Hedvig REST API User Guide

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Preliminary instructions

Review these important general instructions before working with the Hedvig REST API:

Query string limited to 2048 characters

The query string that can be issued as a request has a maximum limit of 2,048 characters, based on RFC 3986.

Be sure to consider this limit when a series of items, for example, a list of virtual disks, is included with a request.

Dollar sign ($) must be escaped with backslash (\)

cURL does not handle the **`$`** (dollar sign) symbol used in Hedvig's snapshot naming convention, so this character must be escaped using the **`\`** (backslash) symbol.

The examples within this document reflect this escaping, but you will need to add backslashes to use output directly from **`ListSnapshots`** or **`MakeSnapshot`**.

FQDNs must be used in all examples

In all of your requests, be sure to replace **`hedvig1.hedviginc.com`** with the *fully qualified domain name (FQDN)* of your Hedvig Storage Cluster Node.

Do not use only the simple name (for example, `hedvig1`).

"Pretty Printing" JSON output

To *pretty print* the JSON output of a **`curl`** command, append this to the command line:

```
| python -m json.tool
```

Login/Logout and other administrative tasks

These requests let you login and logout, as well as perform other administrative tasks.

Logging in and receiving a Session ID

The Hedvig REST API *Session ID* is a security feature for the Hedvig REST API. When you make a Login request, this identifier is returned, and you must include it in all subsequent requests. The Session ID expires if you are inactive for a short time, and you must re-login to continue.

Here is an example:

```
curl -G hedvig1.snc1.hedviginc.com/rest/ --data-urlencode
   "request={type:Login, category:UserManagement,
   params:{userName:'admin', password:'admin23',
   cluster:'cluster.hedviginc.com'}}" | python -m json.tool
```

Here is an example of a returned **`result`** with your **`Session ID`**:

```
{
    "requestId": "5E7D8FD7-8390-C47E-3AAC-519C51AC5F79",
    "result": {
        "datacenters": [
            {
                "dcname": "snc1"
            },
            {
                "dcname": "snc2"
            },
            {
                "dcname": "snc3"
            }
        ],
        "displayActivityLog": true,
        "displayName": "admin",
        "dualdc": true,
        "hcisetup": false,
        "primaryTenant": "Hedvig",
        "rackAware": true,
        "roles": {
            "Hedvig": "SuperUser"
        }
        "sessionId": "05b1b99eb3385ce5c1dc95e07e2812b5",
        "userName": "admin",
    },
    "status": "ok",
    "type": "Login"
}
```

Sending or getting security tokens

To send or get a security token:

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:SendSecurityToken, category:UserManagement,
   params:{userName:'admin', tenant:'Hedvig'},
   sessionId:'05b1b99eb3385ce5c1dc95e07e2812b5'}" | python -m json.tool
```

```
{
    "requestId": "49928DE9-8AAB-9A11-2572-BA6A0C443D9A",
    "securitytoken": "4cd8d047-04ad-4c95-b739-4494bf369ff7",
    "status": "ok",
    "type": "SendSecurityToken",
    "user": "admin"
}
```

Changing passwords

To change a password:

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ChangeUserPassword, category:UserManagement,
   params:{userName:'admin', oldPassword:'hedvig', newPassword:'x4y7z2'},
   sessionId:'05b1b99eb3385ce5c1dc95e07e2812b5'}" | python -m json.tool
```

```
{
    "requestId": "7011CA14-42A5-795C-0EBC-B4DA171072B6",
    "status": "ok",
    "type": "ChangeUserPassword"
}
```

Logging out

To securely end your session, use the **`Logout`** request, after which the Session ID will be invalidated and can no longer be used for any subsequent requests. You must re-login to start a new session if you want to continue.

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:Logout, category:UserManagement,
   sessionId:'05b1b99eb3385ce5c1dc95e07e2812b5'}" | python -m json.tool
```

```
{
    "requestId": "2DE34C10-E29E-4080-320A-EC4D8B51115E",
    "status": "ok",
    "type": "Logout"
}
```

Managing users

Adding users [AddUser]

To add a new user.

Parameters

Note: All parameters are required.

displayName	provides the name to display for this user
userName	provides the name of this user
tenant	establishes the tenant for this user. This tenant must have already been set up in the system.
role	sets the role of this user **values:** PowerUser SuperUser Monitor Admin
email	provides the email of this user, in the format 'user@company.com'
mobile	provides the mobile phone number of this user, in the format '1234567890'
password	provides the password for this user. To generate a password automatically, use password:'' and isGeneratedPassword:'true'
isGeneratedPassword	allows an automatic password to be generated for this user, when you enter password:'' and isGeneratedPassword:'true' **values:** true | false (default)
isLdapUser	establishes whether this is an LDAP user **values:** true | false (default)

Example cURL command request

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:AddUser, category:UserManagement,
   params:{displayName:'hedviguser', userName:'hedviguser', tenant:'Hedvig',
   role:'SuperUser', email:'hedviguser@hedviginc.com', mobile:'1234567890',
   password:'hedvig', isGeneratedPassword:'false', isLdapUser:'false'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:       "AddUser",
   category:   "UserManagement",
   params:     {
               displayName: "hedviguser",
               userName: "hedviguser",
               tenant: "Hedvig",
               role: "SuperUser",
               email: "hedviguser@hedviginc.com",
               mobile: "1234567890",
               password: "hedvig",
               isGeneratedPassword: "false",
               isLdapUser: "false"
               },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "CFC8BBA3-BB06-12D9-771A-E5F830BE72B2",
    "result": {
        "isLdapUser": false,
        "tenant": "Hedvig",
        "userName": "hedviguser"
    },
    "status": "ok",
    "type": "AddUser"
}
```

Managing tenants

Adding tenants [AddTenant]

To add a new tenant.

Parameters

Note: All parameters are required.

tenant	provides the name to display for this tenant
size (required)	sets size (in units of GB or TB). **example:** size:{unit:'GB', value:10} (default is 10 GB)

Example cURL command request

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:AddTenant, category:AdminManagement,
   params:{tenant:'Tenant1',size:{unit:'GB', value:10}},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:       "AddTenant",
   category:   "AdminManagement",
   params:     {
                tenant: "Tenant1",
                size: {
                       unit: "GB",
                       value: 10
                      }
                },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "CFC8BBA3-BB06-12D9-771A-E5F830BE72B2",
    "result": {
    },
    "status": "ok",
    "type": "AddTenant"
}
```

Resizing tenants [ResizeTenant]

To add a new tenant.

Parameters

Note: All parameters are required.

tenant	provides the name to display for this tenant
size (required)	sets size (in units of GB or TB). Must be greater than the current size. **example:** size:{unit:'GB', value:10} (default is 10 GB)

Example cURL command request

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ResizeTenant, category:AdminManagement,
   params:{tenant:'Tenant1',size:{unit:'GB', value:20}},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:       "ResizeTenant",
   category:   "AdminManagement",
   params:     {
                tenant: "Tenant1",
                size: {
                       unit: "GB",
                       value: 20
                      }
                },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "CFC8BBA3-BB06-12D9-771A-E5F830BE72B2",
    "result": {
    },
    "status": "ok",
    "type": "ResizeTenant"
}
```

Managing virtual disks (NFS and block)

These requests manage the virtual disks (both NFS and block) in a Hedvig Storage Cluster.

Creating virtual disks [AddVirtualDisk]

To create a new virtual disk or a batch of new virtual disks.

Parameters

Note: Only the `diskType`, `name`, `scsi3pr`, and `size` parameters are required. All other parameters are optional.

batch	creates a group of virtual disks **values:** count: integer (total number of disks) digits: integer (number of digits to concatenate) start: integer (number for first disk)
blockSize	sets block size **Note**: Must be set to 4096 (4k) if you are enabling RDM and/or deduplication. **values:** NFS: only allowed value is 512 BLOCK: [512 | 4096 (4k) (default) | 65536 (64k)]
cacheEnabled	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 **Note**: For added efficiency, client-side caching is also deduplication-enabled. **values:** true | false (default)
clusteredFileSystem	formats a clustered file system on top of a virtual disk to be presented to multiple hosts **Notes**: (1) This is 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. **values:** true | false (default)

compressed	enables compression to reduce data size **Note**: This is automatically enabled when you enable deduplication. **values:** true | false (default)
consistency	sets the consistency level **values:** WEAK | STRONG (default)
dataCenters	provides the names of the data centers for replicationPolicy of DataCenterAware or RackAware **Note**: Selecting certain data centers will automatically set the replication factor. **example:** dataCenters:[snc1,snc2,snc3] (DataCenterAware) dataCenters:[snc1] (RackAware)
deduplication	**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. **values:** true | false (default)
description	gives general descriptive information **example:** description:'This is an NFS virtual disk.'

diskType (required)	sets the protocol type **Notes**: For NFS, (1) a clustered file system is automatically enabled, (2) block size is automatically set to 512, and (3) you cannot enable RDM. **values:** NFS | BLOCK (default)
name (required)	provides the name(s) for the virtual disk(s), which must contain alphanumeric characters only (no special characters or spaces) **example:** name:'HedvigVdisk'
rdm	enables RDM (raw device mapping) for direct LUN access to VM guests **Notes**: (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. **values:** true | false (default)
replicationFactor	sets the number of replicas (1 to 6) to create. 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. **values:** 1-6 (default is 3)
replicationPolicy	sets replication policy **Notes**:(1) If a cluster is DataCenterAware when you add clone(s) to that cluster, you must also make the clone(s) DataCenterAware to enable deduplication. (2) For DataCenterAware or RackAware, you must also include the appropriate dataCenters. **values:** Agnostic [also known as RackUnaware] (default) | RackAware | DataCenterAware

residence	determines the type of Hedvig Storage Pool in which to store a virtual disk **values:** 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: The 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. **Important**: FLASH is not recommended.
scsi3pr (required)	enables SCSI-3 Persistent Reservations for use with Clustered Shared Volumes (CSV) **Note**: This is not supported for diskType NFS. **values:** true | false
size (required)	sets size (in units of GB or TB). Hedvig supports single block and NFS virtual disks of unlimited size. **Note**: 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. **example:** size:{unit:'GB', value:10} (default is 10 GB)

Example cURL command request

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:AddVirtualDisk, category:VirtualDiskManagement,
   params:{name:'HedvigVdisk', batch:{count:10, digits:2, start:1},
   size:{unit:'GB', value:10}, diskType:BLOCK, scsi3pr:false},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:       "AddVirtualDisk",
   category:   "VirtualDiskManagement",
   params:     {
                name:  "HedvigVdisk",
                batch: {
                        count: 10
                        digits: 2
                        start: 1
                       },
                blockSize: 4096,
                cacheEnabled: false,
                clusteredFileSystem: false,
                description: "Batch of disks created",
                diskType: "BLOCK",
                replicationFactor: 3,
                replicationPolicy: "Agnostic",
                residence: "HDD",
                scsi3pr: "false",
                size: {
                       unit: "GB",
                       value: 10
                      }
               },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example cURL command request - for Data Center Aware

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:AddVirtualDisk, category:VirtualDiskManagement,
   params:{name:'HedvigVdisk', size:{unit:'GB', value:10}, diskType:BLOCK,
   scsi3pr:false, replicationPolicy:DataCenterAware, replicationFactor:3,
   dataCenters:[snc1,snc2,snc3]},
   sessionId:'959d7cbe498ba63c6152d88babb3f4de'}" | python -m json.tool
```

Example response


```
{
    "requestId": "A5F432AF-BB59-771F-005B-CEBFA3346ACE",
    "result": [
        {
            "name": "HedvigVdisk01",
            "status": "ok"
        },
        {
            "name": "HedvigVdisk02",
            "status": "ok"
        },
        {
            "name": "HedvigVdisk03",
            "status": "ok"
        },
        {
            "name": "HedvigVdisk04",
            "status": "ok"
        },
        {
            "name": "HedvigVdisk05",
            "status": "ok"
        },
        {
            "name": "HedvigVdisk06",
            "status": "ok"
        },
        {
            "name": "HedvigVdisk07",
            "status": "ok"
        },
        {
            "name": "HedvigVdisk08",
            "status": "ok"
        },
        {
            "name": "HedvigVdisk09",
            "status": "ok"
        },
        {
            "name": "HedvigVdisk10",
            "status": "ok"
        }
    ],
    "status": "ok",
    "type": "AddVirtualDisk"
}
```

Listing all virtual disks [ListVirtualDisks]

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

Parameters

none

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ListVirtualDisks, category:VirtualDiskManagement,
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ListVirtualDisks",
   category:  "VirtualDiskManagement",
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response


```
{
    "requestId": "C1B37B9A-251C-2A04-460D-76D337EDBF71",
    "result": {
        "disks": [
           {
                "backup": "OST",
                "blockSize": 512,
                "cacheEnabled": true,
                "clusteredFileSystem": true,
                "compressed": true,
                "consistency": "STRONG",
                "createdBy": "HedvigAdmin",
                "deduplication": true,
                "diskType": "NFS_MASTER_DISK",
                "encryption": false,
                "isClone": false,
                "replicationFactor": 3,
                "replicationPolicy": "Agnostic",
                "residence": "HDD",
                "scsi3pr": false,
                "size": {
                    "units": "GB",
                    "value": 10
                },
                "status": "ok",
                "targetLocations": [],
                "tenant": "Hedvig",
                "vDiskName": "HedvigVdisk01"
```

```
            },
            {
                "backup": "NONE",
                "blockSize": 4096,
                "cacheEnabled": false,
                "clusteredFileSystem": false,
                "compressed": false,
                "consistency": "STRONG",
                "createdBy": "HedvigAdmin",
                "deduplication": false,
                "diskType": "BLOCK",
                "encryption": false,
                "isClone": false,
                "replicationFactor": 3,
                "replicationPolicy": "Agnostic",
                "residence": "HDD",
                "scsi3pr": false,
                "size": {
                    "units": "GB",
                    "value": 10
                },
                "status": "ok",
                "targetLocations": [],
                "tenant": "Hedvig",
                "vDiskName": "HedvigVdisk02"
            },
        ],
        "provisionedSize": "118.0 GB"
    },
    "status": "ok",
    "type": "ListVirtualDisks"
}
```

Viewing details for a single virtual disk [VirtualDiskDetails]

To view detailed information for a single virtual disk.

Parameters

virtualDisk	name of virtual disk **example:** virtualDisk:'HedvigVdisk01'

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:VirtualDiskDetails, category:VirtualDiskManagement,
   params:{virtualDisk:'HedvigVdisk01'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
     type:      "VirtualDiskDetails",
     category:  "VirtualDiskManagement",
     params:    {
                  virtualDisk: "HedvigVdisk01"
                },
     sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "18DB3D6B-6504-C6BB-61CE-969E18869EE3",
    "result": {
        "backup": "OST",
        "blockSize": 512,
        "cacheEnabled": true,
        "cloudEnabled": false,
        "cloudProvider": "NONE",
        "clusteredFileSystem": true,
        "compressed": true,
        "compressionRatio": 88.71849394024098,
        "consistency": "STRONG",
        "createdBy": "HedvigAdmin",
        "creationTime": "01-8-2018 23:56:28:565",
```

```
        "dataCenters": [
            [
                "snc1",
                "snc2",
                "snc3"
            ]
        ],
        "deduplication": {
            "percentageSaved": 0.8396004438400269,
            "saved": {
                "units": "GB",
                "value": 58.3
            },
            "tddc": {
                "units": "GB",
                "value": 6.6
            },
            "total": {
                "units": "GB",
                "value": 363.5
            }
        },
        "description": "Created by a non CLI interface",
        "diskType": "NFS_MASTER_DISK",
        "encryption": false,
        "exportedBlockSize": 512,
        "hasClones": false,
        "mntlocation": "hedvigvip1.hedviginc.com:50000",
        "replicationFactor": 3,
        "replicationPolicy": "DataCenterAware",
        "residence": "HDD",
        "scsi3pr": false,
        "scsiSerialNumber": 14,
        "scsinaa": true,
        "size": {
            "units": "GB",
            "value": 10
        },
        "systemdedupdiskname": "Hedvigdedup_Counter_0",
        "targetLocations": [
            "hedvigvip1.hedviginc.com:50000"
        ],
        "tenant": "Hedvig",
        "vDiskName": "HedvigVdisk01",
        "versionCounter": 1"
    }
    "status": "ok",
    "type": "VirtualDiskDetails"
}
```

Resizing virtual disks [ResizeDisks]

To resize specified virtual disk(s) to a *larger* size (*shrinking* of virtual disks is not supported).

Parameters

size	sets new (larger) size of virtual disk(s), in GB or TB **example**: size:{unit:'GB', value:25}
virtualDisks	name of virtual disk(s), which may have different sizes **example**: virtualDisks:['HedvigVdisk01', 'HedvigVdisk02']

Example cURL command request

```
curl -X POST hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ResizeDisks, category:VirtualDiskManagement,
   params:{virtualDisks:['HedvigVdisk01', 'HedvigVdisk02'], size:{unit:'GB',
   value:25}}, sessionId:'d93ca275a6eedd1e9ec10696e923aded'}"
   | python -m json.tool
```

formatted value of cURL command request

```
{
   type:     "ResizeDisks",
   category: "VirtualDiskManagement",
   params:   {
              virtualDisks: [ "HedvigVdisk01", "HedvigVdisk02" ],
              size: {
                      unit: "GB",
                      value: 25
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "B57CCABF-5C76-3E94-A1C0-D276A916C5DD",
    "result": [
        {
            "name": "HedvigVdisk01",
            "status": "ok"
        },
        {
            "name": "HedvigVdisk02",
            "status": "ok"
        }
    ],
    "status": "ok",
    "type": "ResizeDisks"
   }
```

Getting virtual disk metrics [GetVirtualDiskMetrics]

To get virtual disk read and write metrics.

Note: To get *child* virtual disk metrics, use **`ListChildVDiskDetails`** to get the virtual disk identifier and then use this identifier as the **`virtualDisk`** name, along with **`diskType`** of NFS. See *Listing child virtual disks [ListChildVDiskDetails].*

Parameters

controllers	FQDN(s)of the virtual disk host(s) **example:** controllers:['hedvigvip1.hedviginc.com']
diskType	type of protocol **values:** NFS | BLOCK **example:** diskType:NFS
virtualDisk	name of virtual disk **example:** virtualDisk:'HedvigVdisk01'

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:GetVirtualDiskMetrics, category:VirtualDiskManagement,
   params:{virtualDisk:'HedvigVdisk01', diskType:BLOCK,
   controllers:['hedvigvip1.hedviginc.com']},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "GetVirtualDiskMetrics",
   category:  "VirtualDiskManagement",
   params:    {
                virtualDisk: "HedvigVdisk01",
                diskType:     "BLOCK",
                controllers: [ "hedvigvip1.hedviginc.com" ]
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response


```
{
   "requestId": "88A2852A-BD82-5560-D4AE-FA4835F9641A",
   "result": [
       {
            "Read Information": {
                "IOPS": [
                    0,
                    0,
                    0,
                    20,
                    ...
              ],
                "Latency": [
                    0,
                    0,
                    0,
                    0.20000000000000001,
                    ...
               ],
                "MIN": [
                    0,
                    0,
                    ...
               ],
                "Max": [
                    0,
                    0,
                    0,
                    1,
                    ...
               ],
                "Throughput": [
                    0,
                    0,
                    0,
                    0.009765625,
                    0,
                    ...
                    0.009765625
                ]
            },
            "Write Information": {
                "IOPS": [
                    0,
                    0,
                    0,
                    20,
                    0,
                    ...
                    0,
                    20
                ],
```

```
                "Latency": [
                    0,
                    0,
                    0,
                    14.4,
                    0,
                    ...
                    0,
                    0,
                    13.699999999999999
                ],
                "MIN": [
                    0,
                    0,
                    0,
                    11,
                    ...
                    0,
                    11
                ],
                "Max": [
                    0,
                    0,
                    0,
                    25,
                    ...
                    0,
                    0,
                    20
                ],
                "Throughput": [
                    0,
                    0,
                    0,
                    0.009765625,
                    0,
                    0,
                    ...
                    0.009765625
                ]
            },
            "controller": "hedvigvip1.hedviginc.com"
        }
    ],
    "status": "ok",
    "type": "GetVirtualDiskMetrics"}
```

Adding virtual disk tags [ManageTags]

To add tags to a virtual disk.

Parameters

virtualDisk	name of virtual disk **example:** virtualDisk:'HedvigVdisk01'
tags	array of tags and their values **example:** tags:['tag 1=Finance', 'tag 2=HR']

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ManageTags, category:VirtualDiskManagement,
   params:{virtualDisk:'HedvigVdisk01', tags:['tag 1=Finance', 'tag 2=HR']},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ManageTags",
   category:  "VirtualDiskManagement",
   params:    {
                virtualDisk: "HedvigVdisk01",
                tags: [ "tag 1=Finance", "tag 2=HR" ]
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "EC50A0E3-0189-6425-6E8A-4164E49B1BBE",
    "status": "ok",
    "type": "ManageTags"
}
```

Showing virtual disk tags [ShowTags]

To show tags allocated to a specific virtual disk.

Parameters

virtualDisk	name of virtual disk **example:** virtualDisk:'HedvigVdisk01'
tagName	(optional) single tag for which to return value. If this is not specified, all tags are returned. **example:** tagName:tag 2

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode "request={type:ShowTags,
   category:VirtualDiskManagement, params:{virtualDisk:'HedvigVdisk01'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ShowTags",
   category:  "VirtualDiskManagement",
   params:    {
                virtualDisk: "HedvigVdisk01"
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "9085A6A0-4D78-1E58-F9D2-D172A7980997",
    "result": [
        {
            "tagName": "tag 1",
            "tagValue": "Finance"
        },
        {
            "tagName": "tag 2",
            "tagValue": "HR"
        }
    ],
    "status": "ok",
    "type": "ShowTags"
}
```

Listing virtual disks by tags [ListVirtualDisksByTags]

To return the details for all virtual disks that have a specific tag(s).

Parameters

tags	array of tag names **example:** tags:['tag 1','tag 2']

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ListVirtualDisksByTags, category:VirtualDiskManagement,
   params:{tags:['tag 1', 'tag 2']},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ListVirtualDisksByTags",
   category:  "VirtualDiskManagement",
   params:    {
                tags: [ "tag 1", "tag 2" ]
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response


```
{
    "cloud": "CloudInfo(cloudEnabled:false, cloudProvider:null)",
    "requestId": "323FC1E3-7781-27DD-80FE-92583915A581",
    "result": {
        "cloud": {
            "enabled": false,
            "provider": ""
        },
        "disks": [
            {
                "backup": "NONE",
                "blockSize": 4096,
                "cacheEnabled": false,
                "clusteredFileSystem": false,
                "compressed": false,
                "consistency": "STRONG",
                "createdBy": "HedvigAdmin",
                "deduplication": false,
                "diskType": "BLOCK",
                "encryption": false,
                "isClone": false,
                "replicationFactor": 3,
                "replicationPolicy": "Agnostic",
                "residence": "HDD",
                "scsi3pr": false,
                "size": {
                    "units": "GB",
                    "value": 15
                },
                "status": "ok",
                "targetLocations": [
                    "hedvigvip1.hedviginc.com:50000"
                ],
                "tenant": "Hedvig",
                "vDiskName": "HedvigVdisk01"
            }
        ],
        "provisionedSize": "15.0 GB"
    },
    "status": "ok",
    "type": "ListVirtualDisksByTags"
}
```

Deleting virtual disks [DeleteVDisk]

To delete specified virtual disk(s).

Parameters

virtualDisks	name of virtual disk(s) **example:** virtualDisks:['HedvigVdisk01', 'HedvigVdisk02']

Example cURL command request

```
curl -X POST hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:DeleteVDisk, category:VirtualDiskManagement,
   params:{virtualDisks:['HedvigVdisk01', 'HedvigVdisk02']},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "DeleteVDisk",
   category:  "VirtualDiskManagement",
   params:    {
               virtualDisks: [ "HedvigVdisk01", "HedvigVdisk02" ],
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "D2C21738-E3B1-74F9-C6DE-95EAA75BBA3A",
    "result": [
        {
            "name": "HedvigVdisk01",
            "status": "ok"
        }
        {
            "name": "HedvigVdisk02",
            "status": "ok"
        }
    ],
    "status": "ok",
    "type": "DeleteVDisk"
}
```

Managing NFS virtual disks

These requests are applicable only to the *NFS* virtual disks in a Hedvig Storage Cluster.

Exporting an NFS virtual disk to a client [Mount]

To export a specified NFS virtual disk to a client.

Parameters

targets	FQDN(s) of the client **example:** targets:['hedvigvip1.hedviginc.com']
virtualDisk	name of virtual disk (must be NFS type) **example:** virtualDisk:'HedvigVdisk01'

Example cURL command request

```
curl -X POST hedvig1.hedviginc.com/rest/ --data-urlencode "request={type:Mount,
   category:VirtualDiskManagement, params:{virtualDisk:'HedvigVdisk01',
   targets:['hedvigvip1.hedviginc.com']},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "Mount",
   category:  "VirtualDiskManagement",
   params:    {
               virtualDisk: "HedvigVdisk01",
               targets:     ["hedvigvip1.hedviginc.com"]
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response


```
{
    "requestId": "4934FE12-2C0B-F975-1D9D-57AD03B87F1A",
    "result": {
        "exportInfo": [
            {
                "status": "ok",
                "target": "hedvigvip1.hedviginc.com"
            }
        ]
    },
    "status": "ok",
    "type": "Mount"
}
```

Listing clients for an exported NFS virtual disk [ListExportedTargets]

To list the clients for an exported NFS virtual disk.

Parameters

virtualDisk	name of virtual disk (must be NFS type) **example:** virtualDisk:'HedvigVdisk01'

Example cURL command request

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ListExportedTargets, category:VirtualDiskManagement,
   params:{virtualDisk:'HedvigVdisk01'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ListExportedTargets",
   category:  "VirtualDiskManagement",
   params:    {
                virtualDisk: "HedvigVdisk01"
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "2F09ECB1-2F52-DC64-8933-49F85D50C8F3",
    "result": [
        "hedvigvip1.hedviginc.com"
    ],
    "status": "ok",
    "type": "ListExportedTargets"
}
```

Removing an exported NFS virtual disk [Unmount]

To remove an exported NFS virtual disk from a client

Parameters

targets	FQDN(s) of the client(s) **example:** targets:['hedvigvip1.hedviginc.com']
virtualDisk	name of virtual disk (must be NFS type) **example:** virtualDisk:'HedvigVdisk01'

Example cURL command request

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:Unmount, category:VirtualDiskManagement,
   params:{virtualDisk:'HedvigVdisk01', targets:['hedvigvip1.hedviginc.com']},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "Unmount",
   category:  "VirtualDiskManagement",
   params:    {
               virtualDisk: "HedvigVdisk01",
               targets:     ["hedvigvip1.hedviginc.com"]
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "C96B38C3-E2AA-3565-5258-C0B09CB50EFC",
    "result": [
        {
            "status": "ok",
            "target": "hedvigvip1.hedviginc.com"
        }
    ],
    "status": "ok",
    "type": "Unmount"
}
```

Managing block virtual disks

These requests are applicable only to the *block* virtual disks in a Hedvig Storage Cluster.

Adding block virtual disks as LUNs [AddLun]

To add block virtual disk(s) as LUN(s) to iSCSI target(s).

Parameters

targets	FQDN(s) of the iSCSI target(s) **example:** targets:['hedvigvip1.hedviginc.com']
virtualDisks	name of virtual disk(s) (must be block type) **example:** virtualDisks:['HedvigVdisk01', 'HedvigVdisk02']
readonly	Allows the data to be read only. Typically, you would set this up on a LUN that already has data, so the data can be read, but not modified. **values:** true | false (default)

Example cURL command request

```
curl -X POST hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:AddLun, category:VirtualDiskManagement,
   params:{virtualDisks:['HedvigVdisk01', 'HedvigVdisk02'],
   targets:['hedvigvip1.hedviginc.com'], readonly:false},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:       "AddLun",
   category:   "VirtualDiskManagement",
   params:     {
                 virtualDisks: [ "HedvigVdisk01", "HedvigVdisk02" ],
                 targets:      [ "hedvigvip1.hedviginc.com" ]
                 readonly:     "false"
               },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response


```
{
    "requestId": "2EF8E6BE-3474-F873-21AD-BB9495A12B9C",
    "result": [
         {
            "name": "HedvigVdisk01",
            "status": "ok",
            "targets": [
                {
                    "message": " is already associated with the host
                                                    hedvigvip1.hedviginc.com",
                    "name": "hedvigvip1.hedviginc.com",
                    "status": "warning"
                }
            ]
        },       {
            "name": "HedvigVdisk02",
            "status": "ok",
            "targets": [
                {
                    "name": "hedvigvip1.hedviginc.com",
                    "status": "ok"
                }
            ]
        }
    ],
    "status": "ok",
    "type": "AddLun"
}
```


Listing iSCSI targets for an exported block virtual disk [VirtualDiskDetails]

To list the iSCSI target(s) to which a specific block virtual disk or LUN has been mapped, see *Viewing details for a single virtual disk [VirtualDiskDetails].*

Adding ACL access to block virtual disk LUNs [PersistACLAccess]

To add an initiator's IP to an iSCSI target's ACL.

Parameters

address	address of initiator needing access to mount iSCSI disk **example:** address:'172.22.22.22'
host	FQDN of the virtual disk host **example:** host:'hedvigvip1.hedviginc.com'
type	type of initiator **values:** host | ip | iqn
virtualDisks	name of virtual disk(s) (must be block type) **example:** virtualDisks:['HedvigVdisk01', 'HedvigVdisk02']

Example cURL command request

```
curl -X POST hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:PersistACLAccess, category:VirtualDiskManagement,
   params:{virtualDisks:['HedvigVdisk01', 'HedvigVdisk02'],
   host:'hedvigvip1.hedviginc.com', address:'172.22.22.22', type:host},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "PersistACLAccess",
   category:  "VirtualDiskManagement",
   params:    {
                virtualDisks:  [ "HedvigVdisk01", "HedvigVdisk02" ],
                host:          "hedvigvip1.hedviginc.com",
                address:       "172.22.22.22",
                type:           host
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response


```
{
    "requestId": "E6CAD7B5-831C-26CA-A6D2-5AA23D89AA7D",
    "result": [
        {
            "name": "HedvigVdisk01",
            "status": "ok"
        }
        {
            "name": "HedvigVdisk02",
            "status": "ok"
        }
   ],
    "status": "ok",
    "type": "PersistACLAccess"
}
```

Listing ACL access for a block virtual disk LUN [GetACLInformation]

To get information about an existing iSCSI ACL configuration for a specified block virtual disk.

Parameters

virtualDisk	name of virtual disk (must be block type) **example:** virtualDisk:'HedvigVdisk01'

Example cURL command request

```
curl -X POST hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:GetACLInformation, category:VirtualDiskManagement,
   params:{virtualDisk:'HedvigVdisk01'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "GetACLInformation",
   category:  "VirtualDiskManagement",
   params:    {
                virtualDisk: "HedvigVdisk01",
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
)
```

Example response

```
{
    "requestId": "570A0788-8525-4140-747F-600F1C522514",
    "result": [
        {
            "host": "hedvigvip1.hedviginc.com",
            "initiator": [
                {
                    "ip": "172.22.22.22",
                    "name": "vdisk-01-22.hedviginc.com"
                }
            ]
        }
    ],
    "status": "ok",
    "type": "GetACLInformation"
}
```

Removing ACL access from a block virtual disk [RemoveACLAccess]

To remove an initiator's IP from an iSCSI target's ACL.

Parameters

address	address of the initiator **example:** address:['172.22.22.22']
host	FQDN of the virtual disk host **example:** host:'hedvigvip1.hedviginc.com'
virtualDisk	name of the virtual disk (must be block type) **example:** virtualDisk:'HedvigVdisk01'

Example cURL command request

```
curl -X POST hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:RemoveACLAccess, category:VirtualDiskManagement,
   params:{virtualDisk:'HedvigVdisk01', host:'hedvigvip1.hedviginc.com',
   address:['172.22.22.22']}, sessionId:'d93ca275a6eedd1e9ec10696e923aded'}"
   | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "RemoveACLAccess",
   category:  "VirtualDiskManagement",
   params:    {
                virtualDisk: "HedvigVdisk01",
                host:        "hedvigvip1.hedviginc.com",
                address:     [ "172.22.22.22" ]},
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
)
```

Example response

```
{
    "requestId": "E04990A7-EF21-F914-F92E-1B03D35DA361",
    "status": "ok",
    "type": "RemoveACLAccess"
}
```

Unmapping a block virtual disk LUN [UnmapLun]

To unmap a block virtual disk LUN from a specified iSCSI target.

Parameters

target	FQDN of the iSCSI target **example:** target:'hedvigvip1.hedviginc.com'
virtualDisk	name of the virtual disk (must be block type) **example:** virtualDisk:'HedvigVdisk01'

Example cURL command request

```
curl -X POST hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:UnmapLun, category:VirtualDiskManagement,
   params:{virtualDisk:'HedvigVdisk01', target:'hedvigvip1.hedviginc.com'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "UnmapLun",
   category:  "VirtualDiskManagement",
   params:    {
                virtualDisk: "HedvigVdisk01",
                target:      "hedvigvip1.hedviginc.com"
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "E40F356B-4C3F-9CBA-B354-7A5E493A10E7",
    "result": {},
    "status": "ok",
    "type": "UnmapLun"
}
```

Managing snapshots for block virtual disks

These requests manage snapshots for block virtual disks. Snapshots are *not* supported for NFS virtual disks.

Creating snapshots for block virtual disks [MakeSnapshot]

To create snapshot(s) for block virtual disk(s).

Parameters

virtualDisks	name of virtual disk(s) (must be block type) **example:** virtualDisks:['HedvigVdisk01', 'HedvigVdisk02']

Example cURL command request

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:MakeSnapshot, category:SnapshotManagement,
   params:{virtualDisks:['HedvigVdisk01']},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "MakeSnapshot",
   category:  "SnapshotManagement",
   params:    {
               virtualDisks: [ "HedvigVdisk01", "HedvigVdisk02" ],
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "755AB68D-8CCA-0C59-D8C2-ABAA7BCAEF48",
    "result": [
        {
            "name": "HedvigVdisk01",
            "snapshotName": "HedvigVdisk01$Snapshot$1",
            "status": "ok"
        }
    ],
    "status": "ok",
    "type": "MakeSnapshot"
}
```

Listing all snapshots of a block virtual disk [ListSnapshots]

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

Parameters

virtualDisk	name of virtual disk (must be block type) **example:** virtualDisk:'HedvigVdisk01'

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ListSnapshots, category:SnapshotManagement,
   params:{virtualDisk:'HedvigVdisk01'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ListSnapshots",
   category:  "SnapshotManagement",
   params:    {
                virtualDisk: "HedvigVdisk01"
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "9C775129-70BB-E8F0-30DB-7430ADD0B116",
    "result": [
        {
            "details": "Taken on: 01/11/2019 23:06:43",
            "name": "HedvigVdisk01$Snapshot$1"
        }
    ],
    "status": "ok",
    "type": "ListSnapshots"
}
```

Reverting to a specific snapshot [RevertToSnapshot]

To revert to a specific version of a snapshot.

Notes:

(1) Any changes between the most recent snapshot and the active filesystem will be lost when using **`RevertToSnapshot`**, so it is recommended that you take a snapshot first in order to rollback if necessary.

(2) Any active filesystems or hosts currently accessing a virtual disk when **`RevertToSnapshot`** is issued may need to be refreshed to see the previous version of the filesystem and/or virtual disk.

Parameters

snapshotName	name of snapshot **example:** snapshotName:'HedvigVdisk01\$Snapshot\$1'

Example cURL command request

```
curl -X POST hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:RevertToSnapshot, category:SnapshotManagement,
   params:{snapshotName:'HedvigVdisk01\$Snapshot\$1'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "RevertToSnapshot",
   category:  "SnapshotManagement",
   params:    {
                snapshotName: "HedvigVdisk01\$Snapshot\$1"
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "name": "HedvigVdisk01$Snapshot$1",
    "requestId": "16A14653-7558-4BAB-9982-E57F8AD06D0C",
    "status": "ok",
    "type": "RevertToSnapshot"
}
```

Cloning a block virtual disk from a snapshot [CloneSnapshot]

To clone a block virtual disk from a specified snapshot.

Parameters

Note: Only the `clonedSnapshotName` and `name` parameters are required. All other parameters are optional. If you do not specify a parameter, the snapshot value is used.

batch	creates a group of clones **values:** count: integer (total number of clones) digits: integer (number of digits to concatenate) start: integer (number for first disk)
blockSize	sets block size **Note**: Must be set to 4096 (4k) if you are enabling RDM and/or deduplication. **values**: [512 | 4096 (4k) (default) | 65536 (64k)]
cacheEnabled	enables client-side caching support for cloned virtual disk blocks, to cache to local SSD or PCIe devices at the application compute tier for high performance **Note**: For added efficiency, client-side caching is also deduplication-enabled. **values:** true | false (default)
clonedSnapshotName (required)	provides the name of the snapshot to clone **example:** clonedSnapshotName:'HedvigVdisk01\$Snapshot\$1'
cloneType	sets the type of clone **value:** Shallow (default)
clusteredFileSystem	formats a clustered file system on top of a clone to be presented to multiple hosts **Notes**: (1) Block size is automatically set to 512. (2) You cannot enable RDM on a clustered file system. **values:** true | false (default)
compressed	enables compression to reduce data size **Note**: This is automatically enabled when you enable deduplication. **values:** true | false (default)

dataCenters	provides the names of the data centers for replicationPolicy of DataCenterAware or RackAware **Note**: Selecting certain data centers will automatically set the replication factor. **example:** dataCenters:[snc1,snc2,snc3] (DataCenterAware) dataCenters:[snc1] (RackAware)
description	gives general descriptive information **example:** description:'This is a clone of the HedvigVdisk01 virtual disk.'
exportedBlockSize	exported block size **Note**: Contact Hedvig support for more information.
name (required)	provides the name(s) for the clone(s), which must contain alphanumeric characters only (no special characters or spaces) **example:** name:'HedvigVdisk'
rdm	enables RDM (raw device mapping) for direct LUN access to VM guests **Notes**: (1) Block size is automatically set to 4096 (4k). (2) You cannot enable RDM on a clustered file system. **values:** true | false (default)
replicationFactor	sets the number of replicas (1 to 6) to create. 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. **values:** 1-6 (default is 3)
replicationPolicy	sets replication policy **Notes**:(1) If a cluster is DataCenterAware when you add clone(s) to that cluster, you must also make the clone(s) DataCenterAware to enable deduplication. (2) For DataCenterAware or RackAware, you must also include the appropriate dataCenters. **values:** Agnostic [also known as RackUnaware] (default) | RackAware | DataCenterAware

residence	determines the type of Hedvig Storage Pool in which to store a clone **values:** 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: The clone will be pinned only to SSD assets (which must be present) in the storage cluster, essentially creating an all-flash array for the clone. **Important**: FLASH is not recommended.

Example cURL command request

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:CloneSnapshot, category:SnapshotManagement,
   params:{name:'ClonedVdisk', batch:{count:2, digits:1, start:1},
   size:{units:'GB', value:25},
   clonedSnapshotName:'HedvigVdisk01\$Snapshot\$1'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:       "CloneSnapshot",
   category:   "SnapshotManagement",
   params:     {
                 name:  "ClonedVdisk",
                 batch: { count:  2,
                          digits: 1,
                          start:  1},
                 clonedSnapshotName: "HedvigVdisk01\$Snapshot\$1"
               },
   sessionId:  "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example cURL command request - for Data Center Aware

```
curl -X PUT hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:CloneSnapshot, category:SnapshotManagement,
   params:{name:'ClonedVdisk',
   clonedSnapshotName:'HedvigVdisk01\$Snapshot\$1',
   replicationPolicy:DataCenterAware, replicationFactor:3,
   dataCenters:[snc1,snc2,snc3], batch:{count:2,digits:1,start:1},
   blockSize:512, cacheEnabled:true, cloneType:Shallow,
   clusteredFileSystem:true, compressed:true, description:'Created for
   testing purposes', rdm:true, residence:HDD, exportedBlockSize:4096},
   sessionId:'27cd28c0c42d9dc0707052cd06b46dba'}" | python -m json.tool
```

Example response


```
{
    "requestId": "BF16EB07-B7B8-634D-6AD1-54093A6ACCE5",
    "result": [
        {
            "baseDisk": "HedvigVdisk01",
            "name": "ClonedVdisk1",
            "status": "ok"
        },
        {
            "baseDisk": "HedvigVdisk01",
            "name": "ClonedVdisk2",
            "status": "ok"
        }
    ],
    "status": "ok",
    "type": "CloneSnapshot"
}
```

Listing clones for a snapshot [ListClonesForSnapshot]

To list all of the clones for a specified snapshot.

Parameters

snapshotName	name of cloned snapshot **example:** snapshotName:'HedvigVdisk01\$Snapshot\$1'

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ListClonesForSnapshot, category:SnapshotManagement,
   params:{snapshotName:'HedvigVdisk01\$Snapshot\$1'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ListClonesForSnapshot",
   category:  "SnapshotManagement",
   params:    {
                "snapshotName": "HedvigVdisk01\$Snapshot\$1"
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "EF542AD7-4606-0A0D-7903-DC1E77A77BAB",
    "result": [
        {
            "name": "ClonedVdisk1"
        },
        {
            "name": "ClonedVdisk2"
        }
    ],
    "status": "ok",
    "type": "ListClonesForSnapshot"
}
```

Listing storage cluster nodes for a snapshot [ListClusterNodes]

To list all of the Hedvig Storage Cluster Nodes for a specified snapshot.

Parameters

snapshotName	name of snapshot **example:** snapshotName:'HedvigVdisk01\$Snapshot\$1'

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ListClusterNodes, category:ClusterWatch,
   params:{snapshotName:'HedvigVdisk01\$Snapshot\$1'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ListClusterNodes",
   category:  "ClusterWatch",
   params:    {
                "snapshotName:'HedvigVdisk01\$Snapshot\$1'}"
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "574EBB21-FF49-58AB-D839-AFA000A6DCD1",
    "result": {
        "cloud": {},
        "nodes": [
            {
                "location": "hedvig1.hedviginc.com:7000",
                "nodeType": "pages",
                "status": "up",
                "storageId": "05d59ba1d73781e11968c39196c0eece"
            },
            {
                "location": "hedvig2.hedviginc.com:7000",
                "nodeType": "pages",
                "status": "up",
                "storageId": "f69481477d4b4e12a89cee61b8765bdb"
            },
```

```
            {
                "location": "hedvig3.hedviginc.com:7000",
                "nodeType": "pages",
                "status": "up",
                "storageId": "a417d18d04d8a4fa1da56face103595d"
            },
            {
                "location": "hedvig1.hedviginc.com:7010",
                "nodeType": "data",
                "status": "ok",
                "storageId": "419d25e683f817f54ac68f335ae43d25"
            },
            {
                "location": "hedvig2.hedviginc.com:7010",
                "nodeType": "data",
                "status": "ok",
                "storageId": "29406487935cb521119847e1cd5197f7"
            },
            {
                "location": "hedvig3.hedviginc.com:7010",
                "nodeType": "data",
                "status": "ok",
                "storageId": "4631fab070c991f4d3a0179f6cced54d"
            },
            {
                "location": "hedvigvip1.hedviginc.com",
                "nodeType": "EdgeNode",
                "protocol": "block"
            },
            {
                "location": "hedvigvip1.hedviginc.com",
                "nodeType": "EdgeNode",
                "protocol": "nfs"
            }
        ]
    },
    "status": "ok",
    "type": "ListClusterNodes"
}
```

Deleting a snapshot of a block virtual disk [DeleteSnapshot]

To delete a specified snapshot of a block virtual disk.

Note: You cannot delete a snapshot that has clones associated with it.

Parameters

snapshotName	name of snapshot **example:** snapshotName:'HedvigVdisk01\$Snapshot\$1'

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:DeleteSnapshot, category:SnapshotManagement,
   params:{snapshotName:'HedvigVdisk01\$Snapshot\$1'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "DeleteSnapshot",
   category:  "SnapshotManagement",
   params:    {
                snapshotName: "HedvigVdisk01\$Snapshot\$1"
              },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "name": "HedvigVdisk02$Snapshot$1",
    "requestId": "76EA5EE8-EA95-3F4D-FF80-4963730FF4A4",
    "status": "ok",
    "type": "DeleteSnapshot"
}
```

Managing child virtual disks

These requests manage child virtual disks.

Listing child virtual disks [ListChildVDiskDetails]

To list all of the child virtual disks (VMDK files) for a specified virtual disk.

Parameters

virtualDisk	name of virtual disk **example:** virtualDisk:'HedvigVdisk01'

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ListChildVDiskDetails, category:VirtualDiskManagement,
   params:{virtualDisk:'vcptest'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:       "ListChildVDiskDetails",
   category:   "VirtualDiskManagement",
   params:     {
                virtualDisk: "vcptest"
               },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "31A4ABF0-03A0-0B34-CC16-1E551B7EE48C",
    "result": [
        {
            "description": "vmware.log",
            "name": "709"
        },
        {
            "description": "vmware.log",
            "name": "1183"
        },
        {
```

```
            "description": "vmware.log",
            "name": "230"
        },
        {
            "description": "65a-win1-821cd619.vswp",
            "name": "231"
        },
        {
            "description": "lx-esxi65a-clnt4-flat.vmdk",
            "name": "596"
        },
        {
            "description": "vmware.log",
            "name": "752"
        },
        {
            "description": "65a-win2-821cd61a.vswp",
            "name": "753"
        },
        {
            "description": "vmx-lx-esxi65a-clnt3-2866892840-1.vswp",
            "name": "1178"
        },
        {
            "description": "65a-win4-821cd61c.vswp",
            "name": "1332"
        },
        {
            "description": "lx-esxi65a-clnt4-aae15029.vswp",
            "name": "710"
        },
        {
            "description": "vmware.log",
            "name": "1331"
        },
        {
            "description": "65a-win2_1-flat.vmdk",
            "name": "1694"
        },
        {
            "description": "lx-esxi65a-clnt3-flat.vmdk",
            "name": "955"
        },
        ...
        {
            "description": "vmx-lx-esxi65a-clnt4-2866892841-1.vswp",
            "name": "704"
        }
    ],
    "status": "ok",
    "type": "ListChildVDiskDetails"
}
```

Managing Hedvig Storage Clusters

These requests manage the various components of a Hedvig Storage Cluster.

Viewing storage cluster information [ClusterInformation]

To view high level information about a Hedvig Storage Cluster.

Parameters

none

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ClusterInformation, category:ClusterWatch,
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ClusterInformation",
   category:  "ClusterWatch",
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response


```
{
    "requestId": "FF348B12-DEE4-6429-7DD5-842F69DE0843",
    "result": {
        "capacity": {
            "percentageUsed": 0.0015252205776050687,
            "total": {
                "units": "TB",
                "value": 32.7
            },
            "used": {
                "units": "GB",
                "value": 51.1
            }
        },
        "cloud": {},
        "hPods": [
            {
                "name": "hpod-cptest1",
                "podId": [
                    {
                        "id": "4194e046c8c3e787231f66406039a0b8",
                        "members": [
                            {
                                "isAlive": true,
                                "location": "hedvig3.hedviginc.com:7100",
                                "status": "ok"
                            },
                            {
                                "isAlive": true,
                                "location": "hedvig2.hedviginc.com:7100",
                                "status": "ok"
                            },
                            {
                                "isAlive": true,
                                "location": "hedvig1.hedviginc.com:7100",
                                "status": "ok"
                            }
                        ],
                        "status": "ok"
                    }
                ],
                "status": "ok"
            }
        ],
        "nodes": [
            {
                "location": "hedvig1.hedviginc.com:7000",
                "nodeType": "pages",
                "status": "up",
                "storageId": "05d59ba1d73781e11968c39196c0eece"
            },
```

```
{
    "location": "hedvig2.hedviginc.com:7000",
    "nodeType": "pages",
    "status": "up",
    "storageId": "f69481477d4b4e12a89cee61b8765bdb"
},
{
    "location": "hedvig3.hedviginc.com:7000",
    "nodeType": "pages",
    "status": "up",
    "storageId": "a417d18d04d8a4fa1da56face103595d"
},
{
    "capacity": {
        "percentageUsed": 0.0015251709846779704,
        "total": {
            "units": "TB",
            "value": 10.9
        },
        "used": {
            "units": "GB",
            "value": 17
        }
    },
    "containers": 4,
    "isStoragePoolDisabled": false,
    "location": "hedvig3.hedviginc.com:7010",
    "nodeType": "data",
    "status": "ok",
    "storageId": "419d25e683f817f54ac68f335ae43d25",
    "storagePoolIds": [
        "419d25e683f817f54ac68f335ae43d25$1",
        "419d25e683f817f54ac68f335ae43d25$2"
    ]
},
{
    "capacity": {
        "percentageUsed": 0.0015251962468028069,
        "total": {
            "units": "TB",
            "value": 10.9
        },
        "used": {
            "units": "GB",
            "value": 17
        }
    },
    "containers": 4,
    "isStoragePoolDisabled": false,
    "location": "hedvig1.hedviginc.com:7010",
    "nodeType": "data",
    "status": "ok",
    "storageId": "29406487935cb521119847e1cd5197f7",
    "storagePoolIds": [
```

```
                    "29406487935cb521119847e1cd5197f7$1",
                    "29406487935cb521119847e1cd5197f7$2"
                ]
            },

            {
                "capacity": {
                    "percentageUsed": 0.0015252942685037851,
                    "total": {
                        "units": "TB",
                        "value": 10.9
                    },
                    "used": {
                        "units": "GB",
                        "value": 17
                    }
                },
                "containers": 4,
                "isStoragePoolDisabled": false,
                "location": "hedvig2.hedviginc.com:7010",
                "nodeType": "data",
                "status": "ok",
                "storageId": "4631fab070c991f4d3a0179f6cced54d",
                "storagePoolIds": [
                    "4631fab070c991f4d3a0179f6cced54d$1",
                    "4631fab070c991f4d3a0179f6cced54d$2"
                ]
            },
            {
                "location": "hedvigvip1.hedviginc.com",
                "nodeType": "EdgeNode",
                "protocol": "block"
            },
            {
                "location": "hedvigvip1.hedviginc.com",
                "nodeType": "EdgeNode",
                "protocol": "nfs"
            }
        ]
    },
    "status": "ok",
    "type": "ClusterInformation"
}
```

Viewing storage cluster node information [NodeInformation]

To view information about a specified Hedvig Storage Cluster Node.

Parameters

storageId	Storage ID for specified storage cluster node **example:** storageId:'0bec7e13e3ef80ec4ba44d3cc8307ff9'
location	FQDN of storage cluster node with port number **example:** location:'hedvig1.hedviginc.com:7010'

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:NodeInformation, category:ClusterWatch,
   params:{storageId:'0bec7e13e3ef80ec4ba44d3cc8307ff9',
   location:'hedvig1.hedviginc.com:7000'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "NodeInformation",
   category:  "ClusterWatch",
   params:    {
                storageId:"0bec7e13e3ef80ec4ba44d3cc8307ff9",
                location:"hedvig1.hedviginc.com:7000"
              },
sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "6B1074AE-A0AE-E597-0803-0D864009FA3F",
    "result": {
        "capacity": {
            "percentageUsed": 0.0031454707495868206,
            "total": {
                "units": "GB",
                "value": 30
            },
            "used": {
                "units": "MB",
                "value": 96.5
            }
        },
```

```
        "containerCount": 0,
        "icingaId": "hedvig1.hedviginc.com",
        "location": "hedvig1.hedviginc.com:7000",
        "status": "ok",
        "storageId": "91e0db82129d2be9bb473756ab96eaf5",
        "storagePoolIds": "91e0db82129d2be9bb473756ab96eaf5$1",
        "storagePoolInformation": [
            {
                "capacity": {
                    "percentageUsed": 0.00314547061920166,
                    "total": {
                        "units": "GB",
                        "value": 30
                    },
                    "used": {
                        "units": "MB",
                        "value": 96.5
                    }
                },
                "containers": [],
                "disks": [
                    {
                        "name": "/hedvig/d4",
                        "status": "ok",
                        "type": "HDD"
                    },
                    {
                        "name": "/hedvig/d3",
                        "status": "ok",
                        "type": "HDD"
                    },
                    {
                        "name": "/hedvig/d5",
                        "status": "ok",
                        "type": "HDD"
                    }
                ],
                "id": "91e0db82129d2be9bb473756ab96eaf5$1",
                "isStoragePoolDisabled": false
            }
        ]
    },
    "status": "ok",
    "type": "NodeInformation"
```

Showing NFS export and/or LUN information for a host [ShowTarget]

To show NFS export, LUN information, or both, for a specified host.

Parameters

host	FQDN of the virtual disk host **example:** host:'hedvigvip1.hedviginc.com'
protocols	protocol to inspect **values:** nfs | block | both

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ShowTarget, category:ClusterWatch,
   params:{host:'hedvigvip1.hedviginc.com', protocols:'both'},
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:       "ShowTarget",
   category:   "ClusterWatch",
   params:     {
                   host: "hedvigvip1.hedviginc.com",
                   protocols: "both"
               },
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response


```
{
    "requestId": "1E1F20BF-223F-865E-C9BC-88C73BD52F21",
    "result": {
        "Export Information": [
            "/exports/dockertest",
            "/exports/HedvigNFSvdisk01"
        ],
        "Lun Information": [
          {
             "ACL Information": "172.22.19.76",
             "Account Information": "",
             "Backing Store Path": "HedvigVdisk01",
             "Backing Store Type": "hedvig",
             "Driver": "iscsi",
             "Lun Id": "HedvigVdisk01",
             "Online": "Yes",
             "SCSI ID": "Hedvig 3",
             "SCSI SN": "3",
             "Size": " 536871 MB, Block size: 4096",
             "State": "ready",
             "Target":"iqn.2012-05.com.hedvig:storage.hvip1.hedviginc.com-1",
             "Type": "disk",
             "index": 34
          },
          {
             "ACL Information": "172.22.19.79",
             "Account Information": "",
             "Backing Store Path": "HedvigVdisk02",
             "Backing Store Type": "hedvig",
             "Driver": "iscsi",
             "Lun Id": "HedvigVdisk02",
             "Online": "Yes",
             "SCSI ID": "Hedvig 4",
             "SCSI SN": "4",
             "Size": " 214748 MB, Block size: 4096",
             "State": "ready",
             "Target":"iqn.2012-05.com.hedvig:storage.hvip1.hedviginc.com-2",
             "Type": "disk",
             "index": 2
          },
          {
             "ACL Information": "172.22.19.76",
             "Account Information": "",
             "Backing Store Path": "HedvigVdisk03",
             "Backing Store Type": "hedvig",
             "Driver": "iscsi",
             "Lun Id": "HedvigVdisk03",
             "Online": "Yes",
             "SCSI ID": "Hedvig 5",
             "SCSI SN": "5",
             "Size": " 536871 MB, Block size: 4096",
             "State": "ready",
```

```
            "Target":"iqn.2012-05.com.hedvig:storage.hvip1.hedviginc.com-3",
            "Type": "disk",
            "index": 3
        },
        {
            "ACL Information": "172.22.28.3",
            "Account Information": "",
            "Backing Store Path": "HedvigVdisk04",
            "Backing Store Type": "hedvig",
            "Driver": "iscsi",
            "Lun Id": "HedvigVdisk04",
            "Online": "Yes",
            "SCSI ID": "Hedvig 6",
            "SCSI SN": "6",
            "Size": " 10737 MB, Block size: 4096",
            "State": "ready",
            "Target":"iqn.2012-05.com.hedvig:storage.hvip1.hedviginc.com-4",
            "Type": "disk",
            "index": 4
        }
      ],
      "initiator": [
          {
              "ip": "172.22.19.76",
              "name": "Initiator: iqn.1994-05.com.:701c1d8:hedviginc.com"
          },
          {
              "ip": "172.22.19.79",
              "name": "Initiator: iqn.1994-05.com.:hedviginc.com"
          }
      ]
  },
  "status": "ok",
  "type": "ShowTarget"
}
```

Listing all hosts and protocols [ListTargets]

To list all of the hosts, along with their protocols, in a Hedvig Storage Cluster.

Parameters

none

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ListTargets, category:VirtualDiskManagement,
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ListTargets",
   category:  "VirtualDiskManagement",
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "EF2829F9-7C46-0671-77DA-51E05F991C32",
    "result": [
        {
            "protocol": "block",
            "target": "hedvigvip1.hedviginc.com"
        },
        {
            "protocol": "block",
            "target": "hedvigvip2.hedviginc.com"
        },
        {
            "protocol": "block",
            "target": "hedvigvip3.hedviginc.com"
        },
        {
            "protocol": "nfs",
            "target": "hedvigvip1.hedviginc.com"
        },
        {
            "protocol": "nfs",
            "target": "hedvigvip4.hedviginc.com"
        },
    ],
    "status": "ok",
    "type": "ListTargets"
}
```

Listing all data centers [ListDataCenters]

To list all data centers in a Hedvig Storage Cluster. This is useful when creating virtual disks with a data center aware replication policy.

Parameters

none

Example cURL command request

```
curl -G hedvig1.hedviginc.com/rest/ --data-urlencode
   "request={type:ListDataCenters, category:VirtualDiskManagement,
   sessionId:'d93ca275a6eedd1e9ec10696e923aded'}" | python -m json.tool
```

formatted value of cURL command request

```
{
   type:      "ListDataCenters",
   category:  "VirtualDiskManagement",
   sessionId: "d93ca275a6eedd1e9ec10696e923aded"
}
```

Example response

```
{
    "requestId": "58DF7B3A-74E0-737D-8A71-5BB803249F3D",
    "result": [
        {
            "dcname": "snc1"
        },
        {
            "dcname": "snc2"
        },
        {
            "dcname": "snc3"
        }
    ],
    "status": "ok",
    "type": "ListDataCenters"
}
```

Glossary

This glossary contains definitions of terms used in this document. See also the Hedvig Storage Glossary.

Table 1: 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.*
API	An *application programming interface* is a set of routines, protocols, and tools for building software and applications.
child virtual disk	A *child virtual disk,* also known as a *redo log* or a *delta link,* provides an ongoing way to save changes to a specific virtual disk, without actually altering this virtual disk, which is then known as the *parent virtual disk*. See also *parent virtual disk.*
controller, CVM	See *Hedvig Storage Proxy.*
CSV	*Cluster Shared Volumes* is a feature of *failover clustering* (or *HA* clustering) first introduced in Windows Server 2008 R2 for use with the Hyper-V role. A CSV is a shared disk containing an NTFS or ReFS (ReFS: Windows Server 2012 R2 only) volume that is made accessible for read and write operations by all nodes within a Windows Server *failover cluster.*
FQDN	A *fully qualified domain name*, also referred to as an *absolute domain name*, is a domain name that specifies its exact location in the tree hierarchy of the DNS, that is, `hostname.domain.com` or `host.rack.dc.domain.com.`
HDD	A *hard disk drive* is the traditional spinning hard drive, which provides basic nonvolatile storage on a computer.
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.

term	definition
Hedvig Storage Pool	A *Hedvig Storage Pool* is a logical grouping of multiple physical disks that are presented as a single entity.
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.*
IOPS	*Input/output operations per second* is a common performance measurement used to benchmark computer storage devices.
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.
NFS	A *network file system* is a distributed file system protocol that allows a user on a client computer to access files over a computer network much like local storage is accessed.
parent virtual disk	A *parent virtual disk* is a virtual disk for which at least one *child virtual disk* has been made. See also *child virtual disk.*
RDM	*Raw device mapping* enables a storage LUN to be directly connected to a VM from the SAN.
REST	*Representational state transfer* is the software architectural style of the World Wide Web.
SCSI	*Small computer system Interface* is a set of standards for physically connecting and transferring data between computers and peripheral devices.
SCSI reservations	*SCSI reservations* are used to control access to a shared SCSI device such as a disk or tape drive. An initiator sets a reservation on a LUN to prevent another initiator from making changes to the LUN. This is similar to the file-locking concept. SCSI reservations are always set by a host initiator. Ideally, the same initiator would perform a SCSI release on the affected LUN. See also *SCSI-3 PR.*

term	definition
SCSI-3 PR	*SCSI-3 Persistent Reservations* add the ability for a SCSI reservation to persist even if the bus is reset for error recovery. See also *SCSI reservations.*
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.
VM	A *virtual machine* is a software computer that, like a physical computer, runs an operating system and applications.

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