



CHAPTER 6

Distributing Device Alias Services

All switches in the Cisco MDS 9000 Family support Distributed Device Alias Services (device alias) on a per-VSAN basis and on a fabric-wide basis. Device alias distribution allows you to move host bus adapters (HBAs) between VSANs without manually reentering alias names.

This chapter includes the following topics:

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- [Guidelines and Limitations, page 6-6](#)
- [Default Settings, page 6-6](#)
- [Configuring Device Aliases, page 6-6](#)
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Information About Device Aliases

When the port WWN (pWWN) of a device must be specified to configure different features (zoning, QoS, port security) in a Cisco MDS 9000 Family switch, you must assign the correct device name each time you configure these features. An incorrect device name can cause unexpected results. You can avoid this problem if you define a user-friendly name for a port WWN and use this name in all of the configuration commands as required. These user-friendly names are referred to as *device aliases* in this chapter.

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About Device Alias Modes

Device alias supports two modes: basic and enhanced mode.

- When device alias runs in the basic mode, all applications function like the applications on the Cisco SAN-OS Release 3.0 switches. When you configure the basic mode using device aliases, the application immediately expands to pWWNs. This operation continues until the mode is changed to enhanced.
- When device alias runs in the enhanced mode, all applications accept the device-alias configuration in the native format. The applications store the device alias name in the configuration and distribute it in the device alias format instead of expanding to pWWN. The applications track the device alias database changes and take actions to enforce it.

A native device-alias configuration is not accepted in the interop mode VSAN. IVR zoneset activation will fail in interop mode VSANs if the corresponding twilight zones being injected are native device alias members.

Changing Mode Settings

When the device alias mode is changed from basic to enhanced mode, the applications are informed about the change. The applications start accepting the device alias-based configuration in the native format.



Note

Because the device alias was previously running in the basic mode, the applications do not have any prior native device alias configuration.

The applications check for an existing device alias configuration in the native format. If the device alias is in the native format, the applications reject the request and device alias mode cannot be changed to basic.

All native device alias configurations (both on local and remote switches) must be explicitly removed, or all device alias members must be replaced with the corresponding pWWN before changing the mode back to basic.

Device Alias Mode Distribution

If the device alias distribution is turned on, it is distributed to the other switches in the network whenever there is a change in the mode. You cannot change the mode from basic to enhanced unless all the switches are upgraded to Cisco SAN-OS Release 3.1. The device alias enhancements will not apply unless the entire fabric is upgraded to Cisco SAN-OS Release 3.1.



Note

When all the switches are upgraded to Cisco SAN-OS Release 3.1, you cannot automatically convert to enhanced mode. You do not need to change to enhanced mode, you can continue working in the basic mode.

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Merging Device Alias

If two fabrics are running different device alias modes and are joined together, the device alias merge will fail. There is no automatic conversion of one mode to the other during the merge process. You will need to resolve the issue.

**Note**

Release 3.0 switches run in basic mode.

At the application level, a merger takes place between the applications and the fabric. For example, zone merge occurs when the E port is up and the IVR/PSM/DPVM merge occurs due to CFS. This merge is completely independent of the device alias merge.

If the application running on an enhanced fabric has a native device alias configuration, the application must fail the merge. The application has to fail the merge even though the other fabric is can support the native device alias-based configuration, but is running in the basic mode. You will need to resolve the issue. Once the device alias merge issue is resolved, each application must be fixed accordingly.

Resolving Merge and Device Alias Mode Mismatch

If two fabrics are running in different modes and the device alias merge fails between the fabrics, the conflict can be resolved by selecting one mode or the other. If you choose the enhanced mode, ensure that all the switches are running at least the Cisco SAN-OS Release 3.1. Otherwise, the enhanced mode cannot be turned on. If you choose the basic mode, the applications running on the enhanced fabric have to comply with the device alias merge.

The device alias merge fails because of mode mismatch, but the application merge succeeds if it does not have any native device alias configurations.

If the native device alias configuration is attempted on an application from a Release 3.1 switch, the commit must be rejected because of device alias mode mismatch on some of the applications.

**Note**

The applications should not accept any native device alias configuration over SNMP if the device alias is running in the basic mode on that particular switch.

**Note**

Confcheck is added when the enhanced mode is turned on and removed when it is turned off. Applications have to add confcheck if they have a device alias configuration in the native format. They have to remove confcheck once the configuration is removed.

Device Alias Features

Device aliases have the following features:

- The device alias information is independent of your VSAN configuration.
- The device alias configuration and distribution is independent of the zone server and the zone server database.
- You can import legacy zone alias configurations without losing data.

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- The device alias application uses the Cisco Fabric Services (CFS) infrastructure to enable efficient database management and distribution. Device aliases use the coordinated distribution mode and the fabric-wide distribution scope (refer to the *Cisco MDS 9000 Family NX-OS System Management Configuration Guide*).
- When you configure zones, IVR zones, or QoS features using device aliases, and if you display these configurations, the device aliases are automatically displayed along with their respective pWWNs.

Device Alias Requirements

Device aliases have the following requirements:

- You can only assign device aliases to pWWNs.
- The mapping between the pWWN and the device alias to which it is mapped must have a one-to-one relationship. A pWWN can be mapped to only one device alias and vice versa.
- A device alias name is restricted to 64 alphanumeric characters and may include one or more of the following characters:
 - a to z and A to Z
 - 1 to 9
 - - (hyphen) and _ (underscore)
 - \$ (dollar sign) and ^ (up caret)

Zone Aliases Versus Device Aliases

[Table 6-1](#) compares the configuration differences between zone-based alias configuration and device alias configuration.

Table 6-1 Comparison Between Zone Aliases and Device Aliases

Zone-Based Aliases	Device Aliases
Aliases are limited to the specified VSAN.	You can define device aliases without specifying the VSAN number. You can also use the same definition in one or more VSANs without any restrictions.
Zone aliases are part of the zoning configuration. The alias mapping cannot be used to configure other features.	Device aliases can be used with any feature that uses the pWWN.
You can use any zone member type to specify the end devices.	Only pWWNs are supported along with new device aliases such as IP addresses.
Configuration is contained within the Zone Server database and is not available to other features.	Device aliases are not restricted to zoning. Device alias configuration is available to the FCNS, zone, fcping, traceroute, and IVR applications.

Device Alias Databases

The device alias feature uses two databases to accept and implement device alias configurations:

- Effective database—The database currently used by the fabric.

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- Pending database—Your subsequent device alias configuration changes are stored in the pending database.

If you modify the device alias configuration, you need to commit or discard the changes as the fabric remains locked during this period.

About Device Alias Distribution

By default, device alias distribution is enabled. The device alias feature uses the coordinated distribution mechanism to distribute the modifications to all switches in a fabric.

If you have not committed the changes and you disable distribution, then a commit task will fail.

About Creating a Device Alias

When you perform the first device alias task (regardless of which device alias task), the fabric is automatically locked for the device alias feature. Once you lock the fabric, the following situations apply:

- No other user can make any configuration changes to this feature.
- A copy of the effective database is obtained and used as the pending database. Modifications from this point on are made to the pending database. The pending database remains in effect until you commit the modifications to the pending database or discard (**abort**) the changes to the pending database.

Fabric Lock Override

If you have performed a device alias task and have forgotten to release the lock by either committing or discarding the changes, an administrator can release the lock from any switch in the fabric. If the administrator performs this task, your changes to the pending database are discarded and the fabric lock is released.



Tip

The changes are only available in the volatile directory and are subject to being discarded if the switch is restarted.

About Legacy Zone Alias Configuration Conversion

You can import legacy zone alias configurations to use this feature without losing data if they follow the following restrictions:

- Each zone alias has only one member.
- The member type is pWWN.
- The name and definition of the zone alias should not be the same as any existing device alias name.

If any name conflict exists, the zone aliases are not imported.

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**Tip**

Ensure that you copy any required zone aliases to the device alias database as required by your configuration.

When an import operation is complete, the modified alias database is distributed to all other switches in the physical fabric when you perform the **commit** operation. At this time if you do not want to distribute the configuration to other switches in the fabric, you can perform the **abort** operation and the merge changes are completely discarded.

Guidelines and Limitations

This section explains the database guidelines for this feature.

For information about CFS merge support, refer to the *Cisco MDS 9000 Family NX-OS System Management Configuration Guide* for detailed concepts.

When merging two device alias databases, follow these guidelines:

- Verify that two device aliases with different names are not mapped to the same pWWN.
- Verify that two different pWWNs are not mapped to the same device aliases
- Verify that the combined number of the device aliases in both databases does not exceed 8191 (8K). For example, if database N has 6000 device aliases and database M has 2192 device aliases, this merge operation will fail.

Default Settings

Table 6-2 lists the default settings for device alias parameters.

Table 6-2 **Default Device Alias Parameters**

Parameters	Default
Database in use	Effective database.
Database to accept changes	Pending database.
Device alias fabric lock state	Locked with the first device alias task.

Configuring Device Aliases

This section includes the following topics:

- [Creating Device Aliases, page 6-7](#)
- [Distributing the Device Alias Database, page 6-7](#)
- [Committing Changes, page 6-7](#)
- [Discarding Changes, page 6-8](#)
- [Using Device Aliases or FC Aliases, page 6-8](#)
- [Populating Device Alias to Interface Description, page 6-9](#)

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Creating Device Aliases

Detailed Steps

To lock the fabric and create a device alias in the pending database, follow these steps:

-
- | | |
|---------------|---|
| Step 1 | Expand End Devices , and then select Device Alias in the Physical Attributes pane.
You see the device alias configuration in the Information pane. |
| Step 2 | Click the Configuration tab and click the Create Row icon.
You see the Device Alias Creation dialog box. |
| Step 3 | Select a switch from the drop-down menu. |
| Step 4 | Complete the Alias name and pWWN fields. |
| Step 5 | Click Create to create this alias or click Close to discard any unsaved changes. |
-

Distributing the Device Alias Database

Detailed Steps

To enable the device alias distribution, follow these steps:

-
- | | |
|---------------|---|
| Step 1 | Expand End Devices and then select Device Alias in the Physical Attributes pane.
You see the device alias configuration in the Information pane.
The CFS tab is the default tab. |
| Step 2 | Select enable from the Global drop-down menus to enabled switch aliases. |
| Step 3 | Select commit from the Config Action drop-down menu for the newly enabled switches. |
| Step 4 | Click Apply Changes to commit and distribute these changes or click Undo Changes to discard any unsaved changes. |
-

Committing Changes

If you commit the changes made to the pending database, the following events occur:

1. The pending database contents overwrites the effective database contents.
2. The pending database is emptied of its contents.
3. The fabric lock is released for this feature.

Detailed Steps

To commit the changes to the device alias database, follow these steps:

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-
- Step 1** Expand **End Devices**, and then select **Device Alias** in the Physical Attributes pane.
You see the device alias configuration in the Information pane. The **CFS** tab is the default tab.
- Step 2** Select **enable** from the Global drop-down menus to enable switch aliases.
- Step 3** Select **commit** from the Config Action drop-down menu for the newly enabled switches.
- Step 4** Click **Apply Changes** to commit and distribute these changes or click **Undo Changes** to discard any unsaved changes.
-

Discarding Changes

If you discard the changes made to the pending database, the following events occur:

1. The effective database contents remain unaffected.
2. The pending database is emptied of its contents.
3. The fabric lock is released for this feature.

Detailed Steps

To discard the device alias session, follow these steps:

-
- Step 1** Expand **End Devices** and then select **Device Alias** in the Physical Attributes pane.
You see the device alias configuration in the Information pane. The **CFS** tab is the default tab.
- Step 2** Select **abort** from the Config Action drop-down menu.
- Step 3** Click **Apply Changes** to discard the session.
-

Using Device Aliases or FC Aliases

You can change whether DCNM-SAN uses FC aliases or global device aliases from DCNM-SAN Client without restarting Cisco DCNM for SAN.

Detailed Steps

To change whether DCNM-SAN uses FC aliases or global device aliases, follow these steps:

-
- Step 1** Click **Server > Admin**.
You see the Admin dialog box.
- Step 2** For each fabric that you are monitoring with Cisco DCNM for SAN, check the **Device Alias** check box to use global device aliases, or uncheck to use FC aliases.
- Step 3** Click **Apply** to save these changes or click **Close** to exit the dialog box without saving any changes.
-

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Populating Device Alias to Interface Description

When an end device is not logged into the switch, the Device Alias is blank. To find out what device is supposed to connect to an FC port when the device is logged out, you can populate the interface description with the device alias when the devices are logged in.

Detailed Steps

To populate the interface description with the device alias, follow these steps:

-
- Step 1** From the Physical Attributes pane, expand End Devices.
 - Step 2** From the right pane, click the **General** tab.
 - Step 3** Select the rows of FC interfaces.
 - Step 4** Click the **Alias->Description** button.
 - Step 5** Click the **commit** button.
-

Field Descriptions for Device Aliases

This section displays the field descriptions for this feature.

Device Alias Configuration

Field	Description
Device Alias	The device alias of this entry. A device can have only one alias configured.
WWN	The Fibre Channel device which is given a device alias.

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Device Alias Mode

Field	Description
ConfigMode	Specifies the mode in which the device aliases can be configured. When it is set to basic, the device aliases operate in basic mode of operation. When basic mode is turned on, all MIBs which are using device aliases should internally convert them to their equivalent pWWNs and use the pWWNs. The mechanism to be followed for this conversion is implementation specific. When it is set to enhanced, the Device aliases operate in enhanced mode of operation. When enhanced mode is turned on, all MIBs which are using device aliases should use them as is without any conversion. Since the device aliases are used directly without any conversion, this is the native mode of operation of device aliases.

Device Alias Discrepancies

Field	Description
Discrepancy	Represents the checksum computed over the database represented by cfdaConfigTable and the cfdaConfigMode object. This object is used by a network manager to check if the above mentioned objects have changed on the local device. The method used to compute the checksum is implementation specific.

Additional References

For additional information related to implementing VSANs, see the following section:

- [Related Document, page 6-11](#)
- [Standards, page 6-11](#)
- [RFCs, page 6-11](#)

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- [MIBs, page 6-11](#)

Related Document

Related Topic	Document Title
Cisco MDS 9000 Family Command Reference	<i>Cisco MDS 9000 Family Command Reference</i>

Standards

Standard	Title
No new or modified standards are supported by this feature, and support for existing standards has not been modified by this feature.	—

RFCs

RFC	Title
No new or modified RFCs are supported by this feature, and support for existing RFCs has not been modified.	—

MIBs

MIBs	MIBs Link
• CISCO-FC-DEVICE-ALIAS-MIB	To locate and download MIBs, go to the following URL: http://www.cisco.com/en/US/products/ps5989/prod_technical_reference_list.html

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