



## CHAPTER 24

# Distributing Device Alias Services

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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 sections:

- [About Device Aliases, page 24-1](#)
- [Device Alias Databases, page 24-2](#)
- [About Legacy Zone Alias Configuration You can import legacy zone alias configurations to use this feature without losing data, if they satisfy the following restrictions:, page 24-6](#)
- [Device Alias Statistics Cleanup, page 24-7](#)
- [Device Alias Configuration Verification, page 24-7](#)
- [Default Settings, page 24-11](#)

## About Device Aliases

When the port WWN 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 right device name each time you configure these features. An inaccurate device name may cause unexpected results. You can circumvent this problem if you define a user-friendly name for a port WWN and use this name in all the configuration commands as required. These user-friendly names are referred to as *device aliases* in this chapter.

## 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.
- 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 (see [Chapter 6, “Using the CFS Infrastructure”](#)).

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- When you configure zones, IVR zones, or QoS features using device aliases, and if you display these configurations, you will automatically see that the device aliases are 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 24-1 compares the configuration differences between zone-based alias configuration and device alias configuration.

**Table 24-1** 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 like 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.
- Pending database—Your subsequent device alias configuration changes are stored in the pending database.

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

This section includes the following sections:

- [Creating Device Aliases](#), page 24-3
- [About Device Alias Distribution](#), page 24-3
- [Committing Changes](#), page 24-4
- [Discarding Changes](#), page 24-4
- [About Legacy Zone Alias Configuration](#) You can import legacy zone alias configurations to use this feature without losing data, if they satisfy the following restrictions:, page 24-6
- [Disabling and Enabling Device Alias Distribution](#), page 24-5

## Creating Device Aliases

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

	Command	Purpose
Step 1	switch# <b>config t</b> switch(config)#	Enters configuration mode.
Step 2	switch(config)# <b>device-alias database</b> switch(config-device-alias-db)#	Enters the pending database configuration submode.
Step 3	switch(config-device-alias-db)# <b>device-alias name Device1 pwwn 21:01:00:e0:8b:2e:80:93</b>	Specifies a device name (Device1) for the device that is identified by its pWWN. Starts writing to the pending database and simultaneously locks the fabric as this is the first-issued device alias configuration command.
	switch(config-device-alias-db)# <b>no device-alias name Device1</b>	Removes the device name (Device1) for the device that is identified by its pWWN.
	switch(config-device-alias-db)# <b>device-alias rename Device1 Device2</b>	Renames an existing device alias (Device1) with a new name (Device2).

To display the device alias configuration, use the **show device-alias name** command.

```
switch# show device-alias name x
device-alias name x pwwn 21:01:00:e0:8b:2e:80:93
```

## 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 (See [Example 24-1](#)).

### Example 24-1 Displays a Failed Status

```
switch# show device-alias status
```

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```
Fabric Distribution: Disabled
Database:- Device Aliases 25
Status of the last CFS operation issued from this switch:
=====
Operation: Commit
Status: Failed (Reason: Operation is not permitted as the fabric distribution is
currently disabled.)
```

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.

- Step 1** Select a switch from the drop-down menu.
- Step 2** Complete the Alias name and pWWN fields.

## 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.

To commit the changes, follow these steps:

	Command	Purpose
<b>Step 1</b>	switch# <b>config t</b> switch(config)#	Enters configuration mode.
<b>Step 2</b>	switch(config)# <b>device-alias commit</b>	Commits the changes made to the currently active session.

## 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.

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To display the status of the discard operation, use the show **device alias status** command.

	Command	Purpose
Step 1	switch# <b>config t</b> switch(config)#	Enters configuration mode.
Step 2	switch(config)# <b>device-alias abort</b>	Discards the currently active session.

```
switch# show device-alias status
Fabric Distribution: Enabled
Database:- Device Aliases 24
Status of the last CFS operation issued from this switch:
=====
Operation: Abort
Status: Success
```

## 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.

To use administrative privileges and release a locked device alias session, use the **clear device-name session** command in EXEC mode.

```
switch# clear device-alias session
```

To display the status of the clear operation, use the **show device-alias status** command.

```
switch# show device-alias status
Fabric Distribution: Enabled
Database:- Device Aliases 24
Status of the last CFS operation issued from this switch:
=====
Operation: Clear Session <-----Lock released by administrator
Status: Success <-----Successful status of the operation
```

## Disabling and Enabling Device Alias Distribution

To disable or enable the device alias distribution, follow these steps:

	Command	Purpose
Step 1	switch# <b>config t</b> switch(config)#	Enters configuration mode.
Step 2	switch(config)# <b>no device-alias distribute</b>	Disables the distribution.
	switch(config)# <b>device-alias distribute</b>	Enables the distribution (default).

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To display the status of device alias distribution, use the `show device-alias status` command (see [Example 24-2](#) and [Example 24-3](#)).

### Example 24-2 Displays Device Alias Status When Distribution Is Enabled

```
switch# show device-alias status
Fabric Distribution: Enabled <-----Distribution is enabled
Database:-Device Aliases 24
Locked By:-User "Test" SWWN 20:00:00:0c:cf:f4:02:83<-Lock holder's user name and switch ID
Pending Database:- Device Aliases 24
Status of the last CFS operation issued from this switch:
=====
Operation: Enable Fabric Distribution
Status: Success
```

### Example 24-3 Displays Device Alias Status When Distribution Is Disabled

```
switch# show device-alias status
Fabric Distribution: Disabled
Database:- Device Aliases 24
Status of the last CFS operation issued from this switch:
=====
Operation: Disable Fabric Distribution
Status: Success
```

**About Legacy Zone Alias Configuration** You can import legacy zone alias configurations to use this feature without losing data, if they satisfy 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.



#### Tip

Ensure to 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.

## Imported a Zone Alias

To import the zone alias for a specific VSAN, follow these steps:

	Command	Purpose
Step 1	switch# <b>config t</b> switch(config)#	Enters configuration mode.
Step 2	switch(config)# <b>device-alias import fcalias vsan 3</b>	Imports the fcalias information for the specified VSAN.

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To display device alias information in zone sets, use the **show zoneset** command (see [Example 24-4](#) and [Example 24-5](#)).

### Example 24-4 Displays the Device Aliases in the Zone Set Information

```
switch# show zoneset
zoneset name s1 vsan 1
  zone name z1 vsan 1
    pwwn 21:01:00:e0:8b:2e:80:93 [x] <-----Device alias displayed for each pWWN.
    pwwn 21:00:00:20:37:39:ab:5f [y]
  zone name z2 vsan 1
    pwwn 21:00:00:e0:8b:0b:66:56 [SampleName]
    pwwn 21:00:00:20:37:39:ac:0d [z]
```

### Example 24-5 Displays the Device Aliases in the Active Zone Set

```
switch# show zoneset active
zoneset name s1 vsan 1
  zone name z1 vsan 1
    * fcid 0x670100 [pwwn 21:01:00:e0:8b:2e:80:93] [x]
    pwwn 21:00:00:20:37:39:ab:5f [y]

  zone name z2 vsan 1
    * fcid 0x670200 [pwwn 21:00:00:e0:8b:0b:66:56] [SampleName]
    pwwn 21:00:00:20:37:39:ac:0d [z]
```

## Device Alias Statistics Cleanup

Use the **clear device-name statistics** command to clear device alias statistics (for debugging purposes):

```
switch# clear device-alias statistics
```

## Database Merge Guidelines

Refer to the “[CFS Merge Support](#)” section on [page 6-8](#) 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.

## Device Alias Configuration Verification

You can view device alias information by using the **show device-alias** command. See [Examples 24-6](#) to [24-17](#).

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**Example 24-6 Displays All Configured Device Aliases from the Effective Database**

```
switch# show device-alias database
device-alias name SampleName pwwn 21:00:00:e0:8b:0b:66:56
device-alias name x pwwn 21:01:00:e0:8b:2e:80:93

Total number of entries = 2
```

**Example 24-7 Displays the Pending Database with No Modifications**

```
switch# show device-alias database pending
There are no pending changes
```

**Example 24-8 Displays the Pending Database with Modifications**

```
switch# show device-alias database pending
device-alias name x pwwn 21:01:00:e0:8b:2e:80:93
device-alias name SampleName pwwn 21:00:00:e0:8b:0b:66:56
device-alias name y pwwn 21:00:00:20:37:39:ab:5f
device-alias name z pwwn 21:00:00:20:37:39:ac:0d

Total number of entries = 4
```

**Example 24-9 Displays the Specified Device Name in the Pending Database**

```
switch# show device-alias name x pending
device-alias name x pwwn 21:01:00:e0:8b:2e:80:93
```

**Example 24-10 Displays the Specified pWWN in the Pending Database**

```
switch# show device-alias pwwn 21:01:00:e0:8b:2e:80:93 pending
device-alias name x pwwn 21:01:00:e0:8b:2e:80:93
```

**Example 24-11 Displays the Difference Between the Pending and Effective Databases**

```
switch# show device-alias database pending-diff
- device-alias name Doc pwwn 21:01:02:03:00:01:01:01
+ device-alias name SampleName pwwn 21:00:00:e0:8b:0b:66:56
```

**Example 24-12 Displays the Specified pWWN**

```
switch# show device-alias pwwn 21:01:01:01:01:11:01:01
device-alias name Doc pwwn 21:01:01:01:01:11:01:01
```

**Example 24-13 Displays the Device Alias in the FLOGI Database**

```
switch# show flogi database
-----
INTERFACE  VSAN      FCID          PORT NAME          NODE NAME
-----
fc2/9      1         0x670100     21:01:00:e0:8b:2e:80:93  20:01:00:e0:8b:2e:80:93
                                     [x] <-----Device alias name
```



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```
fc2/12      1      0x670200  21:00:00:e0:8b:0b:66:56  20:00:00:e0:8b:0b:66:56
                [SampleName] <-----Device alias name
```

```
Total number of flogi = 2
```

**Example 24-14 Displays the Device Alias in the FCNS Database**

```
switch# show fcns database
```

```
VSAN 1:
```

```
-----
FCID          TYPE  PWWN                                (VENDOR)          FC4-TYPE:FEATURE
-----
0x670100      N     21:01:00:e0:8b:2e:80:93 (Qlogic)          scsi-fcp:init
                [x]
0x670200      N     21:00:00:e0:8b:0b:66:56 (Qlogic)          scsi-fcp:init
                [SampleName]
```

```
Total number of entries = 2
```

**Example 24-15 Displays the fcping Statistics for the Specified Device Alias**

```
switch# fcping device-alias x vsan 1
28 bytes from 21:01:00:e0:8b:2e:80:93 time = 358 usec
28 bytes from 21:01:00:e0:8b:2e:80:93 time = 226 usec
28 bytes from 21:01:00:e0:8b:2e:80:93 time = 372 usec
```

**Example 24-16 Displays the fctrace Information for the Specified Device Alias**

```
switch# fctrace device-alias x vsan 1
Route present for : 21:01:00:e0:8b:2e:80:93
20:00:00:05:30:00:4a:e2(0xffffc67)
```

Where available, device aliases are displayed regardless of a member being configured using a **device-alias** command or a zone-specific **member pwwn** command (see [Example 24-4](#) and [Example 24-5](#)).

**Example 24-17 Displays Statistics for the Device Alias Application**

```
switch# show device-alias statistics
Device Alias Statistics
=====
Lock requests sent: 2
Database update requests sent: 1
Unlock requests sent: 1
Lock requests received: 1
Database update requests received: 1
Unlock requests received: 1
Lock rejects sent: 0
Database update rejects sent: 0
Unlock rejects sent: 0
Lock rejects received: 0
Database update rejects received: 0
Unlock rejects received: 0
Merge requests received: 0
Merge request rejects sent: 0
Merge responses received: 2
Merge response rejects sent: 0
```

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```
Activation requests received: 0
Activation request rejects sent: 0
Activation requests sent: 2
Activation request rejects received: 0
```

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## Default Settings

Table 24-2 lists the default settings for device alias parameters.

**Table 24-2**      ***Default Device Alias Parameters***

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

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