



Managing Virtual Disks

A VDisk is a virtual representation of a LUN that is exposed by the cluster to the hosts in a SAN. Each VDisk is independently associated with a single I/O group.

This chapter includes the following sections:

- [Virtualization Policies, page 5-2](#)
- [Licensing Requirements, page 5-2](#)
- [Configuring VDisks, page 5-3](#)

Virtualization Policies

Virtualization is the process of creating a pool of storage that can be split into VDIs. VDIs are visible to the host systems that use them and provide a common way to manage SAN storage. VDIs in the Cisco MDS 9000 Family use one of three virtualization policies: striped, sequential, or image.

Striped

When a VDI is created using a striped policy its extents are allocated from the specified ordered list of MDIs. The allocation algorithm starts with the first MDI in the ordered list and attempts to allocate an extent to it and then moves on to the next disk.

MDI in turn process allocation—if a specified MDI has no free extents then it misses its turn and the turn passes to the next MDI in the list. When the end of the list is reached the turn loops back to the first disk in the list. The disk allocation proceeds until all required extents are allocated.

A specific MDI can appear more than once in the list. This causes two extents to be allocated from the disk on each pass of the list. This might be useful when striping across MDIs of different sizes.

Sequential

When a VDI is created using a sequential policy its extents are allocated from a single specified MDI. The target MDI is searched for regions containing free extents which are sequential such that the region is large enough to allocate the VDI from completely sequential extents. If it finds more than once such region, it chooses the smallest region which satisfies this condition. If it finds no such regions, the VDI creation fails.

Image

Image mode provides support to import existing data from a disk that was previously not managed by SVC.

Licensing Requirements

The total virtualized capacity that is licensed is the number of Gigabytes (GB) of VDI capacity that are exported by the cluster. By default, this capacity is set to zero (0). The required amount of virtualization capacity must be licensed and configured using the **feature enable** command before creating any VDI.

When you reach 90% capacity, any attempt to create or extend VDIs results in a warning messages. The software does not stop you from creating and expanding VDIs. Instead, errors are placed in the featurization log when your usage reaches or exceeds 100%.

Configuring VDisks

To configure VDisks, follow these steps.

- Step 1** Create and identify three (3) VDisks from the marketing MDisk group and one (1) VDisk for the finance group.

```
switch1(svc)# cluster config SampleCluster
switch1(svc-cluster)# vdisk add crm-log iogroup 1 mdisk-grp marketing capacity 2 gb
Warning: licensed virtualisation capacity has been exceeded
```



Tip The official purchased virtualization capacity must be configured before any VDisk is created.

This warning is used if you are exceed the amount of virtualization for which you have a license. Use the **feature enable capacity** command to configure the amount of purchased virtualization capacity.

- Step 2** Configure the licensed virtualization capacity to be 200GB and continue to create the VDisks for the marketing and finance MDisk groups.

```
switch(svc-cluster)# vdisk add crm-data iogroup 1 mdisk-grp marketing capacity 2 gb clean
switch(svc-cluster)# vdisk add crm-idx iogroup 1 mdisk-grp marketing capacity 1 gb
switch(svc-cluster)# vdisk add fn-1 iogroup 2 mdisk-grp finance capacity 2 gb
```



Note The **clean** option initializes the entire VDisk to 0. Until the cleaning is done, the VDisk stays in the offline state.

- Step 3** Exit to the SVC configuration mode.

```
switch(svc-cluster)# exit
switch(svc)#
```

- Step 4** Verify the VDisk configuration using the **show cluster cluster-name vdisk** command.

```
switch(svc)# show cluster SampleCluster vdisk
```

name	capacity	iogroup	mdisk-grp	name	policy	status
crm-idx	1.00 GB	1	marketing	marketing	striped	online
crm-log	1.00 GB	1	marketing	marketing	striped	online
crm-data	2.00 GB	1	marketing	marketing	striped	offline
fn-1	2.00 GB	2	finance	finance	striped	online



Tip The crm-data VDisk is offline due to the use of the **clean** option during the VDisk creation process in [Step 2](#). Clearing a disk takes time—please wait for this process to complete.

- Step 5** Reissue the **show cluster cluster-name vdisk** command to ensure that all VDisks are online.

```
switch(svc)# show cluster SampleCluster vdisk
```

name	capacity	iogroup	mdisk-grp	name	policy	status
crm-idx	1.00 GB	1	marketing	marketing	striped	online
crm-log	1.00 GB	1	marketing	marketing	striped	online
crm-data	2.00 GB	1	marketing	marketing	striped	online
fn-1	2.00 GB	2	finance	finance	striped	online



Note The online status for each VDisk indicates that formatting is complete.

- Step 6** Use the **show cluster *cluster-name* mdisk-group** command to verify the number of VDisks created in each MDisk.

```
switch(svc)# show cluster SampleCluster mdisk-grp
-----
name           Capacity    free      extent   number   number   status
              GB         GB       size(MB) of mdisks of vdisks
-----
finance        7.56 GB    5.56 GB  16       5        1        online
marketing      6.48 GB    2.48 GB  16       5        3        online
```

- Step 7** Use the **show cluster *cluster-name* iogroup** command to verify the number of VDisks available for each I/O group.

```
switch(svc)# show cluster SampleCluster iogroup
-----
ID  Name                Node count  Vdisk count
-----
1   io_grp0             2          3
2   io_grp1             2          1
3   io_grp2             0          0
4   io_grp3             0          0
5   recovery_io_grp    0          0
```



Note The `recovery-io-group` is an internal SVC I/O group created for cluster recovery processes.