

# Oracle® Enterprise Manager Ops Center

Tuning Monitoring Rules and Policies

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This guide provides an end-to-end example for how to use Oracle Enterprise Manager Ops Center.

## Introduction

Oracle Enterprise Manager Ops Center includes set of monitoring policies that provide in-depth monitoring for your managed assets. This example shows you how to tune the alert triggers for your organization. For example, you might want to create a specific monitoring profile for assets that are on a critical path.

All of the monitoring rules for a specific type of asset, such as an operating system, are bundled into a monitoring policy. When you add an asset to Oracle Enterprise Manager Ops Center, the software automatically begins monitoring it with the appropriate default monitoring policy. You can use the default policies, or you can tune them for your needs. Tuning includes disabling, editing, and adding rules. You can tune rules for an individual asset, or you can create customized policies that monitor groups of like-assets. For example, you can create a group and add your mission-critical operating systems to the group. You can then create a monitoring policy with rules that are specific for the members of that group.

Monitoring rules define the values and boundaries for an asset's activity and the alerting conditions. Information on the available monitored attributes is available in the Javadoc that is in the Oracle Enterprise Manager Ops Center Software Developer's Kit (SDK). System-defined rules are for specific attributes and are hard-coded into the drivers. You can only disable and enable them. The more interesting rules are the user-defined rules. You can edit them, add new rules, or apply rules to a specific asset or group of assets. These rules are associated with, and determined by, the type of managed resource:

- **Threshold** – Sets an upper or lower monitoring threshold for the monitored attribute.
- **Boolean Control** – Sets a logical operator of true or false for the monitored attribute.
- **Enumerated Control** – A series of values that defines a subset of specific values among the possible values of the monitored attribute. An alert occurs when the attribute matches one of those specific values.
- **Expression** – Defines the variables, literals, and operators for an attribute. An expression is an instruction to execute something that returns a value.

Most of these rule types include some parameters that you can tune, or edit. For example, threshold type rules have default values for Info, Warning, and Critical severity level alarms. You can change the values for each severity level.

You can view and edit the rules for a specific asset or policy:

- **Asset View** – Rules for a specific asset are located in asset’s Monitoring tab. Expand the Asset drawer and select an asset. Click the Monitoring tab in the center pane.
- **Policy View** – Rules for a specific policy are located in Monitoring Policies in Plan Management. Expand the Plan Management drawer, scroll down to the Operational Plans section and click Monitoring Policies.

Policies enable you to maintain consistency by applying the same rule parameters to individual assets or to a group of assets. When you edit a rule from the asset view, you create a separate policy. This might be appropriate for a single system, but the preferred method is to perform the tasks from the policy view. When you tune from the policy view, all assets associated with the policy use the same rules.

The goal of this document is to provide an example of how you can tune monitoring for your organization. This example shows you how to copy the generic OC - Operating System monitoring policy and create a new policy called Critical Operating Systems. In this example, the new policy is tuned by editing an existing rule, creating new rules, and then assigning systems to the policy.

See [Related Articles and Resources](#) for links to related information and articles.

## What You Will Need

You need the following to tune monitoring:

- Several assets managed with Oracle Enterprise Manager Ops Center.
- The Policy / Plan Administrator role in order to modify monitoring policies.
- The Fault Administrator role in order to apply a monitoring policy to an asset. To apply the monitoring policy to a group, the Asset Administrator role is also required.

## Tuning Monitoring Rules and Policies

Tuning rules and policies involves creating monitoring policies that meet your organization’s objectives.

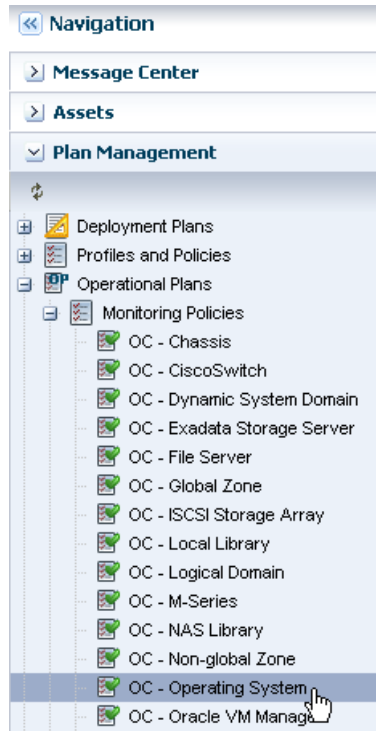
This example describes how to do the following:

- [Create a New Policy](#)
- [Edit a Rule](#)
- [Add New Rules](#)
  - [Add a New Threshold Rule](#)
  - [Add a New Boolean Rule](#)
  - [Add a New Enumerated Rule](#)
- [Associate a Group of Assets With the Policy](#)

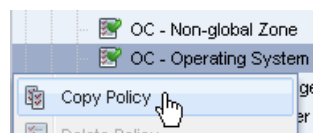
## Create a New Policy

The default set of policies all begin with the letters OC and are read-only. To create a new policy, copy an existing policy for the target type that you want to monitor, such as operating systems.

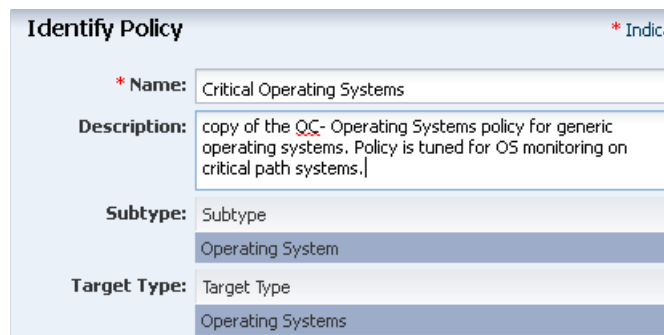
1. Expand Plan Management in the Navigation pane, scroll down to Operational Plans, then click Monitoring Policies.



2. Select the policy you want to copy, then either right click and click Copy Policy or click Copy Policy in the Actions pane. In this example, select and copy the OC - Operating Systems policy.



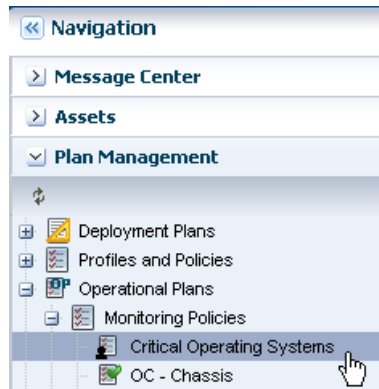
3. Revise the policy name and description for the new policy, then click Next. In this example, the new policy is called Critical Operating Systems.

A screenshot of the 'Identify Policy' dialog box. The dialog has a title bar with 'Identify Policy' and a '\* Indic.' icon. It contains several fields:

- \* Name:** Critical Operating Systems
- Description:** copy of the OC- Operating Systems policy for generic operating systems. Policy is tuned for OS monitoring on critical path systems.
- Subtype:** Subtype (dropdown menu with 'Operating System' selected)
- Target Type:** Target Type (dropdown menu with 'Operating Systems' selected)

4. Click Finish to create the policy.

The policy appears in the list of Monitoring Policies. Click the policy to display details in the center pane. You can now tune the new policy by editing and adding rules.

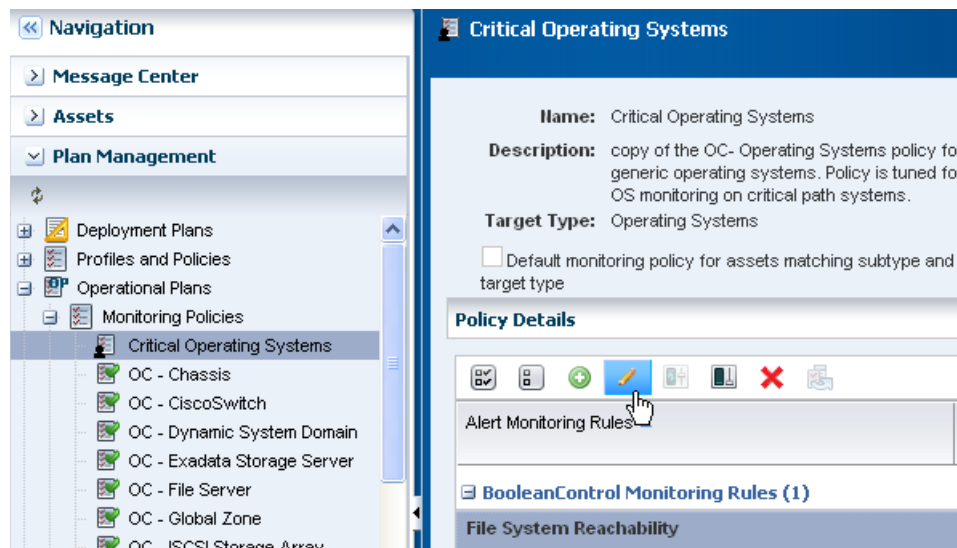


## Edit a Rule

You can only edit rules that are in user-defined policies. You cannot change the monitored attribute, rule name, or description of a user-defined policy, but you can change the monitoring and alert conditions. You can change the monitoring time frame, the amount of time between when the event occurs and the alert to generate, the alert parameters, and the actions.

This example shows how to change the alert parameters for a threshold type rule to be more stringent for the critical operating systems.

1. With the policy open in the center pane, select the rule you want to edit, then click the Edit icon. In this example, the File System Reachability rule in the Boolean Control rules section is selected.



2. Edit the rule parameters. In this example, the default time to generate an alert is changed from 10 minutes to 5 minutes.

**Configure Alert Rule Parameters**

**Rule Type:** Boolean Control

**Monitored Attribute:** FileSystemUsages.name=\*.reachable

**Monitoring Rule Name:** File System Reachability

**Description:** -

Monitor for alert limits continuously  
 Monitor for alert limits at specific time, start at:  End:

**Generate alert after:**  Minutes

Rule Parameters:	
Severity	Monitored Attribute
Critical	FileSystemUsages.name=*.reachable

3. Click Apply to submit the changes.

## Add New Rules

In addition to using the default rules, you can create your own rules and add them to your user-defined monitoring policies. Before you add new rules, you must know the valid constructor details, attributes, and parameters. See [Get a List of the Monitoring Attributes](#) for more information.

The following examples are available for creating a new rule:

- [Add a New Threshold Rule](#)
- [Add a New Boolean Rule](#)
- [Add a New Enumerated Rule](#)

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**Note:** It is a good practice to test your new rules. The software will show that you have successfully added your rule, but it does not test the validity of the new rule. In some, but not all cases, the word No appears in the Enabled column for a newly created, but invalid rule.

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## Get a List of the Monitoring Attributes

The Java documentation contains a list of the valid attributes that you can use when you create new monitoring rules. The Java documentation is in the Software Development Kit package (SUNWxvmoc-sdk.pkg) in the Oracle Enterprise Manager Ops Center downloaded installation bundle.

1. Go to the /OC/xvmoc\_full\_bundle/SunOS\_\*/Product/components/packages directory on the Enterprise Controller. For example:
 

```
/var/tmp/OC/xvmoc_full_bundle/SunOS_i386/Product/components/packages
```
2. Unpack the Software Development Kit package (SUNWxvmoc-sdk.pkg). You can do this on the Enterprise Controller, or any other system.
 

```
# pkgadd -d SUNWxvmoc-sdk.pkg
```
3. Open the javadoc index, then the OperatingSystem javadoc page, or just go to the OperatingSystem javadoc page.

**Index** – file:/// <host\_name>/xvm\_oc/doc/javadoc/index.html

or

**OperatingSystem** page – file:///<host\_name>/xvm\_  
oc/doc/javadoc/com/sun/hss/type/os/OperatingSystem.html

4. Locate the parameter you need. This graphic is an example of the `FileSystemUsage` parameter that is used to construct a Boolean rule later in this document. The javadoc provides the constructor details, and the parameters that you can use in creating a rule. In this case, the parameters are: `name`, `type`, `totalSpace`, `freeSpace`, `usedSpace`, `freeSpacePercentage`, and `usedSpacePercentage`. A brief description appears next to each parameter.

### Constructor Detail

#### FileSystemUsage

```
public FileSystemUsage(java.lang.String name,  
                      java.lang.String type,  
                      long totalSpace,  
                      long freeSpace,  
                      long usedSpace,  
                      float freeSpacePercentage,  
                      float usedSpacePercentage)
```

Constructs a `FileSystemUsage` given its `name`, `type`, total space, free space, used space, free space percentage and

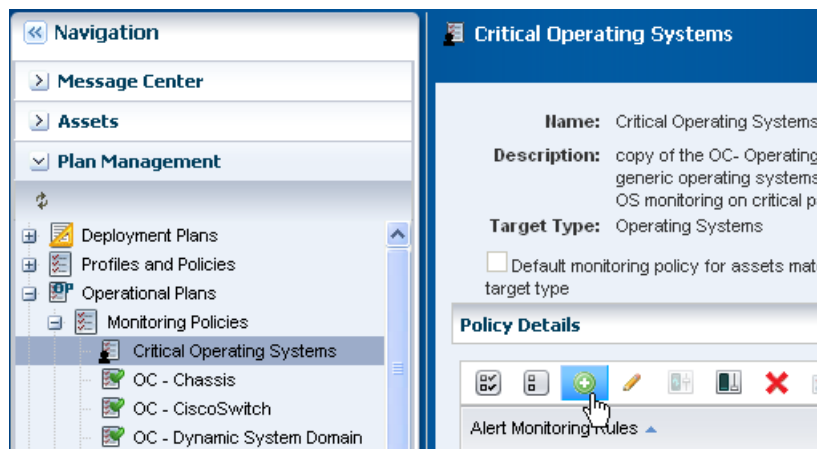
#### Parameters:

`name` - the name of the file system  
`type` - the type of the file system  
`totalSpace` - the total space of the file system  
`freeSpace` - the free space of the file system  
`usedSpace` - the used space of the file system  
`freeSpacePercentage` - the free space percentage  
`usedSpacePercentage` - the used space percentage

## Add a New Threshold Rule

A Threshold rule sets an upper or lower monitoring threshold for the monitored attribute. You must define the monitored attribute for this type of rule. The following are some examples of monitored attributes:

- `CpuUsage.usagePercentage`
  - `ProcessUsage.topMemoryProcesses.pid=*.physicalMemoryUsage`
  - `DiskUsageSet.name=*.busyPercentage`
1. With the policy open in the center pane, click the Add icon.



2. Select Threshold from the menu.

3. Enter the monitored attribute and description.

**Configure Alert Rule Parameters**

\* Rule Type:

\* Asset Type:

\* Monitored Attribute:

\* Monitoring Rule Name:

Description:

Monitor for alert limits continuously

Monitor for alert limits at specific time, start at:  End:

Generate alert after:  Minutes

4. Define the amount of time that can elapse before an alert is generated, then define the alert severity parameters and limits.

Generate alert after:  Minutes

**Rule Parameters:**

Severity	Monitored Attribute	Operator	Value
Critical	DiskUsageSet.name=*.busyPercentage	>	80.00
Warning	DiskUsageSet.name=*.busyPercentage	>	75.00
Info	DiskUsageSet.name=*.busyPercentage	>	70.00

5. Click Apply.

The new rule is now part of the policy.

**Threshold Monitoring Rules (9)**

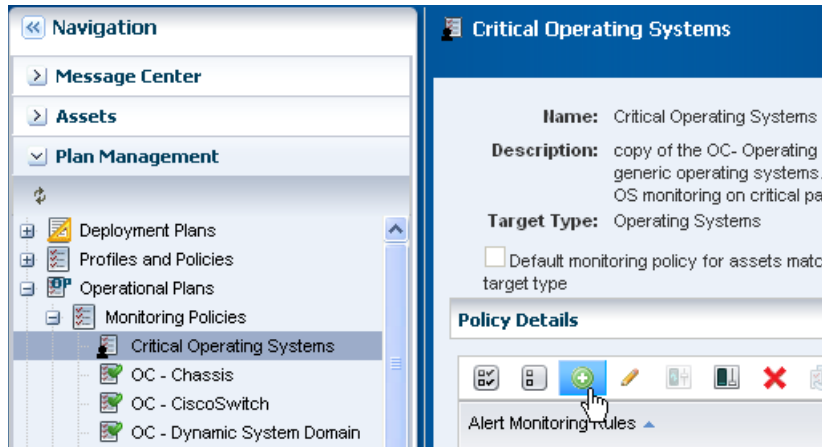
<b>CPU Usage Percentage</b> Immediate Action: N/A	Warning: 90.0
<b>Disk IO Queue Length</b> Immediate Action: N/A	Warning: 3.00
<b>Disk IO Utilization Percentage</b> Immediate Action: N/A	Warning: 95
<b>File System Used Space Percentage</b> Immediate Action: N/A	Critical: 95.0 Warning: 80.0
<b>Memory Usage Percentage</b> Immediate Action: N/A	Warning: 100.0
<b>Percentage of Disk Used</b> disk usage, percent busy Immediate Action: N/A	Critical: 80 Warning: 75 Info: 70

## Add a New Boolean Rule

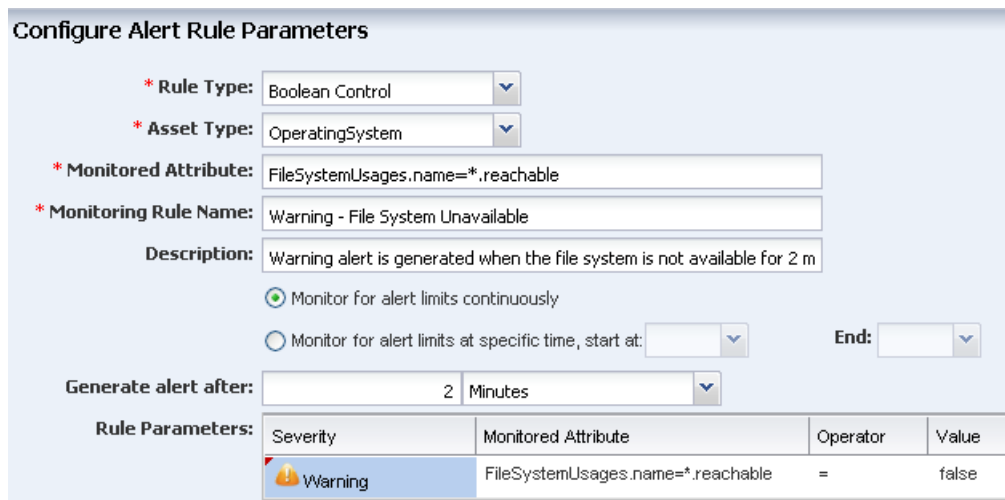
A Boolean rule sets a logical operator of true or false for the monitored attribute.

A default Boolean rule uses the FileSystemUsages.name=\*.reachable parameter and generates a critical problem when the file system is not reachable for five (5) minutes. This example uses the same parameter, but triggers a warning when the file system cannot be reached for two (2) minutes.

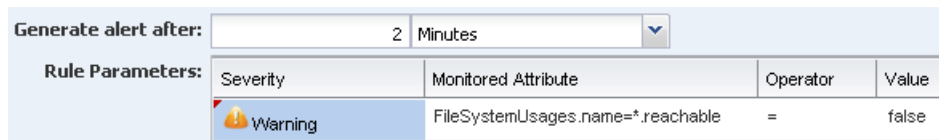
1. With the policy open in the center pane, click the Add icon.



2. Select Boolean Control from the Rule Type menu.
3. Enter `FileSystemUsages.name=*.reachable` in the monitored attribute field, name the rule, and add a description



4. Define the amount of time that can elapse before an alert is generated. This example uses 2 minutes. Select the Warning severity parameter. The monitored attribute is populated from the field at the top of the page. The operator is equals (=) and the Value is false.



5. Click Apply.

The new rule is now part of the policy. The first rule is the default system-defined Boolean control rule that generates a Critical problem when the file system is not reachable for 5 minutes. The second rule, which is highlighted, is the new rule that generates a Warning when the file system is not reachable for 2 minutes.

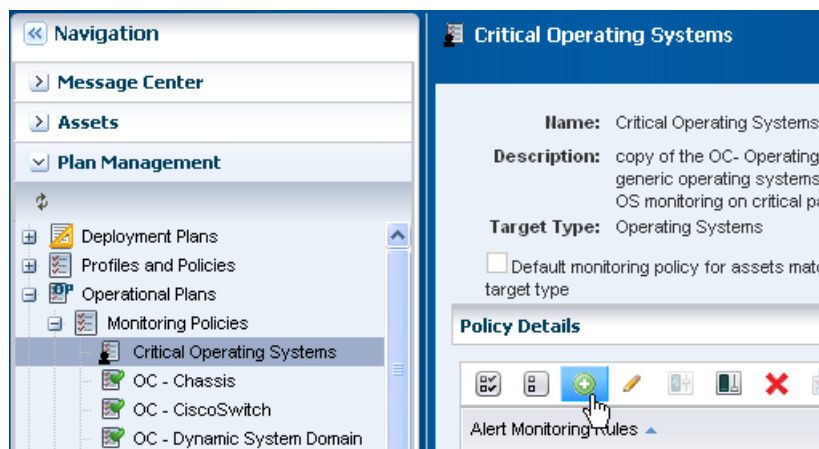


Policy Details		
Alert Monitoring Rules	Alert Limits	Enabled ?
<b>BooleanControl Monitoring Rules (2)</b>		
<b>File System Reachability</b> Immediate Action: N/A	Critical: false	Yes
<b>Warning - File System Unavailable</b> Warning alert is generated when the file system is not available for 2 minutes.	Warning: false	Yes

## Add a New Enumerated Rule

An Enumerated rule contains series of values that defines a subset of specific values among the possible values of the monitored attribute. An alert occurs when the attribute matches one of those specific values. The state of the SMF service for a non-global zone is an example of an enumerated rule. The attribute `ServiceInfos.id=*.state` is used in this example. The rule generates a critical alert when the SMF services are disabled.

1. With the policy open in the center pane, click the Add icon.



2. Select Enumerated Control from the Rule Type drop-down menu and OperatingSystem from the Asset Type drop-down menu.
3. Enter `ServiceInfos.id=*.state` in the monitored attribute field, name the rule, and add a description.

### Configure Alert Rule Parameters

\* Rule Type: Enumerated Control

\* Asset Type: OperatingSystem

\* Monitored Attribute: ServiceInfos.id=\*.state

\* Monitoring Rule Name: SMF Services disabled

Description: SMF services are in a disabled state

Monitor for alert limits continuously

Monitor for alert limits at specific time, start at: [ ] End: [ ]

Generate alert after: 0 Minutes

- Define the amount of time that can elapse before an alert is generated. In this example, the policy is 0 minutes and there is no delay before generating an alert. Select the Critical severity parameter. The monitored attribute is populated from the field at the top of the page. The operator is equals (=) and the Value is disabled.

Generate alert after:  Minutes ▼

Rule Parameters:

	Severity	Monitored Attribute	Operator	Value
<input checked="" type="checkbox"/>	CRITICAL	ServiceInfos.id=* .state	=	disabled
<input type="checkbox"/>	WARNING	ServiceInfos.id=* .state	=	
<input type="checkbox"/>	INFO	ServiceInfos.id=* .state	=	



- Click Apply.

The new rule is now part of the policy. When the SMF service is disabled, a critical alert is generated.

**Policy Details**

Alert Monitoring Rules ▲ | Alert Limits | Enabled ?

**EnumeratedControl Monitoring Rules (2)**

<b>SMF Services disabled</b> SMF services are in a disabled state Immediate Action: N/A	 Critical: disabled	Yes
<b>SMF Service State</b> Immediate Action: N/A	 Critical: maintenance	Yes

## Associate a Group of Assets With the Policy

The software automatically assigns a default monitoring policy when an asset is managed. You can change that default action for a defined set of systems by creating a group and associating the group with your customized monitoring policy.

With this example, you created a monitoring policy called Critical Operating Systems and tuned the rules to be more stringent. Now you can create an asset group and assign the monitoring policy to the group.

You can configure group rules to automatically add newly managed assets to the group. This example assumes that the host name for each of your critical operating systems includes the term *xvm* and uses that as a deciding factor in what is added to the group.

- Click Assets in the Navigation pane, then click Create Group.
- Enter a name and description for the group. Select a Top Level location. In Advanced Options, select Configure Group Rules and Preview Group Before Creation. Click Next.

**Configure Group** \* Indicates Required

Enter the required information to configure a group.

\* **Group Name:**

**Description:**

**Location:**  Top Level (root)  
 Inside a user-defined group or

**Advanced Options:**  Configure group rules  
 Configure subgroups  
 Preview group before creation

- Configure the group rules. Select All, then select Operating System as the asset type in the first drop-down menu. Use the Add icon to add rules. This example uses one rule, which is to add all assets that have a user friendly name that contain the term xvm. Click Next.

**Configure Group Rules**

You can create rules that will automatically add assets to this group based on asset type and characteristics. Any asset that matches asset type and attribute parameters of at least one rule is included in the group.

**Rule 1** To be added, assets must match  All  Any of the rule filters below

- The Preview Group page shows all assets that meet the rules that you defined. These are the assets that will be added to the group. Click Next.

**Preview Group**

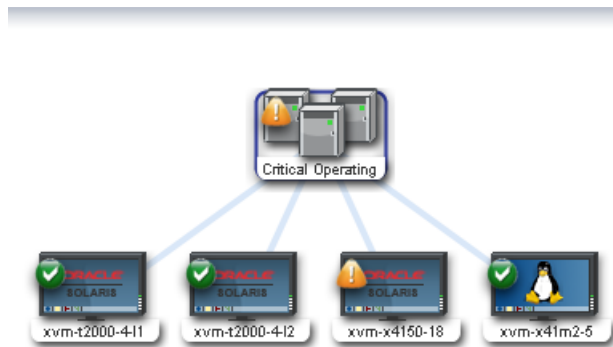
The following assets and subgroups will be included in your group

Assets	
Name	Type
xvm-x41m2-5	OperatingSystem
xvm-t2000-4-l2	OperatingSystem
xvm-x4150-18	OperatingSystem
xvm-t2000-4-l1	OperatingSystem

- Click Finish to create the group.
- Expand Assets, select All User Defined Groups filter from the menu.



Assets

- Select the group. The Summary page and Membership Graph appear in the center pane. The Membership Graph shows the group with four members. One of the members has a Warning alert. The Warning shows on the affected asset and at the group level.



8. Click Apply Monitoring Profile in the Actions pane.
9. Select the policy from the Policy menu, then click Apply.

Select a monitoring policy for the targets:

\* Policy:   

Target(s):

Asset Name	Product Name	Type
xvm-x41m2-5	Oracle VM Server 3.0	Operating System

The policy is now associated with all assets in the group. To see all assets associated with the policy, open the policy in Plan Management, then view the Membership Graph, or click View Associated Assets.

## What's Next?

Use the Analytics feature to analyze how a specific operating system is performing, and further tune the rules. You can create monitoring policies for other asset types and add those policies to your user-defined groups.

A best practice is to tune the rules in the monitoring policy, not the asset. When you tune a rule from the asset view, you create a new policy. The new policy is no longer associated with the group or with other assets of the same type and you can easily lose consistency in your monitoring strategy.

## Related Articles and Resources

The following chapters in the *Oracle Enterprise Manager Ops Center Feature Reference Guide* contain more information:

- Monitoring Rules and Policies
- Asset Management
- Operating Systems

For more examples, see the [How To library](#).

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