CHAPTER 6

Configuring DMM for Data Migration

This chapter describes how to use the DMM to configure and monitor data migration jobs.

This chapter includes the following topics:

Information About the Cisco MDS DMM for Data Migration

Cisco MDS Data Mobility Manger (DMM) is an intelligent software application for achieving data migrations. DMM runs on the MSM-18/4 module or the MDS 9222i switch and operates across the SAN fabric.

Cisco MDS DMM offers capabilities and features that simplify data migration and minimize disruptions and reconfigurations. For example, the MSM-18/4 module or the MDS 9222i switch can be located anywhere in the fabric. No reconfiguration is required for the server, the existing storage, or the SAN fabric. Cisco MDS DMM uses resources on the MSM-18/4 module or the MDS 9222i switch to perform the migration, so it adds no processing overhead on the application servers.

Cisco MDS DMM supports online migration, allowing applications to continue to access the existing storage devices. The MSM-18/4 module or the MDS 9222i switch coordinates all server access to the storage and runs the data migration. However, this activity is transparent to the server, which continues to have full access to the data.

Cisco MDS DMM supports data migration at the server or storage device level of granularity. Server level migration involves migrating the storage data used by the specified server. Storage device level migration involves migrating all storage data from the specified storage device.

This section includes the following topics:

About DMM CLI Commands

The DMM feature includes CLI commands to configure and perform data migration jobs. Job and session configuration commands are entered at the switch CLI prompt.

A DMM job can be active on more than one switch. For example, in a dual-fabric topology with multipath configurations, the DMM job runs on a switch in each fabric. To configure the job, you enter DMM CLI commands on both switches.

The DMM feature runs on an MSM-18/4 module or MDS 9222i switch. Each session runs on only one MSM-18/4 module or MDS 9222i switch. Enter the session configuration commands on the MDS switch that will perform the session migration.

The DMM **show** commands are accessed directly from the MSM-18/4 module or MDS 9222i switch. From the command prompt in the switch, you must attach to the MSM-18/4 module or MDS 9222i switch before entering these commands.

About the DMM GUI

The DMM GUI is integrated into the DCNM-SAN and provides wizards to configure server-based and storage-based data migrations. The DMM GUI also provides a status window to monitor and control data migration jobs and sessions.

The following sections provide additional information about the DMM GUI:

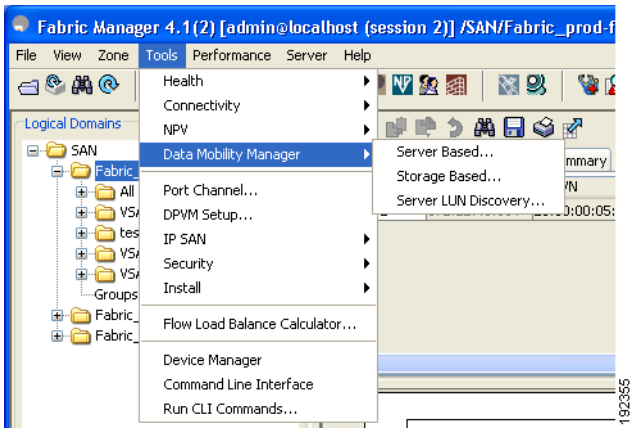
DMM Data Migration Wizards

The DMM GUI provides wizards to configure and perform data migration jobs. You can launch the DMM wizards from DCNM-SAN by choosing the Data Mobility Manager option from the Tools menu. (See Figure 6-1.)

There are separate options to launch server-based data migration jobs and storage-based data migration jobs.

You can also launch the DMM wizards from the job status display. On the Data Migration Status toolbar, the Config Server-based Mode tool launches the wizard for a server-based job and the Config Storage-based Mode tool launches the wizard for a storage-based job. (See Figure 6-1.)

Figure 6-1 Launching the Wizard



The DMM wizard guides the users through the configuration steps. At the end of each step, the wizard communicates with the MSM-18/4 module or the MDS 9222i switch as required (to create the job, to obtain configuration information, or to create the sessions).

The DMM GUI uses the configuration information from the MSM-18/4 module or the MDS 9222i switch to automate parts of the data migration configuration. For example, when you choose a server enclosure, the GUI displays the storage devices (and a list of storage device ports) that are exposed to the server enclosure (based on VSAN and zone information).

The DMM feature performs LUN discovery to select the LUNs available for migration and automates the session creation by matching the LUNs in the existing and new storage. The wizard allows you to adjust the session configuration prior to sending it to the MSM-18/4 module or the MDS 9222i switch.

DMM Job Migration Status

In the DCNM-SAN window, the Data Migration Status area displays a list of jobs and information about each job. The Data Migration Status area also contains a toolbar of commands that operate on the selected job or jobs. The commands are context sensitive and depending on the status of the selected job or jobs, only certain commands are activated.

The information displayed in the Data Migration Status area is updated periodically, based on polling the MSM-18/4 module or the MDS 9222i switch. Set the polling interval using the Poll Interval drop-down list.

You can view the sessions associated with a job by clicking the maximize button (+) next to a job. The display expands to show information about all the sessions associated with the job. (See Figure 6-1.)

Post-Migration Activities Using the CLI

After the data migration job has completed successfully, you need to reconfigure the server to use the new storage. The exact post-migration configuration steps vary depending on the operating system of the server.

Reconfiguration includes the following steps:

- Perform a graceful shutdown on all server applications that use the migrated LUNs to ensure that there are no pending I/O operations on the existing storage.

- Unmount the existing LUNs and the associated storage ports.
- Use either of the following options to remove server access:
  - Configure zoning to remove server access to the existing LUNs.
  - Use an appropriate array tool to remove the masking or mapping access. Choose this option if an application, that is being migrated, requires access to the existing storage after the first migration is completed.
- Use the DMM CLI to perform these tasks:
  - For **Method 1**— Delete the data migration job. DMM removes the FC-Redirect entries to the SMM. Server writes are no longer mirrored to the existing and new storage.
  - For **Method 2**— Finish the data migration job. When the job moves to **Completed** state, delete the data migration job. See the "Finishing Jobs" section on page 6-41 for more details.
  - For **Method 3**— Finish the data migration job. When the job moves to **Completed** state, delete the data migration job. See the "Finishing Jobs" section on page 6-41 for more details.
- Configure zoning to add server access to the new LUNs.
- From the server, scan for the new storage.
- Mount the file system for the new storage.
- From the server, restart the server applications to access data from the new storage.

Post-Migration Activities Using the GUI

After the data migration job has completed successfully, you need to reconfigure the server to use the new storage. The exact post-migration configuration steps vary depending on the operating system of the server.

Reconfiguration includes the following steps:

- Perform a graceful shutdown of all server applications that use the migrated LUNs, to ensure that there are no pending I/O operations on the existing storage.
- On each selected host, unmount all volumes to the existing storage.

Note It is important to unmount all volumes to the existing storage array, including the volumes that are not migrated. This prevents brief path interruption to those LUNs that use the same storage ports as the ports that are migrated.

- Remove host access to the existing storage by following either of the following procedures:
  - Configure zoning to remove host access to the existing storage. After this the migration job will go into Reset state. This is not an error.
  - Use an appropriate array tool to remove the masking or mapping access. Choose this option if an application, that is being migrated, requires access to the existing storage after the first migration is completed.
- For Method 1—Use the DMM GUI to delete the data migration job. The MSM-18/4 module or MDS 9222i switch removes the FC-Redirect entries, so that server and storage traffic no longer flows through the MSM-18/4 module or MDS 9222i switch.
- For Method 2—Use the DMM GUI to finish the data migration job. When the job moves to the Completed state, delete the data migration job. See the "Finishing Jobs" section for more details.

- Configure zoning to add host access to the new storage.
- From the server, scan for the new storage.
- Mount the file system for the new storage.
- From the server, restart the server applications to access data from the new storage.
- (Optional) Remove the existing storage:
  - Reconfigure the server to remove the existing storage LUNs.
  - Remove the existing storage from the SAN.

Ports for Server-Based Jobs

When creating a server-based migration job, you must include all active paths from the host or the server HBA ports to the LUNs being migrated. This is because all writes to a migrated LUN need to be mirrored or logged to the new storage until the job is destroyed or the cutover occurs, so that no data writes are lost.

For additional information about selecting ports for server-based jobs, refer to the "Ports for Server-Based Jobs" section on page 6-5.

Licensing Requirements for DMM

The following table shows the licensing requirements for configuring DMM for Data Migration:

Product	License Requirement
DMM_FOR_SSM_PKG	DMM for Data Migration requires a license. Any feature not included in a license package is bundled with the Cisco NX-OS system images and is provided at no extra charge to you. For a complete explanation of the NX-OS licensing scheme, see the *Cisco MDS 9000 Family NX-OS Licensing Guide*.

Guidelines and Limitations

When using the DMM CLI commands, note the following guidelines:

- In DMM job configuration mode, the job configuration is not saved until you enter the **commit** command. If you exit DMM configuration mode without issuing the **commit** command, all job configuration changes are discarded. You only need to enter the **commit** command when configuring a new job.
- For a storage-based migration, all servers that use the selected storage enclosure must use the same operating system (for example, all AIX or all Solaris).
- If the MDS switch (hosting the storage or the server) performs a restart after the migration but before the job is destroyed, you must restart the data migration from the beginning.

When using the DMM GUI, note the following guidelines:

- You can use the DMM GUI simultaneously on multiple DCNM-SAN client sessions. However, we recommend that you limit DMM GUI usage to one client session at a time. If an MSM-18/4 module or the MDS 9222i switch receives conflicting commands from two different client sessions, the MSM-18/4 module or the MDS 9222i switch may reject the commands.

  For the DMM GUI to operate correctly, fabrics must be opened in DCNM-SAN using SNMPv3. The MSM-18/4 module or the MDS 9222i switch on fabrics opened with SNMPv2 are not available for data migration.

Configuring DMM Data Migration Using the CLI

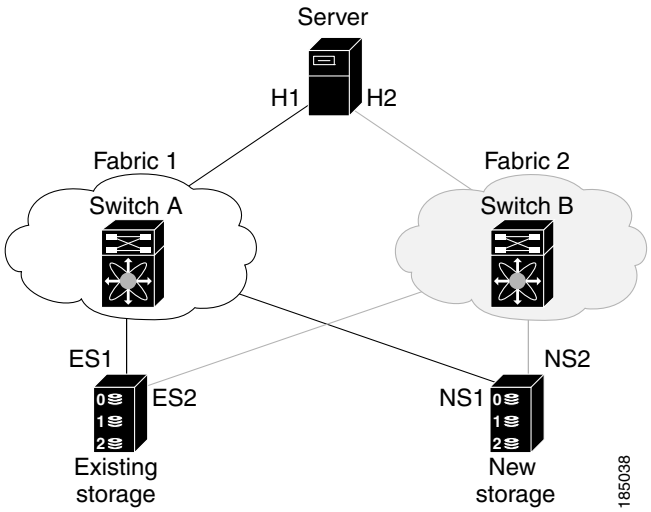
When you enter the command to create a data migration job, the CLI enters DMM job configuration submode. This submode provides commands to configure the server HBA ports, storage ports, and job attributes. The job is only created on the MSM-18/4 module or MDS 9222i switch when you enter the **commit** command.

In a dual-fabric topology with redundant paths, the data migration job runs on an MSM-18/4 module or MDS 9222i switch in each fabric. You need to configure the job on both MSM-18/4 modules or MDS 9222i switches.

In this chapter, the examples and command descriptions use the following terminology (Figure 6-2):

- The dual fabric configuration includes Fabric 1 and Fabric 2.
- Switch A (on Fabric 1) contains the MSM-18/4 module or MDS 9222i switch for data migration jobs.
- Switch B (on Fabric 2) contains the MSM-18/4 module or MDS 9222i switch for data migration jobs.
- H1 and H2 are the server HBA ports to each fabric.
- ES1 and ES2 are the existing storage ports.
- NS1 and NS2 are the new storage ports.

Figure 6-2 Example Topology



The steps to configure a data migration job are described in the following sections:

- Configuring the Virtual Initiator (Storage-Based Migration), page 6-7
- Creating the Data Migration Job, page 6-9
- Configuring the Job, page 6-9
- Committing the Job, page 6-10
- Configuring the Peer MSM-18/4 Module or MDS 9222i Switch, page 6-11
- Configuring Sessions, page 6-12
- Completing DMM Jobs, page 6-12

Configuring the Virtual Initiator (Storage-Based Migration)

Note This step is not required for a server-based data migration job.

Prerequisites

- Prior to creating a storage-based data migration job, you must retrieve the virtual initiator (VI) port world wide name (pWWN) and create a new zone containing the pWWNs of the VI and the storage ports. To use the new zone, add the new zone to a zone set and activate the zone set.
- Prior to creating the data migration job, you must complete the following configuration tasks on the storage devices:
  - Configure the existing storage to give the VI pWWN access to LUNs that need to be migrated.
  - Configure the new storage to give the VI pWWN access to LUNs that need to be migrated.

Note For a dual-fabric topology, you must repeat the same set of configuration steps on switch B. Retrieve the VI information and create a new zone on switch B and configure the storage to allow the VI to access the LUNs exposed in fabric B. For an example configuration, see the "Storage-Based Migration Example" section on page 6-52.

Detailed Steps

To configure the VI in Fabric 1, follow these steps:

	Command	Purpose
Step 1	**config t** **Example:** switch# **config t** switch(config)#	Enters configuration mode.
Step 2	**dmm module** *module-id* **job** *job-id* **get-vi vsan** *0-4093* **Example:** switchA(config)# **dmm module** *module-id* **job** *job-id* **get-vi vsan** *0-4093*	Retrieves the VI information for the specified MSM-18/4 module or MDS 9222i switch. You must specify a unique job identifier. The command output displays the assigned VI node WWN and port WWN.
Step 3	switchA(config)# **zone name** *name* **vsan** *0-4093*	Creates a new zone.
Step 4	switchA(config-zone)# **member pwwn** *value*	Uses the member command multiple times to add the VI pWWN, the existing storage pWWNs, and the new storage pWWNs.
Step 5	switchA(config-zone)# **exit**	Exits zone configuration submode.
Step 6	switchA(config)# **zoneset name** *name* **vsan** *0-4093*	Enters configuration mode for the active zone set. Specify the name of the active zone set.
Step 7	switchA(config-zoneset)# **member** *name*	Adds the named zone to the zone set.
Step 8	switchA(config-zoneset)# **exit**	Exits zone set configuration submode.
Step 9	switchA(config)# **zoneset activate name** *name* **vsan** *0-4093*	Reactivates the zone set.

Creating the Data Migration Job

To configure a data migration job, first create the job on Switch A. After creating the job, the CLI enters DMM job configuration mode, where you enter the commands for configuring the job.

Detailed Steps

To create the data migration job, follow these steps:

	Command	Purpose
Step 1	`switchA# config t`	Enters configuration mode.
Step 2	`switchA(config)# dmm module` *module-id* `job` *job-id* `create`	Creates a migration job on the specified MSM-18/4 module or MDS 9222i switch and enters DMM job configuration mode. Specify a unique job identifier. For a storage-based job, use the same job identifier that you specified when retrieving the VI information (in the previous task).

Configuring the Job

Use the commands in DMM job configuration mode to add the server and storage ports to the job.

Note To prevent data corruption, the job must contain all the server HBA ports that can access the set of LUNs being migrated, and all storage ports that expose these LUNs:

- Add all server HBA ports in this fabric that can access the LUNs being migrated.
- Add all storage ports in the fabric that expose the set of LUNs being migrated.

For additional information, see the "Checking the Storage ASL Status" section on page 4-4.

In a dual-fabric topology, configure the IP address of the peer MSM-18/4 module or MDS 9222i switch (the DMM peers communicate using the management IP network).

Detailed Steps

To configure the data migration job, use the following steps:

	Command	Purpose
Step 1	`switchA(config-dmm-job)# server vsan 0-4093 pwwn pWWN`	Specifies the VSAN and pWWN of the server HBA port to include in the migration. **Note** All server HBA ports (in fabric 1) that can access the LUNs to be migrated need to be added to this job.
Step 2	`switchA(config-dmm-job)# storage vsan 0-4093 pwwn pWWN existing`	Specifies the VSAN and pWWN of the existing storage port. **Note** All existing storage ports (in fabric 1) that expose the LUNs to be migrated need to be added to this job.
Step 3	`switchA(config-dmm-job)# storage vsan 0-4093 pwwn pWWN new`	Specifies the VSAN and pWWN of the new storage port. **Note** All new storage ports (in fabric 1) that expose the new LUNs need to be added to this job.
Step 4	`switchA(config-dmm-job)# attributes job_type {1 | 2} job_mode {1 | 2} job_rate {1 | 2 | 3 | 4} job_method {1|2|3}`	Specifies the job type, job mode, and job rate: For **job_type,** enter 1 for server-based migration or 2 for storage-based migration. For **job_mode,** enter 1 for online or 2 for offline migration. For **job_rate,** enter 1 for best effort, 2 for slow, 3 for medium, and 4 for fast data migration. For **job_method,** enter 1 for Method 1, 2 for Method 2, and 3 for Method 3.
Step 5	`switchA(config-dmm-job)# peer IP_address`	Configures the IP address of the MSM-18/4 module or MDS 9222i switch on switch B. For information about configuring the MSM-18/4 module or MDS 9222i switch IP addresses, see the "Configuring IP Connectivity" section on page 2-6

Committing the Job

To commit the job, use the **commit** command. This commits the data migration job on switch A.

When you enter the **commit** command, the switch sends the job configuration to the MSM-18/4 module or MDS 9222i switch.

The DMM feature sends configuration information to other switches in the fabric as required, so that all traffic between the server HBA port and the existing storage is redirected to the MSM-18/4 module or MDS 9222i switch.

The MSM-18/4 module or MDS 9222i switch performs discovery of all existing and new storage LUNs visible to the server HBA ports/VIs in this job.

Note The **commit** command may require a noticeable amount of time to complete, depending on the number of LUNs to be discovered.

Configuring the Peer MSM-18/4 Module or MDS 9222i Switch

This section explains how to configure the data migration job on the peer MSM-18/4 module or MDS 9222i switch.

Restrictions

- You must use the same job number that you created on switch A.

Detailed Steps

To configure the data migration job on the peer MSM-18/4 module or MDS 9222i switch, follow these steps:

	Command	Purpose
Step 1	`switchB# configuration terminal`	Enters configuration mode.
Step 2	`switchB(config)# dmm module` *module-id* `job` *job-id* `create`	Creates a migration job on the specified MSM-18/4 module or MDS 9222i switch and enters DMM job configuration mode. **Note** Enter the same job ID that you created on switch A.
Step 3	`switchB(config-dmm-job)# server vsan` *0-4093* `pwwn` *pWWN*	Specifies the VSAN and pWWN of the server HBA port to include in the migration. **Note** All server HBA ports (in Fabric 2) that can access the LUNs to be migrated need to be added to this job.
Step 4	`switchB(config-dmm-job)# storage vsan` *0-4093* `pwwn` *pWWN* `existing`	Specifies the VSAN and pWWN of the existing storage port. **Note** All existing storage ports (in Fabric 2) that expose the LUNs to be migrated need to be added to this job.
Step 5	`switchB(config-dmm-job)# storage vsan` *0-4093* `pwwn` *pWWN* `new`	Specifies the VSAN and pWWN of the new storage port. **Note** All new storage ports (in Fabric 2) that expose the new LUNs need to be added to this job.
Step 6	`switchB(config-dmm-job)# attributes job_type {1 | 2} job_mode {1 | 2} job_rate {1 | 2 | 3 | 4} job_method {1 | 2 | 3}`	Specifies the job type, job mode, job rate, and job method. **Note** The configuration values for the attributes and the schedule must match on both switches.
Step 7	`switchB(config-dmm-job)# peer` *IP_address*	Configures the IP address of the MSM-18/4 module or MDS 9222i switch on switch A.
Step 8	`switchB(config-dmm-job)# commit`	Commits the data migration job on switch B.

Configuring Sessions

For a server-based migration, configure all of the sessions on one MSM-18/4 module or MDS 9222i switch.

For a storage-based migration, you can manually balance the load on the MSM-18/4 modules or the MDS 9222i switches by configuring sessions on both the MSM-18/4 modules or the MDS 9222i switches.

To verify that the MSM-18/4 module or MDS 9222i switch has discovered the LUNs correctly, enter the **show dmm job job-id** *job id* **storage** command from the MSM-18/4 module or MDS 9222i switch CLI.

Prerequisites

- For a storage-based migration, use the pWWN of the VI as the server in the session configuration.

Detailed Steps

To configure sessions, follow these steps:

	Command	Purpose
Step 1	`switchA(config)# dmm module` *module-id* `job` *job-id* `session`	Enters session configuration mode for the specified job on the specified MSM-18/4 module or MDS 9222i switch.
Step 2	`switchA(config-session)# server` *pWWN* `src_tgt` *pWWN* `src_lun` *num* `dst_tgt` *pWWN* `dst_lun` *num*	Configures a session. The server HBA port, existing storage port, and new storage port must all belong to the same VSAN. • **server** is the server pWWN (server-based job) or VI pWWN (storage-based job). • **src_tgt** is the existing storage pWWN. • **src_lun** is the LUN number in the existing storage. Enter this value in hexadecimal notation. • **dst_tgt** num is the new storage pWWN. • **dst_lun** is the LUN number in the new storage. Enter this value in hexadecimal notation.

Completing DMM Jobs

When all of the sessions in a job have completed successfully, you can delete the job in coordination with other post-migration tasks, which are described in the following sections:

- Finishing the Job, page 6-13
- Deleting the Job, page 6-13

Finishing the Job

Detailed Steps

To finish the data migration job, follow this step:

	Command	Purpose
Step 1	`switch# configuration terminal`	Enters configuration mode.
Step 2	`switch(config)# dmm module` *module-id* `job` *job-id* `finish`	Finishes the specified data migration job. This is valid only for Method 2. See "Finishing Jobs" section on page 6-41 for more details.

Deleting the Job

Detailed Steps

To delete the data migration job, follow this step:

	Command	Purpose
Step 1	`switch# configuration terminal`	Enters configuration mode.
Step 2	`switch(config)# dmm module` *module-id* `job` *job-id* `destroy` `switchA#`	Deletes the specified data migration job.

Configuring DMM Data Migration Using the GUI

Cisco MDS Data Mobility Manger (DMM) is an intelligent software application for achieving data migrations. DMM runs on the MSM-18/4 module or the MDS 9222i switch and operates across the SAN fabric.

Cisco MDS DMM offers capabilities and features that simplify data migration and minimize disruptions and reconfigurations. For example, the MSM-18/4 module or the MDS 9222i switch can be located anywhere in the fabric. No reconfiguration is required for the server, the existing storage, or the SAN fabric. Cisco MDS DMM uses resources on the MSM-18/4 module or the MDS 9222i switch to perform the migration, so it adds no processing overhead on the application servers.

Cisco MDS DMM supports online migration, allowing applications to continue to access the existing storage devices. The MSM-18/4 module or the MDS 9222i switch coordinates all server access to the storage and runs the data migration. However, this activity is transparent to the server, which continues to have full access to the data.

Cisco MDS DMM supports data migration at the server or storage device level of granularity. Server level migration involves migrating the storage data used by the specified server. Storage device level migration involves migrating all storage data from the specified storage device.

This section includes the following topics:

Task Flow for Configuring Data Migration Using GUI

Use the following guidelines to configure Server-Based Data Migration using GUI:

- Create the job and select the server and storage ports.
- Select the MSM-18/4 module or the MDS 9222i switch to run the data migration job.
- (Optional) Select the migration path.
- (Optional) Correlate the LUN maps (existing storage).
- (Optional) Correlate the LUN maps (new storage).
- Configure the data migration sessions.

Use the following guidelines to configure Storage-Based Data Migration using GUI:

- Create the job and select the storage ports.
- Select the MSM-18/4 module or the MDS 9222i switch to run the data migration job.
- (Optional) Select the migration path manually.
- Configure the virtual initiators (VI) in the storage arrays.
- Verify the zones to be activated.
- (Optional) Correlate the LUN map (existing storage).
- (Optional) Correlate the LUN map (new storage).
- Configure the data migration sessions.

Configuring a Server-Based Migration Job Using Method 1 and Method 2

This section includes the following topics:

Creating a Server-Based Migration Job

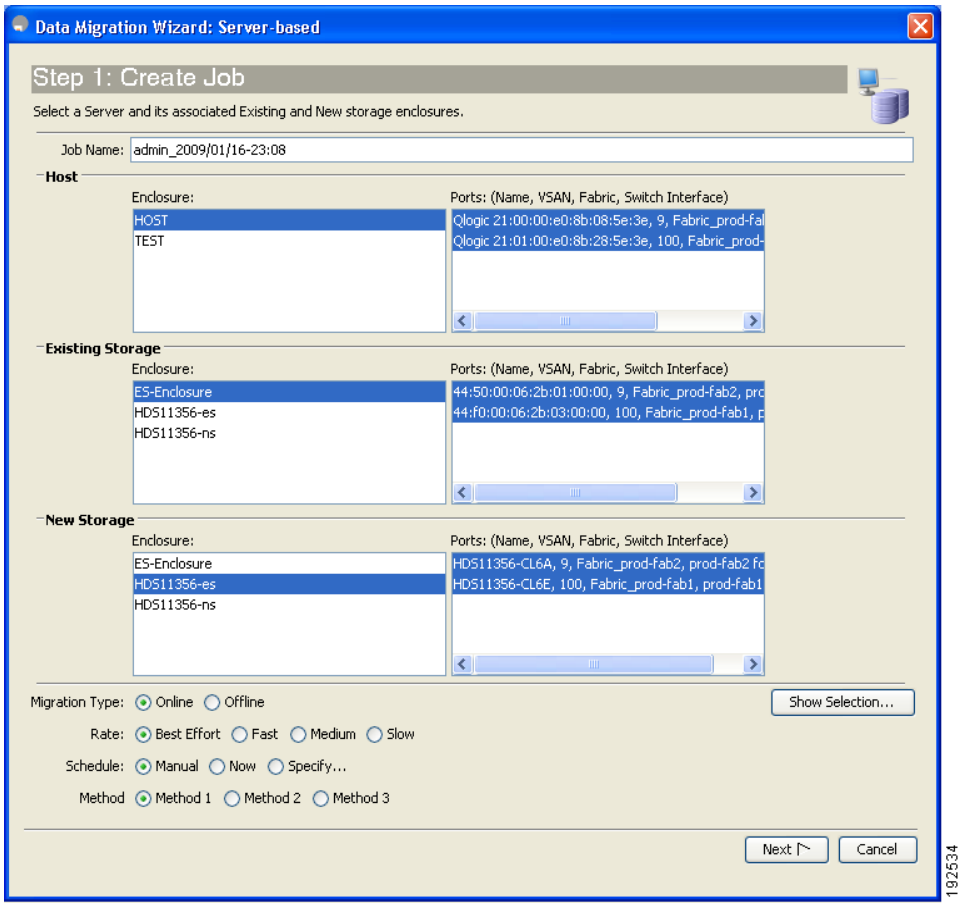
Detailed Steps

To create a server-based data migration job using Method 1 and Method 2, launch DCNM-SAN and follow these steps:

Step 1 In the Tools menu, choose **Data Mobility Manager> Server based**.

You see the Create Job window. (See Figure 6-3.)

Figure 6-3 Create Job Window



The Create Job window displays the server and storage enclosures available for data migration.

When you select a host enclosure, the wizard lists all existing storage that the selected host port can access (based on Zone and VSAN information). For the new storage, DMM includes zoned and unzoned devices (because the new device may not be zoned yet).

Step 2 From the Enclosure field of the Host pane, choose the server to include in this job. You may need to scroll down to see all of the enclosures.

When you select a server enclosure, you see the available ports in the Ports field of the Host pane. The wizard selects the correct host enclosure ports, so do not change the selection. For additional information about ports to include in the data migration, see the "Ports for Server-Based Jobs" section on page 6-5.

Step 3 From the Enclosure field of the Existing Storage pane, choose the existing storage enclosure for this job.

When you select an existing storage enclosure, you see the available ports in the Ports field. The wizard selects all of the ports to include in the job.

Step 4 If the storage is an active-active array, select only the active ports. For additional information about ports to include for an active-passive array, see section "Single LUN Set, Active-Active Array" section on page 3-5.

Step 5 From the Enclosure field of the New Storage pane, choose the new storage enclosure for this job.

When you choose a new storage enclosure, you see the available ports in the Ports field. The wizard selects all of the ports to include in the job.

Step 6 If the storage is an active-passive array, select only the active ports. For additional information about ports to include for an active-passive array, see section "Single LUN Set, Active-Passive Array" section on page 3-7.

Step 7 (Optional) In the Job Name field, enter a name for the job. The default value is "admin_" concatenated with today's date and the current time.

Step 8 (Optional) To configure the job as offline, click the **Offline** Migration Type radio button. The default migration type is online.

Step 9 (Optional) To configure the migration rate, click the appropriate **Rate** radio button. The default rate is best effort, which means that the MSM-18/4 module or the MDS 9222i switch migrates the data as fast as resources allow. Slow, medium, and fast are configurable migration rates. Their default values are 25, 50, and 100 MB/s, respectively.

Step 10 (Optional) To configure a schedule for the job, click the appropriate **Schedule** radio button. The default is Manual, which means that the job is created but will not be started. Schedule means that the job is scheduled at a later stage.

- Click the **Now** radio button for the job to start right after the configuration is complete.
- Click the **Specify** radio button to configure a scheduled start time for the job. Additional fields are displayed, so that you can enter a start date and time.

Note You cannot schedule the job to start before the existing time. If you enter values before the current time, the job starts at the present time.

Step 11 Select a method:

- **Method 1**
  For the existing storage LUN whose data is already migrated to a new storage LUN, any new SCSI write I/Os from the server is written to both the existing and new storage LUN before sending a response back to the server. Method 1 is typically used in local data migration.
- **Method 2**
  SCSI write I/Os from the server to any existing storage LUN are written only to the existing storage LUN. The write I/O changes to the existing storage LUN are marked in the Modified Region Log (MRL) before sending a response back to the server. These changes are then migrated to the new storage LUN on subsequent iterations. Method 2 is used in remote data center migration.

Step 12 Click **Next**.

If the job configuration is OK, you see the Select SSM window.

If the job configuration contains errors, you see a pop-up window with one of the following error messages:

- No host enclosures are defined.
- You cannot select a host enclosure with ports that connect to more than two fabrics.
- There are no paths from the selected host port to any storage ports.
- You must select at least one host port, existing storage port and new storage port.
- If the existing and new storage are in the same enclosure, you cannot select the same storage port for the existing and new storage.
- The matching host port and storage ports (existing and new) must connect across the same fabric.

- The matching host port and storage ports (existing and new) must be members of the same VSAN.

Selecting the MSM-18/4 Modules or the MDS 9222i Switches for the Migration

The Select SSM window displays the DMM-enabled MSM-18/4 modules or MDS 9222i switches available to run the migration job.

The wizard preselects the least-loaded MSM-18/4 module or MDS 9222i switch in each fabric and automatically selects the path for each source and destination port pair.

If the selections are acceptable, you can click **Next** to proceed to the next configuration task. The wizard sends the job configuration information to both the MSM-18/4 modules or the MDS 9222i switches and the MSM-18/4 modules or the MDS 9222i switches create the data migration job. The MSM-18/4 modules or MDS 9222i switches return information (such as LUN maps) that is required to configure sessions. You see the Create Session window.

Detailed Steps

To manually select an MSM-18/4 module or MDS 9222i switch or migration paths for the data migration, follow these steps:

Step 1 (Optional) Click a new row to select an MSM-18/4 module or MDS 9222i switch. Hold down the **Control** key and click to deselect a row. The number of active jobs in each MSM-18/4 module or MDS 9222i switch is displayed in the # of Active Jobs field.

Step 2 (Optional) Check the **Manual Migration Path** check box to view and manually select source and destination paths. This action causes a pop-up window to open after you perform Step 3. For information about selecting paths see the "Selecting Paths to Existing and New Storage" section on page 6-36.

Note All available MSM-18/4 modules or MDS 9222i switches may not be listed in the table. For example, a configured but unlicensed module may not be listed in the table.

Step 3 Click **Next**.

If you had checked the Manual Migration Path check box, you see the Choose Existing and New Path window.

Step 4 (Optional) To select a migration path, Click a row to select a path.

Step 5 When you have chosen an existing and new path, click **Next**.

The wizard sends the job configuration information to both MSM-18/4 modules or MDS 9222i switches, and the MSM-18/4 modules or MDS 9222i switches create the data migration job. The MSM-18/4 module or MDS 9222i switches return information (such as LUN maps) that is required to configure sessions.

If the job configuration is OK, you see the Create Session window.

If the job configuration contains errors, you see a pop-up window with the following error message:

- Mismatched number of LUNs.

  If the number of LUNs on the existing and new storage does not match, the wizard generates an error message and stops. You need to correct the LUN configurations on the storage devices.

Configuring Migration Sessions

The Create Session window displays the sessions available for migration.

The wizard preconfigures the sessions by matching existing and new LUN pairs, based on information provided by the MSM-18/4 module or MDS 9222i switch. Click **Finish** to accept the sessions as configured.

Detailed Steps

To manually configure sessions for the data migration, follow these steps:

Step 1 Check or uncheck the **Select** check boxes to select (or deselect) sessions for this data migration job. Each session is a source and destination LUN pair.

Step 2 (Optional) Correct any anomalies, which are highlighted in red.

Step 3 Click **Finish**.

The session configuration is sent to the MSM-18/4 modules or MDS 9222i switches.

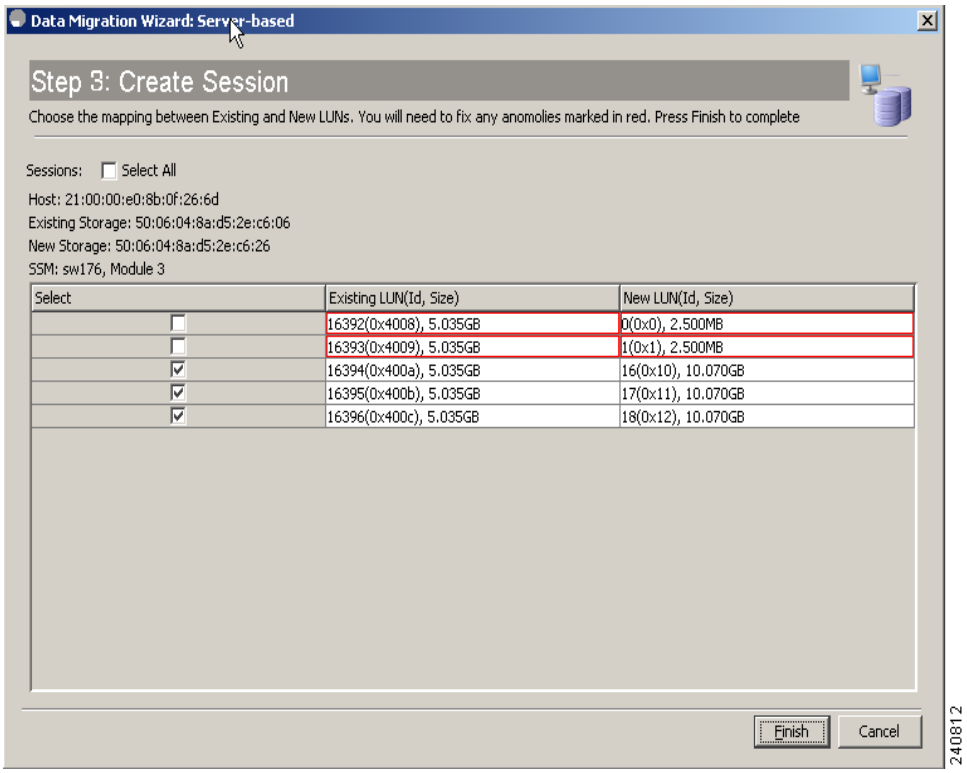
DMM refreshes the Data Migration Status area to display the new data migration job.

Note LUN is the logical unit number as reported by the SCSI REPORT LUNS command (SCSI Opcode 0xA0. See SPC-3 SCSI Standard for more details). The LUN identifier, displayed by DMM, is used in the session configuration. Use this definition when you map devices seen by the server to the drives exported by the storage port.

Correcting Session Anomalies

If the GUI detects a problem with a session, the GUI highlights the LUN fields in red. Figure 6-4 shows an example in which LUN 0 in the new storage is smaller than the matching LUN in the existing storage.

Figure 6-4 LUN Size Mismatch



To manually override the preselected LUN match, click the Existing LUN (Id, Size) or New LUN (Id, Size) field. The field expands to show the available LUN choices.

Select the existing and new LUNs that you want to match up.

Note The LUN for the new storage must have the same or greater capacity than the existing storage.

Configuring a Server-Based Migration Job Using Method 3

When you configure a server-based job using Method 3, these three possible configurations are available:

- Three-fabric— Two production fabrics and one migration fabric
- Two-fabric— One production fabric and one migration fabric
- Single-fabric, multi-VSAN— One or two production VSANs and one migration VSAN

For more information about Method 3 topologies, refer to the "Supported Topologies in Method 3" section on page 3-9.

The Cisco DMM wizard creates and configures the job in six steps, which are described in the following sections:

Creating a Server-Based Migration Job

Detailed Steps

To create a server-based data migration job using Method 3, launch DCNM-SAN and follow these steps:

Step 1 In the Tools menu, choose **Data Mobility Manager> Server based**.

You see the Create Job window.

The Create Job window displays the server and storage enclosures available for data migration.

When you select a host enclosure, the wizard lists all existing storage that the selected host port can access (based on zone and VSAN information). For the new storage, DMM includes zoned and unzoned devices (because the new device may not be zoned yet). When you select the new storage port, DCNM-SAN identifies the fabric containing the new storage as the migration fabric and the other two fabrics are identified as production fabrics.

Note The available ports for existing storage are filtered based on the selected host ports. The available ports for new storage are not filtered; in Method 3, the new storage is not visible to the host.

Step 2 From the Enclosure field of the Host pane, choose the server to include in this job. You may need to scroll down to see all of the enclosures.

When you select a server enclosure, you see the available ports in the Ports field of the Host pane. The wizard selects the correct host enclosure ports, so do not change the selection. For additional information about ports to include in the data migration, see the "Ports in a Server-Based Job" section on page 3-4.

Step 3 From the Enclosure field of the Existing Storage pane, choose the existing storage enclosure for this job.

When you select an existing storage enclosure, you see the available ports in the Ports field. The wizard selects all of the ports to include in the job. If the storage is an active-passive array, select only the active ports. For additional information about ports to include for an active-passive array, see the "Single LUN Set, Active-Passive Array" section on page 3-7.

Step 4 From the Enclosure field of the New Storage pane, choose the new storage enclosure for this job.

When you choose a new storage enclosure, you see the available ports in the Ports field. The wizard selects all of the ports to include in the job. If the storage is an active-passive array, select only the active ports. For additional information about ports to include for an active-passive array, see the "Single LUN Set, Active-Passive Array" section on page 3-7.

Note After the storage ports for the existing storage and new storage are chosen, the DCNM-SAN automatically selects the fabric, to which the new storage port belongs to, as the migration fabric and the remaining fabrics as the production fabric.

Step 5 (Optional) In the Job Name field, enter a name for the job. The default value is “admin_” concatenated with today’s date and the current time.

Step 6 (Optional) To configure the job as offline, click the **Offline Migration Type** radio button. The default migration type is online.

Step 7 (Optional) To configure the migration rate, click the appropriate **Rate** radio button. The default rate is best effort, which means that the MSM-18/4 module or MDS 9222i switch migrates the data as fast as resources allow. Slow, medium, and fast are configurable migration rates. Their default values are 25, 50, and 100 MB/s, respectively.

Step 8 (Optional) To configure a schedule for the job, click the appropriate **Schedule** radio button. The default is **Manual**, which means that the job is created but will not be started. Schedule the job at a later stage.

- Click the **Now** radio button for the job to start right after configuration is complete.
- Click the **Specify** radio button to configure a scheduled start time for the job. Additional fields are displayed, so that you can enter a start date and time.

Note You cannot schedule the job to start before the existing time. If you enter values before the current time, the job starts at the present time.

Step 9 Choose Method 3.

Step 10 Click **Next**.

When Method 3 option is selected and **Next** is clicked, Cisco DMM checks if the following conditions are met:

- The existing storage and the new storage are not zoned to common hosts, even if the host is not selected for the migration job.
- The existing storage does not belong to more than three fabrics.
- The new storage does not belong to more than one fabric.
- The existing storage and the new storage have at least one common fabric or VSAN that can be the migration fabric or VSAN.

For server migration jobs, Cisco DMM also checks if the following conditions are met:

- The host that is connected to the existing storage does not belong to more than two fabrics.
- The host and the existing storage ports are in the same fabric or VSAN.

For jobs that are single-fabric with multiple VSANs separating the production and migration VSANs, Cisco DMM also checks if the following conditions are met:

- The host and the new storage are not in the same zone.
- Only one existing storage port and one new storage port are selected from the migration fabric.

If the job configuration contains errors, a pop-up window displays with one of the following error messages:

- No host enclosures are defined.
- You cannot select a host enclosure with ports that connect to more than two fabrics.

- There are no paths from the selected host port to any storage ports.
- You must select at least one host port, existing storage port, and new storage port.
- If the existing and new storage are in the same enclosure, you cannot select the same storage port for the existing and new storage.
- There must be no new storage port included in the production fabric.
- There must be no server port included in the migration fabric.

Selecting the Server MSM-18/4 Module or MDS 9222i Switch in Production Fabrics

The Select Server SSM window displays the DMM-enabled modules in the production fabrics. All available DMM-enabled modules may not be listed in the table. For example, a configured but unlicensed module may not be listed in the table.

The Cisco DMM wizard preselects the least-loaded MSM-18/4 module or MDS 9222i switch in each production fabric. If the selections are acceptable, click **Next** to proceed to the next configuration task.

For a single-fabric and two-fabric topologies with one production fabric, only one fabric is displayed in the Select server window for each fabric.

Detailed Steps

To manually select an MSM-18/4 module or MDS 9222i switch for single production fabric, follow these steps:

Step 1 Click a new row to select an MSM-18/4 module or MDS 9222i switch. Hold down the **Control** key and click to deselect a row. The number of active jobs in each MSM-18/4 module or MDS 9222i switch is displayed in the # of Active Jobs field.

Step 2 Click **Next**.

You can choose either one or two MSM-18/4 modules or MDS 9222i switches from the table and proceed to the next configuration. If two MSM-18/4 modules or MDS 9222i switches are chosen, then after clicking **Next**, the DMM wizard checks to ensure the two MSM-18/4 modules or MDS 9222i switches belong to different VSANs.

For a three-fabric topology with two production fabrics, two fabrics will be displayed on the Select server window.

You can choose only one MSM-18/4 module or MDS 9222i switch from each of the tables.

To manually select an MSM-18/4 module or MDS 9222i switch for two production fabrics, follow these steps:

Step 1 Click a new row to select an MSM-18/4 module or MDS 9222i switch for production fabric 1. Hold down the **Ctrl** key and click to deselect a row. The number of active jobs in each MSM-18/4 module or MDS 9222i switch is displayed in the # of Active Jobs field.

Step 2 Select a corresponding MSM-18/4 module or MDS 9222i switch for production fabric 2.

Note You must select a combination of two MSM-18/4 modules or two MDS 9222i switches, one in each production fabric. A combination of one MSM-18/4 module and one MDS 9222i switch is not allowed.

Step 3 Click **Next**. The wizard sends the job configuration information to both production fabrics.

Selecting the Data Mover MSM-18/4 Module or MDS 9222i Switch

Note If you have selected server MSM in the production fabric, select a data mover MSM. If you have selected server MDS in the production fabric, then select a data mover MDS.

The Select Data Mover SSM window displays the DMM-enabled MSM-18/4 module or MDS 9222i switch in the migration fabric.

The wizard preselects the least-loaded MSM-18/4 module or MDS 9222i switch in the migration fabric. If the selections are acceptable, click **Next** to proceed to the next configuration task.

Detailed Steps

To manually select MSM-18/4 module or MDS 9222i switch in production fabrics, follow these steps:

Step 1 Click a new row to select an MSM-18/4 module or MDS 9222i switch. Hold down the **Ctrl** key and click to deselect a row. The number of active jobs in each MSM-18/4 module or MDS 9222i switch is displayed in the # of Active Jobs field.

Step 2 Click **Next**. The wizard sends the job configuration information to the migration fabric.

Selecting the DPP Virtual Initiator

In a server-based job using method 3, the DMM uses a VI**.** The VI is created in the same VSAN as the existing and new storage ports in the migration fabric. Depending on the selected MSM-18/4 module or MDS 9222i switch the VI information is displayed in the DPP VI Selection window.

Detailed Steps

To configure the VIs, follow these steps:

Step 1 From the drop-down list, choose a VI for each MSM-18/4 module or MDS 9222i switch.

Step 2 Configure the chosen VIs in the migration fabric to allow access to the LUNs being migrated.

Step 3 Click **Create/Activate zone**.

You will see the zone creation and activation status window.

Configuring Migration Sessions

The Create Session window displays the LUNs available for migration.)

Detailed Steps

To create sessions for the data migration job, follow these steps:

Step 1 Check or uncheck the **Select** check boxes to select or deselect sessions for this data migration job. Each session is a source and destination LUN pair.

Step 2 (Optional) Correct any anomalies, which are highlighted in red. See the "Correcting Session Anomalies" section on page 6-19 for details.

Step 3 Click **Finish**.

This sends the data migration session configurations to the MSM-18/4 module or MDS 9222i switch. DMM updates the Data Migration Status area in the DCNM-SAN window to display the new data migration job.

The wizard preselects default matches of existing and new LUN pairs.

Note LUN is the logical unit number as reported by the SCSI REPORT LUNS command (SCSI Opcode 0xA0. See the SPC-3 SCSI Standard for more details). The LUN Identifier, displayed by DMM, is used in the session configuration. Use this definition when you map devices seen by the server to the drives exported by the storage port.

Configuring a Storage-Based Migration Job Using Method 1 and Method 2

The DMM GUI wizard guides you through the steps required to configure a storage-based job. The wizard uses information from the MSM-18/4 modules or MDS 9222i switches to preconfigure much of the required information.

The wizard allows you to create a storage-based job using three different methods, Method 1, Method 2, and Method 3.

This section, assumes a dual-fabric topology with multipath ports defined in the server and in the storage devices.

The wizard creates and configures the job in five steps, which are described in the following sections:

- Creating a Job and Selecting Storage Enclosures (Storage-Based Migration), page 6-25
- Selecting MSM-18/4 Modules or MDS 9222i Switches for the Migration (Storage-Based Migration), page 6-26
- Configuring the Virtual Initiators in the Storage Arrays (Storage-Based Migration), page 6-27
- Configuring Migration Sessions, page 6-34

Creating a Job and Selecting Storage Enclosures (Storage-Based Migration)

Detailed Steps

To create a storage-based data migration job, launch DCNM-SAN and follow these steps:

Step 1 In the Tools menu, choose **Data Mobility Manager > Storage based**.

You see the Create Job window.

Step 2 From the Enclosure field of the Existing Storage pane, choose the existing storage enclosure. The wizard selects all of the ports to include in the job.

Step 3 If the storage is an active-active array, select only the active ports. For additional information about ports to include for an active-passive array, see the "Single LUN Set, Active-Active Array" section on page 3-5.

Step 4 From the Enclosure field of the New Storage pane, choose the new storage enclosure. The wizard selects all of the ports to include in the job.

Step 5 If the storage is an active-passive array, select only the active ports. For additional information about ports to include for an active-passive array, see the "Single LUN Set, Active-Passive Array" section on page 3-7.

Step 6 (Optional) In the Job Name field, enter a name for the job. The default value is "admin_" concatenated with today's date and the current time.

Step 7 (Optional) To configure the job as offline, click the **Offline Migration Type** radio button. The default migration type is online.

Step 8 (Optional) To configure the migration rate, click the appropriate **Rate** radio button. The default rate is best effort, which means that the MSM-18/4 module or MDS 9222i switch migrates the data as fast as resources allow. Slow, medium, and fast are configurable migration rates. Their default values are 25, 50, and 100 MB/s, respectively.

Step 9 (Optional) To configure a schedule for the job, click the appropriate **Schedule** radio button. The default is Manual, which means that the job is created but will not be started. Schedule the job at a later stage.

- Click the **Now** radio button for the job to start right after configuration is complete.
- Click the **Specify** radio button to configure a scheduled start time for the job. Additional fields are displayed, so that you can enter a start date and time.

Note You cannot schedule the job to start before the existing time. If you enter values before the current time, the job starts at the present time.

Step 10 Select a method:

- **Method 1**
  For an existing storage LUN whose data is already migrated to a new storage LUN, any new SCSI Write I/Os from the server is written to both the existing and new storage LUN before sending a response back to the server. Method 1 is typically used in local data migration.
- **Method 2**
  SCSI Write I/Os from the server to any existing storage LUN are written only to the existing storage LUN. The Write I/O changes to the existing storage LUN are marked in the Modified Region Log (MRL) before sending a response back to the server. These changes are then migrated to the new storage LUN on subsequent iterations. Method 2 is used in remote data center migration.

Step 11 (Optional) Click the **Show Dependent Ports** button to display all host ports zoned by the selected storage. The host ports are displayed in the Hosts area of the DCNM-SAN window.

If the new storage is not zoned, the Hosts area displays all hosts connected to the new storage.

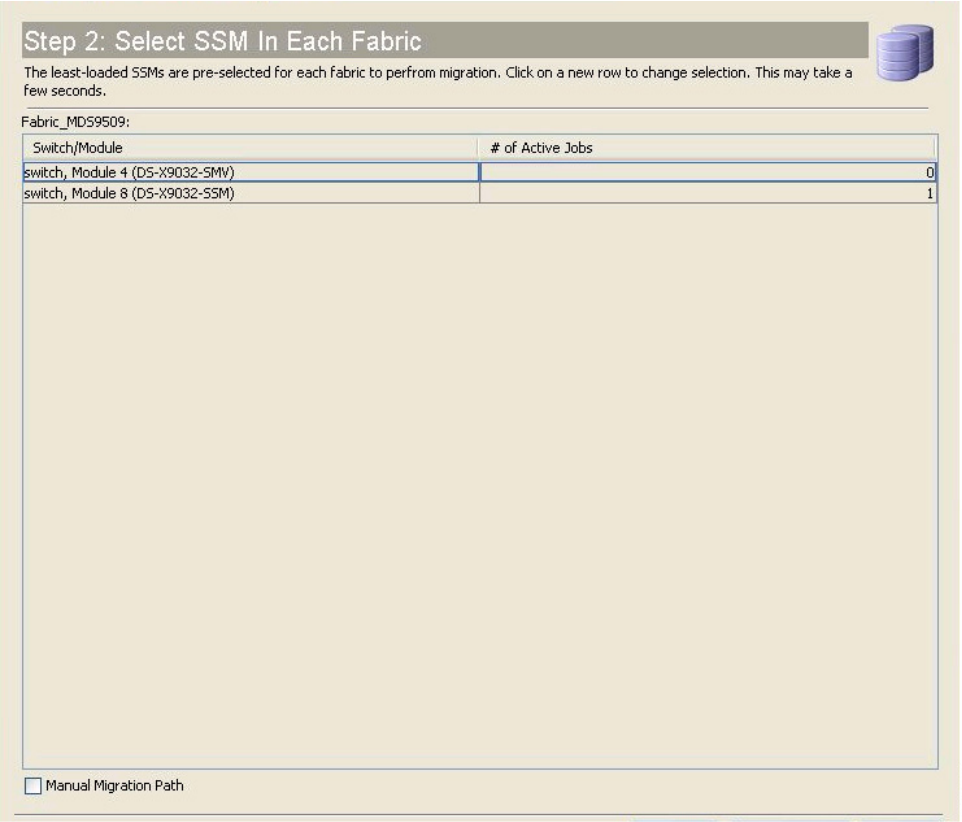
Step 12 Click **Next**.

You see the Select SSM window. (See Figure 6-5.)

Selecting MSM-18/4 Modules or MDS 9222i Switches for the Migration (Storage-Based Migration)

Figure 6-5 shows the Select SSM window, which displays the available MSM-18/4 modules or MDS 9222i switches to run the migration job.

Figure 6-5 Select SSM for Storage-Based Job



The wizard preselects the least-loaded MSM-18/4 module or MDS 9222i switch in each fabric and automatically selects the path for each source and destination port pair.

If the selections are acceptable, you can click **Next** to proceed to the next configuration task. The wizard sends the job configuration information to both the MSM-18/4 modules or MDS 9222i switches, and the MSM-18/4 modules or MDS 9222i switches create the data migration job. The MSM-18/4 modules or MDS 9222i switches return information (such as LUN maps) that is required to configure sessions. You see the DPP VI Selection window.

Detailed Steps

To manually select the MSM-18/4 module or the MDS 9222i switch or migration paths for the data migration, follow these steps:

Step 1 (Optional) Click a new row to select a MSM-18/4 module or MDS 9222i switch. Hold down the **Control** key and click to deselect a row. The number of active jobs in each of the MSM-18/4 module or MDS 9222i switch is displayed in the # of Active Jobs field.

Step 2 (Optional) Check the **Manual Migration Path** check box to view and manually select source and destination paths. This action causes a pop-up window to open after you perform Step 3. For information about selecting paths see the "Selecting Paths to Existing and New Storage" section on page 6-36.

Step 3 Click **Next**.

If you had checked the **Manual Migration Path** check box, you see the Choose Existing and New Path window.

Step 4 (Optional) To select a migration path, click a row to select a path.

Step 5 When you have chosen an existing and new path, click **Next**.

The wizard sends the job configuration information to both the MSM-18/4 modules or MDS 9222i switches and the MSM-18/4 modules or MDS 9222i switches create the data migration job. The MSM-18/4 modules or MDS 9222i switches return information (such as LUN maps) that is required to configure sessions.

If the job configuration is OK, you see the DPP VI Selection window.

If the job configuration contains errors, you see a pop-up window with the following error message:

- Mismatched number of LUNs.

If the number of LUNs on the existing and new storage do not match, the wizard generates an error message and stops. You need to correct the LUN configurations on the storage devices.

Configuring the Virtual Initiators in the Storage Arrays (Storage-Based Migration)

In a storage-based job, the DMM feature creates a virtual initiator (VI) for each MSM-18/4 module or MDS 9222i switch that was selected for the current job. The VI is created in the same VSAN as the storage ports (existing and new). If the job contains multiple storage ports, DMM creates the VI in one of the VSANs.

For the data migration to work correctly, you must configure the storage arrays (existing and new) to allow the VIs access to all LUNs that are being migrated. The VI information is displayed in the DPP VI Selection window.

Detailed Steps

To configure the VIs, follow these steps:

Step 1 From the drop-down list, choose a VI for each MSM-18/4 module or MDS 9222i switch.

Step 2 Configure the chosen VIs in the existing and new storage devices to allow access to the LUNs being migrated. The exact configuration steps to follow are manufacturer-specific.

Step 3 Click **Create/Activate zone**. You will see the zone creation and activation status window.

Note If your storage array provides a host group configuration (for example, some EMC arrays), ensure that the VIs are added to the same host group as the servers that access the array. This must be done for both existing and new storage.

Configuring Migration Sessions

The Create Session window displays the LUNs available for migration.

Detailed Steps

To create sessions for the data migration job, follow these steps:

Step 1 Check or uncheck the **Select** check boxes to select or deselect sessions for this data migration job. Each session is a source and destination LUN pair.

Step 2 (Optional) Check the **Load Balance** check box to balance the sessions between the MSM-18/4 modules or MDS 9222i switches.

Step 3 (Optional) Correct any anomalies, which are highlighted in red. See the "Correcting Session Anomalies" section on page 6-19 for details.

Step 4 Click **Finish**.

This sends the data migration session configurations to the MSM-18/4 modules or MDS 9222i switches. DMM updates the Data Migration Status area in the DCNM-SAN window to display the new data migration job.

The wizard preselects default matches of existing and new LUN pairs.

Note LUN is the logical unit number as reported by the SCSI REPORT LUNS command (SCSI Opcode 0xA0. See the SPC-3 SCSI standard for more details). The LUN Identifier displayed by DMM, is used in the session configuration. Use this definition when you map devices seen by the server to the drives exported by the storage port.

Configuring a Storage-Based Migration Job Using Method 3

Configuring a storage-based job using Method 3 allows three possible configurations listed as follows:

- Three-fabric: Two production fabrics and one migration fabric.
- Two-fabric: One production fabric and one migration fabric.
- Single-fabric, multi-VSAN: Single fabric, MSM-18/4 modules, or MDS 9222i switches belong to different VSANs.

For more information about Method 3 topologies, refer to the "Supported Topologies in Method 3" section on page 3-9.

The Cisco DMM wizard creates and configures the job in six steps, which are described in the following sections:

- Creating a Job and Selecting Storage Enclosures (Storage-Based Migration), page 6-29

Creating a Job and Selecting Storage Enclosures (Storage-Based Migration)

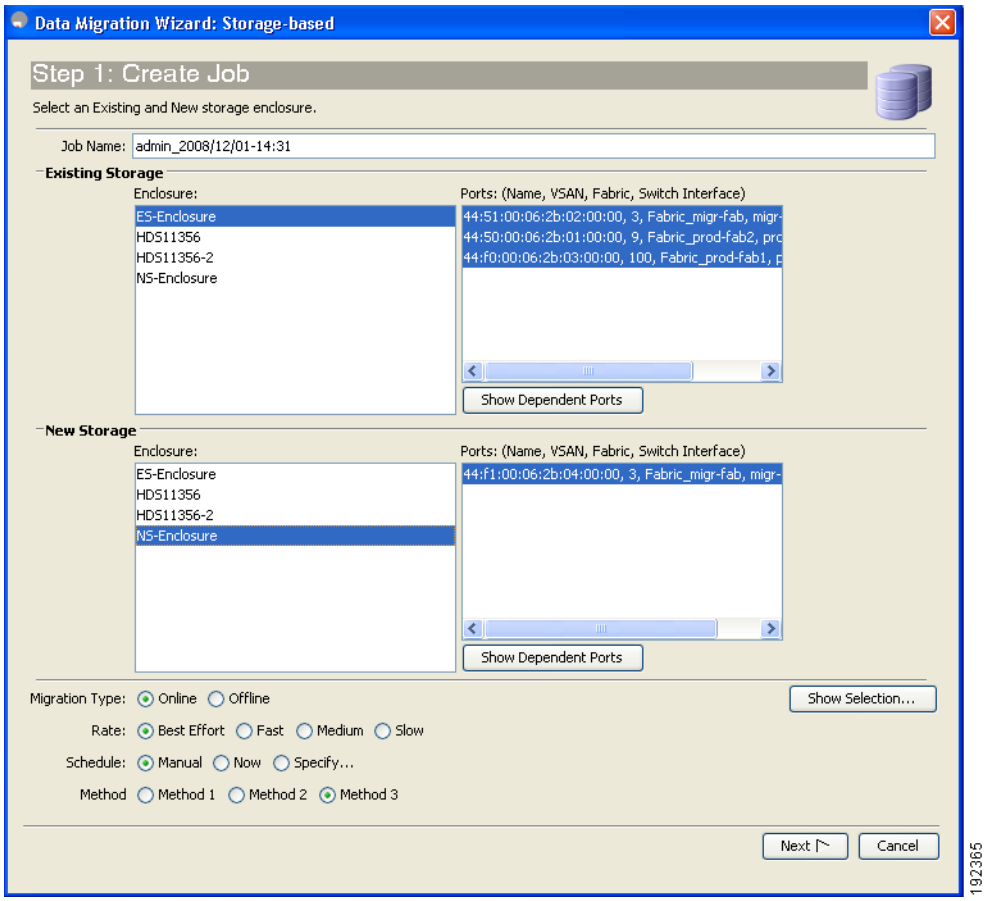
Detailed Steps

To create a storage-based data migration job, launch DCNM-SAN and follow these steps:

Step 1 In the Tools menu, choose **Data Mobility Manager > Storage based**.

You see the Create Job window. (See Figure 6-6.)

Figure 6-6 Create Job Window (Storage-Based)



Step 2 From the Enclosure field of the Existing Storage pane, choose the existing storage enclosure.

Step 3 The wizard selects all of the ports to include in the job. If the storage is an active-passive array, select only the active ports. For additional information about ports to include for an active-passive array, see the "Single LUN Set, Active-Passive Array" section on page 3-7.

Step 4 From the Enclosure field of the New Storage pane, choose the new storage enclosure.

Step 5 The wizard selects all of the ports to include in the job. If the storage is an active-passive array, select only the active ports. For additional information about ports to include for an active-passive array, see the "Single LUN Set, Active-Passive Array" section on page 3-7.

Note After the storage ports for the existing storage and new storage are selected, the DCNM-SAN automatically selects the fabric that the new storage port belongs to as the migration fabric and the remaining fabrics as the production fabric.

Step 6 (Optional) In the Job Name field, enter a name for the job. The default value is "admin_" concatenated with today's date and the current time.

Step 7 (Optional) To configure the job as offline, click the **Offline** Migration Type radio button. The default migration type is online.

Step 8 (Optional) To configure the migration rate, click the appropriate **Rate** radio button.

The default rate is best effort, which means that the MSM-18/4 modules or MDS 9222i switches migrates the data as fast as resources allow. Slow, medium, and fast are configurable migration rates. Their default values are 25, 50, and 100 MB/s, respectively.

Step 9 (Optional) To configure a schedule for the job, click the appropriate **Schedule** radio button.

The default is **Manual**, which means that the job is created but will not be started. **Schedule** the job at a later stage.

- Click the **Now** radio button for the job to start right after configuration is complete.
- Click the **Specify** radio button to configure a scheduled start time for the job. Additional fields are displayed, so that you can enter a start date and time.

Note You cannot schedule the job to start before the existing time. If you enter values before the current time, the job starts at the present time.

Step 10 Choose Method 3.

Step 11 (Optional) Click the **Show Dependent Ports** button to display all host ports zoned by the selected storage. The host ports are displayed in the Hosts area of the DCNM-SAN window. If the new storage is not zoned, the Hosts area displays all hosts connected to the new storage.

Step 12 Click **Next**.

When Method 3 option is selected and **Next** is clicked, Cisco DMM checks if the following conditions are met:

- The existing storage and the new storage are not zoned to common hosts, even if the host is not selected for the migration job.
- The existing storage does not belong to more than three fabrics.
- The new storage does not belong to more than one fabric.
- The existing storage and the new storage have at least one common fabric or VSAN that can be the migration fabric or VSAN.

For server migration jobs, the Cisco DMM also checks if the following conditions are also met:

- The host, that is connected to the existing storage, does not belong to more than two fabrics.
- The host and the existing storage ports are in the same fabric or VSAN.

For jobs that are single-fabric with multiple VSANs separating the production and migration VSANs, the Cisco DMM also checks if the following conditions are met:

- The host and the new storage are not in the same zone.
- Only one existing storage port and one new storage port are selected from the migration fabric.

If the job configuration contains errors, a pop-up window displays with one of the following error messages:

- No host enclosures are defined.
- You cannot select a host enclosure with ports that connect to more than two fabrics.
- There are no paths from the selected host port to any storage ports.
- You must select at least one host port, existing storage port, and new storage port.
- If the existing and new storage are in the same enclosure, you cannot select the same storage port for the existing and new storage.
- There must be no new storage ports included in the production fabric.
- There must be no server ports included in the migration fabric.

Selecting the Server MSM-18/4 Module or MDS 9222i Switch in Production Fabrics

The Select server SSM window displays the DMM-enabled modules in the production fabrics.

All available DMM-enabled modules may not be listed in the table. For example, a configured but unlicensed module may not be listed in the table.

For a single-fabric and two-fabric topologies with one production fabric, only one fabric is displayed in the Select server MSM-18/4 module or MDS 9222i switch in Each Fabric window.

The Cisco DMM wizard preselects the least-loaded MSM-18/4 module or MDS 9222i switch in each fabric and automatically selects the path for each source and destination port pair.

If the selections are acceptable, click **Setup Job** to proceed to the next configuration task.

Detailed Steps

To manually select an MSM-18/4 module or MDS 9222i switch for single production fabric, follow these steps:

Step 1 Click a new row to select an MSM-18/4 module or MDS 9222i switch. Hold down the **Control** key and click to deselect a row. The number of active jobs in each MSM-18/4 module or MDS 9222i switch is displayed in the # of Active Jobs field.

Step 2 Click **Setup Job**.

You can choose either one or two MSM-18/4 modules or MDS 9222i switches from the table and proceed to the next configuration. If two MSM-18/4 modules or MDS 9222i switches are chosen, then after clicking **Setup Job**, the DMM wizard checks to ensure the two MSM-18/4 modules or MDS 9222i switches belong to different VSANs.

For a three-fabric topology with two production fabrics, two fabrics will be displayed on the Select server module. You can choose only one switch module from each tables.

Detailed Steps

To manually select a switch module for two production fabrics, follow these steps:

Step 1 Click a new row to select an MSM-18/4 module or MDS 9222i switch for production fabric 1. Hold down the **Ctrl** key and click to deselect a row. The number of active jobs in each MSM-18/4 module or MDS 9222i switch is displayed in the # of Active Jobs field.

Step 2 Select a corresponding switch module for production fabric 2.

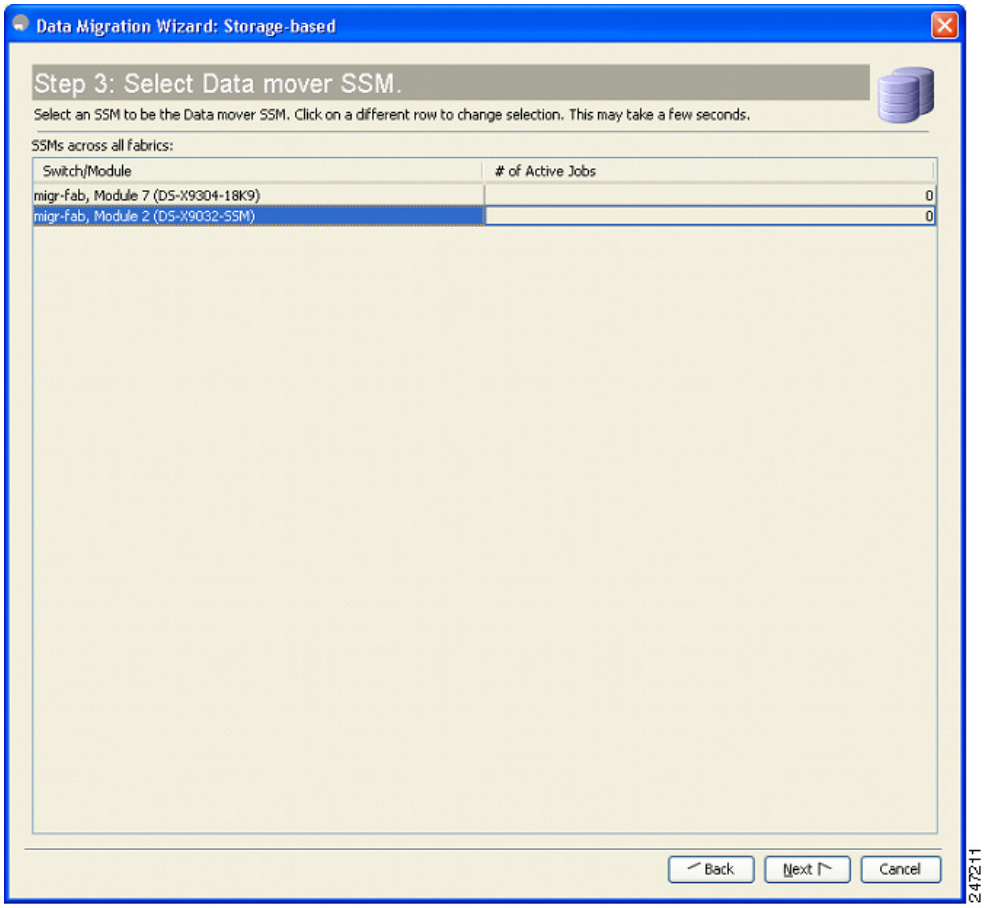
Note You must select a combination of two switch modules, one in each production fabric. A combination of two different module types are not allowed.

Selecting the Data Mover MSM-18/4 Module or MDS 9222i Switch or MSM

The Select Data Mover window (Figure 6-7) displays all the valid DMM-enabled modules in the migration fabric.

The wizard preselects the least-loaded MSM-18/4 module or MDS 9222i switch in the migration fabric. If the selections are acceptable, click **Next** to proceed to the next configuration task.

Figure 6-7 Select Data Mover Window



Prerequisites

- If you have selected server MSM in the production fabric, then select a data mover MSM. If you have selected server MDS in the production fabric, select a data mover MDS.

Detailed Steps

To manually select an MSM-18/4 module or MDS 9222i switch in production fabrics, follow these steps:

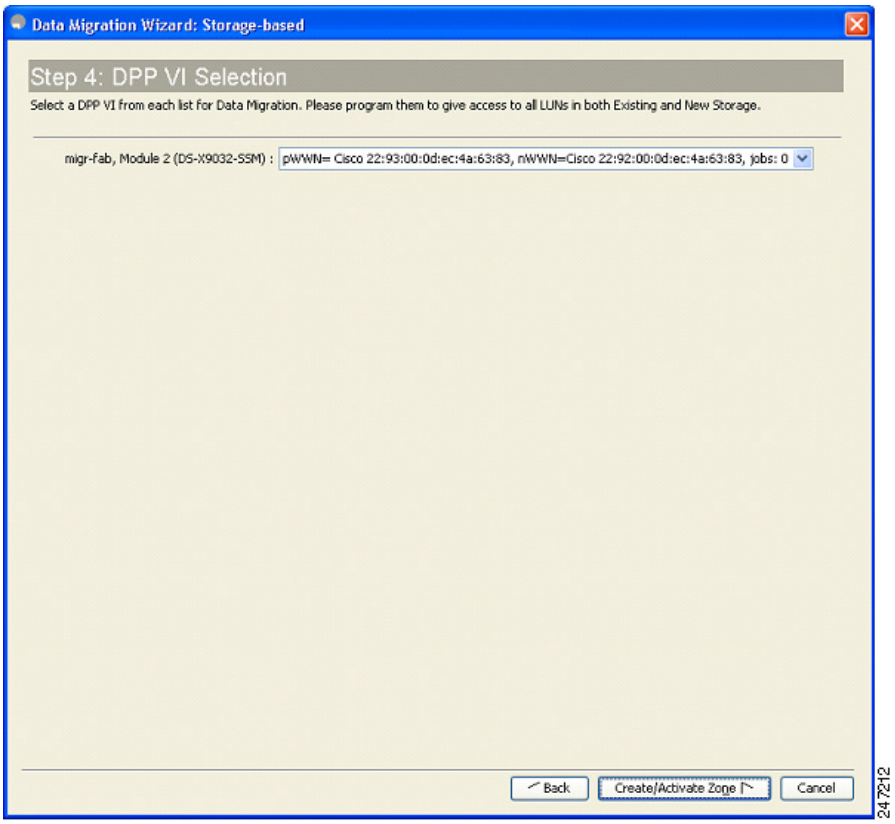
Step 1 Click a row to select one data mover MSM-18/4 module or MDS 9222i switch from this fabric. Hold down the **Ctrl** key and click to deselect a row. The number of active jobs in each MSM-18/4 module or MDS 9222i switch is displayed in the # of Active Jobs field.

Step 2 Click **Next**. The wizard sends the job configuration information to the migration fabric.

Selecting the DPP Virtual Initiator

In a storage-based job using method 3, Cisco DMM uses a VI**.** The VI is created in the same VSAN as the existing and new storage ports in the migration fabric. Depending on the data mover MSM-18/4 module or MDS 9222i switch selected, the DPP VI information is displayed in the DPP VI Selection window. (See Figure 6-8.)

Figure 6-8 Select DPP VI Window



Detailed Steps

To configure the VIs, follow these steps:

Step 1 From the drop-down list, choose a VI for each MSM-18/4 module or MDS 9222i switch.

Step 2 Configure the chosen VIs in the migration fabric to allow access to the LUNs being migrated.

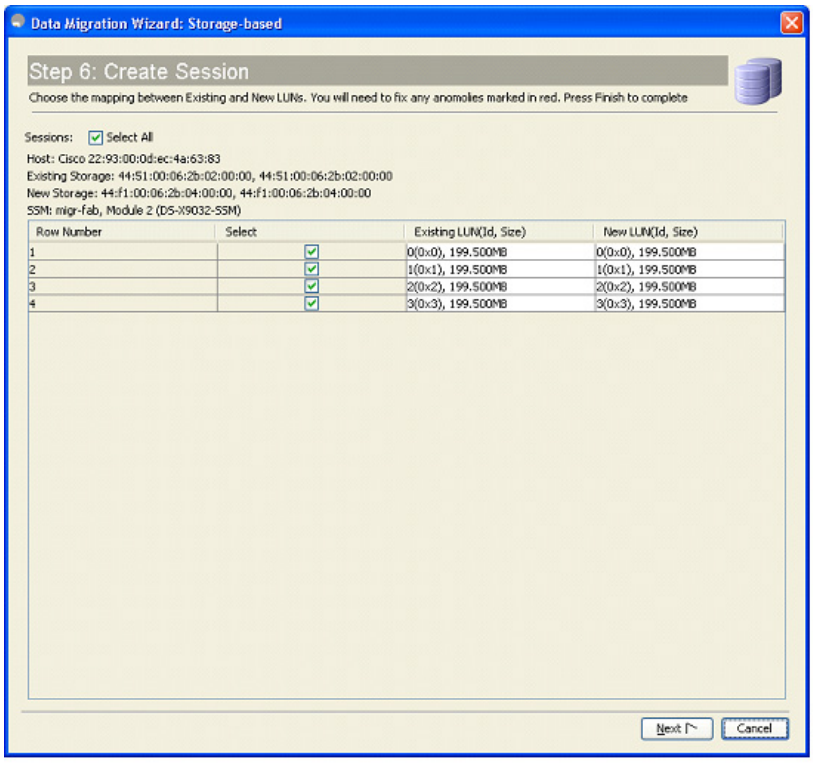
Step 3 Click **Create/Activate zone** to proceed to the next step.

Configuring Migration Sessions

The Create Session window displays the LUNs that are available for migration. (See Figure 6-9.)

The migration sessions are created in the data mover MSM-18/4 module or MDS 9222i switch.

Figure 6-9 Create Sessions Window



The wizard preselects default matches of existing and new LUN pairs.

Detailed Steps

To create sessions for the data migration job, follow these steps:

Step 1 Check or uncheck the **Select** check boxes to select or deselect sessions for this data migration job. Each session is a source and destination LUN pair. To select all the sessions, check **Select All** check box.

Step 2 Click **Next**.

Note LUN is the logical unit number as reported by the SCSI REPORT LUNS command (SCSI Opcode 0xA0. See the SPC-3 SCSI Standard for more details). The LUN Identifier, displayed by DMM, is used in the session configuration. Use this definition when you map devices seen by the server to the drives exported by the storage port.

Configuring Optional Steps

The DMM GUI wizard provides two optional configuration steps that apply to both types of data migration jobs (server-based and storage-based).

If the DMM feature cannot automatically correlate the LUN maps across multiple paths for the existing storage or the new storage, the wizard displays the configuration steps to manually correlate the LUNs.

This section includes the following topics that provide information on the additional configuration steps:

Selecting Paths to Existing and New Storage

The data migration wizard automatically selects a path through the SAN for each source and destination port pair.

If you checked the Manual Migration Path check box in the Select MSM-18/4 or MDS 9222i switch window**,** you see the Choose Existing and New Path window.

This window shows all the available paths, with the selected paths highlighted.

Prerequisites

- You must select one existing storage path and one new storage path.

Detailed Steps

To select a migration path, follow these steps:

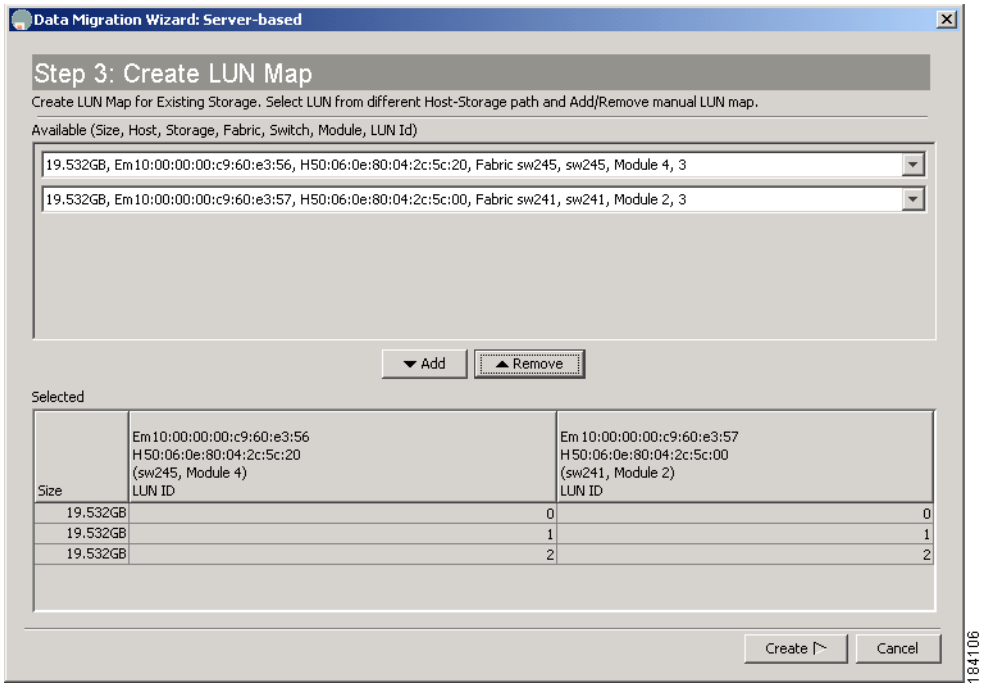
Step 1 Click a path to select or deselect the path.

Step 2 When you have selected an existing and new storage path, click **Next**.

Correlating LUN Maps (Existing Storage)

After you click **Next** in the Select SSM window, DMM automatically correlates the LUN maps. If DMM is unable to correlate the LUN maps for paths to the existing storage, you see the Create LUN Map window. (See Figure 6-10.)

Figure 6-10 Correlate LUN Map (Existing Storage)



Detailed Steps

To correlate the LUN maps for the existing storage, follow these steps:

Step 1 Use the pull-down lists to select a matching set of LUNs on the existing storage paths.

Step 2 Click the **add** button to add the LUN set to the selected list.

Step 3 Repeat Step 1 and Step 2 for each of the LUN sets.

Step 4 Click **Create**.

This opens the Create LUN Map window (for the new storage).

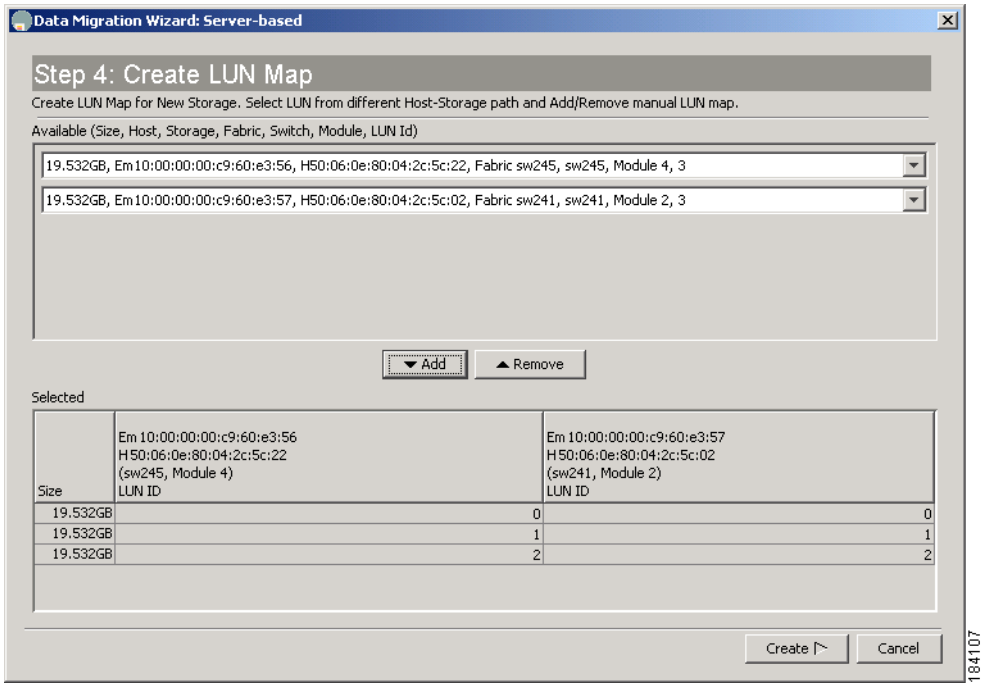
Note For a storage migration job, the path from the VIs are also displayed and also require correlation.

You must correlate an existing LUN to only one new LUN.

Correlating LUN Maps (New Storage)

After you click Next in the Select MSM-18/4 module or MDS 9222i switch window, DMM automatically correlates the LUN maps. If DMM is unable to correlate the LUN maps for paths to the new storage, you see the Create LUN Map window. (See Figure 6-11.)

Figure 6-11 Correlate LUN Map (New Storage)



Detailed Steps

To manually correlate the LUNs for the new storage, follow these steps:

Step 1 Use the pull-down lists to select a matching set of LUNs on the new storage.

Step 2 Click the **add** button to add the LUN set to the Selected list.

Step 3 Repeat Step 1 and Step 2 for each of the LUN sets.

Step 4 Click **Create**.

This opens the Configure Session window, which displays the available migration sessions.

Note For a storage migration job, the path from the VIs are also displayed and also require correlation.

Using the Data Migration Status

To display Data Migration Status in the Information pane, expand **Intelligent Features** and then select **Data Mobility Manager** in **Physical Attributes**.

The Data Migration Status displays the status of data migration jobs and their sessions. The Data Migration Status also provides a toolbar containing tools to create new jobs and perform operations on existing jobs.

Note If the DMM job consists of more than ten sessions, at any given instance a maximum of ten sessions are executed simultaneously.

Job Status Display Using DMM Commands

You can invoke commands on DMM jobs by clicking on the command buttons displayed above the list of jobs. The command buttons are context sensitive. Commands are valid or not valid depending on the job status of the selected job or jobs. Command buttons are grayed out for commands that are not valid for any of the selected jobs. For example, the Stop button is available only when one or more data migration session is in progress.

Table 6-1 shows the data migration commands and provides their descriptions.

Table 6-1 Command Valid States

Command	Description	Valid Job Status Values
Verify	Performs offline verification of the selected job. User is prompted to confirm the verification command.	Completed, InProgress.
Delete	Deletes the selected job (or jobs) and retrieves the job execution log from the MSM-18/4 module or MDS 9222i switch. User is prompted to confirm the delete command.	Stopped, Failed, Completed, Reset.
Stop	Stops the selected job.	InProgress, Finishing, Verify InProgress.
Start	Starts the selected job.	Created, Reset.
Modify	Allows you to modify the job attributes or configure a start time for the selected job.	Created, Scheduled, Reset, Stopped.
Finish	Blocks the server access to the existing storage and begins the final pass of migration (only applicable for Method 2).	InProgress.
Log	Opens the DMM log for the selected job.	All job status values.

The following sections contain additional information about the commands:

- Verifying Jobs, page 6-40
- Deleting Jobs, page 6-40

Verifying Jobs

When a job is in completed state, the Verify button is activated in the DMM session status display.

The MSM-18/4 module or MDS 9222i switch reads each migration region from the existing and new storage and then performs a comparison of the data.

You can verify multiple jobs simultaneously. However, the verification uses shared hardware resources in the MSM-18/4 module or MDS 9222i switch. If you try to verify a job for which the resource is already in use (verifying another job), the command fails.

Prerequisites

- Verification is performed in offline mode. Any application using the existing storage needs to be quiesced before you start verification.

Restrictions

- If you try to verify a job for which the resource is already in use (verifying another job), the command fails.

Detailed Steps

To verify a job, follow these steps:

Step 1 Select the job to be verified from the list in the Data Migration Status pane.

Step 2 Click the **Verify** button in the Data Migration Status tool bar.

You see a confirmation pop-up window.

Step 3 Click **OK**.

Deleting Jobs

Click the **Delete** button to permanently delete the selected job (or jobs). You are prompted to confirm the delete operation.

When you delete a job, DMM retrieves the job execution log from the MSM-18/4 module or MDS 9222i switch to a location on the FM server. You can find the job activity log in the following directory for more details:

C:\Documents and Settings\<user>\.cisco_mds9000\tftp\dmm.

You can select multiple jobs for deletion at the same time. This capability is useful when migrating active-passive arrays, which require at least two simultaneous jobs to perform the migration.

Starting and Stopping Jobs

Click the **Stop** button to stop a job that is in progress. Restart the job by clicking the **Start** button.

Modifying Jobs

Detailed Steps

To change the schedule, follow these steps:

Step 1 Select the job to be verified from the list in the Data Migration Status pane.

Step 2 Click the **Modify** button in the Data Migration Status tool bar.

You see the Reschedule Job pop-up window.

Step 3 Modify the migration rate and schedule as required.

Step 4 Click **OK**.

Finishing Jobs

For a Method 2 Data Migration Job, the **finish** operation needs to be performed. Until the **finish** operation is performed, the job continues to remain in the In Progress state. On clicking **finish**, server access to the existing storage LUNs are blocked. Cisco MDS DMM then performs the process of migrating the final list of changed blocks from the existing storage LUNs to new storage LUNs for the last time. A Method 2 DMM job can be deleted only in the completed state.

Displaying Job Logs

Click the **Log** button to display the Job Log for the selected job.

The job log from both the MSM-18/4 modules or MDS 9222i switches for dual fabric job includes the following information:

- Created time
- Scheduled time
- Start time
- Finish-request time
- Completed time
- Failed time
- Stopped time
- Verify start time
- Verify completed time
- Verify failed time

Verifying DMM Data Migration Configuration

To display DMM Data Migration configuration information, perform one of the following tasks:

Command	Purpose
show feature-1	Displays the <Feature-1> configuration
show	Displays ....

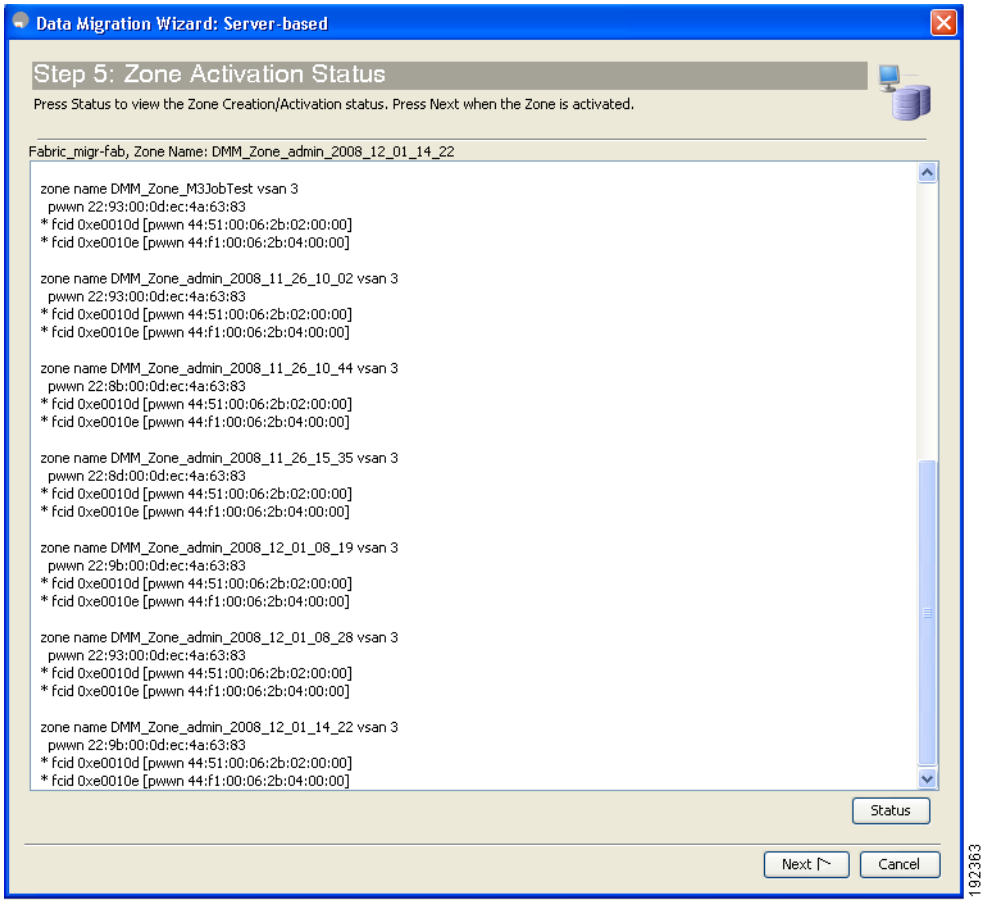
For detailed information about the fields in the output from these commands, refer to the *Cisco DC-OS Command Reference*.

Monitoring DMM for Data Migration

Verifying the New Zone

In a server-based job using Method 3, the DMM feature creates a new zone using the job name as the zone name. The Zone Activation Status window (Figure 6-12) displays information about all zones in each of the three fabrics.

Figure 6-12 Zone Activation Status Window



To verify the new zones, follow these steps:

Step 1 For each fabric, scroll to the end of the list. The newly created zone is at the end of the list. Verify that the activated zones are OK.

Step 2 Click **Next**.

You see the Create Session window.

Note The zone created in Step1 for each fabric should be removed after the job is deleted. The zone removal process might involve removing the zone from the zone database of all the MDS switches in the SAN (including the switches without the MSM-18/4 module or MDS 9222i switch). After you delete the job always remove the VIs from all zones in which they were configured.

Verifying the New Zone (Storage-Based Migration)

In a storage-based job, the DMM feature creates a new zone using the job name as the zone name. The Zone Creation and Activation Status windowdisplays information about all zones in each of the two fabrics.

To verify the new zones, follow these steps:

Step 1 For each fabric, scroll to the end of the list. The newly created zone is at the end of the list. Verify that the activated zones are OK.

Step 2 Click **Next**.

You see the Create Session window.)

Note The zone created in Step1 for each fabric should be removed after the job is deleted. The zone removal process might involve removing the zone from the zone database of all the MDS switches in the SAN (including the switches without the MSM-18/4 module or MDS 9222i switch). Always remove the VIs from all zones from where it is configured after the job is deleted.

Verifying the New Zone

The Zone Activation Status window displays information about all zones in each of the two fabrics. There is no zone created for new storage and host for DMM method 3 but zones are created for existing storage and VI.

To verify the new zones, follow these steps:

Step 1 For each fabric, scroll to the end of the list. The newly created zone is at the end of the list. Verify that the activated zones are correct.

Step 2 Click **Next**.

(Optional) Verifying the Completed Job

When all of the sessions in a job have completed successfully, you can optionally perform verification of the data in the new storage location. The MSM-18/4 module or MDS 9222i switch compares the data in the new storage with the data in the existing storage by reading each migration region from the existing and new storage, and then performing a comparison of the data.

To perform migration verification, follow these steps:

	Command	Purpose
Step 1	`switchA(config)# dmm module module-id job job-id verify`	Verifies the data migration by comparing the data in the new storage with the data in the existing storage. The **verify** command operates in offline mode.
Step 2	`switch# show dmm job job-id session [session-id sess-id]`	Displays the verification progress while verification is performed on a job.

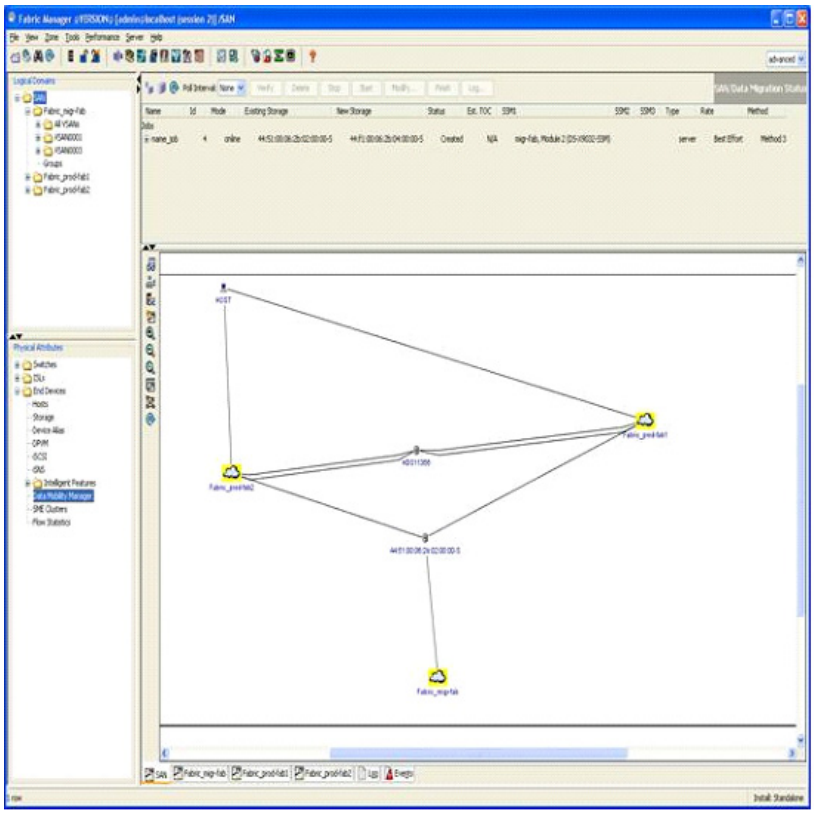
Note Verification is performed in offline mode. Any service using the existing storage needs to be quiesced before you start verification.

Viewing Migration Jobs in DCNM-SAN

After the sessions are created for the migration job, the data migration session configurations are sent to the MSM-18/4 module or MDS 9222i switch.

In the DCNM-SAN GUI, the Jobs panel displays the created migration job and the Data Migration Status area is updated to display the new data migration job. (See Figure 6-13.) In Method 3, all the three MSM-18/4 modules or MDS 9222i switches are listed in the Jobs panel. MSM-18/4 module1 or MDS 9222i switch1 and MSM-18/4 module2 or MDS 9222i switch2 are the server MSM-18/4 modules or MDS 9222i switches. MSM-18/4 module3 or MDS 9222i switch3 is the data mover MSM-18/4 module or MDS 9222i switch.

Figure 6-13 Migration Job Displayed in FM GUI



Displaying the Data Migration Status

To display the Data Migration Status, follow this step:

Step 1 Click **Data Mobility Manager** in the physical attributes panel.

The Job Status area appears in the upper-right quarter of the display. The area is labeled Data Migration Status.

Controlling DMM Jobs

The DMM CLI provides a set of commands to control jobs that have been configured. The job state determines which commands are valid to run. Table 6-5 shows job state values.

Table 6-2 Job Status Values

Job Status Value	Description
Created	The job has been created but has not been scheduled.
Scheduled	The job has been configured with a scheduled start time. It will automatically start at that time.
Complete	The job has been completed successfully.
Verify	The completed job is being verified.
Stopped	The job has been stopped manually by the user.
Failed	The job has been stopped because of failures. See Table 5-5 for details.
In_Progress	The job is currently running.
Reset	The job has been reinitialized because of failures. See Table 5-6 for details.
Finishing	The Method 2 job is in the final copy iteration.
Verify_Stopped	The job verification has been stopped.
Verify_Complete	The job verification has been completed.
Verify_Failure	The job verification is unsuccessful.

Table 6-1 describes the data migration commands.

Table 6-3 Command Valid States

Command	Description	Valid Job Status Values
Verify	Performs offline verification of the selected job, and you are prompted to confirm the verification command.	Completed, InProgress, VerifyStopped, Verify_Failure
Destroy	Deletes the selected job (or jobs) and retrieves the job execution log from the MSM-18/4 module or MDS 9222i switch, and you are prompted to confirm the delete command.	Stopped, Failed, Completed, Reset, VerifyStopped, Verify_Failure, Created, Scheduled
Stop	Stops the selected job.	InProgress
Start	Starts the selected job.	Created, Reset
Modify	Allows you to modify the job attributes or configure a start time for the selected job.	Created, Scheduled, Reset, Stopped
Schedule	Allows you to set up schedules.	Created, Scheduled, Stopped
Validate	Validates the stored configuration for a job in a Reset state.	Reset
Finish	Completes the selected job only in case of Method 2.	InProgress
Log	Opens the DMM log for the selected job.	All job status values

Note You must enter these commands on the switch with sessions configured. If both the MSM-18/4 module or MDS 9222i switch have sessions configured, enter the commands on both switches.

Monitoring DMM Jobs

Use the **show dmm job** command in the MSM-18/4 module or MDS 9222i switch CLI to monitor the status of data migration jobs, and the current progress of jobs and sessions that are in progress.

- You must enter the commans on the switch with sessions configured. If both the MSM-18/4 module or MDS 9222i switch have sessions configured, enter the commands on both switches.

To monitor data migration jobs, follow these steps:

	Command	Purpose
Step 1	`switch# attach module module-id`	Enters CLI mode on the MSM-18/4 module or MDS 9222i switch.

	Command	Purpose
Step 2	`module# show dmm job`	Displays summary information about the data migration jobs configured on this MSM-18/4 module or MDS 9222i switch.
Step 3	`module# show dmm job job-id` *job-id* `{detail | session | storage}`	Displays information about the specified job. The **detail** command displays the job attributes, schedule, server HBA and storage ports, the job log, and job error log. The **session** command displays the sessions included in the job. The **storage** command displays the storage ports included in the job.

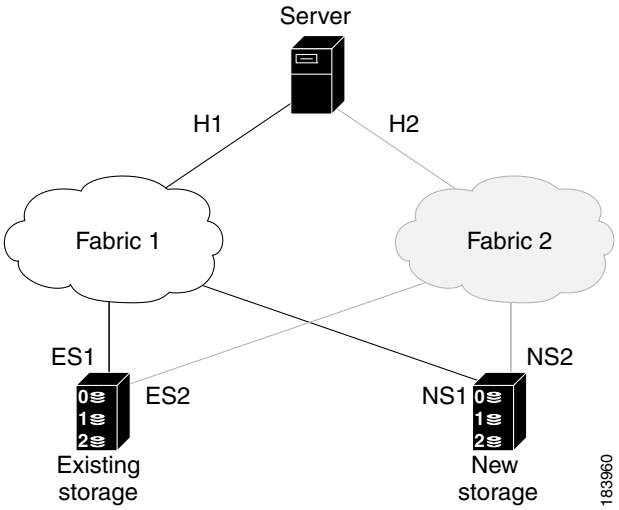
For additional information about monitoring and troubleshooting data migration jobs, see Chapter 5, “Troubleshooting Cisco MDS DMM.”Troubleshooting Cisco MDS DMM.

Configuration Examples for DMM Data Migration

Server-Based Migration Example

The topology (Figure 6-14), is dual fabric with multipath ports defined in the server and redundant paths to the storage devices.

Figure 6-14 Topology for the Example



On both switches, the MSM-18/4 module or MDS 9222i switch is located in slot 8. The pWWNs for the ports are listed here:

Port	pWWN
H1	**21:00:00:e0:8b:0a:5d:e7**
ES1	**50:06:04:82:bf:cf:e0:43**
NS1	**50:06:0e:80:03:4e:95:13**
H2	**21:01:00:e0:8b:0a:5d:e7**
ES2	**50:06:04:82:bf:cf:e0:5d**
NS2	**50:06:0e:80:03:4e:95:03**

To configure sessions, follow these steps:

	Command	Purpose
Step 1	`switchA(config)# dmm module` *module-id* **job** *job-id* **session**	Enters session configuration mode for the specified job on the specified MSM-18/4 module or MDS 9222i switch.
Step 2	`switchA(config-session)# server` *pWWN* **src_tgt** *pWWN* **src_lun** *num* **dst_tgt** *pWWN* **dst_lun** *num*	Configures a session. The server HBA port, existing storage port, and new storage port must all belong to the same VSAN. • **server** is the server pWWN (server-based job) or VI pWWN (storage-based job). • **src_tgt** is the existing storage pWWN. • **src_lun** is the LUN number in the existing storage. Enter this value in hexadecimal notation. • **dst_tgt** num is the new storage pWWN. • **dst_lun** is the LUN number in the new storage. Enter this value in hexadecimal notation.

The following example shows how to configure a data migration job on switch A:

```
switchA# configure terminal
switchA(config)# dmm module 8 job 2345 create
Started New DMM Job Configuration.
Do not exit sub-mode until configuration is complete and committed
switchA(config-dmm-job)# server vsan 100 pwwn 21:0d:00:0d:ec:02:2d:82
switchA(config-dmm-job)# storage vsan 100 pwwn 50:06:04:82:bf:cf:e0:43 existing
switchA(config-dmm-job)# storage vsan 100 pwwn 50:06:0e:80:03:4e:95:13 new
switchA(config-dmm-job)# peer 10.10.2.4
switchA(config-dmm-job)# attributes job_type 1 job_mode 1 job-rate 1 job-method 1
switchA(config-dmm-job)# commit
switchA(config-dmm-job)# end
Ending DMM Job Configuration.
If the Job was not committed, it will be required to reconfigure the job.
```

The following example shows how to configure a data migration job on switch B:

```
switchB# configure terminal
switchB(config)# dmm module 8 job 2345 create
Started New DMM Job Configuration.
Do not exit sub-mode until configuration is complete and committed
switchB(config-dmm-job)# server vsan 100 pwwn 21:0d:00:0d:0a:01:2b:82
switchB(config-dmm-job)# storage vsan 100 pwwn 50:06:04:82:bf:cf:e0:5d existing
switchB(config-dmm-job)# storage vsan 100 pwwn 50:06:0e:80:03:4e:95:03 new
switchB(config-dmm-job)# peer 10.10.1.8
switchB(config-dmm-job)# attributes job_type 1 job_mode 1 job-rate 1 job-method 1
switchB(config-dmm-job)# commit
switchB(config-dmm-job)# end
Ending DMM Job Configuration.
If the Job was not committed, it will be required to reconfigure the job.

switchB#
```

The following example shows how to configure data migration sessions on switch A:

```
switchA(config)# dmm module 4 job 2345 session
switchA(config-session)# server 21:0d:00:0d:ec:02:2d:82 src_tgt 50:06:04:82:bf:cf:e0:43
src_lun 0x5 dst_tgt 50:06:0e:80:03:4e:95:13 dst_lun 0x0
switchA(config-session)# server 21:0d:00:0d:ec:02:2d:82 src_tgt 50:06:04:82:bf:cf:e0:43
src_lun 0x6 dst_tgt 50:06:0e:80:03:4e:95:13 dst_lun 0x1
```

```
switchA(config-session)# exit
```

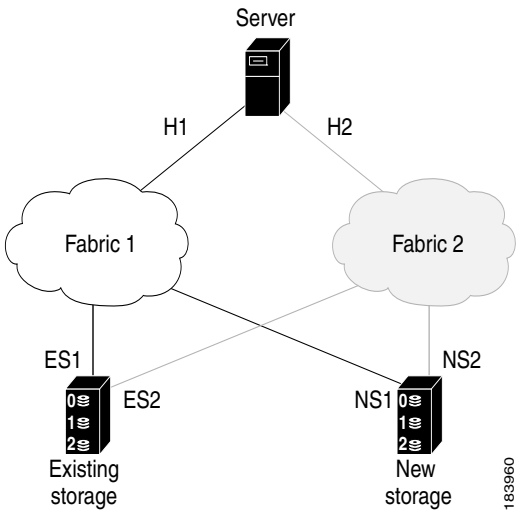
The following example shows how to start a data migration job on switch A:

```
switchA(config)# dmm module 8 job 2345 start
Started New DMM Job Configuration.
Do not exit sub-mode until configuration is complete and committed
switchA(config)# exit
```

Storage-Based Migration Example

The topology (Figure 6-15), is dual fabric with multipath ports defined in the server and redundant paths to the storage devices.

Figure 6-15 Storage-Based Migration Example



On both switches, the MSM-18/4 module or MDS 9222i switch is located in slot 8. The pWWNs for the ports are listed here:

Port	pWWN
Host 1	**21:00:00:e0:8b:0a:5d:e7**
VI 1	**21:0d:00:0d:ec:02:2d:82**
ES1	**50:06:04:82:bf:cf:e0:43**
NS1	**50:06:0e:80:03:4e:95:13**
Host 2	**21:01:00:e0:8b:0a:5d:e7**
VI 2	**21:0d:00:0d:0a:01:2b:82**
ES2	**50:06:04:82:bf:cf:e0:5d**
NS2	**50:06:0e:80:03:4e:95:03**

To configure sessions, follow these steps:

	Command	Purpose
Step 1	`switchA(config)# dmm module` *module-id* `job` *job-id* `session`	Enters session configuration mode for the specified job on the specified MSM-18/4 module or MDS 9222i switch.
Step 2	`switchA(config-session)# server` *pWWN* `src_tgt` *pWWN* `src_lun` *num* `dst_tgt` *pWWN* `dst_lun` *num*	Configures a session. The server HBA port, existing storage port, and new storage port must all belong to the same VSAN. • **server** is the server pWWN (server-based job) or VI pWWN (storage-based job). • **src_tgt** is the existing storage pWWN. • **src_lun** is the LUN number in the existing storage. Enter this value in hexadecimal notation. • **dst_tgt** num is the new storage pWWN. • **dst_lun** is the LUN number in the new storage. Enter this value in hexadecimal notation.

The following example shows how to configure the VI on switch A:

```
switchA# configure terminal
switchA(config)# dmm module 8 job 2345 get-vi vsan 100
DMM Storage Job:0x929 assigned following VI -
VI NodeWWN: 21:0c:00:0d:ec:02:2d:82
VI PortWWN: 21:0d:00:0d:ec:02:2d:82
sjc7-9509-6(config)#
```

The following example shows how to configure the zone and zone set on switch A:

```
switchA(config)# zone name DMM1 vsan 100
switchA(config-zone)# member pwwn 21:0d:00:0d:ec:02:2d:82 -- for vi
switchA(config-zone)# member pwwn 50:06:04:82:bf:cf:e0:43 -- for es
switchA(config-zone)# member pwwn 50:06:0e:80:03:4e:95:13 -- for ns
switchA(config-zone)# exit
```

```
switchA(config)# zoneset name DMM1 vsan 100
switchA(config-zoneset)# member DMM1
switchA(config-zoneset)# exit
switchA(config)#
```

The following example shows how to configure the data migration job on switch A:

```
switchA(config)# dmm module 8 job 2345 create
Started New DMM Job Configuration.
Do not exit sub-mode until configuration is complete and committed
switchA(config-dmm-job)# server vsan 100 pwwn 21:0d:00:0d:ec:02:2d:82
switchA(config-dmm-job)# storage vsan 100 pwwn 50:06:04:82:bf:cf:e0:43 existing
switchA(config-dmm-job)# storage vsan 100 pwwn 50:06:0e:80:03:4e:95:13 new
switchA(config-dmm-job)# peer 10.10.2.4
switchA(config-dmm-job)# attributes job_type 2 job_mode 1 job-rate 1 job-method 1
switchA(config-dmm-job)# commit
switchA(config-dmm-job)# end
Ending DMM Job Configuration.
If the Job was not committed, it will be required to reconfigure the job.
switchB#
```

The following example shows how to configure the VI on switch B:

```
switchB# configure terminal
switchB(config)# dmm module 8 job 2345 get-vi vsan 100
DMM Storage Job:0x929 assigned following VI -
VI NodeWWN: 21:0c:01:0e:ec:02:2d:82
VI PortWWN: 21:0d:00:0d:0a:01:2b:82
switchB(config)#
```

The following example shows how to configure the zone and zone set on switch B:

```
switchB(config)# zone name DMM1 vsan 100
switchB(config-zone)# member pwwn 21:0d:00:0d:0a:01:2b:82 -- for vi
switchB(config-zone)# member pwwn 50:06:04:82:bf:cf:e0:5d -- for es
switchB(config-zone)# member pwwn 50:06:0e:80:03:4e:95:03 -- for ns
switchB(config-zone)# exit
switchB(config)# zoneset name DMM1 vsan 100
switchB(config-zoneset)# member DMM1
switchB(config-zoneset)# exit
switchB(config)#
```

The following example shows how to configure the data migration job on switch B:

```
switchB# configure terminal
switchB(config)# dmm module 8 job 2345 create
Started New DMM Job Configuration.
Do not exit sub-mode until configuration is complete and committed
switchB(config-dmm-job)# server vsan 100 pwwn 21:0d:00:0d:0a:01:2b:82
switchB(config-dmm-job)# storage vsan 100 pwwn 50:06:04:82:bf:cf:e0:5d existing
switchB(config-dmm-job)# storage vsan 100 pwwn 50:06:0e:80:03:4e:95:03 new
switchB(config-dmm-job)# peer 10.10.1.8
switchB(config-dmm-job)# attributes job_type 2 job_mode 1 job-rate 1 job-method 1
switchB(config-dmm-job)# commit
switchB(config-dmm-job)# end
Ending DMM Job Configuration.
If the Job was not committed, it will be required to reconfigure the job.
switchB#
```

The following example shows how to configure the data migration sessions on switch A:

```
switchA(config)# dmm module 4 job 2345 session
switchA(config-session)# server 21:0d:00:0d:ec:02:2d:82 src_tgt 50:06:04:82:bf:cf:e0:43
src_lun 0x5 dst_tgt 50:06:0e:80:03:4e:95:13 dst_lun 0x0
```

```
switchA(config-session)# exit
```

The following example shows how to start the data migration job on switch A:

```
switchA(config)# dmm module 8 job 2345 start
Started New DMM Job Configuration.
Do not exit sub-mode until configuration is complete and committed
switchA(config)# exit
```

The following example shows how to configure the data migration sessions on switch B:

```
switchB(config)# dmm module 4 job 2345 session
switchB(config-session)# server 21:0d:00:0d:0a:01:2b:82 src_tgt 50:06:04:82:bf:cf:e0:5d
src_lun 0x5 dst_tgt 50:06:0e:80:03:4e:95:03 dst_lun 0x0

switchB(config-session)# exit
```

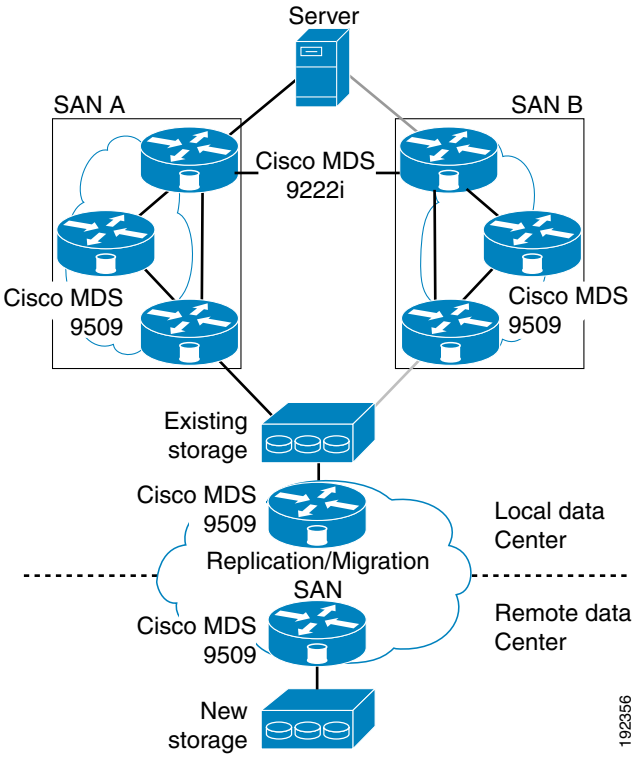
The following example shows how to start the data migration job on switch B:

```
switchB(config)# dmm module 8 job 2345 start
Started New DMM Job Configuration.
Do not exit sub-mode until configuration is complete and committed
switchB(config)# exit
```

DMM Method 3 Migration Example

The topology for the example is shown in Figure 6-16.

Figure 6-16 DMM Method 3 Migration Example



This section describes how to configure a data migration job using DMM method 3. The job needs to be configured on the MSM-18/4 module or MDS 9222i switch in the migration fabric as well as the MSM-18/4 modules or MDS 9222i switches in the production fabrics.

Note DMM method 3 is not available on the MDS 9222i switches.

To configure the migration fabric, follow these steps:

Step 1 Select a VI from the VI list for the module.

```
migr-fab# show dmm module 2 vi-list
================================================================================
DPP-Id   VI-pWWN                   VI-nWWN                 Outstanding jobs
================================================================================
1        22:93:00:0d:ec:4a:63:83  22:92:00:0d:ec:4a:63:83  1
2        22:8b:00:0d:ec:4a:63:83  22:8a:00:0d:ec:4a:63:83  0
3        22:8d:00:0d:ec:4a:63:83  22:8c:00:0d:ec:4a:63:83  0
4        22:95:00:0d:ec:4a:63:83  22:94:00:0d:ec:4a:63:83  0
5        22:97:00:0d:ec:4a:63:83  22:96:00:0d:ec:4a:63:83  0
6        22:8f:00:0d:ec:4a:63:83  22:8e:00:0d:ec:4a:63:83  0
7        22:91:00:0d:ec:4a:63:83  22:90:00:0d:ec:4a:63:83  0
8        22:99:00:0d:ec:4a:63:83  22:98:00:0d:ec:4a:63:83  0
```

Step 2 Create a zone of the selected VI with the ES and NS ports.

Step 3 To create the DMM job.

```
migr-fab# config terminal
migr-fab(config)# dmm module 2 job 4 set-vi  22:93:00:0d:ec:4a:63:83
22:92:00:0d:ec:4a:63:83 vsan 3 (Use the VI selected above and Zoned with the existing
storage and new storage ports)
migr-fab(config)# dmm module 2 job 4 create
migr-fab(config-dmm-job)# attributes job_type 1 job_mode 1 job_rate 1 job_method 3
migr-fab(config-dmm-job)# peer 10.1.2.3 (MSM-18/4 in production fabric 1)
migr-fab(config-dmm-job)# peer 10.1.1.4 (MSM-18/4 in production fabric 2)
migr-fab(config-dmm-job)# storage vsan 3 pwwn 44:51:00:06:2b:02:00:00 existing
migr-fab(config-dmm-job)# storage vsan 3 pwwn 44:f1:00:06:2b:04:00:00 new
migr-fab(config-dmm-job)# commit
migr-fab(config-dmm-job)# exit
migr-fab(config)# dmm module 2 job 4 session
migr-fab(config-dmm-session)# server 22:93:00:0d:ec:4a:63:83 src_tgt
44:51:00:06:2b:02:00:00 src_lun 0 dst_tgt 44:f1:00:06:2b:04:00:00 dst_lun 0
migr-fab(config-dmm-session)# end
```

The following example shows the configuration of production fabric 1:

```
prod-fab1(config)# dmm module 3 job 4 create
Started New DMM Job Configuration.
Do not exit sub-mode until configuration is complete and committed
prod-fab1(config-dmm-job)# attributes job_type 1 job_mode 1 job_rate 1 job_method 3
prod-fab1(config-dmm-job)# peer 10.1.3.2 (only the migration fabric is configured as peer)
prod-fab1(config-dmm-job)# server vsan 100 pwwn 21:01:00:e0:8b:28:5e:3e
prod-fab1(config-dmm-job)# storage vsan 100 pwwn 44:f0:00:06:2b:03:00:00 existing
(only the existing storage is required for production fabric, no new storage is required)
prod-fab1(config-dmm-job)# commit
prod-fab1(config-dmm-job)# end
```

The following example shows the configuration of production fabric 2:

```
prod-fab2(config)# dmm module 4 job 4 create
Started New DMM Job Configuration.
Do not exit sub-mode until configuration is complete and committed
prod-fab2(config-dmm-job)# attributes job_type 1 job_mode 1 job_rate 1 job_method 3
prod-fab2(config-dmm-job)# peer 10.1.3.2
prod-fab2(config-dmm-job)# server vsan 9 pwwn 21:00:00:e0:8b:08:5e:3e
prod-fab2(config-dmm-job)# storage vsan 9 pwwn 44:50:00:06:2b:01:00:00 existing
prod-fab2(config-dmm-job)# job_name name_job
prod-fab2(config-dmm-job)# commit
prod-fab2(config-dmm-job)# end
```

Field Descriptions for Configuring DMM for Data Migration

Job Status Display Fields

The job status display is arranged as a table. Each row of the table displays information about one job. You can expand the job to display a table row for each session in the job. If the DMM job consists of more than 10 sessions at any given instance, a maximum of 10 sessions are executed simultaneously. Table 6-4 describes the information that is displayed in the fields for jobs and sessions.

Table 6-4 Field Definitions in the Job Status Display

Field	Description for a Job Row	Description for a Session Row
Name	The name of the job.	This field is blank.
Id	System-assigned unique identifier for the job.	The session number within the job.
Mode	Server mode or storage mode.	This field is blank.
Existing Storage	Alias name of the port on the existing storage.	LUN number on the existing storage.
New Storage	Alias name of the port on the new storage.	LUN number on the new storage.
Status	Status of the job: a created or scheduled job has not yet started. An in-progress job is currently performing the migration. A completed or verified job has finished successfully. A stopped, failed or reset job has finished unsuccessfully.	Status of the session.
Est.TOC	An estimation of time to complete the migration for the entire job.	An estimation of time to complete the migration for the given session of a job.
MSM-18/4 module1 or MDS 9222i switch1	Switch number and slot of the MSM-18/4 module or MDS 9222i switch executing the migration job.	Displays on MSM-18/4 module1 or MDS 9222i switch1 if the session is executing on MSM-18/4 module1 or MDS 9222i switch1.
MSM-18/4 module2 or MDS 9222i switch2	Switch number and slot of the MSM-18/4 module or MDS 9222i switch executing the migration job.	Displays on MSM-18/4 module2 or MDS 9222i switch2 if the session is executing on MSM-18/4 module2 or MDS 9222i switch2.
Type	Online or offline migration.	This field is blank.
Rate	Best effort, slow, medium, or fast. You set the rate when you configure the migration job. See the "Creating a Server-Based Migration Job" section on page 6-14.	This field is blank.
Method	The method chosen for the Data Migration Job.	The method chosen for the Data Migration Job.

Table 6-5 shows the job status values and provides their descriptions.

Table 6-5 Job Status Values

Job Status Value	Description
Created	The job has been created, but has not been scheduled.
Scheduled	The job has been configured with a scheduled start time. It will automatically start at that time.

Table 6-5 Job Status Values (continued)

Job Status Value	Description
InProgress	The job is currently running.
Finishing InProgress	Method 2 is currently in the final pass of migration.
Completed	The job is completed successfully.
Verifying	The completed job is being verified.
Verify stopped	The verification of the job is stopped.
Verify failed	The verification of the job has failed.
Verify Completed	The completed job is verified.
Stopped	The job is stopped manually by the user.
Failed	The job is stopped because of failures related to storage I/O.
Reset	The job is reinitialized because of failures related to the SAN or IP network. Failure examples include port flaps, connection loss between the peer MSM-18/4 modules or MDS 9222i switches, or the MSM-18/4 module or MDS 9222i switch reloads.

Table 6-6 shows the session status values and provides their descriptions.

Table 6-6 Session Status Values

Session State Value	Description
Created	The session has been created, but the data migration has not started running.
InProgress [1]	The data migration for this session is in progress.
Verify InProgress	The verification of the session is in progress.
Verify Complete	The verification of the session is complete.
Complete	The session has completed successfully.
Failed	The session has failed because of an internal problem.
Suspended	The user has suspended execution of the session.
I/O Failure	The session has failed because of an I/O problem.
Internal Failure	The session has failed because of internal processing errors.

1-%Synched specifies the percentage migrated.

Feature History for Configuring DMM for Data Migration

Table 6-7 lists the release history for this feature.

Table 6-7 Feature History for Configuring DMM for Data Migration

Feature Name	Releases	Feature Information
Storage-based Method 3	4.2(1)	Screenshots added for storage-based Method 3. After creating a job, the DMM wizard checks if conditions are met before proceeding to the next step.
Method 3	4.1(3)	New option in the DMM configuration wizard for creating a job. Allows you to choose the method to perform a data migration job.
MSM 18/4	4.1(1b)	New tab in the DMM configuration wizard. Allows you to choose the MSM.
Method	3.3(1a)	New option in the DMM configuration wizard for creating a job. Allows you to choose the method to perform a data migration job.
Finish	3.3(1a)	New option in the DMM configuration wizard. Blocks the server access to the existing storage and begins the final pass of migration.
Est. TOC	3.3(1a)	New tab in the DMM configuration wizard. An estimation of time to complete the migration of a job.