



# CHAPTER 25

## Creating Dynamic VSANs

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### Information About DPVM

Port VSAN membership on the switch is assigned on a port-by-port basis. By default each port belongs to the default VSAN.

You can dynamically assign VSAN membership to ports by assigning VSANs based on the device WWN. This method is referred to as Dynamic Port VSAN Membership (DPVM). DPVM offers flexibility and eliminates the need to reconfigure the port VSAN membership to maintain fabric topology when a host or storage device connection is moved between two Cisco MDS 9000 family switches or two ports within a switch. It retains the configured VSAN regardless of where a device is connected or moved. To assign VSANs statically, see [Chapter 19, “Configuring and Managing VSANs.”](#)

DPVM configurations are based on port world wide name (pWWN) and node world wide name (nWWN) assignments. A DPVM database contains mapping information for each device pWWN/nWWN assignment and the corresponding VSAN. The Cisco NX-OS software checks the database during a device FLOGI and obtains the required VSAN details.

The pWWN identifies the host or device and the nWWN identifies a node consisting of multiple devices. You can assign any one of these identifiers or any combination of these identifiers to configure DPVM mapping. If you assign a combination, then preference is given to the pWWN.

DPVM uses the Cisco Fabric Services (CFS) infrastructure to allow efficient database management and distribution. DPVM uses the application driven, coordinated distribution mode and the fabric-wide distribution scope (for information about CFS, refer to the *Cisco MDS 9000 Family NX-OS System Management Configuration Guide*).

**Note**

DPVM does not cause any changes to device addressing. DPVM only pertains to the VSAN membership of the device, ensuring that the host gets the same VSAN membership on any port on the switch. For example, if a port on the switch has a hardware failure, you can move the host connection to another port on the switch and you do not need to update the VSAN membership manually.

**Note**

DPVM is not supported on FL ports. DPVM is supported only on F ports.

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## About DPVM Configuration

To use the DPVM feature as designed, be sure to verify the following requirements:

- The interface through which the dynamic device connects to the Cisco MDS 9000 Family switch must be configured as an F port.
- The static port VSAN of the F port should be valid (not isolated, not suspended, and in existence).
- The dynamic VSAN configured for the device in the DPVM database should be valid (not isolated, not suspended, and in existence).

**Note**

The DPVM feature overrides any existing static port VSAN membership configuration. If the VSAN corresponding to the dynamic port is deleted or suspended, the port is shut down.

## About DPVM Databases

The DPVM database consists of a series of device mapping entries. Each entry consists of a device pWWN or nWWN assignment along with the dynamic VSAN to be assigned. You can configure a maximum of 16,000 DPVM entries in the DPVM database. This database is global to the whole switch (and fabric) and is not maintained for each VSAN.

The DPVM feature uses three databases to accept and implement configurations.

- Configuration (config) database—All configuration changes are stored in the configuration database when distribution is disabled.
- Active database—The database currently enforced by the fabric.

- Pending database—All configuration changes are stored in the DPVM pending database when distribution is enabled (see the “[About DPVM Database Distribution](#)” section on page 25-3).

Changes to the DPVM config database are not reflected in the active DPVM database until you activate the DPVM config database. Changes to the DPVM pending database are not reflected in the config or active DPVM database until you commit the DPVM pending database. This database structure allows you to create multiple entries, review changes, and let the DPVM config and pending databases take effect.

## About Autolearned Entries

The DPVM database can be configured to automatically learn (autolearn) about new devices within each VSAN. The autolearn feature can be enabled or disabled at any time. Learned entries are created by populating device pWWNs and VSANs in the active DPVM database. The active DPVM database should already be available to enable autolearn.

You can delete any learned entry from the active DPVM database when you enable autolearn. These entries only become permanent in the active DPVM database when you disable autolearn.



### Note

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Autolearning is only supported for devices connected to F ports. Devices connected to FL ports are not entered into the DPVM database because DPVM is not supported on FL ports.

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The following conditions apply to learned entries:

- If a device logs out while autolearn is enabled, that entry is automatically deleted from the active DPVM database.
- If the same device logs multiple times into the switch through different ports, then the VSAN corresponding to last login is remembered.
- Learned entries do not override previously configured and activated entries.
- Learning is a two-part process—Enabling autolearning followed by disabling autolearning. When the **auto-learn** option is enabled, the following applies:
  - Learning currently logged-in devices—Occurs from the time learning is enabled.
  - Learning new device logins—Occurs as and when new devices log in to the switch.

## About DPVM Database Distribution

Using the CFS infrastructure, each DPVM server learns the DPVM database from each of its neighboring switches during the ISL bring-up process. If you change the database locally, the DPVM server notifies its neighboring switches, and that database is updated by all switches in the fabric.

If fabric distribution is enabled, all changes to the configuration database are stored in the DPVM pending database. These changes include the following tasks:

- Adding, deleting, or modifying database entries.
- Activating, deactivating, or deleting the configuration database.
- Enabling or disabling autolearning.

These changes are distributed to all switches in a fabric when you commit the changes. You can also discard (abort) the changes at this point.

**Tip**


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You can view the contents of the DPVM pending database by using the **show dpvm pending** command.

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**Tip**


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See the “[Viewing the Pending Database](#)” section on page 25-16 to view the contents of the of the pending database.

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If the DPVM database is available on all switches in the fabric, devices can be moved anywhere and offer the greatest flexibility. To enable database distribution to the neighboring switches, the database should be consistently administered and distributed across all switches in the fabric. The Cisco NX-OS software uses the Cisco Fabric Services (CFS) infrastructure to achieve this requirement (refer to the *Cisco MDS 9000 Family NX-OS System Management Configuration Guide*).

## About Locking the Fabric

The first action that modifies the existing configuration creates the DPVM pending database and locks the feature in the fabric. Once you lock the fabric, the following conditions apply:

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

## About Copying DPVM Databases

The following circumstances may require the active DPVM database to be copied to the DPVM config database:

- If the learned entries are only added to the active DPVM database.
- If the DPVM config database or entries in the DPVM config database are accidentally deleted.

**Note**


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If you copy the DPVM database and fabric distribution is enabled, you must commit the changes.

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## Licensing Requirements for VSANs

The following table shows the licensing requirements for this feature:

License	License Description
ENTERPRISE_PKG	The enterprise license is required to enable VSAN. For a complete explanation of the licensing scheme, see the <i>Cisco MDS 9000 Family NX-OS Licensing Guide</i> .

## Guidelines and Limitations

This section explains the database guidelines for this feature.

A database merge refers to a union of the configuration database and static (unlearned) entries in the active DPVM database. For information about CFS merge support, refer to the *Cisco MDS 9000 Family NX-OS System Management Configuration Guide* for detailed concepts.

When merging the DPVM database between two fabrics, follow these guidelines:

- Verify that the activation status and the autolearn status is the same in both fabrics.
- Verify that the combined number of device entries in each database does not exceed 16 K.



### Caution

If you do not follow these two conditions, the merge will fail. The next distribution will forcefully synchronize the databases and the activation states in the fabric.

## Default Settings

Table 25-1 lists the default settings for DPVM parameters.

**Table 25-1** Default DPVM Parameters

Parameters	Default
DPVM	Disabled.
DPVM distribution	Enabled.
Autolearning	Disabled.

## Creating DPVM

This section includes the following topics:

- [Enabling DPVM section, page 25-6](#)
- [Configuring DPVM with the DPVM Wizard section, page 25-6](#)
- [Configuring DPVM Config and Pending Databases section, page 25-7](#)
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- [Comparing Database Differences section, page 25-13](#)

## Enabling DPVM

### Prerequisites

To begin configuring DPVM, you must explicitly enable DPVM on the required switches in the fabric. By default, this feature is disabled in all switches in the Cisco MDS 9000 Family.

The configuration and verification commands for DPVM are only available when DPVM is enabled on a switch. When you disable this feature, all related configurations are automatically discarded.

To enable DPVM on any participating switch, follow these steps:

	Command	Purpose
Step 1	switch# <b>config t</b> switch(config)#	Enters configuration mode.
Step 2	switch(config)# <b>feature dpvm</b>	Enables DPVM on that switch.
	switch(config)# <b>no feature dpvm</b>	Disables (default) DPVM on that switch.



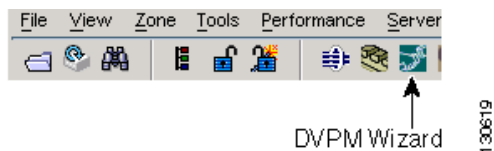
**Note** To overwrite the login information with the duplicate pWWN login, enter the **dpvm overwrite-duplicate-pwwn** command.

## Configuring DPVM with the DPVM Wizard

To use the DPVM Setup Wizard to set up dynamic port VSAN membership, follow these steps:

- Step 1** Click the **DPVM Setup Wizard** icon in the DCNM-SAN toolbar (See [Figure 25-1](#)).

**Figure 25-1 DPVM Wizard Icon**



You see the Select Master Switch page.

- Step 2** Click the switch you want to be the master switch. This switch controls the distribution of the DPVM database to other switches in the fabric.
- Step 3** Click **Next**.  
You see the AutoLearn Current End Devices page.
- Step 4** (Optional) Click the **Create Configuration From Currently Logged In End Devices** check box if you want to turn on autolearning.
- Step 5** Click **Next**.

You see the Edit and Activate Configuration page.


- Step 6** Verify the current or autolearned configuration. Optionally, click **Insert** to add more entries into the DPVM config database.
- Step 7** Click **Finish** to update the DPVM config database, distribute the changes using CFS, and activate the database, or click **Cancel** to exit the DPVM Setup Wizard without saving changes.
- Step 8** Select the switch you want to be the master switch. This switch controls the distribution of the DPVM database to other switches in the fabric.
- Step 9** Click **Next**.
- You see the AutoLearn Current End Devices page.
- Step 10** (Optional) Check the **Create Configuration From Currently Logged In End Devices** check box if you want to enable autolearning.
- Step 11** Click **Next**.
- You see the Edit and Activate Configuration page.
- Step 12** Verify the current or autolearned configuration. Optionally, click **Insert** to add more entries into the DPVM config database.
- Step 13** Click **Finish** to update the DPVM config database, distribute the changes using CFS, and activate the database, or click **Cancel** to exit the DPVM Setup Wizard without saving changes.

## Configuring DPVM Config and Pending Databases

To create and populate the DPVM config and pending databases, 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 mode enhanced</b> switch(config)# <b>device-alias commit</b>	Enables enhanced device alias mode. This is required for device-alias configuration in the DPVM database.
<b>Step 3</b>	switch(config)# <b>dpvm database</b> switch(config-dpvm-db)#	Creates the DPVM config database.
	switch(config)# <b>no dpvm database</b>	Deletes the DPVM config database.
<b>Step 4</b>	switch(config-dpvm-db)# <b>pwwn 12:33:56:78:90:12:34:56 vsan 100</b>	Maps the specified device pWWN to VSAN 100.
	switch(config-dpvm-db)# <b>no pwwn 12:33:56:78:90:12:34:56 vsan 101</b>	Removes the specified device pWWN mapping from the DPVM config database.
<b>Step 5</b>	switch(config-dpvm-db)# <b>nwwn 14:21:30:12:63:39:72:81 vsan 101</b>	Maps the specified device nWWN to VSAN 101.
	switch(config-dpvm-db)# <b>no nwwn 14:21:30:12:63:39:72:80 vsan 101</b>	Removes the specified device nWWN mapping from the DPVM config database.
<b>Step 6</b>	switch(config-dpvm-db)# <b>device-alias device1 vsan 102</b>	Maps the specified device-alias to VSAN 102.
	switch(config-dpvm-db)# <b>no device-alias device1 vsan 102</b>	Removes the specified device-alias mapping from the DPVM config database.

To create and populate the config and pending databases, follow these steps:

- 
- Step 1** Expand **Fabricxx> All VSANs**, and then select **DPVM** in the Logical Attributes pane. You see the DPVM configuration in the Information pane.
- Step 2** Click the **CFS** tab and select a master switch by checking a check box in the Master column.
-  **Note** You must click the CFS tab in order to activate the other tabs.
- 
- Step 3** Click the **Config Database** tab and then click the **Create Row** to insert a new entry. You see the Create Config Database dialog box.
- Step 4** Choose an available WWN and VSAN combination or fill in the pWWN and Login VSAN fields.
- Step 5** Click **Create** to save these changes in the config or pending database or click **Close** to discard any unsaved changes.
- Step 6** Click the **CFS** tab and select the Config Action drop-down menu for the master database.
- Step 7** Select **commit** from the drop-down menu to distribute these changes or **abort** to discard the changes.
- 

## Activating DPVM Config Databases

When you explicitly activate the DPVM config database, the DPVM config database becomes the active DPVM database. Activation may fail if conflicting entries are found between the DPVM config database and the currently active DPVM database. However, you can force activation to override conflicting entries.

To disable DPVM, you must explicitly deactivate the currently active DPVM database by issuing the **no dpvm activate** command.

To activate the DPVM config database, 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>dpvm activate</b>	Activates the DPVM config database.
	switch(config)# <b>no dpvm activate</b>	Deactivates the currently active DPVM database.
	switch(config)# <b>dpvm activate force</b>	Forcefully activates the DPVM config database to override conflicting entries.

To activate the DPVM config database, follow these steps:

- 
- Step 1** Expand **Fabricxx> All VSANs**, and then select **DPVM** from the Logical Attributes pane. You see the DPVM configuration in the Information pane.
- Step 2** Click the **Action** tab and set the Action drop-down menu to **activate** or **forceActivate** to activate the DPVM config database.



- Step 3** Click the **CFS** tab and select the Config Action drop-down menu for the master database.
- Step 4** Select **commit** from the drop-down menu to distribute these changes or **abort** to discard the changes.



**Note** To disable DPVM, you must explicitly deactivate the currently active DPVM database.

## Enabling Autolearning

To enable autolearning, 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>dpvm auto-learn</b>	Enables learning on this switch.
	switch(config)# <b>no dpvm auto-learn</b>	Disables (default) learning on this switch.
	switch(config)# <b>clear dpvm auto-learn</b>	Clears the list of auto-learned entries.
	switch(config)# <b>clear dpvm auto-learn pwwn pwwn</b>	Clears the list of auto-learned pWWN entries in the distributed DPVM database.

To enable autolearning, follow these steps:

- Step 1** Expand **FabriccX> All VSANs**, and then select DPVM from the Logical Attributes pane. You see the DPVM configuration in the Information pane.
- Step 2** Click the **Actions** tab and check the **Auto Learn Enable** check box to enable autolearning.
- Step 3** Click the **CFS** tab and select **commit** to distribute these changes or **abort** to discard the changes.

## Clearing Learned Entries

You can clear DPVM entries from the active DPVM database (if autolearn is still enabled) using one of two methods.

### Restrictions

These two procedures do not start a session and can only be issued in the local switch.

- To clear a single autolearn entry, use the **clear dpvm auto-learn pwwn** command.  
switch# **clear dpvm auto-learn pwwn 55:22:33:44:55:66:77:88**
- To clear all autolearn entries, use the **clear dpvm auto-learn** command.  
switch# **clear dpvm auto-learn**

**Note**

These two commands do not start a session and can only be issued in the local switch.

To clear a single autolearn entry, follow these steps:

- 
- Step 1** Expand **Fabricxx> All VSANs**, and then select **DPVM** from the Logical Attributes pane.  
You see the DPVM configuration in the Information pane.
  - Step 2** Click the **Actions** tab and select **clearOnWWN** from the Auto Learn Clear drop-down menu.
  - Step 3** Check the **clear WWN** check box next to the WWN of the autolearned entry that you want to clear.
  - Step 4** Click **CFS** and select **commit** to distribute these changes or **abort** to discard the changes.
- 

To clear all autolearn entries, follow these steps:

- 
- Step 1** Expand **Fabricxx> All VSANs**, and then select **DPVM** from the Logical Attributes pane.  
You see the DPVM configuration in the Information pane.
  - Step 2** Click the **Actions** tab.  
You see the DPVM Actions menu.
  - Step 3** Select **clear** from the Auto Learn Clear drop-down menu.
  - Step 4** Click the **CFS** tab and select **commit** to distribute these changes or **abort** to discard the changes.
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## Disabling DPVM Database Distribution

To disable DPVM database distribution to the neighboring switches, 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>no dpvm distribute</b>	Disables DPVM distribution to the neighboring switches.
	switch(config)# <b>dpvm distribute</b>	Enables (default) DPVM distribution to the neighboring switches.

These changes are distributed to all switches in a fabric when you commit the changes. You can also discard (abort) the changes at this point.

**Tip**

See the [“Viewing the Pending Database”](#) section on page 25-16 to view the contents of the pending database.

To disable DPVM database distribution to the neighboring switches, follow these steps:

- 
- Step 1** Expand **Fabricxx> All VSANs**, and then select **DPVM** from the Logical Attributes pane. You see the DPVM configuration in the Information pane.
- Step 2** Click the **CFS** tab and select **disable** from the Admin drop-down menu.
- Step 3** Click **Apply Changes** to save this change or click **Undo Changes** to discard the change.
- 

## Locking the Fabric

To lock the fabric and apply changes to the DPVM pending database, 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>dpvm database</b> switch(config-dpvm-db)#	Accesses the DPVM config database.
<b>Step 3</b>	switch(config-dpvm-db)# <b>pwwn</b> <b>11:22:33:44:55:66:77:88 vsan 11</b>	Adds one entry to the DPVM config database.
<b>Step 4</b>	switch(config-dpvm-db)# <b>exit</b> switch(config)#	Exits to configuration mode.
<b>Step 5</b>	switch(config)# <b>dpvm activate</b>	Activates the DPVM config database.

To lock the fabric and apply changes to the DPVM pending database, follow these steps:

- 
- Step 1** Expand **Fabricxx> All VSANs**, and then select **DPVM** from the Logical Attributes pane. You see the DPVM configuration in the Information pane.
- Step 2** Click the **Config Database** tab and **Create Row**. You see the Create Config Database dialog box.
- Step 3** Choose an available pWWN and login VSAN.
- Step 4** Click **Create** to save this change to the pending database or click **Close** to discard any unsaved change.
- 

## Committing Changes

If you commit the changes made to the configuration, the configuration in the DPVM pending database are distributed to other switches. On a successful commit, the configuration change is applied throughout the fabric and the lock is released.

To commit the DPVM pending database, follow these steps:

	Command	Purpose
Step 1	switch# <b>config t</b> switch(config)#	Enters configuration mode.
Step 2	switch(config)# <b>dpvm commit</b>	Commits the database entries that are currently in the DPVM pending database.

To commit the DPVM pending database, follow these steps:

- 
- Step 1** Expand **Fabricxx> All VSANs**, and then select **DPVM** from the Logical Attributes pane. You see the DPVM configuration in the Information pane.
- Step 2** Click the **CFS** tab and select **commit from** the Config Action drop-down menu.
- Step 3** Click **Apply Changes** to save this change or click **Undo Changes** to discard the change.
- 

## Discarding Changes

If you discard (abort) the changes made to the DPVM pending database, the configurations remain unaffected and the lock is released.

To discard the DPVM pending database, follow these steps:

	Command	Purpose
Step 1	switch# <b>config t</b> switch(config)#	Enters configuration mode.
Step 2	switch(config)# <b>dpvm abort</b>	Discards the database entries that are currently in the DPVM pending database.

To discard the DPVM pending database, follow these steps:

- 
- Step 1** Expand **Fabricxx> All VSANs**, and then select **DPVM** from the Logical Attributes pane. You see the DPVM configuration in the Information pane.
- Step 2** Click the **CFS** tab and select **abort** from the Config Action drop-down menu.
- Step 3** Click **Apply Changes** to save this change or click **Undo Changes** to discard the change.
- 

## Clearing a Locked Session

If you have performed a DPVM 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 DPVM pending database are discarded and the fabric lock is released.

## Restrictions

The DPVM pending database is only available in the volatile directory and is subject to being discarded if the switch is restarted.

To use administrative privileges and release a locked DPVM session, use the **clear dpvm session** command in EXEC mode.

```
switch# clear dpvm session
```

To use administrative privileges and release a locked DPVM session using DCNM-SAN, follow these steps:

- 
- Step 1** Expand **Fabricx> All VSANs**, and then select **DPVM** from the Logical Attributes pane. You see the DPVM configuration in the Information pane.
  - Step 2** Click the **CFS** tab and select **clear** from the Config Action drop-down menu.
  - Step 3** Click **Apply Changes** to save this change or click **Undo Changes** to discard the change.
- 

## Copying DPVM Databases

To copy the currently active DPVM database to the DPVM config database, use the **dpvm database copy** command.

```
switch# dpvm database copy active
Legend: "+" New Entry, "-" Missing Entry, "*" Possible Conflict Entry
-----
- pwnn 12:33:56:78:90:12:34:56 vsan 100
- nwnn 14:21:30:12:63:39:72:81 vsan 101
```

To copy the currently active DPVM database to the DPVM config database, follow these steps:

- 
- Step 1** Expand **Fabricx> All VSANs**, and then select **DPVM** in the Logical Attributes pane. You see the DPVM configuration in the Information pane.
  - Step 2** Click the **Actions** tab and check the **CopyActive to Config** check box.
  - Step 3** Click the **CFS** tab and select **commit** from the Config Action drop-down menu.
- 

## Comparing Database Differences

You can compare the DPVM databases as follows:

- Use the **dpvm database diff active** command to compare the active DPVM database with the DPVM config database.

```
switch# dpvm database diff active
Legend: "+" New Entry, "-" Missing Entry, "*" Possible Conflict Entry
-----
- pwnn 44:22:33:44:55:66:77:88 vsan 44
```

```
* pwnn 11:22:33:44:55:66:77:88 vsan 11
```

- Use the **dpvm database diff config** command to compare the DPVM config database with the active DPVM database.

```
switch# dpvm database diff config
Legend: "+" New Entry, "-" Missing Entry, "*" Possible Conflict Entry
-----
+ pwnn 44:22:33:44:55:66:77:88 vsan 44
* pwnn 11:22:33:44:55:66:77:88 vsan 22
```

- Use the **show dpvm pending-diff** command (when CFS distribution is enabled) to compare the DPVM pending database with the DPVM config database.

To add pending database entries to the DPVM config database, follow these steps:

	Command	Purpose
Step 1	switch# <b>config t</b> switch(config)#	Enters configuration mode.
Step 2	switch(config)# <b>dpvm distribute</b>	Enables CFS distribution.
Step 3	switch(config)# <b>dpvm database</b>	Accesses the DPVM config database.
Step 4	switch(config-dpvm-db)# <b>pwnn 44:22:33:44:55:66:77:88 vsan 55</b> switch(config-dpvm-db)# <b>pwnn 55:22:33:44:55:66:77:88 vsan 55</b>	Adds two entries to the DPVM config database.

To compare the currently active database entries to the DPVM config database, follow these steps:

- 
- Step 1** Expand **Fabricxx> All VSANs**, and then select **DPVM** from the Logical Attributes pane.  
You see the DPVM configuration in the Information pane.
- Step 2** Click the **Active Database** tab.  
You see the DPVM active database in the Information pane.
- Step 3** Select **Config** from the Compare With drop-down menu.  
You see the comparison dialog box.
- Step 4** Select **Close** to close the comparison dialog box.
- 

## Verifying the DPVM Configuration

To display the DPVM configuration information, perform one of the following tasks:

Command	Purpose
<b>show dpvm merge statistics</b> switch(config)#	Displays the DPVM databases merge statistics.
<b>clear dpvm merge statistics</b>	Clears the DPVM databases merge statistics.
<b>show dpvm status</b>	Displays the DPVM Configuration Status

Command	Purpose
<code>show dpvm ports vsan 10</code>	Displays the DPVM Current Dynamic Ports for the Specified VSAN
<code>show dpvm database</code>	Displays the DPVM Config Database
<code>show dpvm database active</code>	Displays the DPVM Database
<code>show dpvm pending-diff</code>	Compares Pending Database with the DPVM Config Database

For detailed information about the fields in the output from these commands, refer to the *Cisco MDS 9000 Family Command Reference*.

This section includes the following topics:

- [Displaying DPVM Merge Status and Statistics section, page 25-15](#)
- [Displaying DPVM Configurations section, page 25-16](#)

## Displaying DPVM Merge Status and Statistics

This example shows the conflicts in DPVM databases merge:

```
switch# show dpvm merge status
Last Merge Time Stamp      : Fri Aug  8 15:46:36 2008
Last Merge State           : Fail
Last Merge Result          : Fail
Last Merge Failure Reason  : DPVM DB conflict found during merge [cfs_status: 76] Last
Merge Failure Details: DPVM merge failed due to database conflict
Local Switch WWN           : 20:00:00:0d:ec:24:e5:00
Remote Switch WWN          : 20:00:00:0d:ec:09:d5:c0

-----
              Conflicting DPVM member(s)                Loc VSAN   Rem VSAN
-----
dev-alias dpvm_dev_alias_1 [21:00:00:04:cf:cf:45:ba]    1313       1414
dev-alias dpvm_dev_alias_2 [21:00:00:04:cf:cf:45:bb]    1313       1414
dev-alias dpvm_dev_alias_3 [21:00:00:04:cf:cf:45:bc]    1313       1414
[Total 3 conflict(s)]
rbadri-excal13#
```

This example shows the conflicts in DDAS mode:

```
switch# show dpvm merge status
Last Merge Time Stamp      : Fri Aug  8 15:46:36 2008
Last Merge State           : Fail
Last Merge Result          : Fail
Last Merge Failure Reason  : DPVM DB conflict found during merge [cfs_status: 76] Last
Merge Failure Details: DPVM merge failed due to DDAS mode conflict
Local Switch WWN           : 20:00:00:0d:ec:24:e5:00
Remote Switch WWN          : 20:00:00:0d:ec:09:d5:c0
Local DDAS mode            : Basic
Remote DDAS mode           : Enhanced
```

## Displaying DPVM Configurations

Use the `show dpvm` command to display information about WWNs configured on a per VSAN basis (see Examples 25-1 to 25-5).

### Example 25-1 Displays the DPVM Configuration Status

```
switch# show dpvm status
DB is activated successfully, auto-learn is on
```

### Example 25-2 Displays the DPVM Current Dynamic Ports for the Specified VSAN

```
switch# show dpvm ports vsan 10
-----
Interface Vsan Device pWWN                Device nWWN
-----
fc1/2      10    29:a0:00:05:30:00:6b:a0 fe:65:00:05:30:00:2b:a0
```

### Example 25-3 Displays the DPVM Config Database

```
switch# show dpvm database
pwwn 11:22:33:44:55:66:77:88 vsan 11
pwwn 22:22:33:44:55:66:77:88 vsan 22
pwwn 33:22:33:44:55:66:77:88 vsan 33
pwwn 44:22:33:44:55:66:77:88 vsan 44
[Total 4 entries]
```

### Example 25-4 Displays the DPVM Database

```
switch# show dpvm database active
pwwn 11:22:33:44:55:66:77:88 vsan 22
pwwn 22:22:33:44:55:66:77:88 vsan 22
pwwn 33:22:33:44:55:66:77:88 vsan 33
[Total 3 entries]
* is auto-learnt entry
```

### Example 25-5 Compares Pending Database with the DPVM Config Database

```
switch# show dpvm pending-diff
Legend: "+" New Entry, "-" Missing Entry, "*" Possible Conflict Entry
-----
+ pwwn 55:22:33:44:55:66:77:88 vsan 55
- pwwn 11:22:33:44:55:66:77:88 vsan 11
* pwwn 44:22:33:44:55:66:77:88 vsan 44
```

## Monitoring DPVM

To view the configuration information, perform the following tasks:

- [Viewing the Pending Database section, page 25-16](#)

## Viewing the Pending Database

To view the pending database, follow these steps:



- 
- Step 1** Expand **Fabric> All VSANs**, and then select **DPVM** from the Logical Attributes pane.  
You see the DPVM configuration in the Information pane.
- Step 2** Click the **CFS** tab and set the Config View drop-down menu to **pending**.
- Step 3** Click **Apply Changes**.
- Step 4** Click the **Config Database** tab.  
You see the pending database entries.
- 

## Configuration Examples for DPVM

To configure a basic DPVM scenario, follow these steps:

- 
- Step 1** Enable DPVM and enable DPVM distribution.

```
switch1# config
Enter configuration commands, one per line. End with CNTL/Z.
switch1(config)# feature dpvm
switch1(config)# end
switch1# show dpvm database
switch1# show dpvm database active
switch1# show dpvm status
```

At this stage, the configuration does not have an active DPVM database and the **auto-learn** option is disabled.

- Step 2** Activate a null (empty) database so it can be populated with autolearned entries.

```
switch1# config
Enter configuration commands, one per line. End with CNTL/Z.
switch1(config)# dpvm activate
switch1(config)# dpvm commit
switch1(config)# end
switch1# show dpvm database
switch1# show dpvm database active
switch1# show dpvm status
```

At this stage, the database is successfully activated and the **auto-learn** option continues to be disabled.

- Step 3** Enable the **auto-learn** option and commit the configuration changes.

```
switch1# config
Enter configuration commands, one per line. End with CNTL/Z.
switch1(config)# dpvm auto-learn
switch1(config)# dpvm commit
switch1(config)# end
switch1# show dpvm database active
pwwn 21:00:00:e0:8b:0e:74:8a vsan 4(*)
pwwn 21:01:00:e0:8b:2e:87:8a vsan 5(*)
[Total 2 entries]
* is auto-learnt entry
switch1# show dpvm ports

-----
Interface  Vsan      Device pWWN      Device nWWN
-----
fc1/24     4         21:00:00:e0:8b:0e:74:8a  20:00:00:e0:8b:0e:74:8a
fc1/27     5         21:01:00:e0:8b:2e:87:8a  20:01:00:e0:8b:2e:87:8a
```

```
switch1# show flogi database
-----
INTERFACE  VSAN      FCID          PORT NAME          NODE NAME
-----
fc1/24     4         0xe70100     21:00:00:e0:8b:0e:74:8a  20:00:00:e0:8b:0e:74:8a
fc1/27     5         0xe80100     21:01:00:e0:8b:2e:87:8a  20:01:00:e0:8b:2e:87:8a
```

Total number of flogi = 2.

```
switch195# show dpvm status
DB is activated successfully, auto-learn is on
```

At this stage, the currently logged in devices (and their current VSAN assignment) populate the active DPVM database. However the entries are not yet permanent in the active DPVM database.

The output of the **show dpvm ports** and the **show flogi database** commands displays two other devices that have logged in (referred to as switch9 and switch3 in this sample configuration).

**Step 4** Access switch9 and issue the following commands:

```
switch9# show dpvm database active
pwmn 21:00:00:e0:8b:0e:87:8a vsan 1(*)
pwmn 21:01:00:e0:8b:2e:74:8a vsan 1(*)
[Total 2 entries]
* is auto-learnt entry
switch9# show dpvm status
DB is activated successfully, auto-learn is on
```

**Step 5** Access switch3 and issue the following commands:

```
switch3# show dpvm database active
pwmn 21:00:00:e0:8b:0e:76:8a vsan 1(*)
pwmn 21:01:00:e0:8b:2e:76:8a vsan 1(*)
[Total 2 entries]
* is auto-learnt entry
switch3# show dpvm status
DB is activated successfully, auto-learn is on
```

**Step 6** Disable autolearning in switch1 and commit the configuration changes.

```
switch1# config
Enter configuration commands, one per line. End with CNTL/Z.
switch1(config)# no dpvm auto-learn
switch1(config)# dpvm commit
switch1(config)# end
switch1# show dpvm status
DB is activated successfully, auto-learn is off
switch1# show dpvm database active
pwmn 21:00:00:e0:8b:0e:74:8a vsan 4
pwmn 21:01:00:e0:8b:2e:87:8a vsan 5
pwmn 21:00:00:e0:8b:0e:87:8a vsan 1
pwmn 21:01:00:e0:8b:2e:74:8a vsan 1
pwmn 21:00:00:e0:8b:0e:76:8a vsan 1
pwmn 21:01:00:e0:8b:2e:76:8a vsan 1
[Total 6 entries]
* is auto-learnt entry
switch1# show dpvm status
DB is activated successfully, auto-learn is off
```

At this stage, the autolearned entries are made permanent in the active DPVM database.

**Step 7** Access switch9 and issue the following commands:

```
switch9# show dpvm database active
pwmn 21:00:00:e0:8b:0e:87:8a vsan 1
```

```

pwwn 21:01:00:e0:8b:2e:74:8a vsan 1
pwwn 21:00:00:e0:8b:0e:76:8a vsan 1
pwwn 21:01:00:e0:8b:2e:76:8a vsan 1
pwwn 21:00:00:e0:8b:0e:74:8a vsan 4
pwwn 21:01:00:e0:8b:2e:87:8a vsan 5
[Total 6 entries]
* is auto-learnt entry
switch9# show dpvm status
DB is activated successfully, auto-learn is off

```

**Step 8** Access switch3 and issue the following commands:

```

switch3# show dpvm database active
pwwn 21:00:00:e0:8b:0e:76:8a vsan 1
pwwn 21:01:00:e0:8b:2e:76:8a vsan 1
pwwn 21:00:00:e0:8b:0e:87:8a vsan 1
pwwn 21:01:00:e0:8b:2e:74:8a vsan 1
pwwn 21:00:00:e0:8b:0e:74:8a vsan 4
pwwn 21:01:00:e0:8b:2e:87:8a vsan 5
[Total 6 entries]
* is auto-learnt entry
switch3# show dpvm status
DB is activated successfully, auto-learn is off

```



**Note**

These basic steps help you determine that the information is identical in all the switches in the fabric.

You have now configured a basic DPVM scenario in a Cisco MDS 9000 Family switch.

## Field Descriptions for DPVM

This section describes the field descriptions for this feature.

### DPVM Actions

Field	Description
Action	Helps in activating the set of bindings.
Result	Indicates the outcome of the activation.
Status	Indicates the state of activation. If true, then activation has been attempted as the most recent operation. If false, then an activation has not been attempted as the most recent operation.
CopyActive to Config	When set to copy(1), results in the active (enforced) binding database to be copied on to the configuration binding database. The learned entries are also copied.
Auto Learn Enable	Helps to learn the configuration of devices logged into the local device on all its ports and the VSANs to which they are associated.

Field	Description
Auto Learn Clear	Assists in clearing the autolearned entries.
Clear WWN	Represents the Port WWN (pWWN) to be used for clearing its corresponding autolearned entry.

## DPVM Config Database

Field	Description
Type	Specifies the type of the corresponding instance of cdpvmLoginDev object.
WWN or Name	Represents the logging-in device.
VSAN Id	Represents the VSAN to be associated to the port on the local device on which the device represented by cdpvmLoginDev logs in.
Switch Interface	Represents the device alias.

## DPVM Active Database

Field	Description
Type	Specifies the type of the corresponding instance of cdpvmEnfLoginDev.
WWN or Name	Represents the logging in device address.
VSAN Id	Represents the VSAN of the port on the local device through which the device represented by cdpvmEnfLoginDev logs in.
Interface	Represents the device alias.
IsLearnt	Indicates whether this is a learned entry or not. If true, then it is a learned entry. If false, then it is not.

## Additional References

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

- [Related Document section, page 25-20](#)
- [Standards section, page 25-21](#)
- [RFCs section, page 25-21](#)
- [MIBs section, page 25-21](#)

## 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
<ul style="list-style-type: none"> <li>CISCO-DYNAMIC-PORT-VSAN-MIB</li> </ul>	To locate and download MIBs, go to the following URL: <a href="http://www.cisco.com/en/US/products/ps5989/prod_technical_reference_list.html">http://www.cisco.com/en/US/products/ps5989/prod_technical_reference_list.html</a>

