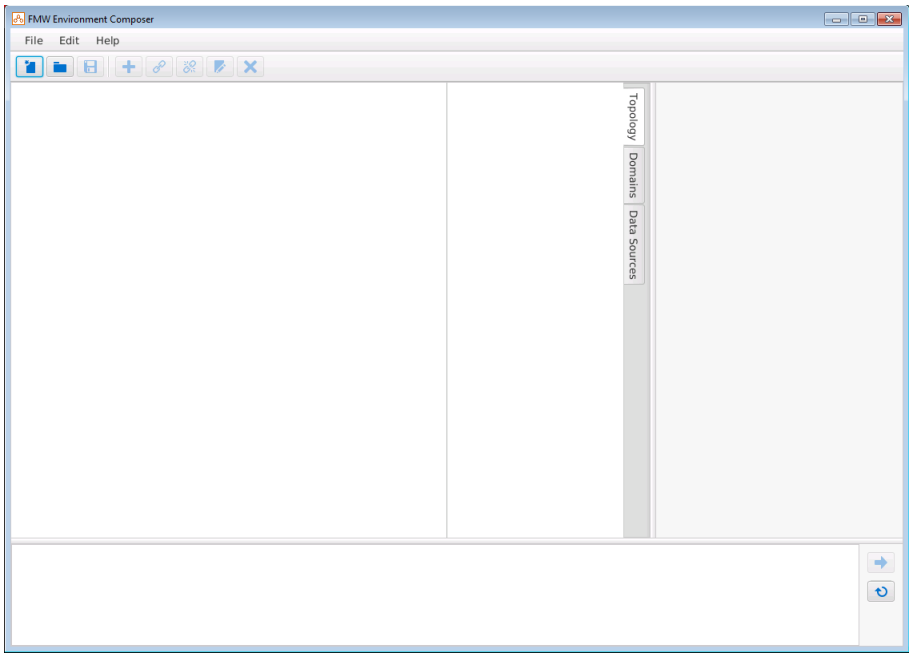
Getting Started with Fusion Middleware Composer
: Fusion Middleware Composer provides several graphical interface tools. Use these tools to complete tasks in Fusion Middleware Composer, such as adding and defining items in the workspace, to build a topology file.

2.3.2 Getting Started with Fusion Middleware Composer

Fusion Middleware Composer provides several graphical interface tools. Use these tools to complete tasks in Fusion Middleware Composer, such as adding and defining items in the workspace, to build a topology file.

After you start Fusion Middleware Composer, the following screen appears:

Figure 2-1 Fusion Middleware Composer Graphical Interface



This screen shows the Fusion Middleware Composer workspace area where you will add and define components to build your topology.

Table 2-2 describes some of the Fusion Middleware Composer graphical tools (Figure 2-2) that you can use to create a topology file.

Figure 2-2 Fusion Middleware Composer Toolbar

Table 2-2 Fusion Middleware Composer Graphical Tools

Tool	Description	Menu Location
	Select this option to create a new topology file. See Creating a New Topology.	**File** > **New**
	Select this option to open an existing topology file. When you select this option, a dialog box appears that you can use to identify the location of the existing topology file that you want to open.	**File** > **Open...**
	Select this option to save the topology file.	**File** > **Save**
	Select this option to add a new item (Host, Domain, Node Manager, etc.) to the topology. The items that you can add depend on the existing object that is selected in the workspace. For example, you can add a server to a cluster only if the cluster object is selected. For more information, see Add and Define the Managed Servers.	**Edit** The menu options available depend on the current object selected in the workspace.

Table 2-2 (Cont.) Fusion Middleware Composer Graphical Tools

Tool	Description	Menu Location
	Select this option to assign an existing item (such as an Oracle home) to another item in the topology (such as a host). The existing items you can assign depend on the object that is selected in the workspace. For example, to assign an Oracle home to a host, the host object must be selected. For more information, see Assigning the Oracle Home to Hosts.	**Edit** The menu options available depend on the current object selected in the workspace.
	Select this option to remove an item (such as an Oracle home) from another item in the topology (such as a host). The item you want to remove must be selected.	**Edit** The menu options available depend on the current object selected in the workspace.
	Select this option to delete an item from the topology. The item you want to delete must be selected.	**Edit** The menu options available depend on the current object selected in the workspace.

See Also:

Building A Topology Using Fusion Middleware Composer
: For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

Starting Fusion Middleware Composer
: You can start and access Fusion Middleware Composer from the *ORACLE_HOME*`/oracle_common/bin` directory.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.3 Example of Building a Topology File

To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

This topic shows an example of the tasks required to create a topology file using Fusion Middleware Composer. Specifically, this example provides step-by-step instructions to create a topology for the Fusion Middleware multi-host environment shown in Figure 2-3.

This topology contains two hosts (APPHOST1 and APPHOST2). APPHOST1 contains the WebLogic Administration Server, a singe machine, and a single Managed Server, while APPHOST2 contains a second machine and second Managed Server. A cluster is shown encompassing both Managed Servers across both APPHOST1 and APPHOST2.

Figure 2-3 Example of an Orace Fusion Middleware Multi Host Topology

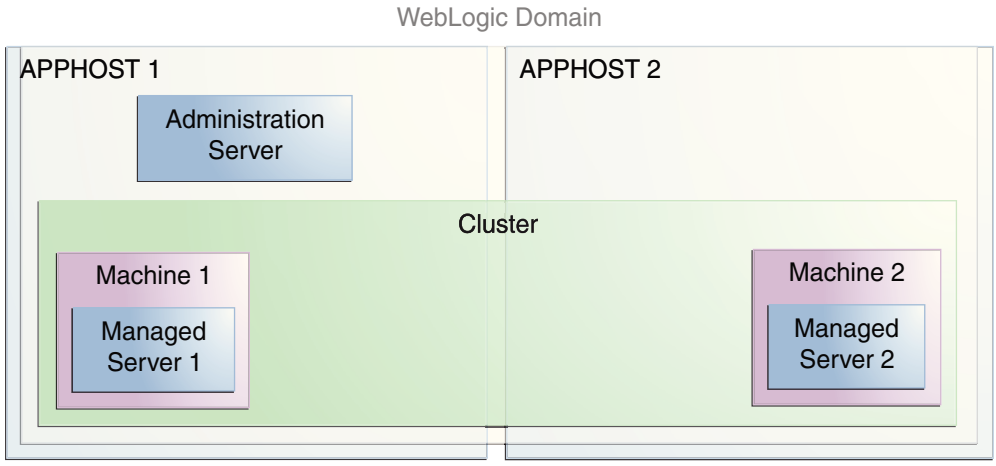


Table 2-3 provides an overview of the tasks required to create a topology file for a multi-host environment.

Table 2-3 Tasks Required to Create a Topology File for a Multi Host Environment

No.	Task	Example
1	Create a new topology file.	Creating a New Topology
2	Identify a wallet file that will be used to hold environment credentials.	Loading a Wallet File
3	Add and define the hosts in your environment.	Adding the Hosts
4	Add and define the Oracle home(s) in your environment.	Adding the Oracle Home

Table 2-3 (Cont.) Tasks Required to Create a Topology File for a Multi Host Environment

No.	Task	Example
5	Build and define the WebLogic domain in your environment, which typically includes an Administration Server and a cluster of Managed Servers.	Building the WebLogic Domain
6	Add and define the Node Managers in your environment.	Adding the Node Managers
7	Assign/Map the components to the appropriate hosts.	Assigning Components to Hosts

See Also:

Building A Topology Using Fusion Middleware Composer
For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

2.3.4 Creating a New Topology

To start adding and defining items in the workspace, create a new topology file where you will save configuration information about your environment. Every time you make changes in the workspace, make sure to save your work to this file.

To create a new topology:

1. Select **File** > **New**.

   You can also create a new topology by selecting the New Topology icon  on the toolbar.

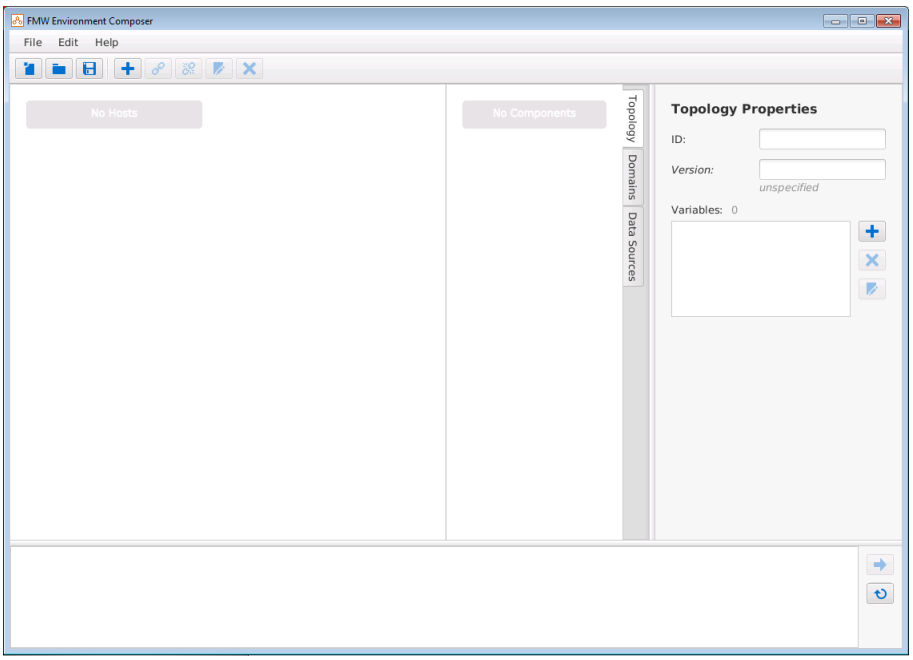
2. Click anywhere in the workspace in the **Topology** tab to display the **Topology Properties** pane on the right.

3. In the **Topology Properties** pane, define the following properties:

Property	Description
ID	Enter a name for the topology file. For example, `my-topology`.
Version	Enter `1.0`. This property allows you to create different versions of a topology and distinguish them from one another.

These properties are used to refer to this topology from other files or from tools that use the topology.

4. Select **File** > **Save As...** to save the file in any directory. The name of the file should match the **ID** attribute. For example, `my-topology.xml`.



See Also:

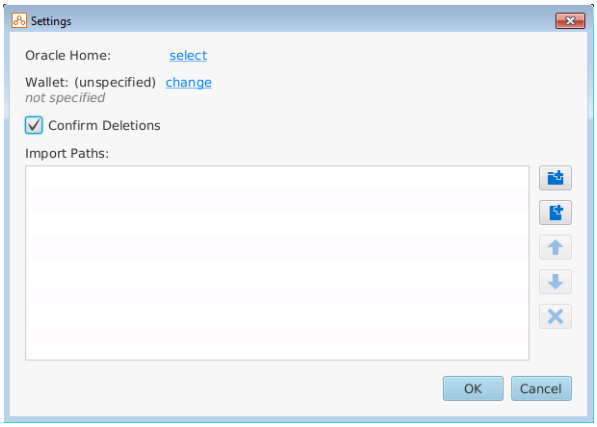
Building A Topology Using Fusion Middleware Composer
: For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.5 Loading a Wallet File

Credentials that are used to connect to the environment and required to run OPatchAuto, such as the credentials for connecting to the domain's Administration Server, must be stored and available in a separate wallet file. In Fusion Middleware Composer, use the Settings page to load and edit an existing wallet file or to create a new wallet.

1. Select **File** > **Settings...** to display the Settings page.



2. On the **Settings** page, click **change** to provide the path to the wallet file.
3. In the dialog box, select **Select an existing wallet** to load the wallet you created in Creating a Wallet to Store Passwords and then click **OK**.

   Alternatively, you can create a new wallet by selecting one of the following options:

   - **Create a new wallet**, which will create a wallet that does not require a password.
   - **Create a new encrypted wallet**, which will create a wallet that is password protected.

   An additional dialog box appears that prompts you to identify the wallet location.
4. Provide the wallet location and click **Open** to load the wallet.
5. After the wallet is loaded, click **OK** to dismiss the Settings page.

See Also:

Building A Topology Using Fusion Middleware Composer
: For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

Creating a Wallet to Store Passwords
: To successfully run OPatchAuto, you must provide a wallet on the command line that contains the necessary password credentials for connecting to the environment.

2.3.6 Adding the Hosts

Building a topology in Fusion Middleware Composer starts with creating a host, which is a physical or virtual machine that can be associated with an Oracle home and domain. A host is defined in the topology by its IP address.

To add the hosts to the topology:

1. Select **Edit** > **Add New Host**.

Alternatively, you can select the Add New Item icon on the toolbar, select **Add New Host** in the dialog box, and then click **OK**.

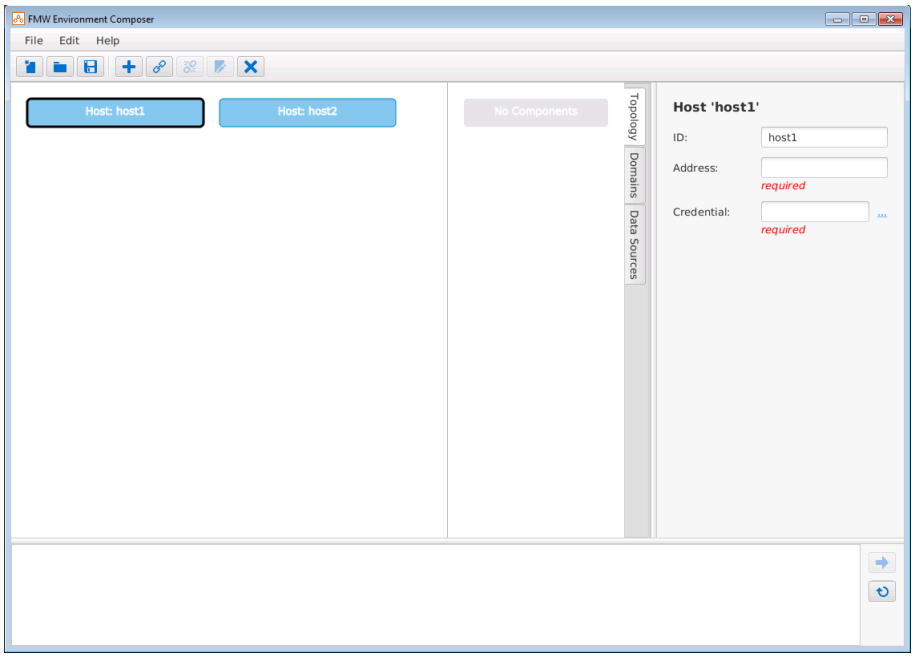
A new host (**host1**) is created in the workspace.

2. Select the host object you just created, and define the following attributes for the host:

Attribute	Description
ID	Keep the default value, host1. The **ID** attribute is an identifier that is used to refer to this host from other parts of the topology.
Address	Enter the listen address for Host host1.
Credential	This attribute is used to identify the credential in the wallet file that will be used to connect to the host. Click **select** to select the credential for the host from the wallet file you loaded in Loading a Wallet File. When you click **select**, a dialog box appears that lists the credentials in the given wallet. If the credential already exists in the wallet, select the appropriate credential from the list and click **OK**. If the credential does not exist in the wallet, click **New** to add the host credential to the wallet and to provide an alias for this credential.

3. Repeat this process to add a second host, host2, to the topology.

After you add and define the hosts, your workspace should look similar to the following example:



See Also:

Building A Topology Using Fusion Middleware Composer
: For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.7 Adding the Oracle Home

After you create and define the hosts, add and define the Oracle home(s) available in the environment. To define an Oracle home, you must provide the absolute path to the Oracle home directory.

To add and define an Oracle home:

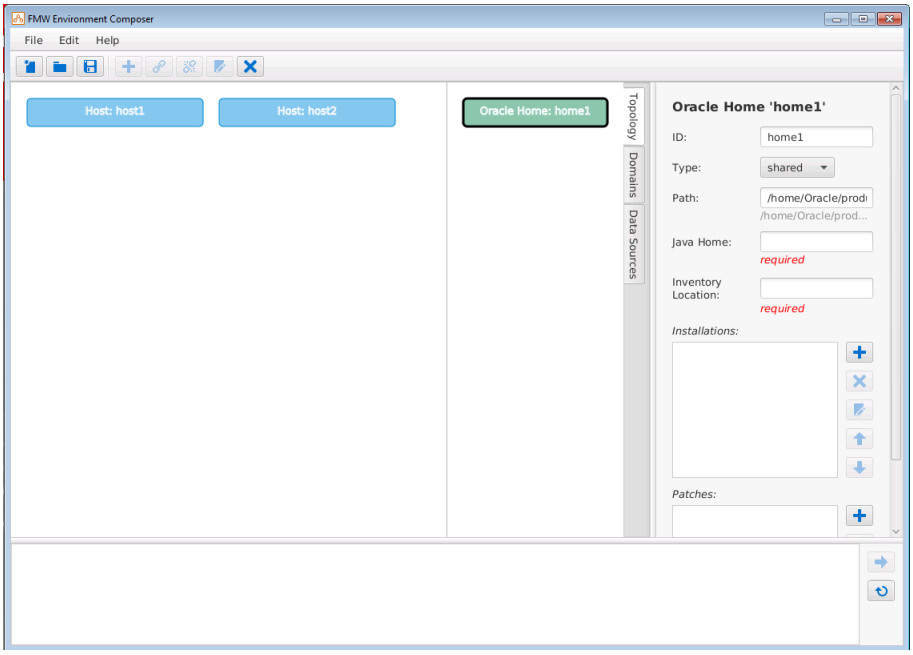
1. Click anywhere in the workspace in the **Topology** tab.
   Ensure that the existing topology objects in the workspace are not selected.
2. Select **Edit** > **Add New Oracle Home**.

   Alternatively, you can select the Add New Item icon  on the toolbar, select **Add New Oracle Home** in the dialog box, and then click **OK**.

   An Oracle home (**home1**) is created in the workspace.
3. Select the Oracle home object you just created, and define the following attributes for the Oracle home:

Attribute	Description
ID	Keep the default value, home1. The **ID** attribute is an identifier that is used to refer to this Oracle home from other parts of the topology.
Type	Select **shared**, which defines that the Oracle home is on shared storage. If your Oracle home is on local storage, select **local** . This information is used to determine how many copies of the Oracle home there are in the environment, which is important when applying a patch to the Oracle home. If there are copies of the Oracle home on multiple hosts, each Oracle home should be defined individually, and the **Type** attribute should be **local** for each one. Only use **shared** if the Oracle home is on shared disk that is mounted on more than one host.
Path	Enter the full path to the Oracle home that is being patched.

After you add and define the Oracle home, your workspace should look similar to the following example:



See Also:

Building A Topology Using Fusion Middleware Composer
: For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.8 Building the WebLogic Domain

For a multi-host environment, you need to build and define a WebLogic domain, which typically includes an Administration Server and a cluster of Managed Servers.

Building the WebLogic domain includes the following steps:

See Also:

Building A Topology Using Fusion Middleware Composer
: For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file

allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

Add and Define a Domain
: Before you define the servers in the topology, add and define the domain. To define a domain, you must provide the absolute path to the domain home location on a given host.

Add and Define the WebLogic Administration Server
: After you create and define the domain, add the WebLogic Administration Server to the domain in the topology.

Add and Define a Cluster
: Before you can add Managed Servers to the domain, you must add and define the cluster where the Managed Servers are running.

Add and Define the Managed Servers
: After you have created and defined the domain and a cluster in your topology, assign the Managed Servers to the cluster in the domain.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.8.1 Add and Define a Domain

Before you define the servers in the topology, add and define the domain. To define a domain, you must provide the absolute path to the domain home location on a given host.

To add and define a domain:

1. Click anywhere in the workspace in the **Topology** tab.
   Ensure that the existing topology objects in the workspace are not selected.
2. Select **Edit** > **Add New Domain** to add a domain to the workspace.

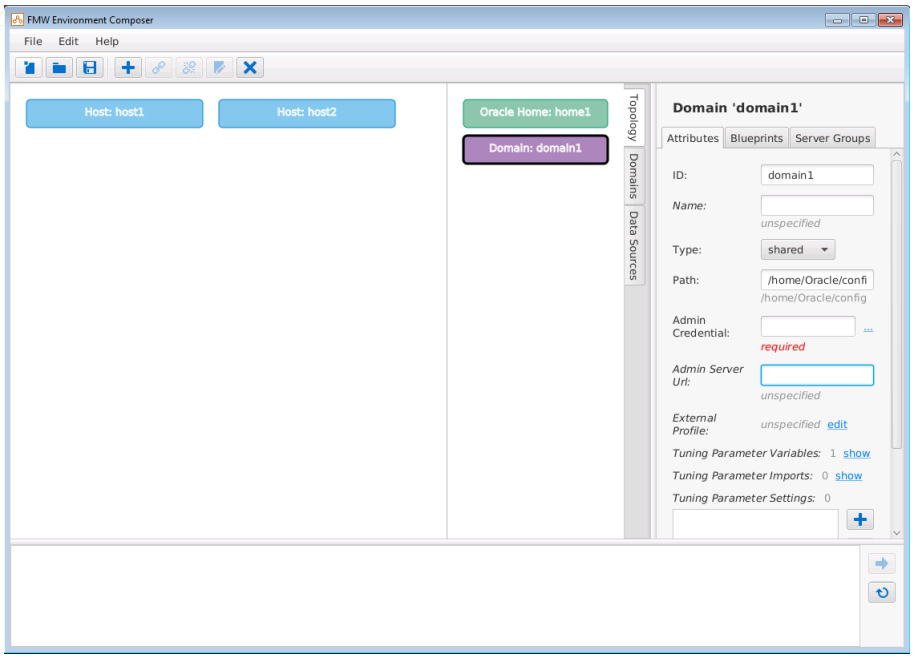
   Alternatively, you can select the Add New Item icon  on the toolbar, select **Add New Domain** in the dialog box, and then click **OK**.

   A new domain object (**domain1**) is created in the workspace.
3. Select the domain object that you just created, and define the following **Attributes** for the domain:

Attribute	Description
ID	Keep the default value, domain1. The **ID** attribute is an identifier that is used to refer to this domain from other parts of the topology.
Name	Enter the name of the domain. This attribute should match the name provided during domain configuration.
Type	Select **shared** to indicate that the domain is on shared storage. If your domain is on local storage, select **local** .
Path	Enter the full path to the Domain home that is being patched.

Attribute	Description
Admin Credential	This attribute is used to identify the credential in the wallet file that will be used to connect to the domain's Administration Server. Click **select** to select the credential for the Administration Server from the wallet file you loaded in Loading a Wallet File. When you click **select**, a dialog box appears that lists the credentials in the given wallet. If the credential already exists in the wallet, select the appropriate credential from the list and click **OK**. If the credential does not exist in the wallet, click **New** to add the Administration Server credential to the wallet and to provide an alias for this credential.
Admin Server Url	Enter the URL that is used to connect to the WebLogic Administration Server. For example, `t3://examplehost.exampledomain.com:7001`.

After you have added and defined a domain, your workspace should look similar to the following example:



See Also:

Building the WebLogic Domain
: For a multi-host environment, you need to build and define a WebLogic domain, which typically includes an Administration Server and a cluster of Managed Servers.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.8.2 Add and Define the WebLogic Administration Server

After you create and define the domain, add the WebLogic Administration Server to the domain in the topology.

To add the WebLogic Administration Server to the domain:

1. Select the domain object in the workspace, and then select **Edit** > **Add New Server to Domain 'domain1'** to add the Administration Server.

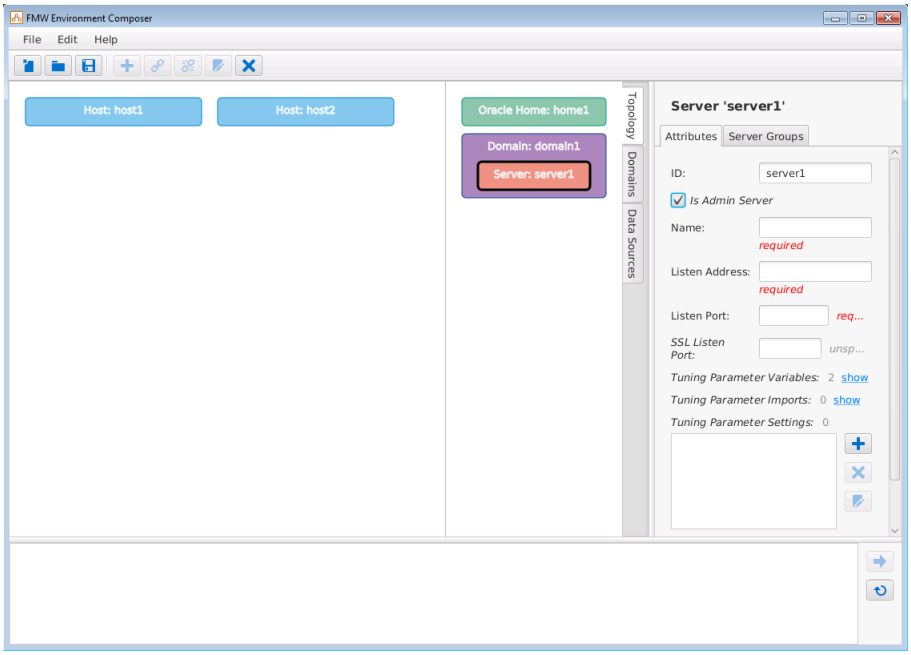
   Alternatively, you can select the Add New Item icon  on the toolbar, select **Add New Server to Domain 'domain1'** in the dialog box, and click **OK**.

   A new server (**server1**) is added to the domain in the workspace.

2. Select the server1 object you just created, and define the following **Attributes** for the Administration Server:

Attribute	Description
ID	Keep the default value, server1. The **ID** attribute is an identifier that is used to refer to this server from other parts of the topology.
Is Admin Server	Select the **Is Admin Server** check box to identify this server as the Administration Server.
Name	Enter a name for the Administration Server. For example, `AdminServer`.
Listen Address	Enter the listen address of the Administration Server.
Listen Port	Enter the listen port of the Administration Server. For example, `7001`.

After you added and defined the Administration Server, your workspace should look similar to the following example:



See Also:

Building the WebLogic Domain
: For a multi-host environment, you need to build and define a WebLogic domain, which typically includes an Administration Server and a cluster of Managed Servers.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.8.3 Add and Define a Cluster

Before you can add Managed Servers to the domain, you must add and define the cluster where the Managed Servers are running.

To add a cluster to the topology:

1. Select the domain object in the workspace, and then select **Edit** > **Add New Cluster to Domain 'domain1'** to add a cluster to the workspace.

   Alternatively, you can select the Add New Item icon  on the toolbar, select **Add New Cluster to Domain 'domain1'** in the dialog box, and click **OK**.

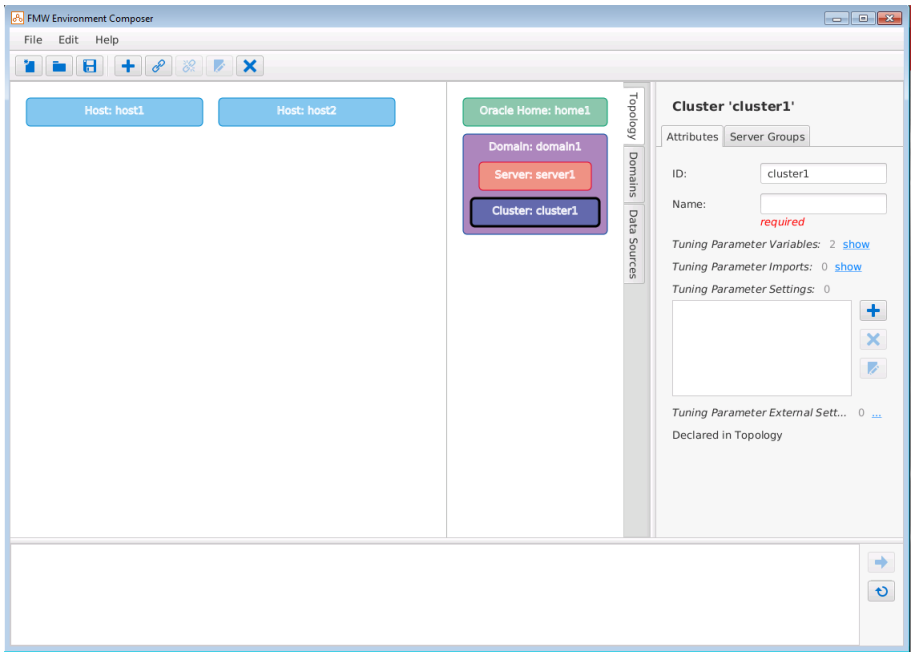
   A new cluster (**cluster1**) is added to the domain in the workspace.

2. Select the cluster1 object you just created, and define the following **Attributes** for the cluster:

Attribute	Description
ID	Keep the default value, cluster1. The **ID** attribute is an identifier that is used to refer to this cluster from other parts of the topology.

Attribute	Description
Name	Enter the name of the cluster.

After you have added and defined a cluster, your workspace should look similar to the following example:



See Also:

Building the WebLogic Domain
: For a multi-host environment, you need to build and define a WebLogic domain, which typically includes an Administration Server and a cluster of Managed Servers.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.8.4 Add and Define the Managed Servers

After you have created and defined the domain and a cluster in your topology, assign the Managed Servers to the cluster in the domain.

To add Managed Servers to a cluster:

1. Select the cluster object in the workspace, and then select **Edit** > **Add New Server to Cluster 'cluster1'**.

   Alternatively, you can select the Add New Item icon  on the toolbar to add a Managed Server to the cluster.

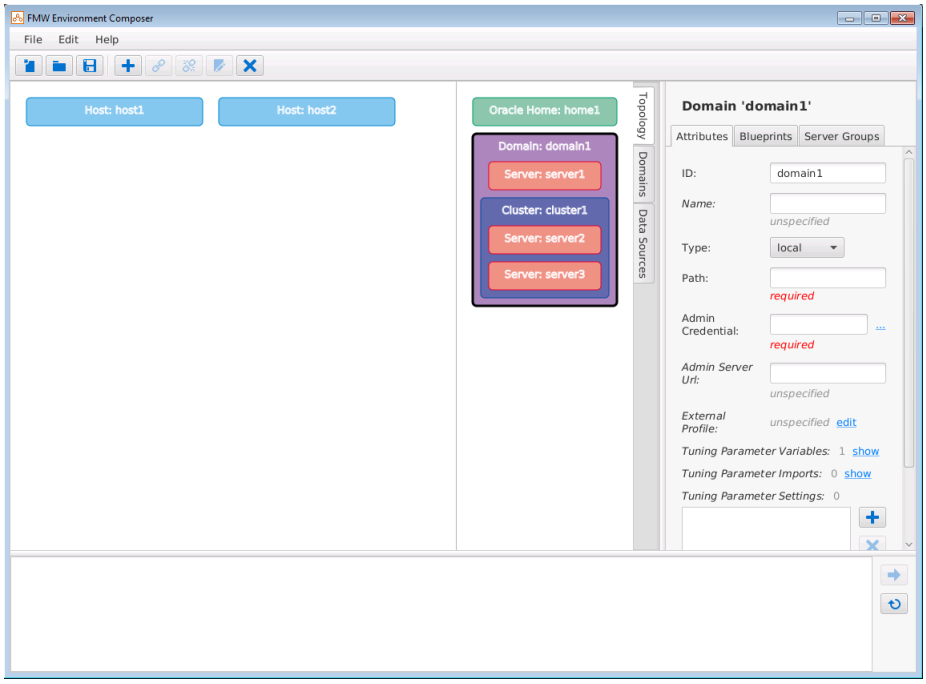
   A new server (**server2**) is created in the workspace.

2. Define the following **Attributes** for the Managed Server:

Attribute	Description
ID	Keep the default value, server2. The **ID** attribute is an identifier that is used to refer to this server from other parts of the topology.
Name	Enter a name for the Managed Server. For example, `managed_server1`.
Listen Address	Enter the listen address of the Managed Server.
Listen Port	Enter the listen port of the Managed Server.

3. Repeat this process to add a second Managed Server, server3, to the cluster.

After you have added and defined the Managed Servers, your workspace should look similar to the following example:



See Also:

Building the WebLogic Domain
: For a multi-host environment, you need to build and define a WebLogic domain, which typically includes an Administration Server and a cluster of Managed Servers.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.9 Adding the Node Managers

If you have Node Managers being used in the environment, each Node Manager has to be defined in the topology file.

1. Click anywhere in the workspace in the **Topology** tab.
   Ensure that the existing topology objects in the workspace are not selected.
2. Select **Edit** > **Add New Node Manager** to add a Node Manager to the workspace.

   Alternatively, you can select the Add New Item tool  on the toolbar, select **Add New Node Manager** in the dialog box, and click **OK**.

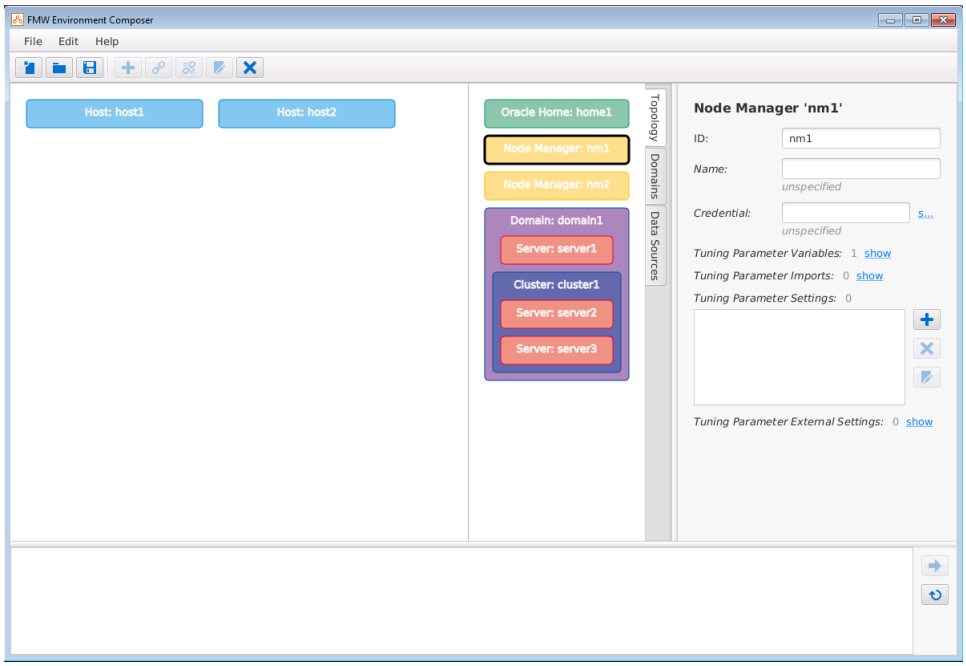
   A Node Manager (**nm1**) is created in the workspace.
3. Select the Node Manager object you just created, and define the following attributes for the Node Manager:

Attribute	Description
ID	Keep the default value, nm1. The **ID** attribute is an identifier that is used to refer to this Node Manager from other parts of the topology.
Name	Enter the name of the Node Manager. This attribute should match the name provided during domain configuration. For example, `Machine 1`.
Credential	This attribute is used to identify the credential in the wallet file that will be used to connect to the Node Manager. Click **select** to select the credential for the Node Manager from the wallet file you loaded in Loading a Wallet File. When you click **select**, a dialog box appears that lists the credentials in the given wallet. If the credential already exists in the wallet, select the appropriate credential from the list and click **OK**. If the credential does not exist in the wallet, click **New** to add the Node Manager credential to the wallet and to provide an alias for this credential.
NmAddress	Under **Tuning Parameter Settings**, click the Add New Item icon  to add a value for the Node Manager listen address (**NmAddress**) attribute. When you click this icon, a dialog box appears. For **Name**, select **NmAddress** from the drop-down menu, and then enter the Node Manager listen address in the **Value** field.

Attribute	Description
NmPort	Under **Tuning Parameter Settings**, click the Add New Item icon  to add a value for the Node Manager listen port (**NmPort**) attribute. When you click this icon, a dialog box appears. For **Name**, select **NmPort** from the drop-down menu, and then enter the Node Manager listen port in the **Value** field (for example, 5556).

4. Repeat this process to add and define a second Node Manager, nm2.

After you have added and defined the Node Managers, your workspace should look similar to the following example:



See Also:

Building A Topology Using Fusion Middleware Composer

For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file

allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

Example of Building a Topology File
To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.10 Assigning Components to Hosts

After all the components in the environment have been defined, map the components on the right side of the Fusion Middleware Composer workspace to the appropriate hosts on the left to finish building the topology.

Note:

The examples in this section show you how to use the Assign Existing Item tool  on the toolbar to complete this task. You can also use the drag and drop feature to assign components to the hosts. You do this by clicking and holding down the mouse button over an item on the right side of the workspace, dragging it to the appropriate location in the hosts on the left, and then releasing the mouse button to drop it.

For more information, see the following tasks:

See Also:

Building A Topology Using Fusion Middleware Composer
For multi-host patching, a prerequisite is to define your configuration in a topology file. Use Fusion Middleware Composer to create this file and provide information about your environment to OPatchAuto. This file

allows OPatchAuto to identify the topology you want to patch and automatically perform the patching steps without manual intervention.

Assigning the Oracle Home to Hosts
: After you create the Oracle home, assign the Oracle home (home1) to the appropriate hosts (host1 and host2) in the topology.

Assigning the Domain to Hosts
: After you create the domain and assign the Oracle home to the hosts, assign the domain (domain1) to the hosts (host1 and host2) in the topology.

Assigning the Administration Server to a Host
: After you create the Administration Server and assign the domain to the hosts, assign the Administration Server (server1) to a host (host1) in the topology.

Assigning Node Managers to Hosts
: After you create the Node Managers and assign the domain to the hosts, assign the Node Managers (nm1 and nm2) to the appropriate hosts (host1 and host2) in the topology.

Assigning Managed Servers to Hosts
: After you create the Managed Servers and assign the domain to the hosts, assign the Managed Servers (server2 and server3) to the appropriate hosts (host1 and host2) in the topology.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

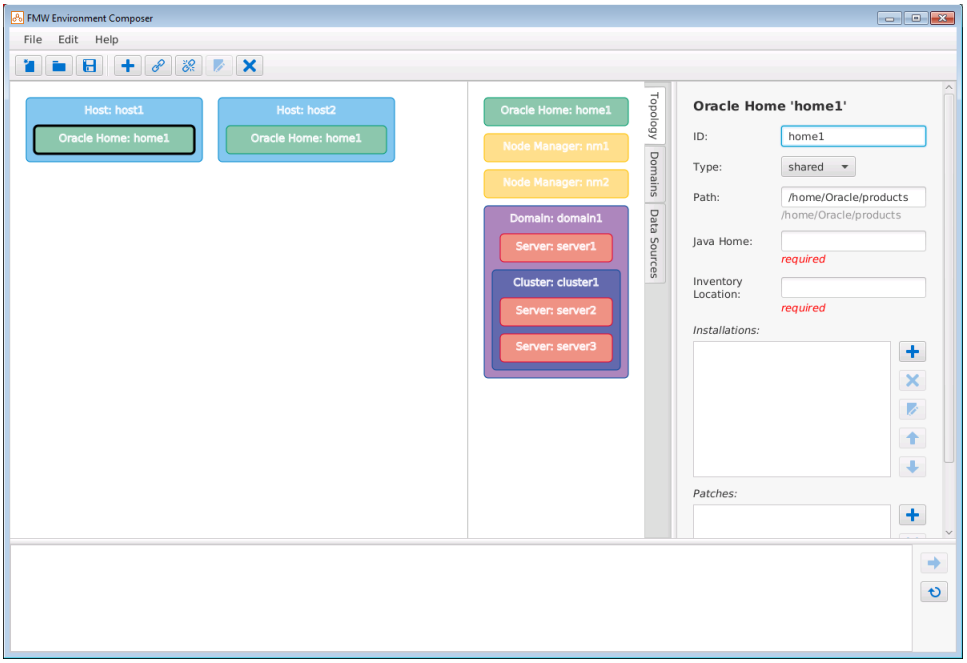
2.3.10.1 Assigning the Oracle Home to Hosts

After you create the Oracle home, assign the Oracle home (home1) to the appropriate hosts (host1 and host2) in the topology.

To assign the Oracle home to the hosts:

1. Select the Host host1 object in the workspace, and then select  on the toolbar.
2. In the dialog box, select the Oracle home (home1) to add to Host host1 and click **OK**.
3. Repeat this process to assign the Oracle home to Host host2.

After you assign the Oracle home to both hosts, your workspace should look similar to the following example:



See Also:

Assigning Components to Hosts
: After all the components in the environment have been defined, map the components on the right side of the Fusion Middleware Composer workspace to the appropriate hosts on the left to finish building the topology.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

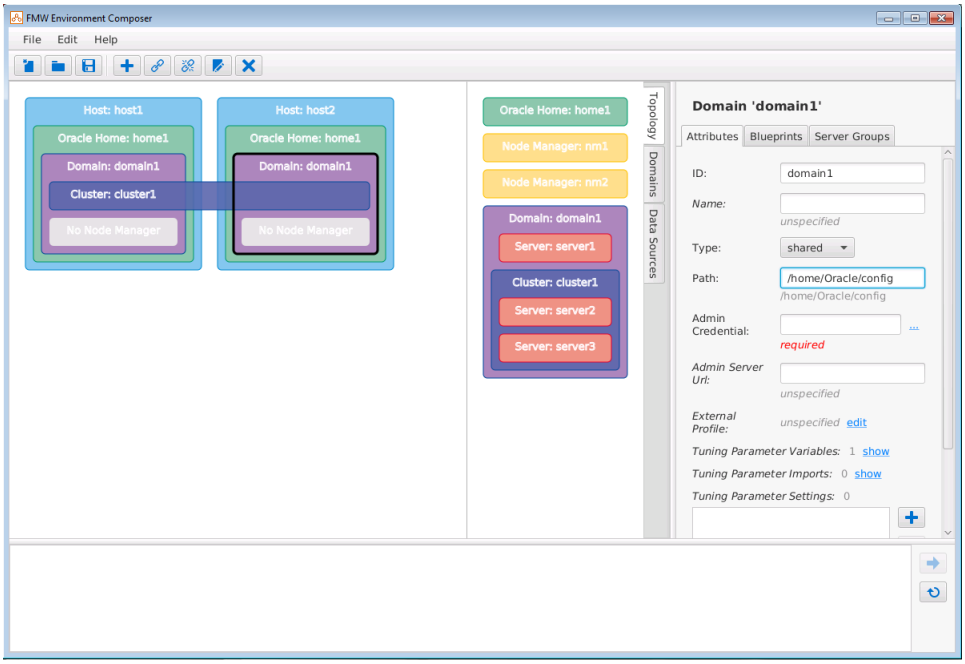
2.3.10.2 Assigning the Domain to Hosts

After you create the domain and assign the Oracle home to the hosts, assign the domain (domain1) to the hosts (host1 and host2) in the topology.

To assign the domain to hosts:

1. Select the Oracle home object in Host host1, and then select  on the toolbar.
2. In the dialog box, select the domain (domain1) to add to Oracle Home home1 and click **OK**.
3. Repeat this process to assign the domain (domain1) to the Oracle home in Host host2.

After you assign the domain to both hosts, your workspace should look similar to the following example:



See Also:

Assigning Components to Hosts
: After all the components in the environment have been defined, map the components on the right side of the Fusion Middleware Composer workspace to the appropriate hosts on the left to finish building the topology.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.10.3 Assigning the Administration Server to a Host

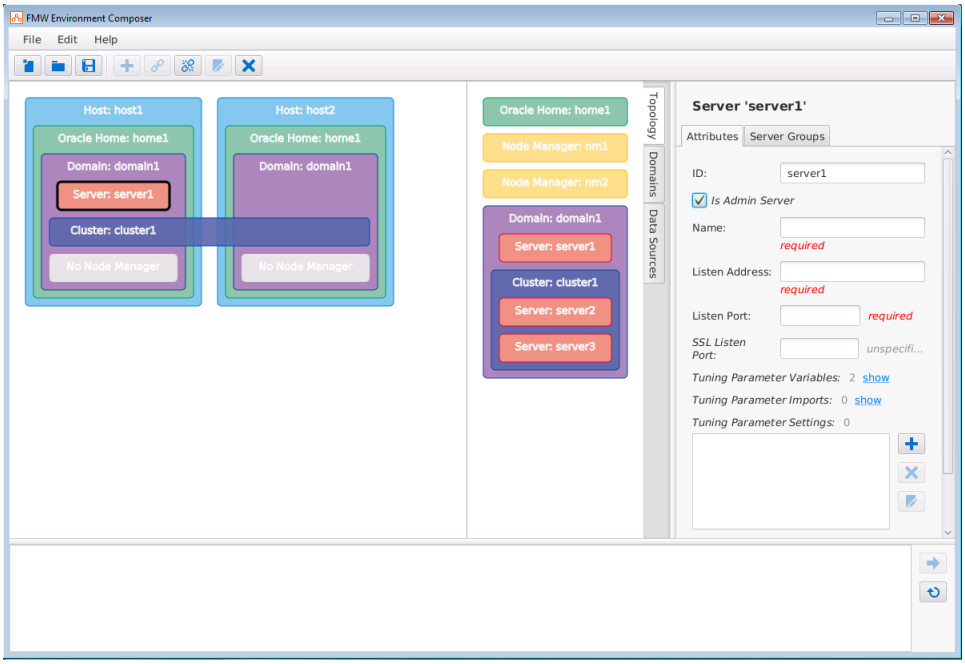
After you create the Administration Server and assign the domain to the hosts, assign the Administration Server (server1) to a host (host1) in the topology.

To assign an Administration Server to a host:

1. Select the domain object in Host host1, and then select  on the toolbar.
2. In the dialog box, select **Assign Existing Servers for Domain 'domain1' to Host 'host1' (home1)...** and click **OK**.

   An additional dialog box appears that lists the servers you can assign to the host.
3. Select the server (server1) to assign to Host host1 and click **OK**.

After you assign the Administration Server to a host, your workspace should look similar to the following example:



See Also:

Assigning Components to Hosts
: After all the components in the environment have been defined, map the components on the right side of the Fusion Middleware Composer workspace to the appropriate hosts on the left to finish building the topology.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

2.3.10.4 Assigning Node Managers to Hosts

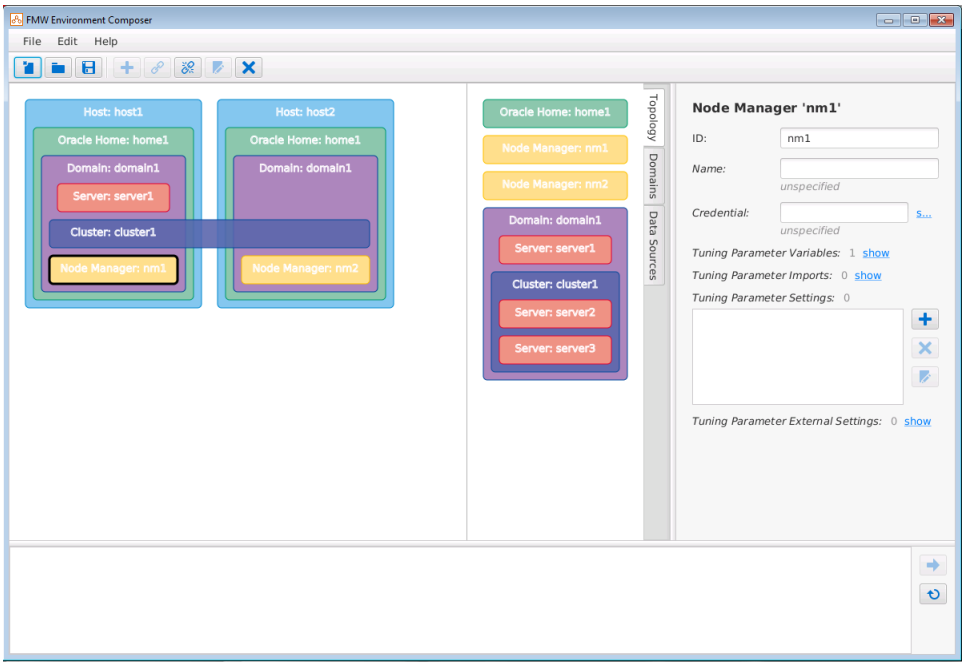
After you create the Node Managers and assign the domain to the hosts, assign the Node Managers (nm1 and nm2) to the appropriate hosts (host1 and host2) in the topology.

To assign Node Managers to hosts:

1. Select the domain object in Host host1, and then select  on the toolbar.
2. In the dialog box, select **Assign Existing Node Manager to Domain 'domain1'...** and click **OK**.

   An additional dialog box appears that lists the Node Managers you can assign to the host.
3. Select the Node Manager (nm1) to assign to Host host1 and click **OK**.
4. Repeat this process to assign the second Node Manager (nm2) to the domain on Host host2.

After you assign the Node Managers to the domain on both hosts, your workspace should look similar to the following example:



See Also:

Assigning Components to Hosts
: After all the components in the environment have been defined, map the components on the right side of the Fusion Middleware Composer workspace to the appropriate hosts on the left to finish building the topology.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.

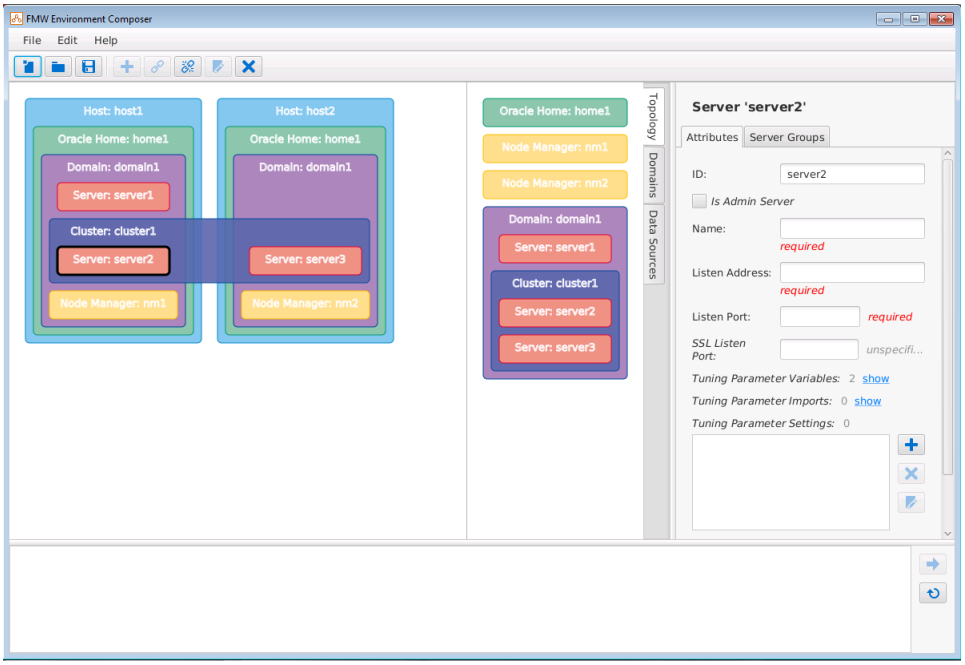
2.3.10.5 Assigning Managed Servers to Hosts

After you create the Managed Servers and assign the domain to the hosts, assign the Managed Servers (server2 and server3) to the appropriate hosts (host1 and host2) in the topology.

To assign Managed Servers to hosts:

1. Select the domain object in Host host1, and then select  on the toolbar.
2. In the dialog box, select **Assign Existing Servers for Domain 'domain1' to Host 'host1' (home1)...** and click **OK**.
3. Select the server (server2) to assign to Host host1 and click **OK**.
4. Repeat this process to assign the second Managed Server (server3) to the domain on Host host2.

After you assign the Managed Servers to the domain on the appropriate hosts, your workspace should look similar to the following example:



See Also:

Assigning Components to Hosts
: After all the components in the environment have been defined, map the components on the right side of the Fusion Middleware Composer workspace to the appropriate hosts on the left to finish building the topology.

Example of Building a Topology File
: To start building a topology file, use the graphical tools to add and define the hosts and components in the workspace. You can then assign the components to the appropriate hosts.