Hedvig Command Reference

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Accessing a Hedvig Storage Cluster using the Hedvig CLI

Note: For information about using the Hedvig WebUI, see the *Hedvig User Guide.*

1. To access a Hedvig Storage Cluster using the Hedvig CLI, login to any storage cluster node as the `root` user, enter your root password, and type:

   ```
   scripts
   ./secured-cli.sh
   ```

2. Then enter the username, password, and domain name (optional).

```
Emilys-MacBook-Air:~ emily$ ssh root@intel1.snc1.hedviginc.com
root@intel1.snc1.hedviginc.com's password:
Last login: Tue Apr 10 11:14:36 2018 from 192.168.48.102
---------------
You have logged into a Hedvig Node
To launch the Hedvig Menu, run /usr/local/hedvig/scripts/menu_hedvig.sh

---------------
[root@intel1 ~]# scripts
[root@intel1 scripts]# ./secured-cli.sh
Listening for transport dt_socket at address: 41394



            ^ - ^
          ( O   O)
        /'`    '    `'\
          | ''''''''|
          | \ ''' / |
           '' '' ''

        ———,,—,,———

Welcome to Hedvig CLI.

SLF4J: Class path contains multiple SLF4J bindings.
SLF4J: Found binding in [jar:file:/usr/local/hedvig/server/lib/kilim.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: Found binding in [jar:file:/usr/local/hedvig/server/lib/slf4j-log4j12-1.6.6.jar!/org/slf4j/impl/StaticLoggerBinder.class]
SLF4J: See http://www.slf4j.org/codes.html#multiple_bindings for an explanation.
SLF4J: Actual binding is of type [org.slf4j.impl.Log4jLoggerFactory]
Enter username > boyle
*********
Enter Domain | LDAP/AD Server Name > ldap.forumsys.com
 logged in as SuperUser under tenancy Hedvig
Type 'showcommands' or '?' for help. Type 'exit' or 'quit' to quit.
intel_cluster> |
```

3. As instructed, to see a list of commands, enter:

   ```
   showcommands OR ?
   ```

4. You will see a list of the available commands, as shown in *Command listing.*

5. You can get help on any command by typing the command, following by `--h[elp]`.

   ```
   connect --h
   usage: connect -h <arg> -s <arg>
    -h,--host <arg>           host name
    -s,--server type <arg>    server type pages | hblock | hnfs | htgt
   ```

Command listing

```
addaccess                  Add an initiator's IP to a iscsi target's ACL
addaccount                 Add CHAP account to a virtual disk
addexport                  Exports the specified VDisk on remote host
                           (NFS).
addlun                     Add lun to the iscsi target
addtags                    Add tags to a vdisk.
clonesnapshot              Makes a clone of a given vDisks
connect                    Connects to the specified host
deletesnapshot             Deletes the specified snapshot from the
                           cluster
deletevdisk                Deletes the specified vdisk from the cluster
descvdisk                  Describes the attributes for a given VDisk.
filtervdisksbytags         Filters all the vdisks based on the tags.
getallctrsaspartofspm      Lists all containers that are affected for a
                           given SPMId within a host.
getcompressionstats        Gets the compression percentage for a given
                           VDisk.
getctrcompressionstats     Gets the compression percentage for a given
                           container of a given VDisk.
getcontainercompactiondetails     Gets the container compaction details.
getfailedlocnsforcontainer Get failed locations for specified container
getstoragepoolformntpt     Returns storage pool Id to which a mnt pt is
                           associated with, on the specified hblock host
listsystemdedupdisks       Returns the list of all counter based system
                           dedup disks in the system.
lsclonesforsnapshot        Returns the list of clones for a given
                           snapshot.
lsclonesforvdisk           Returns the list of clones for a given vDisk.
lsdedupvdisks              Returns the list of all dedup vdisks in the
                           cluster.
lssnapshots                Returns all the snapshots for a given vdisk
lsstorageids               Returns list of data nodes storage Ids
lsstoragepools             Returns the list of storage pools and it's
                           associated disks.
lsvdisks                   Returns the list of all vdisks in the cluster.
lssysdedupdiskssize        Displays the size of system dedupdisks
mkvdisk                    Create a VDisk with the specified attributes.
rebalancestatus            Shows the status of rebalancing for the
                           specified rblid, sender and receiver host
removeaccess               Remove an initiator's IP to a iscsi target's
                           ACL
removeaccount              Remove CHAP account associated with a virtual
                           disk
removetags                 Removes a specified tag name if none specified
                           removes all the tags associated for the vdisk
rereplicationstats         Displays the rereplication statistics
resizevdisk                Resize a given vDisk
restartsnmpagent           Restart Snmp agent on the specified host
reverttosnapshot           Reverts to the version of the given snapshot
rmcontroller               Removes the registered controller from this
                           cluster.
```

rmexport	Removes the exported VDisk on remote host (NFS).
sendtesttrap	Send a test snmp trap from the specified host
showaccess	Lists all clients that have access to a virtual disk
showallcontrollers	Lists all the controller vm's that are part of this cluster.
showallcontainers	Lists all the container replicas that are part of this cluster for a given virtual disk.
showallrblids	Lists all the Rebalancing Ids happening as part of this cluster.
showallrereplicationids	Lists all the Rereplication(s) happening as part of this cluster.
showallspmids	Lists all the StoragePoolMigrations as part of this cluster.
showcommands	Same as listcommands.
showexportsfortarget	Displays all the NFS exports on the given target.
showstorageid	Provides a detailed listing of the specified storage ID
showstorageids	Provides a detailed listing of all storage IDs in the cluster
showtags	Display the tags associated with a given vdisk the command can also filter based on a specified tag.
showtarget	Show information about the iscsi target
showvdisksforcontroller	Show all vdisks for controller
snapshot	Takes a snapshot of a given vdisk
spmstatus	Provides a detailed listing of the specified storage pools migration status
unmaplun	Unmaps the lun from the specified target if one is specified else it unmaps the lun from all exposed targets.
vdiskdeletestatus	Deletion status of vdisk
createairmapping	Create air mapping
getairmapping	get air mapping for a source
deleteairmapping	delete specific air mapping

Creating, reading, updating, and deleting virtual disks

These commands create, read, update, and delete virtual disks.

Creating a virtual disk [mkvdisk]

To create a new virtual disk.

Syntax
```
mkvdisk [-a arg] [-b arg] [-c] [-d arg] [-e] [-f] [-g arg] [-h arg] [-i]
   [-j arg] [-k arg] [-l arg] [-m arg] -n arg [-o arg] [-p arg] [-q]
   [-r arg] -s arg -t arg [-u] [-w arg] [-x arg] [-y arg] [-z]
```

Argument descriptions

`-a, --list of datacenters entered for replication` *arg*	Data center name(s) for a replication policy [`-p`] of DataCenterAware, in a comma-separated list [for example, `-a snc1,snc2,snc3`], or a replication policy of RackAware [for example, `-a snc1`].
`-b, --blocksize` *arg*	Block size of this virtual disk: **512**: only allowed value for NFS virtual disks **4096** (4k): default for block virtual disks **65536** (64k) **Notes**: (1) Must be set to 4096 (4k) if enabling RDM and/or deduplication. (2) See also *Factors affecting virtual disk block size and other options.*
`-c, --cacheenable`	Enables client-side caching support for virtual disk blocks, to cache to local SSD or PCIe devices at the application compute tier for high performance.
`-d, --description` *arg*	Description of this virtual disk
`-e, --rdm`	Enables RDM (raw device mapping) for direct LUN access to VM guests. **Note**: (1) Block size is automatically set to 4096 (4k). (2) You cannot enable RDM for an NFS virtual disk. (3) You cannot enable RDM on a clustered file system.
`-f, --clusteredfilesystem`	Enables clustered file system formatting on top of this virtual disk, to be presented to multiple hosts. **Note**: (1) Automatically enabled for an NFS virtual disk. (2) Block size is automatically set to 512. (3) You cannot enable RDM on a clustered file system.
`-g, --cloudProvider` *arg*	Cloud provider

`-h, --Workload Type` `    (FILER/OST/HEDVIG)` *arg*	Backup type for an NFS virtual disk: **FILER**: enables the FILER workload type. **OST**: enables the Hedvig OST Plugin for NetBackup [also set retention policy (`-y`)]. **HEDVIG**: enables Hedvig backup. **Notes**: (1) Virtual disks that have been enabled for backup are *targets for backups only*, and VMs cannot be run on them. (2) See also the *Hedvig OST Plugin for NetBackup User Guide.*
`-i, --encryptionEnable`	Enables encryption on this virtual disk.
`-j, --parityFrags` *arg*	Number of parity fragments (default 2).
`-k, --dataFrags` *arg*	Number of data fragments (default 4).
`-l, --consistencyLevel` *arg*	Consistency level: **WEAK** or **STRONG** [default]c
`-m, --diskresidence` *arg*	Hedvig Storage Pool type in which to store this virtual disk: **HDD** [default]: The system will *auto-tier*, that is, *hot data* will be placed on the highest performing media – typically SSD assets (if present) – while *cold data* will reside on spinning hard disks. **FLASH**: This virtual disk will be pinned only to SSD assets (which must be present) in the storage cluster, essentially creating an all-flash array for the virtual disk.
`-n, --name` *arg*	Name of virtual disk. Must contain alphanumeric characters only (no special characters or spaces). IMPORTANT Hedvig does *not* currently support *reusing* the name of a deleted virtual disk.
`-o, --erasurePlugin` *arg*	Erasure backend plugin name (default ISA_L_RS_CA UCHY)
`-p, --replicationpolicy` *arg*	Sets Replication Policy: **Agnostic**: Also called *Rack Unaware*. **DataCenterAware**: Data is spread across multiple data centers (private data centers and public clouds). Selecting certain data centers sets the replication factor automatically. With this option, you must use the `-a` option to name data centers. **RackAware**: Data is spread across physically distinct racks in a single data center. No more than one copy of the same data is placed on the same rack, to avoid single-rack failure. With this option, you must use the `-a` option to name data centers.

`-q, --persistentReservation`	Enables persistent reservation support.
`-r, --replicationfactor` *arg*	Number of replicas (1 to 6) to create for this virtual disk. A replication factor of 3 is the default and is highly recommended.
	IMPORTANT A replication factor of 1 offers *no copy protection* and should be used only when data protection is guaranteed outside the Hedvig system.
`-s, --size` *arg*	Size of this virtual disk. Units can be GB or TB (format: 20GB). Hedvig supports single block virtual disks of unlimited size, and single NFS virtual disks of up to 4 TB.
	Notes: (1) Although Hedvig software allows unlimited size for virtual disks, other factors in your setup may not. For example, VMware imposes a limit of 62 TB per virtual disk per virtual machine. (2) See also *Why virtual disk sizes may appear "rounded down".*
`-t, --diskType` *arg*	Type of protocol for this virtual disk: **Block** or **NFS**. For NFS, (1) Clustered file system is automatically enabled. (2) Block size is set automatically to 512. (3) You cannot enable RDM.
`-u, --dedup`	Enables deduplication on this virtual disk.
	IMPORTANT Be aware of the following when enabling deduplication for a virtual disk: (1) Disk residence is automatically set to HDD. (2) Compression is automatically enabled. (3) Deduplication cannot be enabled for a block virtual disk with a clustered file system. (4) For dual data centers with replicationPolicy of DataCenterAware, you can choose a replicationFactor of 2, 4, or 6. (5) You can create global system deduplication-enabled virtual disks for multiple combinations of data centers when the number of data centers exceeds three. (6) You can create RackAware and/or Agnostic replication policy system deduplication virtual disks in a DataCenterAware replication policy environment.

(7) You can create Agnostic replication policy system deduplication virtual disks in a RackAware replication policy environment.

(8) Deduplication metrics are computed on demand and do not run as a scheduled task.

Warning: When you are upgrading your system, a non-disruptive upgrade (NDU) could be problematic for a data center with a RackAware or Agnostic replication policy, in an environment with deduplication-enabled virtual disks.

`-w, --protectionPolicy` *arg*	Specifies protection policy: **Mirror** (default) or **Erasure**.
`-x, --tenant` *arg*	Specifies tenant to which virtual disk belongs.
`-y, --Specify retention policy` `    for dedup backup vdisks` *arg*	Sets the retention policy for backup (`-h`) and deduplication (`-u`).

HOURLY	**TWO_WEEKS**	**TWO_MONTHS**
DAILY	**ONE_MONTH**	**SIX_MONTHS**
ONE_WEEK		

`-z, --compressed`	Enables compression to reduce data size. **Note**: This is automatically enabled when you enable deduplication.

Examples

`mkvdisk -n DiskRackAware2 -p RackAware -s 5GB -t NFS`
Datacenter needs to be entered, as the cluster is set up in multi datacenter mode.

`mkvdisk -a snc1 -n DiskRackAware -p RackAware -s 5GB -t NFS`
vDisk by name DiskRackAware has been successfully created

`mkvdisk -a snc1,snc2,snc3 -n DiskDataCenterAware -p DataCenterAware -s 5GB -t NFS`
vDisk by name DiskDataCenterAware has been successfully created

Factors affecting virtual disk block size and other options

Table 1: Factors affecting virtual disk block size and other options

protocol or other option	disk type	block size and other affected options
iSCSI	**BLOCK**	With deduplication enabled, block size is set to 4096 (4k).
NFS	**NFS**	Block size is set to 512, and clustered file system is enabled.
Deduplication enabled	**BLOCK**	Block size is set to 4096 (4k), compression is enabled, and residence is set to HDD.
	NFS	Block size is set to 512, compression is enabled, and residence is set to HDD.

Why virtual disk sizes may appear "rounded down"

When you create a virtual disk ≥ 2200 GB, it may appear that the size has been "rounded down" by 100 GB or more.

The reason for this discrepancy is that the displayed size is the true numeric value of the virtual disk size.

For example, 12500 GB is actually 12500 GB / 1024 GB/TB ~ 12.2 TB.

Here are a few more examples:

- a 2200 GB virtual disk is displayed as 2.1 TB

- a 2300 GB virtual disk is displayed as 2.2 TB

- a 3000 TB virtual disk is displayed as 2.9 PB

Adding a block virtual disk as a LUN [addlun]

To add a block virtual disk as a LUN to an iSCSI target.

Note: For an object storage operation, creating an OpenStack Swift container – or an Amazon S3 bucket via API – will automatically create an object-based virtual disk on the Hedvig Storage Cluster, and the virtual disk will be automatically mapped to the compute instance.

Syntax
```
addlun -h arg -n arg [-r]
```

Argument descriptions

`-h, --host arg`	Hostname (FQDN) of iSCSI target [Hedvig Storage Proxy (CVM)]
`-n, --name arg`	Name of block virtual disk
`-r, --readonly`	Create a read-only LUN. Typically, you would set this up on a LUN that already has data, so the data can be read, but not modified.

Example
```
addlun -h titanvip1.hedviginc.com -n Disk1 -r
```
Lun # :: 2 is associated with vDisk:: Disk1

Exporting an NFS virtual disk to a client [addexport]

To export an NFS virtual disk to a client. [See also *Export ID handling*.]

Syntax
```
addexport [-f] -h arg -n arg
```

Argument descriptions

`-f, --force`	Forces the deletion
`-h, --host arg`	Hostname (FQDN) of Hedvig Storage Proxy
`-n, --name arg`	Name of NFS virtual disk

Example
```
addexport -h titanvip1.hedviginc.com -n Disk2
```
Exported as /exports/Disk2 on host titanvip1.hedviginc.com

Export ID handling

To prevent Export ID overflow, here is the procedure for setting Export IDs.

- For virtual disks with SCSI serial numbers (scsiSNs) *less than or equal to* 65000:

  The Export ID is set to the scsiSN.

  File handles are 24 bytes in size, and the Export ID field in the file handles is set to the scsiSN of the corresponding NFS virtual disk.

- For virtual disks with SCSI serial numbers (scsiSNs) *greater than* 65000:

  The Export ID is assigned randomly from a pool of numbers (65001 to 65256).

  File handles are 32 bytes in size, and the Export ID field in the file handles is set to 0.

  To uniquely identify the export from the file handle, the scsiSN of the corresponding NFS virtual disk is written into the opaque field of the file handle, which is comprised of the inode of the corresponding file and Export ID.

Setting NFS file attributes [setfileattrs]

To set NFS file attributes.

Syntax
```
setfileattrs -g arg -i arg -n arg -u arg
```

Argument descriptions

`-g, --gid arg`	GID (group identifier)
`-i, --inode arg`	Inode number
`-n, --name arg`	Name of NFS virtual disk
`-u, --uid arg`	UID (user identifier)

Example
```
setfileattrs -g 36 -i 1 -n Disk1 -u 36
```

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Adding ACL access for a virtual disk [addaccess]

To add ACL access for a block virtual disk LUN or for an NFS virtual disk that has been exported. [See also *How to assign the same IQN to a LUN mapped to two storage proxies.*

Syntax
```
addaccess [-h arg] [-i arg] -n arg [-q arg] -t arg
```

Argument descriptions

`-h, --host arg`	Hostname (FQDN) of initiator
`-i, --address arg`	IP address of initiator
`-n, --name arg`	Name of virtual disk
`-q, --iqn arg`	IQN of initiator
`-t, --target arg`	Hostname (FQDN) of target (Hedvig Storage Proxy)

Example
```
addaccess -n Disk1 -q iqn.1991-05.com.microsoft:
    hyperv-a.corp.hedviginc.com -t titanvip1.hedviginc.com
```
Successful

How to assign the same IQN to a LUN mapped to two storage proxies

When you map the same LUN to two Hedvig Storage Proxies, the default is to create two *different* IQNs for the LUN. However, you may want the IQN for the LUN to be the *same* on each storage proxy.

To accomplish this, edit the `config.xml` files for *both* storage proxies. They are usually found in this location:

```
/var/log/hedvig/
```

Add the following entry to the `<common>` section:

```
<iqn_name>a.b.com</iqn_name>
```

In this case, the IQN for LUN N would then be:

```
iqn.2012-05.com.hedvigunm:storage.a.b.com-N
```

Unmapping a block virtual disk mapped as a LUN [unmaplun]

To unmap a block virtual disk that has been mapped as a LUN to a Hedvig Storage Proxy.

Syntax
```
unmaplun [-f] -h arg -n arg
```

Argument descriptions

`-f, --force`	Forces the unmapping of the LUN
`-h, --host arg`	Hostname (FQDN) of Hedvig Storage Proxy from which block virtual disk needs to be unmapped
`-n, --name arg`	Name of block virtual disk

Example
```
unmaplun -h titanvip1.hedviginc.com -n Disk1
```

**vDisk has been successfully unmapped from the
  controller:titanvip1.hedviginc.com**

Removing ACL access for a virtual disk [removeaccess]

To remove ACL access for a block virtual disk LUN or for an NFS virtual disk that has been exported. [See *How to assign the same IQN to a LUN mapped to two storage proxies*.]

Syntax
```
removeaccess [-h arg] [-i arg] -n arg [-q arg] -t arg
```

Argument descriptions

`-h, --host arg`	Hostname (FQDN) of initiator
`-i, --address arg`	IP address of initiator
`-n, --name arg`	Name of virtual disk
`-q, --iqn arg`	IQN of initiator
`-t, --target arg`	Hostname (FQDN) of target (Hedvig Storage Proxy)

Example
```
removeaccess -n Disk1 -q iqn.1991-05.com.microsoft:
    hyperv-a.corp.hedviginc.com -t titanvip1.hedviginc.com
```

Successful

Removing an export from an NFS virtual disk [rmexport]

To remove an export from an NFS virtual disk.

Syntax
```
rmexport [-f] -h arg -n arg
```

Argument descriptions

`-f, --force`	Forces the unmapping of the LUN
`-h, --host arg`	Hostname (FQDN) of Hedvig Storage Proxy from which virtual disk needs to be removed
`-n, --name arg`	Name of NFS virtual disk

Example
```
rmexport -f -h titanvip1.hedviginc.com -n Disk2
```
export Disk2 has been successfully removed from the controller:titanvip1.hedviginc.com

Adding a CHAP account to a virtual disk [addaccount]

You can add CHAP (Challenge-Handshake Authentication Protocol) accounts for block virtual disks.

Here is the recommended workflow:

1. Create a block virtual disk with the required parameters.

2. Add this block virtual disk as a LUN to the iSCSI target.

3. Add initiator access to this block virtual disk using the initiator's IP or IQN.

4. Create a user account on the iSCSI target (which is the username/password that the initiator will use for CHAP).

5. Bind this user account with the LUN corresponding to this virtual disk.

Only initiators whose IP/IQN is in the access list will be able to connect to the iSCSI volume via CHAP. If required, this can be tweaked to allow any initiator to access the iSCSI volume if it passes CHAP.

Note: To remove CHAP accounts, see *Removing a CHAP account from a virtual disk [removeaccount].*

Syntax
```
addaccount -n arg -t arg [-u arg]
```

Argument descriptions

`-n, --name arg`	Name of virtual disk
`-t, --target arg`	Hostname (FQDN) of target (Hedvig Storage Proxy)
`-u, --chapUser arg`	CHAP user name

Example
```
addaccount –n Disk1 -t titanvip1.hedviginc.com -u joseph
```

Removing a CHAP account from a virtual disk [removeaccount]

To remove a CHAP account from a virtual disk.

Syntax
```
removeaccount -n arg -t arg [-u arg]
```

Argument descriptions

`-n, --name arg`	Name of virtual disk
`-t, --target arg`	Hostname (FQDN) of target (Hedvig Storage Proxy)
`-u, --chapUser arg`	CHAP username

Example
```
removeaccount –n Disk1 -t titanvip1.hedviginc.com -u joseph
```

Adding tags to a virtual disk [addtags]

To add up to 10 tags to a specified virtual disk.

Syntax
```
addtags -n arg -o arg
```

Argument descriptions

`-n, --name arg`	Name of virtual disk
`-o, --tagname arg`	Up to 10 tag names, in the format `tag1=value,tag2=value`

Example
```
addtags –n Disk1 –o newtag1=accounting,newtag2=marketing
```
Tags have been successfully added for the vdisk Disk1

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Showing tags for a virtual disk [showtags]

To show the tags for a specified virtual disk.

Syntax
```
showtags -n arg [-o arg]
```

Argument descriptions

```
-n, --name arg
```
Name of virtual disk

```
-o, --name of the tag … arg
```
Tag name, in the format `tag1`

Examples
```
showtags -n Disk1
```

```
Tag Name    Tag Value
===================
newtag1     accounting
newtag2     marketing
```

```
showtags -n Disk1 -o newtag1
```

```
Tag Name    Tag Value
===================
newtag1     accounting
```

Filtering virtual disks by tags [filtervdisksbytags]

To filter virtual disks based on tag(s).

Syntax
```
filtervdisksbytags -t arg
```

Argument descriptions

```
-t, --tags arg
```
Tag name(s), in the format `tag1,tag2,tag3` …

Examples
```
filtervdisksbytags -t newtag1,newtag2,newtag3
```

```
Disk1
Disk2
```

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Removing tags for a virtual disk [removetags]

To remove tag(s) for a specified virtual disk.

Syntax
```
removetags -n arg [-o arg]
```

Argument descriptions

```
-n, --name arg
```
Name of virtual disk
```
-o, --tagname arg
```
Tag name, in the format `tag1`

Examples
```
removetags -n Disk1 -o newtag1
```
Tag newtag1 associated with the vdisk Disk1 has been successfully deleted

```
showtags -n Disk1
```
Tag Name   Tag Value
===================
newtag2   marketing

```
removetags -n Disk1
```
Tag associated with the vdisk Disk1 has been successfully deleted

```
showtags -n Disk1
```
There are no tags associated with the vdisk

Resizing a virtual disk [resizevdisk]

To *increase* the size of a virtual disk.

Hedvig supports single block and NFS virtual disks of unlimited size.

After resizing a *block* virtual disk, a logical volume and/or file system may need to be extended physically to take advantage of the new size.

Resizing an *NFS* virtual disk should be automatically detected by the client.

Notes:

- Decreasing the size of (in other words, *shrinking*) a virtual disk is not supported.

- Although Hedvig software allows unlimited size for virtual disks, other factors in your setup may not. For example, VMware imposes a limit of 62 TB per virtual disk per VM.

- See also *Why virtual disk sizes may appear "rounded down".*

Syntax
```
resizevdisk -n arg -s arg
```

Argument descriptions

`-n, --name arg`	Name of virtual disk
`-s, --size arg`	New (larger) size of virtual disk. Units can be GB or TB (format: 20GB).

Example
```
resizevdisk -n Disk1 -s 64GB
```

vDisk size has been increased from 10.0 GB to 64 GB

Deleting a virtual disk [deletevdisk]

To delete a specified virtual disk.

Note: Before deleting a virtual disk, ensure that (1) the client or application is not accessing the virtual disk, and (2) the virtual disk has been unmapped or had its export removed from the ESXi host.

> **IMPORTANT**: *Deletion* is a destructive operation, and any VM or data
> on the virtual disk will be lost.

Syntax
```
deletevdisk [-f] -n arg
```

Argument descriptions

`-f, --force`	Forces the deletion
`-n, --vDiskname arg`	Name of virtual disk to be deleted

Example
```
deletevdisk -n Disk1
```

WARNING: VDisk Disk1 is mounted at controllers[cvm1.hedviginc.com:50002]

```
deletevdisk -f -n Disk1
```

VDisk Disk1 has been scheduled for delete operation at node cvm1.hedviginc.com

Monitoring virtual disks

These commands monitor the status of virtual disks.

Listing all virtual disks [lsvdisks]

To list all virtual disks in a Hedvig Storage Cluster, with all their attributes.

Syntax
```
lsvdisks
```

Example
```
lsvdisks

Name      Size     Replication Factor   Replication Policy    Block/Sector Size
================================================================================
Disk1    10.0 TB          3             Agnostic                    512
Clone1   10.0 TB          6             DataCenterAware             512
Disk2    20.0 TB          3             Agnostic                    4096
Disk3    15.0 TB          3             DataCenterAware             65536


Disk Residence      Disk Type          De-duplication     Backup
================================================================================
HDD                 NFS_MASTER_DISK     true               NONE
HDD                 NFS_MASTER_DISK     true               NONE
HDD                 BLOCK               false              NONE
HDD                 BLOCK               true               NONE

Total Provisioned Size in the cluster: 55.0 TB
```

Viewing details about a virtual disk [descvdisk]

To view detailed information about a specified virtual disk.

Note: See also *Why virtual disk sizes may appear "rounded down".*

Syntax
```
descvdisk -n arg
```

Argument descriptions
```
-n, --name arg
```
                                        Name of virtual disk

Example
```
descvdisk –n Disk1
```

```
Name:                       Disk1
Author:                     Hedvig CLI
Tenant:                     Hedvig
Description:                Created vdisk using Hedvig CLI
Replication Factor:         3
Size:                       100.0 GB
Disk Type:                  BLOCK
Block Size:                 4 KB
Exported Block Size:        4 KB
Controller(s):             titanvip1.hedviginc.com
Mount Location:            titanvip1.hedviginc.com
File System:               Non-Clustered
Residence:                 HDD
Replication Policy:        DataCenterAware
Mode:                      Normal
Cache Enabled:             true
Compressed:                true
EncryptionEnabled:         N/A
Deduplication:             true
Immutable:                 N/A
Dedup-Ratio:               85.46%
Data Center:               snc1,snc2,snc3
Version Counter:           1
SCSI Serial Number:        298
BackupType:                NONE
IsMidget:                  true
SCSI Persistent Reservation:    false
```

Getting compression percentage for a virtual disk [getcompressionstats]

To get the compression percentage for a specified virtual disk.

Note: For deduplication-enabled virtual disks, this information is not available at a per virtual disk level. Data for all deduplication-enabled virtual disks is actually written to a single disk. However, this command *does* work for the HedvigDedup disk.

Syntax
```
getcompressionstats -n arg
```

Argument descriptions
```
-n, --name arg                          Name of virtual disk
```

Example
```
getcompressionstats –n Disk1
```

VDisk Disk1 is 93.59411958768234% compressed.

Listing containers for a virtual disk [showallcontainers]

To list the container replicas that are part of this cluster for a specified virtual disk.

Syntax
```
showallcontainers -n arg
```

Argument descriptions
```
-n, --name arg                          Name of virtual disk
```

Example
```
showallcontainers –n Disk1
```

Container Idx: 514

```
StorageId                         Location                       Timestamp
==================================================================
0047fbcab2bf925d91901d546097e814    titan3.hedviginc.com:7010    0
a0a172ab4a8b7a1cd5b2d2a03b159513    titan1.hedviginc.com:7010    0
bbb961606f2f4c852b3d52427a85df4d    titan2.hedviginc.com:7010    0
...
```

Getting compression percentage for a virtual disk container [getctrcompressionstats]

To get the compression percentage for a specified container of a virtual disk.

Note: For deduplication-enabled virtual disks, this information is not available at a per virtual disk level. Data for all deduplication-enabled virtual disks is actually written to a single disk. However, this command *does* work for the HedvigDedup disk.

Syntax
```
getctrcompressionstats -h arg -i arg -n arg
```

Argument descriptions

`-h, --host arg`	Hostname (FQDN) of virtual disk
`-i, --index arg`	Container index (just the index, not the full container name), for example, 1.
`-n, --name arg`	Name of virtual disk

Example
```
getctrcompressionstats –h titan1.hedviginc.com –i 1 –n Disk1
```
Container: 1 of VDisk Disk1 on host titan1.hedviginc.com is 5.0% compressed.

Getting compaction details for a virtual disk container [getcontainercompactiondetails]

To get the compaction details for a container of a specified virtual disk.

Syntax
```
getcontainercompactiondetails [-h arg] [-n arg]
```

Argument descriptions

`-h, --host from which we need size of all containers arg`	Host name (default is all)
`-n, --vDiskName arg`	Name of virtual disk

Example
```
getcontainercompactiondetails -h titan1.hedviginc.com -n Disk1
```
Host Name: titan1.hedviginc.com
============================
vDiskName: Disk1

Container Idx	UnCompacted SSTableCount	Compacted SSTableCount	Container Size
1	7	1	52.0 kB
5	1	0	30.0 kB

Getting failed locations for a container [getfailedlocnsforcontainer]

To get the failed locations for a specified container.

Syntax
```
getfailedlocnsforcontainer -c
```

Argument descriptions

`-c, --container` *arg*	Name of the container for which we are requesting the failed container information.

Example
```
getfailedlocnsforcontainer -c 65aclients$1
```

cb708815112cf116e4e9fc6ea9591d65
332b39a38711ea3a5bf88fc442da2230
9f0e5aa2e5ec425a9ba52a0e45081051

Showing all clients with access to a virtual disk [showaccess]

To show all of the clients that have access to a virtual disk.

Syntax
```
showaccess -n arg
```

Argument descriptions

`-n, --name` *arg*	Name of virtual disk

Example
```
showaccess -n Disk1
```

Access information for titanvip1.hedviginc.com - [172.22.22.24]

Showing all exports for a target [showexportsfortarget]

To show all of the NFS virtual disk exports on a given target.

Syntax
```
showexportsfortarget -h arg
```

Argument descriptions

`-h, --host` *arg*	Hostname (FQDN) of Hedvig Storage Proxy

Example
```
showexportsfortarget -h titanvip1.hedviginc.com
```

VDisk: Disk1, Export: /exports/Disk1

Showing all virtual disks for a Hedvig Storage Proxy [showvdisksforcontroller]

To show all virtual disks for a specified Hedvig Storage Proxy.

Syntax
```
showvdisksforcontroller -h arg
```

Argument descriptions
```
-h, --host arg                      Hostname (FQDN) of Hedvig Storage Proxy
```

Example
```
showvdisksforcontroller -h titanvip1.hedviginc.com
NFS Disks
==========
Disk1
==========
BLOCK Disks
==========
Disk2
```

Listing all deduplicated virtual disks [lsdedupvdisks]

To list all deduplicated virtual disks and the resulting percent savings.

Syntax
```
lsdedupvdisks
```

Example
```
lsdedupvdisks
Name    % Savings
================
Disk1   79.05%
Disk2   86.76%
Disk3   43.78%
Disk4   22.54%
```

Listing all counter-based system deduplicated virtual disks [listsystemdedupdisks]

To list all counter-based system deduplicated virtual disks.

Syntax
```
listsystemdedupdisks
```

Argument descriptions

`-d, --filter the orphaned system dedup disks` *arg*	If true, orphaned disks are displayed (true | false).
`-e, --encryption enabled/disabled system dedup disks` *arg*	Encryption enabled flag (true | false).
`-m, --disk residency` *arg*	If true, it is flash, else HDD.

Example
```
listsystemdedupdisks -d true -e true -m true
```

HedvigDedup_Flash_Enc_Counter_0
HedvigDedup_512_Flash_Enc_Counter_0
Total number of system dedup disks: 2

Listing sizes of counter-based system deduplicated virtual disks [lssysdedupdiskssize]

To list the sizes of all counter-based system deduplicated virtual disks.

Syntax
```
lssysdedupdiskssize [-e arg] [-h arg] [-m arg] [-n arg] [-r arg] [-s arg]
```

Argument descriptions

`-e, --encryption enabled/disabled system dedup disks arg`	Encryption enabled flag (true | false)
`-h, --host from which we need size of all containers arg`	Host name (default is all)
`-m, --disk residency arg`	If true, it is Flash, else HDD.
`-n, --systemDedupDiskName arg`	System dedup disk name
`-r, --returns disks based on rank option in either increasing/ decreasing order of usage arg`	Ranking (top | bottom)
`-s, --suppress print of container related information arg`	Suppress display (true | false)

Example
```
lssysdedupdiskssize -e true -h titan1.hedviginc.com -m true -n DedupDisk1
    -r top -s false

Host Name: titan1.hedviginc.com
===============================
System DedupDisk Name: DedupDisk1

Container Idx  Size
=======================
10             1.6 GB
17             515.0 MB
18             516.9 MB
25             515.6 MB
26             339.9 MB
4              2.4 GB
7              625.5 MB
8              1.1 GB
9              2.8 GB

******** Summary of Vdisks and their total size ********

VDisk Name     Total Size
=========================
DedupDisk1     10.4 GB
```

Listing statistics for deduplicated virtual disks [getdedupstatistics]

To list statistics for deduplicated virtual disks.

Syntax
```
getdedupstatistics [-n arg] [-r arg]
```

Argument descriptions

`-n, --returns the # dedup disks arg`	Number of deduplicated virtual disks to list
`-r, --returns top or bottom performing dedup disks arg`	Ranking (top | bottom)

Example
```
getdedupstatistics -n 3 -r top

Datastore Name                    Dedup Savings   Export Name
============================================================
65h-win6-clone1_2-flat.vmdk[975]  100.00%         65hclients
lx-65d-3-flat.vmdk[1974]          99.99%          65dclients
lx-65h-5-flat.vmdk[2019]          99.98%          65hclients
```

Viewing status of a virtual disk deletion [vdiskdeletestatus]

To view the status of a specific virtual disk deletion.

Syntax
```
vdiskdeletestatus -n arg
```

Argument descriptions

`-n, --vDiskname arg`	Name of virtual disk for which you want to check the deletion status

Example
```
vdiskdeletestatus -n Disk1

VDisk Disk1 is pending deletion.

vdiskdeletestatus -n Disk2

Internal Error: The given VDisk is either not valid or has already been
deleted.
```

Creating, reading, updating, & deleting clones & snapshots

These commands create, read, update, and delete clones and snapshots.

Hedvig snapshot technology has zero-impact and is space-efficient. It captures the point-in-time state of a virtual disk using only metadata. Cloning is also a zero-impact operation, enabling the creation of space-efficient independent volume copies.

IMPORTANT: If you are using the Hedvig vSphere Web Client Plugin, Hedvig recommends that you use *either* the Hedvig vSphere Web Client Plugin snapshot or the native VMware snapshot, but do not use *both* at the same time.

Creating a snapshot of a block virtual disk [snapshot]

To create a snapshot of a block virtual disk.

Note: NFS snapshots are not supported.

Syntax
```
snapshot -n arg
```

Argument descriptions

`-n, --name arg`   Name of block virtual disk

Example
```
snapshot -n Disk1
```

Snapshot successful (Did not update Controller):: Disk1$Snapshot$1

Reverting to a specific snapshot [reverttosnapshot]

To revert block virtual disk content to a specific "point-in-time," by using a snapshot.

Syntax
```
reverttosnapshot -n arg
```

Argument descriptions

`-n, --reverttosnapshot arg`   Name of snapshot

Example
```
reverttosnapshot -n Disk1$Snapshot$1
```

Reverted successfully to snapshot (did not update controller) :: Disk1$Snapshot$1

Cloning a virtual disk from a snapshot [clonesnapshot]

To clone a virtual disk from a specified snapshot.

Syntax
```
clonesnapshot [-a arg] [-c] [-d arg] [-m arg] -n arg [-o arg] [-p arg]
              [-r arg] -s arg [-w arg] [-x arg] [-y arg] [-z]
```

Argument descriptions

-a, --list of datacenters entered for replication *arg*	Data center name(s) for a replication policy [-p] of DataCenterAware, in a comma-separated list [for example, -a snc1,snc2,snc3], or a replication policy of RackAware [for example, -a snc1].
-c, --cacheenable	Enables client-side caching support for virtual disk blocks, to cache to local SSD or PCIe devices at the application compute tier for high performance.
-d, --description *arg*	Description of this clone.
-m, --diskresidence *arg*	Hedvig Storage Pool type in which to store this clone: **HDD** [default]: The system will *auto-tier*, that is, *hot data* will be placed on the highest performing media – typically SSD assets (if present) – while *cold data* will reside on spinning hard disks. **FLASH**: This clone will be pinned only to SSD assets (which must be present) in the storage cluster, essentially creating an all-flash array for the virtual disk.
-n, --name *arg*	Name of this clone. Must contain alphanumeric characters only (no special characters or spaces). **IMPORTANT** Hedvig does *not* currently support *reusing* the name of a deleted virtual disk or clone.
-o, --erasurePlugin *arg*	Erasure backend plugin name; default = ISA_L_RS_CA UCHY

`-p, --replicationpolicy` *arg*	Sets Replication Policy: **Agnostic**: Also called *Rack Unaware*. **DataCenterAware**: Data is spread across multiple data centers, which can include private data centers and public clouds. Selecting certain data centers will automatically set the replication factor. With this option, you must specify the data centers using the `-a` option. **RackAware**: Data is spread across physically distinct racks in a single data center. No more than one copy of the same data is placed on the same rack, in order to avoid single-rack failure. With this option, you must specify a data center using the `-a` option.
`-r, --replicationfactor` *arg*	Number of replicas (1 to 6) to create for this clone. A replication factor of 3 is the default and is highly recommended. IMPORTANT A replication factor of 1 offers *no copy protection* and should be used only when data protection is guaranteed outside the Hedvig system.
`-s, --snapshot` *arg*	Name of the snapshot from which to create this clone.
`-w, --protectionPolicy` *arg*	Specifies protection policy: **Mirror** (default) or **Erasure**.
`-x, --dataFrags` *arg*	Number of data fragments (default 4).
`-y, --parityFrags` *arg*	Number of parity fragments (default 2).
`-z, --compressed`	Enables compression to reduce data size. **Note**: This is automatically enabled when you enable deduplication.

Examples
```
clonesnapshot -a snc1 -n Disk1Clone1 -p RackAware -s Disk1$Snapshot$1
```

clone by name Disk1Clone1 has been successfully created

```
clonesnapshot -a snc1,snc2,snc3 -n Disk1Clone2 -p DataCenterAware -r 3
    -s Disk1$Snapshot$1
```

clone by name Disk1Clone2 has been successfully created

Deleting a snapshot [deletesnapshot]

To delete a specific snapshot.

Note: You cannot delete a snapshot that has a clone associated with it. You must delete the clone first using the *deletevdisk* command (see *Deleting a virtual disk [deletevdisk]*).

Syntax
```
deletesnapshot -n arg
```

Argument descriptions

```
-n, --name arg
```
Name of snapshot

Example
```
deletesnapshot -n Disk1$Snapshot$1
```

**VDisk Disk1$Snapshot$1 has 1 clones associated with it.
Unable to delete disk.**

```
deletesnapshot -n Disk1$Snapshot$2
```

Snapshot entered has been successfully deleted

Monitoring clones and snapshots

These commands monitor the status of clones and snapshots.

Listing clones for a virtual disk [lsclonesforvdisk]

To list all of the clones for a specified virtual disk.

Syntax
```
lsclonesforvdisk -n arg
```

Argument descriptions

`-n, --name arg`   Name of virtual disk

Example
```
lsclonesforvdisk -n Disk1
```

Disk1Clone1

Listing clones for a snapshot [lsclonesforsnapshot]

To list all of the clones for a specified snapshot.

Syntax
```
lsclonesforsnapshot -n arg
```

Argument descriptions

`-n, --name arg`   Name of snapshot

Example
```
lsclonesforsnapshot -n Disk1$Snapshot$1
```
Disk1Clone1

Listing snapshots for a virtual disk [lssnapshots]

To list all of the snapshots for a specified virtual disk.

Syntax
```
lssnapshots -n arg
```

Argument descriptions

`-n, --name arg`   Name of virtual disk

Example
```
lssnapshots -n Disk1
```

```
Name                    Details
===================================================
Disk1$Snapshot$1        Taken on: 01/20/2018 16:53:51
```

Managing Hedvig Storage Proxies

These commands manage Hedvig Storage Proxies.

Connecting to a Hedvig Storage Proxy host [connect]

To connect to the specified Hedvig Storage Proxy host.

Syntax
```
connect -h arg -s arg
```

Argument descriptions

`-h, --host arg`	Hostname (FQDN) of Hedvig Storage Proxy
`-s, --server type arg`	Server type: pages | hblock | hnfs | htgt

Example
```
connect -h titanvip1.hedviginc.com -s htgt
```

Connection to requested host :: titanvip1.hedviginc.com:50000 has been established

Showing all Hedvig Storage Proxies [showallcontrollers]

To view all of the Hedvig Storage Proxies in a Hedvig Storage Cluster.

Syntax
```
showallcontrollers
```

Example
```
showallcontrollers
```

```
Protocol Type     Controllers
====================================
block             titanvip1.hedviginc.com
nfs               titanvip1.hedviginc.com
```

Showing all rebalance identifiers [showallrblids]

To view all of the rebalance identifiers in a Hedvig Storage Cluster.

Syntax
```
showallrblids
```

Example
```
showallrblids

Start Time                Rebalance Id
=======================================================================
15-3-2018 01:28:44:816    23b5cd6dd907ae51a84bc7ae18caced6$1521102524816
15-3-2018 02:24:15:376    07c387b8b3d7e658b09252c3ba855e9c$1521105855376
15-3-2018 02:24:15:378    07c387b8b3d7e658b09252c3ba855e9c$1521105855378


   Sender                   Receiver
   =========================================
   titan4.hedviginc.com     titan7.hedviginc.com
   titan9.hedviginc.com     titan6.hedviginc.com
   titan9.hedviginc.com     titan3.hedviginc.com


   Needed   Received   Read Ready   Status
   ====================================
   63       63         63           Completed
   38       38         38           Completed
   55       55         55           Completed
```

Showing iSCSI target for Storage Proxy host [showtarget]

To show an iSCSI target for a specified Hedvig Storage Proxy host. Use `showallcontrollers` [*page 36*] to get exact storage proxy names.

Syntax
```
showtarget -h arg
```

Argument descriptions

`-h, --host arg`   Hostname (FQDN) of Hedvig Storage Proxy

Example
```
showtarget -h titanvip1.hedviginc.com
Target 1: iqn.2012-05.com.hedvig:storage.titanvip1.hedviginc.com-1
    System information:
        Driver: iscsi
        State: ready
    I_T nexus information:
         I_T nexus: 56
           Initiator: iqn.1994-05.com.redhat:f3b9b2c2844c alias:
              seamusclnt4.hedviginc.com
         Connection: 0
             IP Address: 172.17.0.333
    LUN information:
        LUN: 0
            Type: controller
            SCSI ID: Hedvig 00010000
            SCSI SN: beaf20
            Size: 0 MB, Block size: 1
            Online: Yes
            Removable media: No
            Prevent removal: No
            Readonly: No
            SWP: No
            Thin-provisioning: No
            Backing store type: null
            Backing store path: None
            Backing store flags:
        LUN: 1
            Type: disk
            SCSI ID: Hedvig 1
            SCSI SN: 1
            Size: 10737 MB, Block size: 4096
            Online: Yes
            Removable media: No
            Prevent removal: No
            Readonly: No
            SWP: No
            Thin-provisioning: No
            Backing store type: hedvig
            Backing store path: Disk1
            Backing store flags: direct
    Account information:
    ACL information: 172.22.22.56
```

Checking rebalancing status for a Hedvig Storage Proxy [rebalancestatus]

To show the rebalancing status for specified rebalance identifier, sender and receiver host.

Syntax
```
rebalancestatus -i arg -h arg -p arg
```

Argument descriptions

`-i, --rebalanceId arg`	Rebalance identifier
`-r, --receiver host arg`	Receiver hostname (FQDN)
`-s, --sender host arg`	Sender hostname (FQDN)

Example
```
rebalancestatus -i 23b5cd6dd907ae51a84bc7ae18caced6$1521102524816
    -r titan1.hedviginc.com -s titan2.hedviginc.com

SENDER               :  titan2.hedviginc.com
Containers Needed    :  63
Needed               :  ...
Containers Received  :  63
RECEIVED             :  ...
Containers Read Ready :  63
READ-READY           :  ...
```

Removing a Hedvig Storage Proxy [rmcontroller]

To remove a Hedvig Storage Proxy from a Hedvig Storage Cluster.

IMPORTANT: Removing a Hedvig Storage Proxy is final, and there is no way to undo it

Syntax
```
rmcontroller -h arg
```

Argument descriptions

`-h, --host arg`	Hostname (FQDN) of Hedvig Storage Proxy to be removed

Example
```
rmcontroller -h titanvip1.hedviginc.com
```

Managing Hedvig Storage Pools

These commands manage Hedvig Storage Pools.

Showing storage identifiers for a Hedvig Storage Cluster [showstorageids]

To show a detailed listing of all storage identifiers in a Hedvig Storage Cluster.

> **IMPORTANT**: Because background processes use these resources as well, when "capacity used" reaches 90%, the system will stop writing data.

Syntax
```
showstorageids
```

Example
```
showstorageids

Storage Pool Id: 2f6b75b002f0fd7f49973d2980287766$6
Status: Enabled
Total Capacity: 5.5 TB
Total Space Used: 2.0 B
Containers:  ...

Storage Pool Id: 2f6b75b002f0fd7f49973d2980287766$5
Status: Enabled
Total Capacity: 5.5 TB
Total Space Used: 1.6 B
Containers:  ...
```

Listing storage identifiers for Hedvig Storage Cluster Nodes [lsstorageids]

To list the storage identifiers (IDs) for all of the Hedvig Storage Cluster Nodes.

Syntax
```
lsstorageids
```

Example
```
lsstorageids

Storage ID                       Hostname
----------                       --------
7064091cd064c418ca8030772c3cb283    titan2.hedviginc.com
b5bcf3f3e663ec373e9766a02fd89e04    titan1.hedviginc.com
1057a90afb55a8b477743e20e75c534d    titan3.hedviginc.com
```

Listing Hedvig Storage Pools and their virtual disks [lsstoragepools]

To list all Hedvig Storage Pools and their associated virtual disks.

Syntax
```
lsstoragepools -s arg
```

Argument descriptions

`-s, --storageid arg`   Storage identifier for which storage pools and related information are being requested

Example
```
lsstoragepools -s 7064091cd064c418ca8030772c3cb283

23b5cd6dd907ae51a84bc7ae18caced6$1 : /hedvig/d3    /hedvig/d4    /hedvig/d5
23b5cd6dd907ae51a84bc7ae18caced6$2 : /hedvig/d6    /hedvig/d7    /hedvig/d8
23b5cd6dd907ae51a84bc7ae18caced6$3 : /hedvig/d9    /hedvig/d10   /hedvig/d11
23b5cd6dd907ae51a84bc7ae18caced6$4 : /hedvig/d12   /hedvig/d13   /hedvig/d14
23b5cd6dd907ae51a84bc7ae18caced6$5 : /hedvig/d15   /hedvig/d16   /hedvig/d17
23b5cd6dd907ae51a84bc7ae18caced6$6 : /hedvig/d18   /hedvig/d19   /hedvig/d20
```

Showing Hedvig Storage Pools in a Hedvig Storage Cluster Node [showstorageid]

To show all Hedvig Storage Pool identifiers in a specified Hedvig Storage Cluster Node.

Syntax
```
showstorageid -i arg
```

Argument descriptions

`-i, --storageId arg`   Storage identifier of Hedvig Storage Cluster Node

Example
```
showstorageid -i 1057a90afb55a8b477743e20e75c534d

Storage Id:
  1057a90afb55a8b477743e20e75c534d (titan3.hedviginc.com)
Storage Pool Id:
  1057a90afb55a8b477743e20e75c534d$1
  Containers: ...
```

Getting a Hedvig Storage Pool identifier for a mount point [getstoragepoolformntpt]

To get the identifier of the Hedvig Storage Pool to which a specified mount point is associated, on a specified Hedvig Block Process (HBlock) host.

Hint: Use `lsstoragepools` (*41*) to get exact names of mount points.

Syntax
```
getstoragepoolformntpt -d arg -h arg
```

Argument descriptions

`-d, --mntpt` *arg*	Mount point name, appended with `/data`
`-h, --host` *arg*	Hostname (FQDN) of Hedvig Storage Cluster Node

Example
```
lsstoragepools -s 7064091cd064c418ca8030772c3cb283
```

7064091cd064c418ca8030772c3cb283$1 : /hedvig/d3 /hedvig/d4 /hedvig/d5

```
getstoragepoolformntpt -d /hedvig/d3/data -h titan3.hedviginc.com
```

Storage Pool Id: 1057a90afb55a8b477743e20e75c534d$1

Showing all Hedvig Storage Pool migrations in a Hedvig Storage Cluster [showallspmids]

To view all of the Hedvig Storage Pool migrations in a Hedvig Storage Cluster.

Syntax
```
showallspmids
```

Example
```
showallspmids
```

Start Time   SPMId
==
16-3-2018 09:23:31:238   1B909FD5-2D8E-B8D5-AC61-64C50B583AD6

Sid   Host Name   SpoolId   Status
==

77972a78c0829362d7cc13904b679490 titan1.hedviginc.com   4   PENDING

Viewing status for a Hedvig Storage Pool migration [spmstatus]

To view the status of a specified Hedvig Storage Pool migration in a Hedvig Storage Cluster.

Syntax
```
spmstatus [-c arg] -p arg -s arg
```

Argument descriptions

`-c, --container arg`	Container that is part of the Hedvig Storage Pool migration
`-p, --spmId arg`	Hedvig Storage Pool migration identifier that was generated to track the migration
`-s, --sId arg`	Storage identifier that was the source of the Hedvig Storage Pool migration

Example
```
spmstatus -p 1B909FD5-2D8E-B8D5-AC61-64C50B583AD6
    -s 039113946b759831631b6465a1cbb2ab
```

```
StoragePoolMigration status for spmId:5C8F6754-68DB-ADBE-3AD4-23937AE2E3EA
Failed storagePool Id: titan1.hedviginc.com (4)
Total # of containers that are part of the migration: 85
Size of the storagePool that is being migrated: 668.6 GB
Total # of containers that were successfully migrated: 85
Current Processing status for the overall Migration:85/85
Elapsed Time: 25:37:12

Container    Streaming Source        Target                  Progress %
========================================================================
1171$1       titan3.hedviginc.com (5)  titan4.hedviginc.com (3)  100.0
1370$1       titan7.hedviginc.com (1)  titan2.hedviginc.com (4)  100.0
```

Getting containers for a Hedvig Storage Pool migration [getallctrsaspartofspm]

To list all of the containers that are affected by a specified Hedvig Storage Pool migration.

Syntax
```
getallctrsaspartofspm -p arg -s arg
```

Argument descriptions

`-p, --spmId arg`	Hedvig Storage Pool migration identifier that was generated to track the migration
`-s, --sId arg`	Storage identifier that was the source of the Hedvig Storage Pool migration

Example
```
getallctrsaspartofspm -p 1B909FD5-2D8E-B8D5-AC61-64C50B583AD6
    -s 039113946b759831631b6465a1cbb2ab
```

Failed storagePool Id: titan2.hedviginc.com (4)
Total # of containers that are part of the migration: 85

Containers
==========
1171$1
1370$1
1713$1
182$1
1979$7

Managing rereplication

These commands manage rereplication.

Listing all rereplications in a Hedvig Storage Cluster [showallrereplicationids]

To list all of the rereplications in a Hedvig Storage Cluster.

Syntax
```
showallrereplicationids
```

Example
```
showallrereplicationids

Start Time      SID                                     Host Name
==========================================================
11:01:03:944    391413138b696be7e5319c09ccbd7a8e        titan:7000
11:04:23:064    391413138b696be7e5319c09ccbd7a8e        titan:7000

RereplicationId                          Status
================================================
A3FDC944-A9D6-B3C7-E1BD-D7DF9205F16E      Completed
9FDBDE1D-10EC-5801-9E90-4CECDE39AD14      Completed
```

Listing rereplication statistics in a Hedvig Storage Cluster [rereplicationstats]

To view the status of a specified rereplication in a Hedvig Storage Cluster.

Syntax
```
rereplicationstats [-d arg] -r arg -s arg
```

Argument descriptions

`-d, --date arg`	Date for which you want to see rereplication statistics, in the format yyyymmdd
`-r, --rereplicationId arg`	Identifier generated to track the rereplication
`-s, --sId arg`	Security identifier that was source of rereplication

Example
```
rereplicationstats -r A3FDC944-A9D6-B3C7-E1BD-D7DF9205F16E
  -s 391413138b696be7e5319c09ccbd7a8e
```

Managing SNMP and MIBs

These commands manage SNMP and MIBs.

Restarting an SNMP agent [restartsnmpagent]

To restart an SNMP agent.

Syntax
```
restartsnmpagent -h arg
```

Argument descriptions

`-h, --Server arg`   Storage cluster node (FQDN) where agent is running

Example
```
restartsnmpagent -h titan3.hedviginc.com
```
Restarted snmp agent running on titan3.hedviginc.com

Sending a test SNMP trap [sendtesttrap]

To send a test SNMP trap from an SNMP agent.

Syntax
```
sendtesttrap -h arg
```

Argument descriptions

`-h, --Server arg`   Storage cluster node (FQDN) where agent is running

Example
```
sendtesttrap -h titan3.hedviginc.com
```
Sent test snmp trap from: titan3.hedviginc.com

Working with OST AIR

These commands manage the OST AIR operation for the Hedvig OST Plugin for NetBackup.

**Note**: For more information, see the *Hedvig OST Plugin for NetBackup User Guide.*

Creating OST AIR mapping [createairmapping]

To create OST AIR mapping.

Notes:

- The `createairmapping` command must be run on both the source cluster and the target cluster.

- The source and target LSU names relate to the corresponding virtual disk names that are to be used for OST AIR. The virtual disks used for OST AIR *must* be NFS "backup" OST type.

- Multiple data centers can have different NetBackup domains, but must have the same underlying cluster name. Thus, the source and target must have the same cluster name.

- The NetBackup storage server that is mapped to an OST backup virtual disk must use the local cluster name. For example, if the cluster name is HDVGBKUP, the `createairmapping` command must include that name.

  When configuring the NetBackup storage server that is associated with the virtual disk, the name must match the cluster name, as shown below:
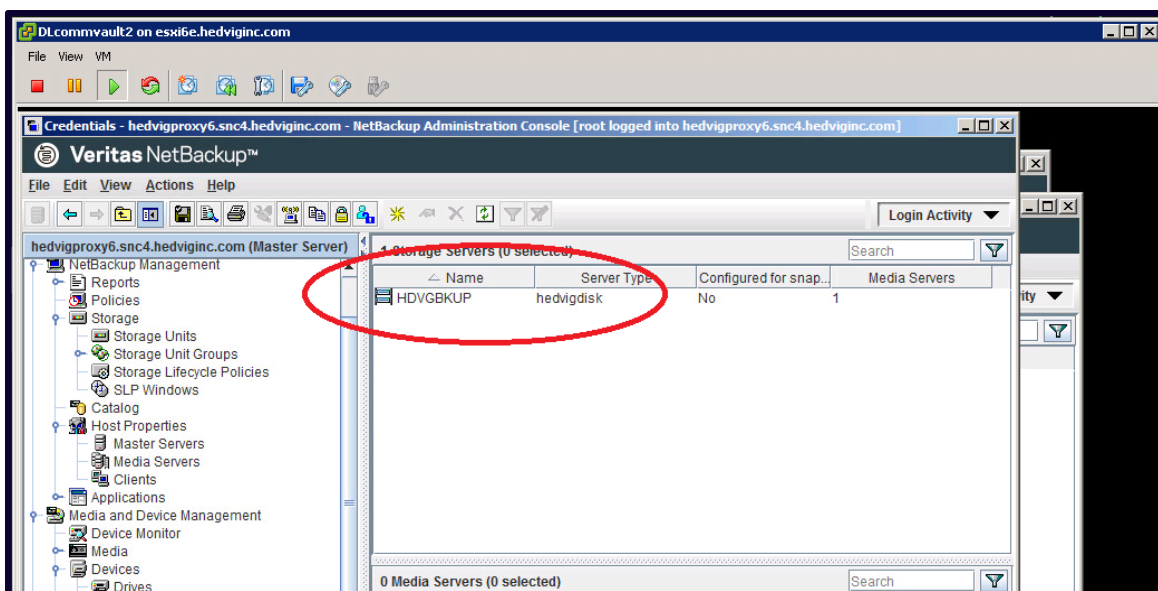
Syntax
```
createairmapping -o arg -r arg -s arg -t arg
```

Argument descriptions

```
-o, --sourcecluster arg
```
Source cluster
```
-r, --targetcluster arg
```
Target cluster
```
-s, --sourcelsu arg
```
Source LSU
```
-t, --targetlsu arg
```
Target LSU

Example
```
createairmapping -o HDVGBKUP -r HDVGBKUP1 -s site1 -t site2
```
AIR mapping has been successfully created

Getting OST AIR mapping for a source [getairmapping]

To get OST AIR mapping for a source.

Syntax
```
getairmapping [-s arg]
```

Argument descriptions
```
-s, --sourcecluster arg
```
Source cluster (optional)

Example
```
getairmappping
```

source LSU	source cluster	target LSU	target cluster
site1	HDVGBKUP	site2	HDVGBKUP1

Deleting OST AIR mapping [deleteairmapping]

To delete OST AIR mapping.

Syntax
```
deleteairmapping -o arg -r arg -s arg -t arg
```

Argument descriptions

```
-o, --sourcecluster arg
```
Source cluster
```
-r, --targetcluster arg
```
Target cluster
```
-s, --sourcelsu arg
```
Source LSU
```
-t, --targetlsu arg
```
Target LSU

Example
```
deleteairmapping -o HDVGBKUP -r HDVGBKUP1 -s site1 -t site2
```
AIR mapping has been successfully deleted

Glossary

This glossary contains definitions of terms used in this document.

Table 2: Glossary of terms

term	definition
ACL	An *access control list* is a list of permissions attached to an object.
agnostic	*Agnostic,* with respect to Replication Policy, means the replication procedure is independent of rack position and data center. This may also be referred to as *rack unaware.*
CHAP	The *Challenge-Handshake Authentication Protocol* authenticates a user or network host to an authenticating entity.
controller, CVM	See *Hedvig Storage Proxy.*
HDD	A *hard disk drive* is the traditional spinning hard drive, which provides basic nonvolatile storage on a computer.
Hedvig Block Process (HBlock)	The *Hedvig Block Process* is responsible for storing the physical blocks.
Hedvig Metadata Process (Pages)	The *Hedvig Metadata Process* is responsible for tracking all system *metadata*.
Hedvig Storage Cluster	A *Hedvig Storage Cluster* is an elastic cluster, formed by using any type of commodity server(s).
Hedvig Storage Cluster Node	A *Hedvig Storage Cluster Node* is an individual commodity server running *Hedvig Storage Service* software.
Hedvig Storage Pool	A *Hedvig Storage Pool* is a logical grouping of multiple physical disks that are presented as a single entity.

term	definition
Hedvig Storage Proxy	A *Hedvig Storage Proxy* is a lightweight software component that deploys at the application tier as a virtual machine or Docker container, or on bare metal, to provide storage access to any physical host or virtual machine in the application tier. The storage proxy presents block, file, and object storage access to app hosts, accelerates read performance with flash caching, drives efficiency with deduplication, and secures data with encryption. *This may also be referred to as a controller, CVM, target, or tgt.*
inode	An *inode* is a data structure used to represent a file system object, which can be one of various things including a file or a directory.

IQN	An *iSCSI qualified name* is the most commonly used format for assigning iSCSI names to nodes (targets and initiators) in an iSCSI network. All IQNs follow this pattern:
	
	`iqn.yyyy-mm.reversed_domain_name:storage_target_name`
	
	`iqn` = literal for iSCSI Qualified Name
	`yyyy-mm` = year and month that the *naming authority* took ownership of the domain name
	`reversed_domain_name` = reversed domain name of the *naming authority*
	`storage_target_name` = optional string to uniquely identify each IQN under the same domain
	
	For example:
	
	`iqn.1991-05.com.microsoft:hyperv-1.corp.hedviginc.com`

iSCSI	*Internet small computer system interface* is an IP-based storage networking standard for linking data storage facilities.
LUN	A *logical unit number* is a number that identifies a logical unit, which is a device addressed by the SCSI protocol or SAN protocols, which encapsulate SCSI, such as Fibre Channel or iSCSI.
MIB	A *management information base* is a database for managing the entities in a communication network. It is most often associated with SNMP.
PCIe	*Peripheral component interconnect express* is a high-speed serial computer expansion bus standard.

term	definition
RDM	*Raw device mapping* enables a storage LUN to be directly connected to a VM from the SAN.
SNMP	*Simple Network Management Protocol* is an Internet-standard protocol for collecting and organizing information about *SNMP managed devices* on IP networks and for modifying that information to change device behavior.
SNMP agent	An *SNMP agent* is a network-management software module that resides on an *SNMP managed device.* An agent has local knowledge of management information and translates that information to or from an SNMP-specific form.
SPM	*Storage Pool Migration* is the process of repairing a failed disk.
SSD	A *solid-state drive* (or *flash* or *pin-to-flash*) is a solid-state storage device that uses integrated circuit assemblies as memory to store data persistently.
target, tgt	See *Hedvig Storage Proxy.*
virtual disk	A *virtual disk* is an abstracted logical disk volume presented to a computer or application for read/write use.

Software-defined AES-256, FIPS compliant encryption of data in flight and at rest