EMC²

EMC® XtremIO Storage Array

Versions 3.0.1, 3.0.2, 3.0.3 and 3.0.5

RESTful API Guide

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This document provides information on using the RESTful API with the XtremIO Storage Array.

Introduction

XtremIO Product Description

XtremIO is an all-flash storage array that has been designed from the ground-up to unlock flash's full performance potential and deliver array-based capabilities that leverage the unique characteristics of SSDs, based on flash media.

XtremIO uses industry standard components and proprietary intelligent software to deliver unparalleled levels of performance. Achievable performance ranges from hundreds of thousands to millions of IOPS, and consistent low latency of under one millisecond.*

The system is also designed to provide minimal planning, with a user-friendly interface that makes provisioning and managing the array very easy.

XtremIO leverages flash to deliver value across the following main dimensions:

- **Performance –** Regardless of how busy the cluster is, and regardless of storage capacity utilization, latency and throughput remain consistently predictable and constant. Latency within the array for an I/O request is typically far less than one millisecond.*
- **Scalability –** The XtremIO storage system is based on a scale-out architecture. The system begins with a single building block, called an X-Brick. When additional performance and capacity are required, the system scales out by adding X-Bricks. Performance scales linearly, ensuring that two X-Bricks supply twice the IOPS and four X-Bricks supply four times the IOPS.

* As measured for small block sizes. Large block I/O by nature incurs higher latency on any storage system.

- **Efficiency –** The core engine implements content-based Inline Data Reduction. The XtremIO Storage Array automatically reduces (deduplicates and compresses) data on the fly, as it enters the system. This reduces the amount of data written to flash, improving longevity of the media and driving down cost. XtremIO arrays allocate capacity to volumes on-demand in granular data blocks. Volumes are always thin-provisioned without any loss of performance, over-provisioning of capacity, or fragmentation. Once content-based inline deduplication is implemented, the remaining data is compressed even further, reducing the amount of writes to the flash media. The data compression is carried out inline on the deduplicated (unique) data blocks.

  Benefits gained from avoiding a large percentage of writes include:

  - Better performance due to reduced data
  - Increased overall endurance of the flash array's SSDs
  - Less required physical capacity to store the data, increasing the storage array's efficiency and dramatically reducing the $/GB cost of storage
- **Data Protection –** XtremIO leverages a proprietary flash-optimized data protection algorithm (XtremIO Data Protection or XDP), which provides performance that is superior to any existing RAID algorithm. Optimizations in XDP also result in fewer writes to flash media for data protection purposes.
- **Functionality –** XtremIO supports high performance and space-efficient snapshots, Inline Data Reduction (including inline deduplication and data compression), thin provisioning, and full VMware VAAI integration, as well as support for Fibre Channel and iSCSI protocols.

About this Guide

Scope

This guide contains a list of all RESTful commands that you can use to manage and monitor the XtremIO Storage Array. The guide is intended for authorized users of the XtremIO Storage Array.

This guide also includes detailed descriptions of all supported fields.

Related Documents

Refer to the following documents for additional information:

- XtremIO Storage Array User Guide
- XtremIO Storage Array Operations Guide
- XtremIO Storage Array Release Notes
- XtremIO Storage Array Security Configuration Guide

RESTful API

The XtremIO's RESTful API allows an HTTP-based interface for automation, orchestration, query and provisioning of the cluster. With the API, third party applications can be used to control and fully administer the array. Therefore, it allows flexible management solutions to be developed for the XtremIO array.

The RESTful API uses the following four HTTP commands to create, update, delete and retrieve configuration.

Command	Effect	Similar to
HTTP GET	Retrieves and lists existing configuration of an object or multiple objects.	XtremIO Management Server CLI 'show' commands
HTTP POST	Creates a new configuration for an object.	XtremIO Management Server CLI 'add' commands
HTTP PUT	Updates the existing configuration for an object.	XtremIO Management Server CLI 'modify' commands
HTTP DELETE	Deletes the existing configuration of an object.	XtremIO Management Server CLI 'remove' commands

JSON Format

The XtremIO's RESTful API uses JSON (JavaScript Object Notation), which is a lightweight data-interchange format.

With JSON, body parameters are formatted as follows:

```
{"parameter1":"value1", "parameter2":"value2",
"name_for_integer_value":123}
```

Object Naming Limitations

Volume names and folder names used as parameters in RESTful API commands must comply with the following limitations:

- Length: up to 64 characters
- Valid characters
  - Alphanumeric characters
  - Space character
  - The following characters: ~ ! @ # $ % ^ * _ + { } | : ? . –
- Invalid characters: & / < > ( )

Accessing the RESTful API

Access to the RESTful API is achieved via HTTPS.

XtremIO Management Server (XMS) uses a self-signed certificate. To gain access to the RESTful API securely and receive certificate verification, you are first required to install the root certificate.

Installing the Root Certificate

To install the root certificate:

1. In Microsoft© Internet Explorer©*, enter the XMS IP address supplied by your system administrator to display the XtremIO splash screen, as shown in Figure 1.

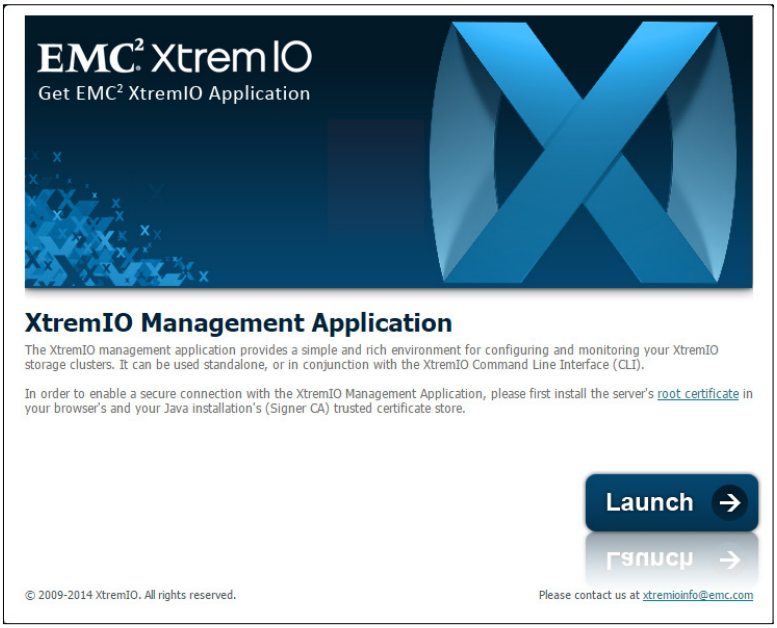

Figure 1: XtremIO Splash Screen

2. Click the **root certificate** hyperlink.
3. When prompted, click **Save** and select the **Save as** option.
4. Browse to the cURL† directory and click **Save**.

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* Microsoft and Windows Explorer are trademarks or registered trademarks of Microsoft Corporation.

† cURL version required: 7.30.0 or greater. When using a scripting tool other than cURL, save the root certificate to the respective scripting tool directory.

5. Launch the cURL command as follows:

```
.\curl.exe -3 --cacert xms_root_ca.cer
https://<USERNAME>:<PASSWORD>@<XMS>/api/json/types
```

Note:

The host CN in the key is the *easy install* cluster name, whereas most of the time it serves as the short name.

A browser 'refresh' error may be experienced when using self-signed certificates. To remedy this error should it occur, re-enter the URL in the browser's address field and press ENTER. Installing a trusted certificate prevents a refresh error.

User Roles

XtremIO Storage Array user accounts are defined for each user's authorized capabilities and roles, which are built into the cluster with predefined authorization capabilities, and cannot be removed, renamed or modified. Each user is issued a User ID (i.e. the user account name) and password.

Three levels of users' roles are supported, as shown in the following table:

Role	RESTful API Capability
Admin	All commands
Configuration	All storage array configuration commands. Cannot manage users or set notification configurations.
Read-Only	HTTP GET commands only

Backward Compatibility

Compatibility Policy

RESTful API resources and any related representations are maintained in a backward compatible manner wherever possible. However, EMC XtremIO may modify the attributes and resources available to the API as well as the company's policies relating to access and use of the API, periodically and without advance notice.

Changes in Versions 3.0 and 3.0.1 Affecting Compatability

- In version **2.4.1**, values of the "Creating Snapshots of a Set of Volumes" command are required to include the prefix \" and the suffix \". This is not required from **Version 3.0** (and later versions).
- In version **2.4**, the deduplication ratio is calculated as "deduplication data in use divided by logical space in use". In version **3.0**, the deduplication ratio is calculated as "logical space in use divided by deduplication data in use" (inverse of that in version **2.4**). In Version **3.0**, the deduplication ratio reports the same number as that reported in the deduplication-ratio text field.

- In version **3.0**, the following object parameters are not in use and have been deprecated:
  - Cluster object:
    - max-snapshots-per-volume
    - meta-data-utilization-level
    - meta-data-utilization
    - vamd-memory
    - vamd-memory-in-use
    - max-cgs-per-volume
    - max-cgs
    - num-of-r-mdls
    - max-snapsets-per-cg
    - max-vol-per-cg
    - num-of-d-mdls
    - min-num-of-ssds-per-healthy-rg
    - num-of-c-mdls
  - Storage Controller object:
    - eth-link-health-level
- In version **3.0.1**, the following object parameters are not in use and have been deprecated:
  - Storage Controller object:
    - hw-revision

Object Naming Change

The following change has been implemented:

- XEnv resource names have changed from X1-SC1-RC and X1-SC1-D to X1-SC1-E1 and X1-SC1-E2.

For the complete list of changes made from the previous versions of EMC XtremIO RESTful API to the current version, refer to RESTful API Changes from Previous Versions, on page 199.

Basic Cluster Management Flow

Basic cluster management involves assigning initiators with access to the cluster's volumes by LUN mapping.

To create a LUN mapping:

1. Add volumes to the cluster (see Adding a New Volume, on page 98).
2. Create an Initiator Group (see Adding an Initiator Group, on page 146).
3. Add initiators to the Initiator Group (see Adding an Initiator, on page 135).
4. Assign volumes to the initiators (see Viewing the Details of a LUN Mapping, on page 184).

Postman REST HTTP Client Ver. 2

To run commands via Google Chrome© Postman©* extension tool:

1. Open Postman.
2. In the **Basic Auth** tab, enter the username (admin, tech, etc.) and your XtremIO password in the respective fields, as shown in Figure 2.
3. Click **Refresh headers**.

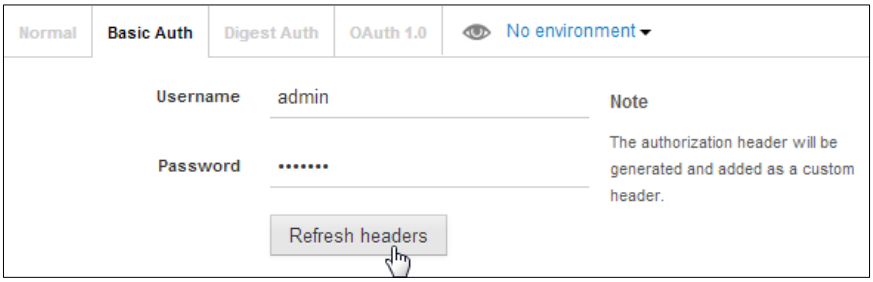

Figure 2: Basic Auth Tab

4. Click the **Normal** tab.
5. Enter the following uniform resource locator text to the first line:

```
https://vxms-xbrick267/api/json/types/
```

- **GET commands:**
  a. Enter the command directly after the uniform resource locator text (entered in Step 5) without a space, followed by parameter(s) and value(s) as necessary, as shown in Figure 3.

Figure 3: JSON Body Parameter Formatting

* Google Chrome and Postman are trademarks or registered trademarks of Google.

b. From the drop-down menu located to the right of the text entered, select **GET,** as shown in Figure 4.

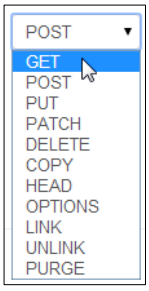

Figure 4: Drop-Down Menu

c. Click **Send**.

d. Click **Preview** (located adjacent to the **Send** button); the response appears, as shown in this guide, in the top-left of the screen.

- **POST commands:**

a. Enter the command directly after the uniform resource locator text (entered in Step 5) without a space.

b. Select **POST** from the drop-down menu shown in Figure 4.

c. On the ribbon located below the command, click the **raw** button, as shown in Figure 5.

Figure 5: raw Button

d. Using JSON body parameter formatting, enter the parameter(s) and value(s) as necessary, to the **raw** field, as shown in Figure 6.

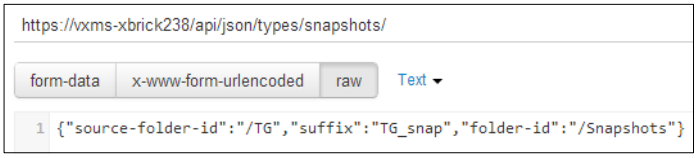

Figure 6: Parameters with Values

e. Click **Send**.

f. Click **Preview (**located adjacent to the **Send** button); the response appears, as shown in this guide, in the top-left of the screen.

- **PUT commands:**

a. Enter the command directly after the uniform resource locator text (entered in Step 5) without a space, followed by an identifier parameter value.

b. Select **PUT** from the drop-down menu, as shown in Figure 4.

c. On the ribbon located below the command, click the **raw** button, as shown in Figure 5.

d. Using JSON body parameter formatting, enter the parameter(s) and value(s) as necessary, to the **raw** field, as shown in Figure 6.

e. Click **Send**; the response appears above the **Preview** button adjacent to the status indicator, as shown in Figure 7.

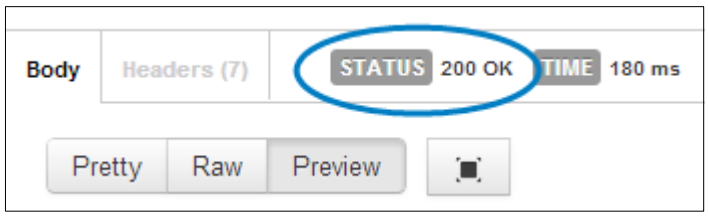

Figure 7: Status Indicator

- **DELETE commands:**

  a. Enter the command directly after the text entered in Step 5 without a space followed by parameter(s) and value(s) as necessary, shown in Figure 3, above.

  b. Select **DELETE** from the drop-down menu, as shown in Figure 4.

  c. Click **Send**; the response appears above the **Preview** button adjacent to the status indicator, as shown in Figure 7.

RESTful API Commands Quick Finder

Command	Description	Page
DELETE /api/json/types/ig-folders/<parameter (ig-folder-id or ?name=ig-folder-name)>	Removes an Initiator Group folder	158
DELETE /api/json/types/initiator-groups/<parameter (ini-grp-id or ?name=ini-grp-name)>	Removes an Initiator Group and its associated initiators	148
DELETE /api/json/types/initiators/<parameter (initiator-id or ?name=initiator-grp-name)>	Removes an initiator	139
DELETE /api/json/types/iscsi-portals/<parameter (iscsi-portal-id or ?name=iscsi-portal-name)>	Removes a portal mapping from a target	181
DELETE /api/json/types/iscsi-routes/<parameter (route-id or ?name=route-name)>	Removes an iSCSI route	182
DELETE /api/json/types/lun-maps/<parameter (lun-maps-id or ?name=lun-maps-name)>	Removes a volume's LUN mapping	187
DELETE /api/json/types/volume-folders/<parameter (folder-id or ?name=folder-name)>	Removes a volume folder	112
DELETE /api/json/types/volumes/<parameter (vol-id or ?name=vol-name)>	Removes a volume	100
DELETE /api/json/types/volumes/<parameter (vol-id or ?name=vol-name)>	Removes a snapshot	126
GET /api/json/types	Displays the list of all supported objects	23
GET /api/json/types/bricks	Displays the list of all X-Bricks	50
GET /api/json/types/bricks/<parameter (brick-id or ?name=brick-name)>	Displays details of the selected X-Brick	51

Command	Description	Page
GET /api/json/types/clusters	Displays information of the cluster being managed	26
GET /api/json/types/clusters/<parameter (sys-id or ?name=sys-name)>	Displays the cluster information	27
GET /api/json/types/data-protection-groups	Lists the XtremIO Data Protection Groups (XDPGs)	83
GET /api/json/types/data-protection-groups/<parameter (dpg-id or ?name=dpg-name)>	Displays an XDPG's details	84
GET /api/json/types/events	Displays the list of all events	197
GET /api/json/types/ig-folders	Displays the list of Initiator Group folders	149
GET /api/json/types/ig-folders/<parameter (folder-ig-id or ?name=folder-ig-name)>	Displays details of Initiator Group folders	150
GET /api/json/types/initiator-groups	Displays the list of all Initiator Groups	140
GET /api/json/types/initiator-groups/<parameter (ini-grp-id or ?name=ini-grp-name)>	Displays the name and index number of the selected Initiator Group	141
GET /api/json/types/initiators	Displays the list of all initiators and their defined properties	127
GET /api/json/types/initiators/<parameter (initiator-id or ?name=initiator-name)>	Displays details of the selected initiator	128
GET /api/json/types/iscsi-portals	Displays the list of all iSCSI portals and their properties	172
GET /api/json/types/iscsi-portals/<parameter (iscsi-portal-id or ?name=iscsi-name)>	Displays a specific iSCSI portal and its properties	176
GET /api/json/types/iscsi-routes	Displays the list of all iSCSI routes and their properties	173
GET /api/json/types/iscsi-routes/<parameter (route-id or ?name=route-name)>	Displays a specific iSCSI route and its properties	174

Command	Description	Page
GET /api/json/types/lun-maps	Displays a list of all LUN mappings between volumes and Initiator Groups	183
GET /api/json/types/lun-maps/<parameter (lun-maps id or ?name=lun-maps-name)>	Displays a LUN mapping's details	184
GET /api/json/types/snapshots	Displays the list of snapshots	113
GET /api/json/types/snapshots/<parameter (snapshot-id or ?name=snapshot-name)>	Displays a snapshot's details	116
GET /api/json/types/ssds	Displays the list of SSDs	188
GET /api/json/types/ssds/<parameter (ssd-id or ?name=ssd-name)>	Displays the details of an SSD	191
GET /api/json/types/storage-controllers	Displays the list of Storage Controllers	68
GET /api/json/types/storage-controllers/<parameter (storage-controllers-id or ?name= storage-controllers-name)>	Displays details of the selected Storage Controller	69
GET /api/json/types/target-groups	Displays the list of all Target Groups	169
GET /api/json/types/target-groups/<parameter (tg-id or ?name=tg-name)>	Displays details of the selected Target Group	170
GET /api/json/types/targets	Displays the list of all targets and their properties	159
GET /api/json/types/targets/<parameter (target-id or ?name=target-name)>	Displays details of the selected target	161
GET /api/json/types/volume-folders	Displays the list of volume folders	102
GET /api/json/types/volume-folders/<parameter (vol-id or ?name=vol-name)>	Displays folder details	104

Command	Description	Page
GET /api/json/types/volumes	Displays the list of all volumes and their defined properties	89
GET /api/json/types/volumes/<parameter (vol-id or ?name=vol-name)>	Displays details of the selected volume	91
GET /api/json/types/xenvs	Displays the list of Storage Controller XEnvs	63
GET /api/json/types/xenvs/<parameter (xenvs-id or ?name=xenvs-name)>	Displays details of the selected Storage Controller XEnv	65
POST /api/json/types/ig-folders	Creates an Initiator Group folder	156
POST /api/json/types/initiator-groups	Adds an Initiator Group and its initiators to the XtremIO cluster	146
POST /api/json/types/initiators	Adds a new initiator and associates it with an existing Initiator Group	135
POST /api/json/types/iscsi-portals	Maps a portal to a target	180
POST /api/json/types/iscsi-routes	Creates an iSCSI route	179
POST /api/json/types/lun-maps	Creates LUN mapping between volumes and Initiator Groups	186
POST /api/json/types/snapshots	Creates a snapshot of a single volume	123
POST /api/json/types/snapshots	Creates snapshots from a folder	124
POST /api/json/types/snapshots	Creates snapshots on a set of volumes	125
POST /api/json/types/volume-folders	Creates a volume folder.	110
POST /api/json/types/volumes	Creates a new volume	98
PUT /api/json/types/ig-folders/<parameter (parent-folder-id or ?name=folder-name)>	Renames an Initiator Group folder	157
PUT /api/json/types/initiator-groups/<parameter (ini-grp-index or ?name=ini-grp- name)>	Renames an Initiator Group	147

Command	Description	Page
PUT /api/json/types/initiators/<parameter (initiator-id or ?name=initiator-name)>	Modifies an initiator	137
PUT /api/json/types/volume-folders/<parameter (parent-folder-id or ?name=folder-name)>	Renames a volume folder	111
PUT /api/json/types/volumes/<parameter (vol-id or ?name=vol-name)>	Modifies a volume	101

Note:

Throughout this document, the "GET" command responses are presented according to their order of appearance in the actual responses. The only exceptions are the "name" and "index" commands, which (when relevant) are located at the top of the list, respectively.

Viewing the Supported Objects

GET /api/json/types

This command (GET /api/json/types) displays the list of all supported objects.

Example request

```
GET /api/json/types HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "children": [
        {
            "href": "https://vxms-xbrick267/api/json/types/target-
groups",
            "name": "target-groups"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/lun-maps",
            "name": "lun-maps"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/storage-
controllers",
            "name": "storage-controllers"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ig-
folders",
            "name": "ig-folders"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/bricks",
            "name": "bricks"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders",
            "name": "volume-folders"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/snapshots",
            "name": "snapshots"
```

```
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/iscsi-
portals",
            "name": "iscsi-portals"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/xenvs",
            "name": "xenvs"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/iscsi-
routes",
            "name": "iscsi-routes"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/events",
            "name": "events"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/initiator-
groups",
            "name": "initiator-groups"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/volumes",
            "name": "volumes"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/clusters",
            "name": "clusters"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/initiators",
            "name": "initiators"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds",
            "name": "ssds"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/data-
protection-groups",
            "name": "data-protection-groups"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/targets",
            "name": "targets"
        }
```

```
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/",
            "rel": "self"
        }
    ]
}
```

Clusters

Viewing the Details of the Managed Cluster

GET /api/json/types/clusters

This command (GET /api/json/types/clusters) displays the information for the cluster currently being managed.

Example request

```
GET /api/json/types/clusters HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "clusters": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/clusters/1",
            "name": "vxms-xbrick267"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/clusters/",
            "rel": "self"
        }
    ]
}
```

Viewing the Cluster Information

GET /api/json/types/clusters/<parameter (sys-id or ?name=sys-name)>

This command (GET /api/json/types/clusters/<parameter [sys-id or ?name=sys-name]>) displays the cluster information.

Input Parameter	Description	Mandatory
• sys-id OR • sys-name	Cluster's name or index number	Yes

Output Parameter	Counter Definition	Description
name	Name	Cluster's name
index	ID	Cluster's index ID as defined by XMS upon its creation; a unique positive number
compression-factor-text	Compression factor text	Cluster-wide compression factor reflecting the overall space saving effects of compression represented by a ratio of X:1. Presented with 1 decimal digit, append ':1' to the value. e.g.: Value of 4.2 shows 4.2:1
wr-bw-64kb	Write bandwidth 64KB	Write bandwidth for 64KB block size
rd-iops-64kb	Read input/output per second 64KB	Current input/output per second for 64KB block size handled by the cluster that is managed by XMS
obj-severity	Object severity	Cluster's severity based on severity level of current alerts (alerts still uncleared) for that cluster and its contained objects or members
rd-bw	Read bandwidth	Cluster's total realtime read bandwidth in MB per second
num-of-rgs	Number of XDPGs	Cluster's number of Data Protection Groups (XDPGs)

Output Parameter	Counter Definition	Description
wr-iops-16kb	Write input/output per second 16KB	Current input/output per second for 16KB block size handled by all clusters managed by XMS
iops	Input/output per second	Cluster's total read and write realtime input/output operations per second
last-upgrade-attempt-version	Last upgrade attempt version	Software version of the last upgrade attempt
wr-iops-gt1mb	Write input/output per second greater than 1MB	Write input/output per second of the entire cluster, for block sizes greater than 1MB
wr-latency-64kb	Write latency 64KB	Write latency time for 64KB size blocks, in µs
avg-latency-512kb	Average latency 512KB	Average latency time for 512KB blocks, in µs
rd-latency-256kb	Read latency 256KB	Read latency time for 256KB size blocks, in µs
num-of-nodes	Number of cluster's Storage Controllers	Cluster's total number of Storage Controllers
wr-bw-by-block	Write bandwidth by block	Cluster's current bandwidth, used to get a snapshot of the aggregated totals by block size
rd-latency-512b	Read latency 512B	Read latency time for 512B size blocks, in KB per second
rd-iops-1kb	Read input/output per second 1KB	Current input/output per second for 1KB block size handled by clusters that are managed by XMS
iscsi-port-speed	iSCSI Port speed	The negotiated speed of all the iSCSI target ports. The same value should be for all target ports. When inconsistent, an alert is issued.
rd-bw-256kb	Read bandwidth 256KB	Read bandwidth for 256KB size blocks
compression-factor	Compression Factor	Cluster-wide compression factor reflecting the overall space saving effects of compression

Output Parameter	Counter Definition	Description
unaligned-rd-iops	Unaligned read input/output per second	Current IOPS of unaligned input/output operations
num-of-tgs	Number of Target Groups	Cluster's number of Target Groups
wr-bw-2kb	Write bandwidth 2KB	Write bandwidth for 2KB block size
rd-iops-8kb	Read input/output per second 8KB	Current input/output per second for 8KB block size handled by the clusters that are managed by XMS
num-of-vols	Cluster's total provisioned volumes	Cluster's total number of volumes
wr-iops-by-block	Write input/output per second by block	Current input/output per second handled by the cluster. A property used to get a snapshot of the aggregated totals by block size.
avg-latency-1mb	Average latency 1MB	Average latency time for 1MB blocks, in µs
avg-latency-256kb	Average latency 256KB	Average latency time for 256KB blocks, in µs
rd-bw-128kb	Read bandwidth 128KB	Read bandwidth for 128KB size blocks
unaligned-rd-bw	Unaligned read bandwidth	Current bandwidth of unaligned input/output operations
size-and-capacity	Cluster's total physical capacity	Cluster's total physical capacity, displayed: 1 x 10TB (number of X-Bricks multiplied by total physical X-Brick capacity)
wr-iops	Cluster's total realtime write input/output per second	Total write realtime input/output operations per second
sys-start-timestamp	Cluster start uptime	Time stamp of cluster's start, in seconds value since 1.1.1970
wr-bw-gt1mb	Write bandwidth greater than 1MB	Write bandwidth of the entire cluster, for block sizes greater than 1MB

Output Parameter	Counter Definition	Description
num-of-tars	Number of target ports	Cluster's total number of target ports
num-of-ib-switches	Number of InfiniBand Switches	Cluster's total number of InfiniBand Switches
acc-num-of-unaligned-wr	Accumulated number of unaligned writes	Cluster's total number of accumulated unaligned writes
dedup-ratio-text	Deduplication ratio savings	Cluster's total deduplication ratio
rd-bw-512kb	Read bandwidth 512KB	Read latency time for 512KB size blocks, in µs
wr-latency-1mb	Write latency 1MB	Write latency time for 1MB size blocks, in µs
acc-size-of-rd	Total cumulative read size	Accumulative capacity KB size of read operations having occurred during cluster's lifespan
wr-latency-4kb	Write latency 4KB	Write latency time for 4KB size blocks, in µs
dedup-ratio	Deduplication ratio	Cluster's current ratio of deduplication space in use to total logical space in use
rd-latency-1mb	Read latency 1MB	Read latency time for 1MB size blocks, in µs
avg-latency-512b	Average latency 512B	Average latency time for 512B blocks, in µs
sys-sw-version	XIOS version	XIOS envrionment version currently running on the Storage Controllers
rd-latency-16kb	Read latency 16KB	Read latency time for 16KB size blocks, in µs
rd-iops-4kb	Read input/output per second 4KB	Current input/output per second for 4KB block size handled by the clusters that are managed by XMS

Output Parameter	Counter Definition	Description
acc-num-of-wr	Total cumulative write IOs	Accumulative number of write operations having occurred during cluster's lifespan
avg-latency-2kb	Average latency 2KB	Average latency time for 2KB blocks, in µs
wr-bw-128kb	Write bandwidth 128KB	Write bandwidth for 128KB block size
sys-psnt-part-number	Cluster's PSNT Part Number	Cluster's Product Serial Number Tag (PSNT) part number
compression-factor-last-sample	Compression factor last sample	Cluster-wide compression factor that provides the compression saving over the data written to the disk during the last sample (last 5 seconds).
rd-iops-256kb	Read input/output per second 256KB	Current input/output per second for 256KB block size handled by the clusters that are managed by XMS.
rd-latency-gt1mb	Read latency greater than 1MB	Latency read time of the entire cluster, for block sizes greater than 1MB
free-ud-ssd-space-in-percent	Free UD SSD Space	Parameter used to monitor the percentage of the cluster's free UD SSD space.
wr-latency-256kb	Write latency 256KB	Write latency time for 256KB size blocks, in µs
upgrade-failure-reason	Upgrade failure reason	Shows permanent error of last upgrade attempts; empty if previous attempt successful, if no previous upgrade command given, or upgrade currently in process.
unaligned-wr-bw	Unaligned write bandwidth	Current bandwidth of unaligned input/output operations
rg-max-ud-allowed-in-ssd-units	XDPG maximum UD allowed in SSD units	XDPG maximum user data allowed in SSD units
useful-ssd-space-per-ssd	Useful SSD space per SSD	User data space per SSD

Output Parameter	Counter Definition	Description
acc-num-of-small-rd	Accumulated number of small reads	Accumulated number of input/output operations for the cluster
rd-latency-32kb	Read latency 32KB	Read latency time for 32KB size blocks, in µs
num-of-xenvs	Number of XEnvs	Cluster's total number of XEnvs
sys-stop-type	Cluster's stop type	Describes the nature of current or last cluster stop.
stopped-reason	Stopped reason	The reason why `sys_state` is `stopped`
wr-iops-32kb	Write input/output per second 32KB	Current input/output per second for 32KB block size handled by all clusters that are managed by XMS
wr-bw-32kb	Write bandwidth 32KB	Write bandwidth for 32KB block size
xms-id	XMS object ID	Object ID of the XMS
rd-iops-gt1mb	Read input/output per second greater than 1MB	Read time of the entire cluster, for block sizes greater than 1MB
wr-latency-gt1mb	Write latency greater than 1MB	Latency write time of the entire cluster, for block sizes greater than 1MB
small-wr-bw	Small write bandwidth	Cluster's small write bandwidth
num-of-ssds	Number of cluster's SSDs	Cluster's total number of SSDs
mode-switch-status	Mode switch status	Current state of encryption mode being changed

Output Parameter	Counter Definition	Description
sys-health-state	Cluster's health state	sys-health-state is a future output option. Do not use until further notification. **Note**: The correct method for gauging the cluster's health is by monitoring the cluster components' fru-lifecycle-state output parameter value, as follows: • When the fru-lifecycle-state value is healthy, the component's health state equals the value of the obj-severity output parameter. • When fru-lifecycle-state value is not healthy, the component's health state equals the value of the fru-lifecycle-state output parameter.
bw	Bandwidth	Cluster's total realtime read and write bandwidth, in MB per second
avg-latency-64kb	Average latency 64KB	Average latency time for 64KB blocks, in µs
wr-bw-512kb	Write bandwidth 512KB	Write bandwidth for 5122KB block size
avg-latency	Cluster's total realtime latency	Realtime average latency of read and write operations, in µs
rd-iops-128kb	Read input/output per second 128KB	Current input/output per second for 128KB block size handled by the clusters that are managed by XMS
rd-latency-1kb	Read latency 1KB	Read latency time for 1KB size blocks, in µs
unaligned-bw	Unaligned I/O bandwidth	Current IOPS of unaligned input/output operations
ud-ssd-space-in-use	User data SSD space in use	Specifies how much user data SSD space is in use.

Output Parameter	Counter Definition	Description
num-of-jbods	Number of DAEs	Cluster's list of disk array enclosures (DAEs)
wr-bw-1mb	Write bandwidth 1MB	Write bandwidth for 1MB block size
wr-bw-512b	Write bandwidth 512B	Write bandwidth for 512B block size
avg-latency-8kb	Average latency 8KB	Average latency time for 8KB blocks, in µs
wr-iops-128kb	Write input/output per second 128KB	Current input/output per second for 128KB block size handled by all clusters that are managed by XMS
unaligned-wr-iops	Unaligned write input/output per second	Current IOPS of unaligned input/output operations
wr-bw-256kb	Write bandwidth 256KB	Write bandwidth for 256KB block size
data-reduction-ratio-text	Data Reduction ratio text	An X:1 representation of the property (X= data-reduction-ratio)
wr-bw	Write bandwidth	Cluster's total realtime write bandwidth in MB per second
wr-latency-16kb	Write latency 16KB	Write latency time for 16KB size blocks, in µs
rd-bw-1kb	Read bandwidth 1KB	Read bandwidth for 1KB size blocks
rd-iops-32kb	Read input/output per second 32KB	Current input/output per second for 32KB block size handled by the clusters that are managed by XMS
small-iops	Small input/output per second	Current IOPS of small input/output operations
wr-latency	write latency	Cluster's total realtime average latency of write operations, in µs
rd-latency-8kb	Read latency 8KB	Read latency time for 8KB size blocks, in µs

Output Parameter	Counter Definition	Description
wr-bw-16kb	Write bandwidth 16KB	Write bandwidth for 16KB block size
vol-size	Volume size	Total provisioned capacity, volume KB size as exposed to initiators
small-rd-iops	Small read input/output per second	Current IOPS of small input/output operations
rd-bw-by-block	Read bandwidth by block	Current aggregated bandwidth handled by all the clusters
ud-ssd-space	User data SSD space	Total user data space on the SSDs
wr-bw-8kb	Write bandwidth 8KB	Write bandwidth for 8KB block size
wr-iops-512b	Write input/output per second 512B	Current input/output per second for 512B block size handled by all clusters that are managed by XMS
rd-iops-512b	Read input/output per second 512B	Current input/output per second for 512B block size handled by the clusters that are managed by XMS
acc-num-of-small-wr	Accumulated number of small writes	Accumulated number input/output operations contained by this folder
rg-min-ud-guaranteed	XDPG minimum user data guaranteed	XDPG reclaims redundancy and protection if SSDs fail, by rebuilding into the remaining SSDs, providing sufficient free space exists. The `rg-min-ud-guaranteed` parameter is a specified minimum guaranteed user data space. If specified as a greater-than-0 value, and a rebuild violates that minimum, the rebuild is not performed and the XDPG remains in degraded mode. Minimum and maximum values may be specified.

Output Parameter	Counter Definition	Description
acc-num-of-rd	Accumulative number of reads	Cluster's total lifespan cumulative read IOs
data-reduction-ratio	Data Reduction Ratio	Overall space saving resulting from data reduction features (deduplication and compression)
license-id	License ID	Cluster's license ID
vaai-tp-limit-crossing	vStorage APIs for Array Integration (VAAI) thin provisioning limit crossing	Triggers notification to XMS user when Thin Provisioning Limit is crossed.
acc-size-of-wr	Total cumulative write size	Accumulative capacity size (in KB) of write operations having occurred during Storage Controller lifespan
shared-memory-in-use-ratio-level	Shows information on shared memory utilization levels based on shared_memory_in_use_ratio.	Used to monitor the shared memory utilization levels based on `shared_memory_in_use_ratio`
rd-bw-2kb	Read bandwidth 2KB	Read bandwidth for 2KB size blocks
rd-iops-by-block	Read input/output per second by block	Current aggregated input/output per second handled by all clusters that are managed by XMS
rg-max-ud-allowed	XDPG maximum user data allowed	XDPG reclaims redundancy and protection if SSDs fail, by rebuilding into the remaining SSDs, providing sufficient free space exists. The `rg-max-ud-allowed` parameter indicates the user-allocated spare capacity enabling at least 1 (or more) guaranteed rebuilds.

Output Parameter	Counter Definition	Description
chap-authentication-mode	CHAP authentication mode	Describes the CHAP (Challenge-Handshake Authentication Protocol) mode for initiator authentication, applicable for iSCSI only.
bw-by-block	Bandwidth by block	Cluster's current aggregated bandwidth
wr-bw-4kb	Write bandwidth 4KB	Write bandwidth for 4KB block size
chap-discovery-mode	CHAP discovery mode	Describes the CHAP mode for initiator discovery, applicable for iSCSI only.
wr-iops-1mb	Write input/output per second 1MB	Current input/output per second for 1MB block size handled by all clusters that are managed by XMS
wr-latency-2kb	Write latency 2KB	Write latency time for 2KB size blocks, in µs
rd-bw-16kb	Read bandwidth 16KB	Read bandwidth for 16KB size blocks
acc-num-of-unaligned-rd	Accumulated number of unaligned reads	Cluster's accumulated number I/Os since adding the initiator
unequal-raid-groups-level	Unequal XDPGs	Occurs when there are at least two XDPGs with different `ud_ssd_space` values.
unaligned-iops	Unaligned input/output per second	Unaligned input/output operations per second
wr-iops-2kb	Write input/output per second 2KB	Current input/output per second for 2KB block size handled by all clusters that are managed by XMS
sc-fp-temperature-monitor-mode	Storage Controller front panel temperature monitor mode	Used to disable the feature if the front panel sensor is faulty.

Output Parameter	Counter Definition	Description
sys-mgr-conn-state	Cluster’s manager connection state	Current connection status between XMS and the cluster's manager
rd-bw-512b	Read bandwidth 512B	Read bandwidth for 512B size blocks
wr-latency-128kb	Write latency 128KB	Write latency time for 128KB size blocks, in µs
rd-latency-512kb	Read latency 512KB	Read latency time for 512KB size blocks, in µs
rd-bw-64kb	Read bandwidth 64KB	Read bandwidth for 64KB size blocks
sys-id	Cluster’s name or index number	Cluster’s name or index number. May be omitted if only one cluster is defined.
avg-latency-32kb	Average latency 32KB	Average latency time for 32KB blocks, in µs
brick-id	X-Brick's index number	X-Brick's index number
rd-bw-1mb	Read bandwidth 1MB	Read bandwidth for 1MB size blocks
rd-latency-4kb	Read latency 4KB	Read latency time for 4KB size blocks, in µs
avg-latency-4kb	Average latency 4KB	Average latency time for 4KB blocks, in µs
sys-activation-timestamp	Cluster’s activation uptime	Cluster’s activation time stamp as of 1.1.1970, in seconds
wr-latency-512b	Write latency 512B	Write latency time for 512B size blocks, in µs
wr-iops-256kb	Write input/output per second 256KB	Current input/output per second for 256KB block size handled by all clusters that are managed by XMS
brick-list	X-Brick list	Cluster’s number of Storage Controllers
rd-bw-4kb	Read bandwidth 4KB	Read bandwidth for 4KB size blocks

Output Parameter	Counter Definition	Description
rd-latency-64kb	Read latency 64KB	Read latency time for 64KB size blocks, in µs
rd-bw-32kb	Read bandwidth 32KB	Read bandwidth for 32KB size blocks
rd-latency-128kb	Read latency 128KB	Read latency time for 128KB size blocks, in µs
rd-latency-2kb	Read latency 2KB	Read latency time for 2KB size blocks, in µs
fc-port-speed	Fibre Channel port speed	Negotiated speed of all Fibre Channel target ports. The same value should be for all target ports.
space-saving-ratio	Cluster's space saving ratio	`dedup_space_in_use` / `vol_size` Note: • Smaller number is best for compression. • 0/0 = 0 (while cluster is without volumes). • Changes when snapshots are created. For example, if one volume exists with blocks as non-zero and unique and 100 snapshots are created, the parameter changes from 1 to 0.01 (a feature, not a bug). • Counter does not have a snap-group equivalent.
compression-mode	Compression mode	Shows the compression mode (always `enabled`).
rd-iops-16kb	Read input/output per second 16KB	Current input/output per second for 16KB block size handled by the clusters that are managed by XMS

Output Parameter	Counter Definition	Description
upgrade-state	Upgrade state	State of cluster's last upgrade process: • May be old, reporting an upgrade from long time ago. • Some states are transient (will change soon due to the upgrade process progress) and some are persistant (will change only upon new upgrade command).
wr-iops-512kb	Write input/output per second 512KB	Current input/output per second for 512KB block size handled by all clusters that are managed by XMS
avg-latency-128kb	Average latency 128KB	Average latency time for 128KB blocks, in µs
space-in-use	Total used physical capacity	Cluster's total physical capacity used as user data (KB)
wr-latency-8kb	Write latency 8KB	Write latency time for 8KB size blocks, in µs
logical-space-in-use	Cluster's total used logical capacity	Total logical address space written to the cluster before deduplication (KB)
vaai-tp-limit	VAAI TP Limit	The threshold used to trigger the 'VAAI Thin Provisioning Space Threshold Warning' on the SCSI interface for reply or sense for any volume that has `vaai_tp_alerts` enabled. Value is cluster-wide, not per volume, and is modifiable once the cluster is created via the CLI command `modify-cluster-thresholds VAAI-TP-limit=[1-100|no-limit]`.
rd-iops-1mb	Read input/output per second 1Mb	Current input/output per second for 1MB block size handled by the clusters that are managed by XMS

Output Parameter	Counter Definition	Description
wr-bw-1kb	Write bandwidth 1KB	Write bandwidth for 1KB block size
rg-min-ud-guaranteed-in-ssd-units	XDPG minimum user data guaranteed in SSD units	XDPG reclaims redundancy and protection if SSDs fail, by rebuilding into the remaining SSDs, providing sufficient free space exists. If so, the XDPG remains in degraded mode and no rebuild occurs. Spare capacity may be allocated so at least one (or more) rebuilds are guaranteed, achieved by limiting the XDPG's user data space. For convenience, the user defines this in number of SSD units. The cluster reports this value both in SSD units and in KB (XDPG max user data allowed in SSD units and XDPG max user data allowed properties).
ib-switch-list	InfiniBand Switch list	Number of InfiniBand Switches in the cluster and the list of their object IDs
sys-psnt-serial-number	Cluster's PSNT serial number	Cluster's Product Serial Number Tag (PSNT) serial number (=cluster)
wr-iops-1kb	Write input/output per second 1KB	Current input/output per second for 1KB block size handled by all clusters that are managed by XMS
rd-iops-2kb	Read input/output per second 2KB	Current input/output per second for 2KB block size handled by the clusters that are managed by XMS
encryption-mode	Encryption mode	Controls whether encryption (Data at Rest) is performed for all cluster SSDs, DAE SSDs and local disks.
rd-bw-8kb	Read bandwidth 8KB	Read bandwidth for 8KB size blocks

Output Parameter	Counter Definition	Description
avg-latency-gt1mb	Average latency greater than 1MB	Average latency time of the entire cluster, for block sizes greater than 1MB
last-upgrade-attempt-timestamp	Last upgrade attempt timestamp	Timestamp of the last attempted upgrade
thin-provisioning-ratio	Ratio of total provisioned capacity to logical space in use	The ratio of the total provisioned capacity to the logical space in use
sys-mgr-conn-error-reason	Cluster's manager connection error reason	Reason for disconnection from the cluster manager
num-of-upses	Number of cluster's BBUs	Cluster's total number of BBUs (Battery Backup Units)
wr-latency-512kb	Write latency 512KB	Write latency time for 512KB size blocks, in µs
naa-sys-id	NAA cluster ID	A volume's SCSI NAA name consists of three elements: a fixed part, a per-cluster NAA cluster ID, and a per-volume part. This property contains the per-cluster part, including the vendor ID and a part of the vendor-specific information.
wr-iops-4kb	Write input/output per second 4KB	Current input/output per second for 4KB block size handled by all clusters that are managed by XMS
wr-iops-64kb	Write input/output per second 64KB	Current input/output per second for 64KB block size handled by all clusters that are managed by XMS
rd-bw-gt1mb	Read bandwidth greater than 1MB	Read time bandwidth of the entire cluster, for block sizes greater than 1MB

Output Parameter	Counter Definition	Description
encryption-supported	Encryption supported	Capability parameter, reflecting whether Data at Rest encryption is possible for this cluster, indicating whether or not all hardware in the cluster (disks, SSDs, local disks) support encryption
small-rd-bw	Small read bandwidth	Current bandwidth of small input/output operations, addressed at the volume
avg-latency-1kb	Average latency 1KB	Average latency time for 1KB blocks, in µs
rd-iops-512kb	Read input/output per second 512KB	Current input/output per second for 512KB block size handled by the clusters that are managed by XMS
small-wr-iops	Small write input/output per second	Current IOPS of small input/output operations
wr-iops-8kb	Write input/output per second 8KB	Current input/output per second for 8KB block size handled by all clusters that are managed by XMS
dedup-space-in-use	Unique volume blocks	Number of blocks containing data with differing contents multiplied by the value of 4
num-of-bricks	Number of X-Bricks	Cluster's total number of X-Bricks
rd-latency	Read latency	Cluster's total realtime average latency of read operations, in µs
free-ud-ssd-space-level	Free user data SSD space level	Monitors the free user data SSD space utilization levels.
max-num-of-ssds-per-rg	Maximum number of SSDs per XDPG	Maximum number of SSDs a XDPG can contain
wr-latency-32kb	Write latency 32KB	Write latency time for 32KB size blocks, in µs

Output Parameter	Counter Definition	Description
iops-by-block	input/output per second by block	Current aggregated input/output per second handled by all clusters that are managed by XMS
mode-switch-new-mode	Mode switch new mode	Describes the most recent `encryption_mode` applied.
shared-memory-efficiency-level	Measures the amount of imbalance between A2H, H2P pool usage.	Measures the amount of imbalance between A2H and H2P pool usage compared to the allocated memories. Low utilization levels of `a2h_utilization` and `h2p_utilization` indicates that they are inefficient (much of the allocated space is unused). At a high level, a memory recovery procedure should be activated.
sys-state	Cluster's health state	Cluster's state according to XMS
avg-latency-16kb	Average latency 16KB	Average latency time for 16KB blocks, in µs
consistency-state	Consistency state	Indicates detection of data consistency error. Resets to `healthy` once the error is determined as non-exisitant.
wr-latency-1kb	Write latency 1KB	Write latency time for 1KB size blocks, in µs
rd-iops	Read input/output per second	Cluster's total read realtime input/output operations per second
small-bw	Small I/O bandwidth	Current bandwidth of small input/output operations, addressed at the volume

Example request by index

```
GET /api/json/types/clusters/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/clusters/?name=vxms-xbrick267 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "compression-factor-text": "1.7:1",
        "wr-bw-64kb": "0",
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        "obj-severity": "information",
        "rd-bw": "0",
        "num-of-rgs": 1,
        "wr-iops-16kb": "0",
        "iops": "0",
        "last-upgrade-attempt-version": "",
        "wr-iops-gt1mb": "0",
        "wr-latency-64kb": "0",
        "avg-latency-512kb": "0",
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        "sys-start-timestamp": 1409002583,
        "wr-bw-gt1mb": "0",
        "name": "xbrick267",
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        "num-of-ib-switches": 0,
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        "dedup-ratio-text": "1.4:1",
        "rd-bw-512b": "0",
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        "acc-size-of-rd": "38639296",
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        "rd-iops-4kb": "0",
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        "wr-bw-128kb": "0",
        "sys-psnt-part-number": "PSNT Not Set",
        "compression-factor-last-sample": 0,
        "index": 1,
        "rd-iops-256kb": "0",
        "rd-latency-gt1mb": "0",
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        "wr-latency-256kb": "0",
        "upgrade-failure-reason": "",
        "unaligned-wr-bw": "0",
        "rg-max-ud-allowed-in-ssd-units": 20,
        "acc-num-of-small-rd": "0",
        "rd-latency-32kb": "0",
        "num-of-xenvs": 4,
        "sys-stop-type": "none",
        "stopped-reason": "none",
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        "small-wr-bw": "0",
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        "rd-iops-32kb": "0",
        "small-iops": "0",
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        "data-reduction-ratio": 2.413884045937484,
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        "vaai-tp-limit-crossing": "healthy",
        "acc-size-of-wr": "36356352",
        "shared-memory-in-use-ratio-level": "healthy",
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        "rd-iops-by-block": "0",
        "rg-max-ud-allowed": "4294967316",
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        "bw-by-block": "0",
        "wr-bw-4kb": "0",
        "chap-discovery-mode": "disabled",
        "wr-iops-1mb": "0",
        "rd-bw-16kb": "0",
        "acc-num-of-unaligned-rd": "0",
        "unequal-raid-groups-level": "ok",
        "unaligned-iops": "0",
        "wr-iops-2kb": "0",
        "sys-mgr-conn-state": "connected",
```

```
        "rd-bw-512kb": "0",
        "wr-latency-128kb": "0",
        "rd-latency-512kb": "0",
        "rd-bw-64kb": "0",
        "sys-id": [
            "7c10648e403f46458a24d78bdbfbe0f3",
            "xbrick267",
            1
        ],
        "avg-latency-32kb": "0",
        "brick-id": null,
        "rd-bw-1mb": "0",
        "rd-latency-4kb": "0",
        "avg-latency-4kb": "0",
        "sys-activation-timestamp": 1408992658,
        "wr-latency-512b": "0",
        "wr-iops-256kb": "0",
        "brick-list": [
            [
                "a95f8c173fc5452ca353fcc6b5dc5c36",
                "X1",
                1
            ]
        ],
        "rd-bw-4kb": "0",
        "rd-latency-64kb": "0",
        "num-of-jbods": 1,
        "rd-latency-128kb": "0",
        "rd-latency-2kb": "0",
        "fc-port-speed": "8GFC",
        "space-saving-ratio": 0.002806391873437063,
        "compression-mode": "enabled",
        "rd-iops-16kb": "0",
        "sc-fp-temperature-monitor-mode": "disabled",
        "upgrade-state": "no_upgrade_done",
        "wr-iops-512kb": "0",
        "avg-latency-128kb": "0",
        "space-in-use": "12151054",
        "wr-latency-8kb": "0",
        "logical-space-in-use": "29548736",
        "vaai-tp-limit": 0,
        "rd-iops-1mb": "0",
        "wr-bw-1kb": "0",
        "rg-min-ud-guaranteed-in-ssd-units": 20,
        "ib-switch-list": [],
        "sys-psnt-serial-number": "XIOQATEST000267",
        "wr-iops-1kb": "0",
        "rd-iops-2kb": "0",
        "encryption-mode": "disabled",
        "sys-state": "active",
```

```
        "rd-bw-8kb": "0",
        "avg-latency-gt1mb": "0",
        "last-upgrade-attempt-timestamp": "",
        "thin-provisioning-ratio": 0.003942343397519411,
        "sys-mgr-conn-error-reason": "none",
        "num-of-upses": 2,
        "naa-sys-id": "44969408734",
        "wr-iops-4kb": "0",
        "wr-iops-64kb": "0",
        "rd-bw-gt1mb": "0",
        "encryption-supported": true,
        "small-rd-bw": "0",
        "avg-latency-1kb": "0",
        "rd-iops-512kb": "0",
        "small-wr-iops": "0",
        "wr-iops-8kb": "0",
        "dedup-space-in-use": "21034528",
        "num-of-bricks": 1,
        "rd-latency": "0",
        "free-ud-ssd-space-level": "healthy",
        "max-num-of-ssds-per-rg": 27,
        "wr-latency-32kb": "0",
        "iops-by-block": "0",
        "mode-switch-new-mode": "disabled",
        "shared-memory-efficiency-level": "healthy",
        "avg-latency-16kb": "0",
        "consistency-state": "healthy",
        "wr-latency-1kb": "0",
        "rd-iops": "0",
        "small-bw": "0"
    },
    "links": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/clusters/1",
            "rel": "self"
        }
    ]
}
```

X-Bricks

Viewing the X-Bricks

GET /api/json/types/bricks

This command (GET /api/json/types/bricks) displays the list of all X-Bricks.

Example request

```
GET /api/json/types/bricks/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "bricks": [
        {
            "href": "https://vxms-xbrick267/api/json/types/bricks/1",
            "name": "X1"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/bricks/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of an X-Brick

GET /api/json/types/bricks/<parameter (brick-id or ?name=brick-name)>

This command (GET /api/json/types/bricks/<parameter [brick-id or ?name=brick-name]>) displays details of the selected X-Brick.

Input Parameter	Description	Mandatory
• brick-id OR • brick-name	X-Brick's name or index number	Yes

Output Parameter	Counter Definition	Description
node-list	List of Storage Controllers	X-Brick's list of Storage Controllers
num-of-nodes	Total number of Storage Controllers	X-Brick's total number of Storage Controllers
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
brick-guid	X-Brick's globally unique Identifier (GUID)	Hardwired in the physical X-Brick and never changes. Once the Storage Controller is installed by XMS, it is specified and validated to be equal to the hardwired X-Brick GUID. X-Brick GUID and X-Brick object GUID are not necessarily the same. Implementation can assign the X-Brick object a different object GUID than that of the hardwired X-Brick GUID.
sys-id	Cluster's name or index number	Cluster's name or index number. May be omitted if only one cluster is defined.
brick-id	X-Brick's index number	X-Brick's index number

Output Parameter	Counter Definition	Description
obj-severity	Oject severity	X-Brick severity based on severity level of current alerts (alerts still uncleared) for that X-Brick and its contained objects or members.
brick-state	X-Brick's current state	X-Brick's current state
num-of-ssds	Number of SSDs	Cluster's total number of SSDs
jbod-list	Cluster's list of DAEs	DAE's number of controller objects and a list of their object IDs. Should be two Storage Controllers per DAE.
ssd-slot-array	Cluster's slot array information	Data of whether X-Brick's slots are empty, what SSDs are seen, etc. Information is updated both for SSDs with an SSD object and for SSDs without one. Information may be slightly out of date (reflects state of 10-20 seconds earlier).

Example request by index

```
GET /api/json/types/bricks/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/bricks/?name=X1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "node-list": [
            [
                "7627a0af8d6c41acae554090ae049b14",
                "X1-SC1",
                1
            ],
            [
                "8a03781f64564b889e1f7ee834b197fc",
                "X1-SC2",
                2
            ]
        ],
        "num-of-nodes": 2,
        "xms-id": [
            "0c2e6400d23e4b8caec944a8b6382822",
            "xms",
            1
        ],
        "brick-guid": "feb814e3d539485f909bf538135491bc",
        "sys-id": [
            "ec7e3ab932474bc6b3e1fbf6fc7cc26b",
            "xbrick238",
            1
        ],
        "brick-id": [
            "4f25c60e47b54abf8aa011e32ab1fac8",
            "X1",
            1
        ],
        "obj-severity": "information",
        "brick-state": "in_sys",
        "num-of-ssds": 25,
        "jbod-list": [
            [
```

```
                "aebbaf43a332432b835aa4351ed48404",
                "X1-DAE",
                1
            ]
        ],
        "ssd-slot-array": [
            [
                0,
                "resident_ssd",
                "none",
                [
                    "455d2eee2e3f409b8e72fed4abdd85cf",
                    "wwn-0x5000cca013100ee8",
                    1
                ],
                "455d2eee2e3f409b8e72fed4abdd85cf",
                "wwn-0x5000cca013100ee8",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
                "none"
            ],
            [
                1,
                "resident_ssd",
                "none",
                [
                    "f39577ee7cf942d4bf9b3937fdc40a8c",
                    "wwn-0x5000cca0131009a8",
                    2
                ],
                "f39577ee7cf942d4bf9b3937fdc40a8c",
                "wwn-0x5000cca0131009a8",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
                "none"
            ],
            [
                2,
                "resident_ssd",
                "none",
                [
                    "2a16be2b3fcd465c806613620437a7de",
                    "wwn-0x5000cca013118260",
                    3
                ],
                "2a16be2b3fcd465c806613620437a7de",
                "wwn-0x5000cca013118260",
                "HITACHI  HUSML404 CLAR400",
```

```
            "390625000",
            "healthy",
            "none"
        ],
        [
            3,
            "resident_ssd",
            "none",
            [
                "867f487e691a459c9bad016657a2698b",
                "wwn-0x5000cca013118828",
                4
            ],
            "867f487e691a459c9bad016657a2698b",
            "wwn-0x5000cca013118828",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            4,
            "resident_ssd",
            "none",
            [
                "15bcb80eaea54419bc224256d33f2b54",
                "wwn-0x5000cca01311839c",
                5
            ],
            "15bcb80eaea54419bc224256d33f2b54",
            "wwn-0x5000cca01311839c",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            5,
            "resident_ssd",
            "none",
            [
                "b78e7ea00412433c8a0fe15b51d24917",
                "wwn-0x5000cca013118be0",
                6
            ],
            "b78e7ea00412433c8a0fe15b51d24917",
            "wwn-0x5000cca013118be0",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
```

```
            [
                6,
                "resident_ssd",
                "none",
                [
                    "1a8b939b4e6942b9b4b096108a7f579a",
                    "wwn-0x5000cca013100348",
                    7
                ],
                "1a8b939b4e6942b9b4b096108a7f579a",
                "wwn-0x5000cca013100348",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
                "none"
            ],
            [
                7,
                "resident_ssd",
                "none",
                [
                    "84c8fdb8f4e545ed8b6483cedf39a807",
                    "wwn-0x5000cca013118e64",
                    8
                ],
                "84c8fdb8f4e545ed8b6483cedf39a807",
                "wwn-0x5000cca013118e64",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
                "none"
            ],
            [
                8,
                "resident_ssd",
                "none",
                [
                    "f512fd0bd7d143749adb19a9e7bc8c00",
                    "wwn-0x5000cca013118a9c",
                    9
                ],
                "f512fd0bd7d143749adb19a9e7bc8c00",
                "wwn-0x5000cca013118a9c",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
                "none"
            ],
            [
                9,
```

```
            "resident_ssd",
            "none",
            [
                "9d56f9b8e2a340e495c8ec27408f8062",
                "wwn-0x5000cca0131181cc",
                10
            ],
            "9d56f9b8e2a340e495c8ec27408f8062",
            "wwn-0x5000cca0131181cc",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            10,
            "resident_ssd",
            "none",
            [
                "9bf1201f1b534c8eb60ede67943ed3bb",
                "wwn-0x5000cca013100a70",
                11
            ],
            "9bf1201f1b534c8eb60ede67943ed3bb",
            "wwn-0x5000cca013100a70",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            11,
            "resident_ssd",
            "none",
            [
                "6a9303f730b44f94b5bb9e0335aad3eb",
                "wwn-0x5000cca013118950",
                12
            ],
            "6a9303f730b44f94b5bb9e0335aad3eb",
            "wwn-0x5000cca013118950",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            12,
            "resident_ssd",
            "none",
            [
                "f3bdbdcbb3d149c1991a22f7ce0d090e",
```

```
                "wwn-0x5000cca013118df8",
                13
            ],
            "f3bdbdcbb3d149c1991a22f7ce0d090e",
            "wwn-0x5000cca013118df8",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            13,
            "resident_ssd",
            "none",
            [
                "2feca631b8714290a2758153e8b7d591",
                "wwn-0x5000cca0131016f4",
                14
            ],
            "2feca631b8714290a2758153e8b7d591",
            "wwn-0x5000cca0131016f4",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            14,
            "resident_ssd",
            "none",
            [
                "80e1ca34233c4349ad4157e7f579b6b3",
                "wwn-0x5000cca013100898",
                15
            ],
            "80e1ca34233c4349ad4157e7f579b6b3",
            "wwn-0x5000cca013100898",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            15,
            "resident_ssd",
            "none",
            [
                "97aacf72c135459fa573fa0f6e7be06c",
                "wwn-0x5000cca0131008a4",
                16
```

```
            ],
            "97aacf72c135459fa573fa0f6e7be06c",
            "wwn-0x5000cca0131008a4",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            16,
            "resident_ssd",
            "none",
            [
                "002153b88861458a99b83e0b64f4ab61",
                "wwn-0x5000cca013117ef0",
                17
            ],
            "002153b88861458a99b83e0b64f4ab61",
            "wwn-0x5000cca013117ef0",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            17,
            "resident_ssd",
            "none",
            [
                "1641ce936aa94b15b10d202a37ac56e7",
                "wwn-0x5000cca013118990",
                18
            ],
            "1641ce936aa94b15b10d202a37ac56e7",
            "wwn-0x5000cca013118990",
            "HITACHI  HUSML404 CLAR400",
            "390625000",
            "healthy",
            "none"
        ],
        [
            18,
            "resident_ssd",
            "none",
            [
                "76c70389edbb41519ec4797c7f2033a1",
                "wwn-0x5000cca01311865c",
                19
            ],
            "76c70389edbb41519ec4797c7f2033a1",
            "wwn-0x5000cca01311865c",
            "HITACHI  HUSML404 CLAR400",
```

```
                "390625000",
                "healthy",
                "none"
            ],
            [
                19,
                "resident_ssd",
                "none",
                [
                    "da71f2c00db045d383914aad83e1535c",
                    "wwn-0x5000cca013118e5c",
                    20
                ],
                "da71f2c00db045d383914aad83e1535c",
                "wwn-0x5000cca013118e5c",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
                "none"
            ],
            [
                20,
                "resident_ssd",
                "none",
                [
                    "0d4ddfe89c1948d0a93be0adf42c7a87",
                    "wwn-0x5000cca0131185f8",
                    21
                ],
                "0d4ddfe89c1948d0a93be0adf42c7a87",
                "wwn-0x5000cca0131185f8",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
                "none"
            ],
            [
                21,
                "resident_ssd",
                "none",
                [
                    "527d8fa04e754de685e6e0114dbfbdf1",
                    "wwn-0x5000cca013125bdc",
                    22
                ],
                "527d8fa04e754de685e6e0114dbfbdf1",
                "wwn-0x5000cca013125bdc",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
```

```
                "none"
            ],
            [
                22,
                "resident_ssd",
                "none",
                [
                    "b8916bf9c1c747f79075387c4522b3b7",
                    "wwn-0x5000cca013121770",
                    23
                ],
                "b8916bf9c1c747f79075387c4522b3b7",
                "wwn-0x5000cca013121770",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
                "none"
            ],
            [
                23,
                "resident_ssd",
                "none",
                [
                    "096f07cb8fd748d6ac0d5cfcc7c273b6",
                    "wwn-0x5000cca0131228b4",
                    24
                ],
                "096f07cb8fd748d6ac0d5cfcc7c273b6",
                "wwn-0x5000cca0131228b4",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
                "none"
            ],
            [
                24,
                "resident_ssd",
                "none",
                [
                    "7e9d7d5f30cc44a08c7f0ec5e7efbb96",
                    "wwn-0x5000cca013124b24",
                    25
                ],
                "7e9d7d5f30cc44a08c7f0ec5e7efbb96",
                "wwn-0x5000cca013124b24",
                "HITACHI  HUSML404 CLAR400",
                "390625000",
                "healthy",
                "none"
            ]
        ],
        "ups-list": [
```

```
            [
                "84e32f1975384720af36e42828333848",
                "X1-BBU",
                1
            ],
            [
                "b5f40885dd704951a73413b8fde80840",
                "X2-BBU",
                2
            ]
        ],
        "rg-id": [
            "23e7dc31e6a34453bc5368c127115ad9",
            "X1-DPG",
            1
        ],
        "index-in-system": 1
    },
    "links": [
        {
            "href": "https://vxms-xbrick238/api/json/types/bricks/1",
            "rel": "self"
        }
    ]
}
```

XEnvs

Viewing XEnvs

GET /api/json/types/xenvs

This command (GET /api/json/types/xenvs) displays the list of Storage Controller XEnvs.

Example request

```
GET /api/json/types/xenvs HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "xenvs": [
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/1",
            "name": "X1-SC1-E1"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/3",
            "name": "X1-SC2-E1"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/2",
            "name": "X1-SC1-E2"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/5",
            "name": "X2-SC1-E1"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/4",
            "name": "X1-SC2-E2"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/7",
            "name": "X2-SC2-E1"
```

```
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/6",
            "name": "X2-SC1-E2"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/8",
            "name": "X2-SC2-E2"
        }
    ],
    "links": [
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/",
            "rel": "self"
        }
    ]
}
```

Viewing XEnvs Information

GET /api/json/types/xenvs/<parameter (xenvs-id or ?name=xenvs-name)>

This command (GET /api/json/types/xenvs/<parameter [xenvs-id or ?name=xenvs-name]>) displays details of the selected Storage Controller XEnvs.

Input Parameter	Description	Mandatory
• xenvs-id OR • xenvs-name	XEnv's name or index number	Yes

Output Parameter	Counter Definition	Description
name	Name	XEnv's name
index	ID	XEnv's index ID as defined by XMS upon its creation; a unique positive number
xenv-csid	Clustering ID for internal messaging	Unique clustering ID for XEnvs internal messaging
xms-id	XMS ID	XtremIO Management Server's index number
xenv-id	XEnv index number	XEnv's index number
brick-id	X-Brick's index number	X-Brick's index number
obj-severity	Object severity	XEnv's severity based on severity level of current alerts (alerts still uncleared) for that XEnv and its contained objects or members
sys-id	Cluster's index number	Cluster's index number
cpu-usage	CPU usage	Percentage of XEnv's CPU usage
xenv-state	XEnv state	State of the XEnv
node-id	Storage Controller object ID	Storage Controller's ID

Example request by index

```
GET /api/json/types/xenvs/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/xenvs/?name=X1-SC1-E1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "xenvs": [
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/1",
            "name": "X1-SC1-E1"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/3",
            "name": "X1-SC2-E1"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/2",
            "name": "X1-SC1-E2"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/5",
            "name": "X2-SC1-E1"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/4",
            "name": "X1-SC2-E2"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/7",
            "name": "X2-SC2-E1"
        },
        {
```

```
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/6",
            "name": "X2-SC1-E2"
        },
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/8",
            "name": "X2-SC2-E2"
        }
    ],
    "links": [
        {
            "href": "https://vxms-
xbrickdrm27.xiodrm.lab.emc.com/api/json/types/xenvs/",
            "rel": "self"
        }
    ]
}
}
```

Storage Controllers

Viewing the Storage Controllers

GET /api/json/types/storage-controllers

This command (GET /api/json/types/storage-controllers) displays the list of Storage Controllers.

Example request

```
GET /api/json/types/storage-controllers HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "storage-controllers": [
        {
            "href": "https://vxms-xbrick267/api/json/types/storage-
controllers/1",
            "name": "X1-SC1"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/storage-
controllers/2",
            "name": "X1-SC2"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/storage-
controllers/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of a Storage Controller

GET /api/json/types/storage-controllers/<parameter (storage-controllers-id or ?name= storage-controllers-name)>

This command (GET /api/json/types/storage-controllers/<parameter [storage-controllers-id or ?name= storage-controllers-name]>) displays details of the selected Storage Controller.

Input Parameter	Description	Mandatory
• storage-controller-id OR • storage-controller-name	Storage Controller's name or index number	Yes

Output Parameter	Counter Definition	Description
index	ID	Storage Controller's index ID as defined by XMS upon its creation; a unique positive number
fru-lifecycle-state	Storage Controller FRU health state	Storage Controller's FRU state using the generic FRU transition states.
obj-severity	Object severity	Storage Controller's severity based on severity level of current alerts (alerts still uncleared) for that Storage Controller and its contained objects or members.
dimm-health-state	DIMM health state	Reflects health state of dual in-line memory module (DIMM).
local-disk-controller-fw-version	Local disk Storage Controller firmware version	Storage Controller's current firmware version
num-of-monitored-upses	Number of monitored BBUs	Number of the Battery Backup Unit (BBUs) that are connected to the Storage Controller
rg-id	XDPG object ID	ID of XDPG associated with this Storage Controller

Output Parameter	Counter Definition	Description
encryption-switch-status	Storage Controller's state of encryption mode	Current state of the encryption mode being changed
jbod-dn	DAE discovery needed	Cluster detects a new DAE.
pci-ib-hba-model	Infiniband HBA model	Infiniband host bus adaptors hardware model
ib1-port-in-peer-index	InfiniBand 1 Port in peer index	Index of the port within the Storage Controller that this port is connected to (0 if the port is unconnected). The value is meaningful only when `port_peer_type` is not `none`.
bios-fw-version	Storage Controller's detected BIOS firmware version	Storage Controller's BIOS firmware version
ib2-link-rate-in-gbps	IB link rate	Storage Controller InfiniBand link rate for port 2
sas1-port-rate	Rate of the SAS port	Rate of the first serial attached SCSI (SAS) port used
fc-hba-model	Fibre Channel HBA model	Fibre Channel host bus adaptors hardware model
ib2-port-state	InfiniBand port 2 state	Storage Controller's InfiniBand port 2 state
hw-revision	Hardware revision	Storage Controller's server hardware revision
node-csid	Internal naming id	Internal Storage Controller naming ID
sas1-port-state	SAS1 port state	State of the first serial attached SCSI (SAS) port used
node-fp-temperature-state	Storage Controller front panel temperature state	Indicates temperature sensor reading for above normal temperatures. Failover is triggered at high threshold.
pci-disk-controller-hw-revision	PCI Disk controller Firmware	Link control card's (LCC) hardware revision

Output Parameter	Counter Definition	Description
ib-addr1	InfiniBand address 1	Storage Controller's internal backend InfiniBand addresses for port 1
ib2-port-in-peer-index	InfiniBand2 Port in peer index	Port index within the Storage Controller that this port is connected to (should be 0 if the port is unconnected). The value is meaningful only when `port_peer_type` is not none.
node-health-state	Storage Controller health state	Reflects overall health state of the Storage Controller and its contained components.
node-mgr-conn-state	Storage Controller manager connection state	Connection state between XMS and Storage Controller manager (clustering agent)
ib-switches-dn	InfiniBand Switches detection needed	Cluster detects new InfiniBand Switches.
name	Name	Storage Controller's name
local-disk-controller-hw-revision	Local disk Storage Controller hardware revision	Hardware upgrade process compares current hardware version, model and firmware revision to the versions in any new software package to be applied. Upgrade fails when current version is unsupported in version to be applied.
ib1-port-state	InfiniBand port 1 state	Storage Controller's InfiniBand port 1 state
enabled-state	Storage Controller's current enabled state	Indicates whether Storage Controller is currently enabled or disabled, either by user or cluster.
ib2-port-misconnection	InfiniBand 2 port misconnection	Indicates whether a connection problem exists between Storage Controllers in InfiniBand port 2.
serial-number	Serial number	Storage Controller's serial number

Output Parameter	Counter Definition	Description
fc-hba-hw-revision	Detected Fibre Channel targets hardware version	Fibre Channel host bus adaptors hardware revision
model-name	Model name	Vendor-assigned model name
mgmt-port-speed	Management port speed	management port's port speed
sas1-hba-port-health-level	InfinBand1 link health level	When a serial attached SCSI (SAS) diagnosis returns an unexpected value
status-led	Status LED	LED state indicating Storage Controller object faults
ipmi-conn-error-reason	IPMI connection error reason	Reason for disconnection from the Storage Controller's intelligent platform management interface (IPMI)
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
current-health-state	Storage Controller's current health state	Storage Controller's health state
upgrade-failure-reason	Upgrade failure reason	Shows the permanent error of the last upgrade attempts. It is blank when the last attempt has been successful, or if no pervious upgrade command was given, or if an upgrade is currently in progress.
internal-sensor-health-state	Internal sensor health state	Reflects health state of the least healthy of all `temperature / voltage/fan/current/internal sensor_types`. Value is based on both the analog and discrete sensors of each type.
journal-state	Journal state	Defines Storage Controller's journal health state regarding failover and failback.

Output Parameter	Counter Definition	Description
temperature-health-state	Temperature health state	Reflects health state of the least healthy temperature `sensor_types`, based on both the analog and discrete sensors.
ipmi-bmc-fw-version	IPMI BMC freeware version	Array element of accepted firmware version
node-psu-dn	Storage Controller power supply unit discovery needed	Cluster has detected a new Storage Controller power supply unit.
ib2-link-health-level	InfiniBand2 link health level	Denotes the most severe problem detected over this InfiniBand link. When any of the InfiniBand diagnosis properties get an unexpected value (i.e., a counter is non-0, or an unexpected link rate), the health state changes to represent the most severe problem.
sw-version	Software version	Storage Controller software version. This should be identical to the cluster's software version, unless it is undergoing special process (upgrade, etc.).
num-of-ssds	Number of SSDs	Total number of SSDs in this Storage Controller's X-Brick
ssd-dn	SSD discovery needed	Cluster has detected a new SSD.
node-stop-reason	Storage Controller stop reason	Reason for Storage Controller stoppage
ib1-peer-oid ib2-peer-oid	InfiniBand1 Peer object id InfiniBand2 Peer object id	The object ID of the specific peer object connected to this Storage Controller
pci-10ge-hba-hw-revision	PCI 10GE HBA hardware revision	iSCSI bus adaptors hardware hardware revision
node-mgr-addr	Storage Controller manager address	IP addresses used to access Storage Controller manager

Output Parameter	Counter Definition	Description
low-ram-level	Low RAM level	Storage Controller's 'RAM Level Low' indicator (represented by the value `true`)
sas2-port-state	SAS2 port state	Status of the serial attached SCSI (SAS) port 2
local-disk-controller-model	Local disk controller model	Local disk controller model's name
active-ipmi-port	Active IPMI port	Indicates which port is currently used for IPMI.
ipmi-bmc-hw-revision	IPMI BMC HW Revision	IPMI hardware revision
sas2-hba-port-health-level	SAS2 HBA port health level	Storage Controller's SAS port number 2 health level
fc-hba-fw-version	Fibre Channel HBA firmware version	Fibre Channel host bus adaptors firmware version
fw-version-error	Firmware version error	Parrameter used to indicate if the firmware or OS upgrade has failed or is in process of upgrading. This reflects the aggregate of all Storage Controller OS and firmware upgrades.
dimm-correctable-errors	DIMM correctable errors	Count of dual in-line memory module (DIMM) error-correcting code (ECC) correctable errors
ib1-link-rate-in-gbps	InfiniBand1 link rate	InfiniBand1 link rate
os-version	Operating system version	Storage Controller operating system version, equivalent to the firmware for other components
identify-led	Identification LED	Property reporting the LED (beacon) state of the LED indicating identification of the Storage Controller. The value of this property is reflected in the UI LED icon.

Output Parameter	Counter Definition	Description
sas-port-conn-wrong-lcc	Checks SC SAS port connection.	Denotes whether or not the Storage Controller SAS port is connected to the correct LCC.
pci-10ge-hba-fw-version	PCI 10GE host bus adaptors freeware version	iSCSI host bus adaptors firmware version
pci-10ge-hba-model	PCI 10GE HBA model	iSCSI host bus adaptors model name
ib1-link-health-level	InfiniBand1 link health level	Denotes the most severe problem detected over this InfiniBand link. When any of the InfiniBand diagnosis properties get an unexpected value (i.e., a counter is non-0, or an unexpected link rate), the health state changes to represent the most severe problem.
monitored-ups-list	Monitored BBU	BBU monitored by this Storage Controller
node-mgr-conn-error-reason	Storage Controller manager connection error reason	Reason for the last disconnection between XMS and the Storage Controller
ipmi-conn-state	IPMI connection state	State of the connection between XMS and Storage Controller's IPMI
fan-health-state	Fan health state	Indicates health state of the least healthy fan `sensor_types`, based on both analog and discrete sensors.
num-of-local-disks	Number of local disks	Storage Controller's total number of local disks
node-psu-list	Storage Controller PSU list	Storage Controller's number of Storage Controller PSU (power supply unit) objects and list of their object IDs. There should be two PSUs per Storage Controller.

Output Parameter	Counter Definition	Description
part-number	Part number	EMC-assigned string identifying part (SKU). Independent of the actual vendor `model_name` used for this FRU.
sys-id	Cluster's index number	ID of the cluster this Storage Controller belongs to
ib1-port-misconnection	InfiniBand1 port misconnection	Indicates if a problem exists in port 1 of the Storage Controller's InfiniBand port connections.
ib2-port-peer-type	InfiniBand 2 port peer type	Defines whether port 2 is connected to a Storage Controller, another switch, or nothing.
brick-id	X-Brick index number	ID of X-Brick this Storage Controller belongs to
dedicated-ipmi-port-speed	Dedicated IPMI port speed	Negotiated speed of the dedicated IPMI port
sas2-port-rate	SAS2 port rate	Rate of the second serial attached SCSI (SAS) port used
pci-disk-controller-fw-version	PCI disk controller	LCC's firmware version
mgmt-port-state	Management port state	Storage Controller's management port state
voltage-health-state	Voltage health state	Reflects the aggregated health state of the voltage sensors.
targets-dn	Targets discovery needed	Cluster has detected new target(s).
pci-ib-hba-hw-revision	PCI InfiniBand HBA revision	InfiniBand host bus adaptors hardware revision
upgrade-state	Upgrade state	The state of the last upgrade process for this Storage Controller.
ib-switch-psu-dn	InfiniBand power supply unit discovery needed	Cluster has detected a new InfiniBand power supply unit.

Output Parameter	Counter Definition	Description
dedicated-ipmi-port-state	Dedicated IPMI port state	State of the dedicated Ethernet port (e.g. eth3) used for IPMI access instead of IPMI using the main Ethernet managment port. Indicates the physical connection only. Does not relate to IP addressing and routing issues.
ipmi-bmc-model	IPMI BMC model	IPMI's hardware model (BMC)
index-in-brick	Index in X-Brick	The uninteruptable power supply (BBU) index within the X-Brick, either 1 or 2. Always 1 for multi-X-Brick clusters (for all X-Bricks), however two BBUs are available for a single X-Brick cluster. Can be either 1 or 2.
backend-storage-controller-state	Backend Storage Controller state	Backend Storage Controller's state
encryption-mode	Encryption mode	Used to control whether encryption (Data at Rest) is performed.
node-guid	Storage Controller GUID	GUID hardwired in the physical Storage Controller. Once it is installed, it never changes.
iscsi-daemon-state	iSCSI daemon state	Indicates the current iSCSI daemon state.
ib1-port-peer-type	IB1 port peer type	Defines whether port 1 is connected to a Storage Controller, another switch, or disconnected.
ipmi-addr	IPMI address	IPMI address and subnet for this Storage Controller
node-stop-type	Storage Controller stop type	Describes the nature of the current/last Storage Controller stop.
ib-addr2	InfiniBand address 2	Storage Controller's internal backend InfiniBand addresses for port 2

Output Parameter	Counter Definition	Description
local-disk-dn	Local disk discovery needed	Cluster has detected a new local disk.
local-disk-list	Local disk list	Storage Controller's number of local disks
num-of-node-psus	Number of Storage Controller PSUs	Storage Controller's number of Storage Controller PSU objects and list of their object IDs. There should be two PSUs per Storage Controller.
node-journaling-health-state	Storage Controller journaling health state	Defines the health state of the journaling component, where in any state other than `healthy`, the Storage Controller is able to maintain a journal due to the possibility of journal loss upon power downs. Journals' health on this Storage Controller, considers both the local and remote journals.
node-index	Storage Controller index	Storage Controller's physical index within the X-Brick (lower-most one is number 1)
jbod-psu-dn	DAE power supply unit discovery needed	Cluster has detected a new DAE power supply unit.
dedicated-ipmi-link-conn-state	Dedicated IPMI link connection state	Initially represents state of the link between the dedicated IPMI port (eth3) and the other Storage Controller (rmm4 port).
mgmt-link-health-level	Management link health state	Storage Controller's management port health state
pci-ib-hba-fw-version	PCI InfiniBand HBA revision	InfiniBand host bus adaptors freeware revision
node-id	Storage Controller object ID	Storage Controller's ID
brick-index	X-Brick Index number	X-Brick's Physical index number containing the Storage Controller within the cluster (lower-most one is number 1)

Example request by index

```
GET /api/json/types/storage-controllers/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/storage-controllers/?name=X1-SC1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "fru-lifecycle-state": "uninitialized",
        "obj-severity": "major",
        "dimm-health-state": "level_1_clear",
        "local-disk-controller-fw-version": "",
        "num-of-monitored-upses": 1,
        "rg-id": [
            "8572907a74e7426ba49478e4e17e9be4",
            "X1-DPG",
            1
        ],
        "encryption-switch-status": null,
        "jbod-dn": null,
        "pci-ib-hba-model": null,
        "ib1-port-in-peer-index": null,
        "bios-fw-version": "",
        "ib2-link-rate-in-gbps": null,
        "sas1-port-rate": "unknown",
        "fc-hba-model": null,
        "node-state": null,
        "ib2-port-state": "up",
        "hw-revision": "",
        "node-csid": "",
        "sas1-port-state": "up",
        "node-fp-temperature-state": null,
        "pci-disk-controller-hw-revision": null,
        "ib-addr1": "169.254.0.1",
        "ib2-port-in-peer-index": null,
        "node-health-state": null,
        "node-mgr-conn-state": "disconnected",
        "ib-switches-dn": null,
        "name": "X1-SC1",
        "local-disk-controller-hw-revision": null,
```

```
        "ib1-port-state": "up",
        "enabled-state": "enabled",
        "ib2-port-misconnection": "healthy",
        "serial-number": "",
        "fc-hba-hw-revision": null,
        "model-name": "",
        "mgmt-port-speed": null,
        "sas1-hba-port-health-level": "level_1_clear",
        "status-led": "na",
        "ipmi-conn-error-reason": "none",
        "xms-id": [
            "d17c17dec47141428c08d7908295d677",
            "xms",
            1
        ],
        "index": 1,
        "current-health-state": "",
        "upgrade-failure-reason": "",
        "internal-sensor-health-state": 0,
        "powered-state": "off",
        "journal-state": null,
        "temperature-health-state": "",
        "ipmi-bmc-fw-version": "",
        "node-psu-dn": null,
        "ib2-link-health-level": "level_1_clear",
        "sw-version": "",
        "num-of-ssds": 25,
        "ssd-dn": null,
        "node-stop-reason": null,
        "ib1-peer-oid": null,
        "ib2-peer-oid": null,
        "pci-10ge-hba-hw-revision": null,
        "node-mgr-addr": "10.76.219.105",
        "low-ram-level": "ok",
        "sas2-port-state": "up",
        "local-disk-controller-model": null,
        "active-ipmi-port": "management",
        "remote-journal-health-state": "healthy",
        "ipmi-bmc-hw-revision": null,
        "sas2-hba-port-health-level": "level_1_clear",
        "pci-disk-controller-model": null,
        "fc-hba-fw-version": "",
        "fw-version-error": "no_error",
        "dimm-correctable-errors": null,
        "ib1-link-rate-in-gbps": null,
        "os-version": "",
        "identify-led": "na",
        "pci-10ge-hba-fw-version": "",
        "pci-10ge-hba-model": null,
        "ib1-link-health-level": "level_1_clear",
```

```
        "monitored-ups-list": [
            [
                "8b11380fc11d44afa4628327a2c2f883",
                "X1-BBU",
                1
            ]
        ],
        "node-mgr-conn-error-reason": "none",
        "ipmi-conn-state": "connected",
        "fan-health-state": "",
        "num-of-local-disks": 4,
        "node-psu-list": [
            [
                "de1345177c8a418cb5fd32a2ca8216bf",
                "X1-SC1-PSU-L",
                1
            ],
            [
                "e693a5863c1940f29d59a454bd98923b",
                "X1-SC1-PSU-R",
                2
            ]
        ],
        "part-number": "100-586-007-00",
        "sys-id": [
            "18e7d305209b4725886ad1b86115e681",
            "xbrick267",
            1
        ],
        "ib1-port-misconnection": "healthy",
        "ib2-port-peer-type": null,
        "brick-id": [
            "146a3035223d43c0995bdec9d423f0cf",
            "X1",
            1
        ],
        "dedicated-ipmi-port-speed": null,
        "sas2-port-rate": "unknown",
        "pci-disk-controller-fw-version": "",
        "mgmt-port-state": null,
        "voltage-health-state": "",
        "targets-dn": null,
        "pci-ib-hba-hw-revision": null,
        "upgrade-state": "no_upgrade_done",
        "ib-switch-psu-dn": null,
        "dedicated-ipmi-port-state": null,
        "ipmi-bmc-model": null,
        "index-in-brick": 1,
        "backend-storage-controller-state": "normal",
        "encryption-mode": null,
        "node-guid": "001e676d897800000000000000000000",
        "iscsi-daemon-state": null,
```

```
        "ib1-port-peer-type": null,
        "ipmi-addr": "10.76.215.105",
        "node-stop-type": "none",
        "ib-addr2": "169.254.0.2",
        "local-disk-dn": null,
        "local-disk-list": [
            [
                "c4a062cbbae3440f8b09755c7b577a4c",
                "X1-SC1-LocalDisk1",
                1
            ],
            [
                "3a5e896a0388457ba005d9195b84bd34",
                "X1-SC1-LocalDisk2",
                2
            ],
            [
                "6162b4a4e34945e7844368445eebd3c6",
                "X1-SC1-LocalDisk5",
                3
            ],
            [
                "33e727baed39476e98c2007bd6aa6acf",
                "X1-SC1-LocalDisk6",
                4
            ]
        ],
        "num-of-node-psus": 2,
        "node-journaling-health-state": "healthy",
        "sdr-fw-version": "",
        "node-index": 1,
        "jbod-psu-dn": null,
        "dedicated-ipmi-link-conn-state": null,
        "mgmt-link-health-level": null,
        "pci-ib-hba-fw-version": "",
        "node-id": [
            "b7b1dcaefb68405c8eb1ad89a402399e",
            "X1-SC1",
            1
        ],
        "brick-index": 1
    },
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/storage-
controllers/1",
            "rel": "self"
        }
    ]
}
```

Data Protection Groups

Listing the Data Protection Groups

GET /api/json/types/data-protection-groups

This command (GET /api/json/types/data-protection-groups) lists the XtremIO Data Protection Groups (XDPGs).

Example request

```
GET /api/json/types/data-protection-groups HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "data-protection-groups": [
        {
            "href": "https://vxms-xbrick267/api/json/types/data-
protection-groups/1",
            "name": "X1-DPG"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/data-
protection-groups/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of a Data Protection Group

GET /api/json/types/data-protection-groups/<parameter (dpg-id or ?name=dpg-name)>

This command (GET /api/json/types/data-protection-groups/<parameter [dpg-id or ?name=dpg-name]>) displays the selected XtremIO Data Protection Group (XDPG) details.

Input Parameter	Description	Mandatory
• dpg-id OR • dpg-name	XDPG's name or index number	Yes

Output Parameter	Counter Definition	Description
index	Index	XDPG's index ID as defined by XMS upon its creation; a unique positive number
ssd-size	SSD size	XDPG's overall size of unfailed SSDs
ssd-preparation-progress	SSD preparation progress	Indicates if XDPG is currently performing SSD preparation and progress, measured in percentage.
obj-severity	Object severity	XDPG's severity based on severity level of current alerts (alerts still uncleared) for that XDPG and its contained objects or members
rd-bw	Realtime read bandwidth	XDPG's total read bandwidth in MB per second
ssd-preparation-in-progress	SSD preparation in progress	Indicates if the XDPG is currently performing an SSD preparation, and its progress, measured in percentage.
iops	Input/output per second	XDPG's total read and write realtime input/output operations per second

Output Parameter	Counter Definition	Description
available-rebuilds	Available rebuilds	Number of available rebuilds the XDPG can currently perform
rebuild-prevention-reason	Rebuild prevention reason	When an XDPG enters a degraded state (either single or dual failure), rebuild is generally initiated. However, conditions may prevent the rebuild. The property includes reason for rebuild prevention.
rg-id	XDPG ID	XDPG's object ID
num-of-nodes	Number of Storage Controllers	XDPG's total number of Storage Controllers
rg-ud-ssd-percent-free-space	XDPG user data percent SSD free space	The percentage of free space of `1-ud_ssd_space_in_use /ud_ssd_space`
sys-id	Cluster name or index number	Cluster's name or index number
integrating-slot-num	Integrating slot number	Slot currently undergoing processing. The value is 0 when no specific slot is undergoing processing.
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
rebuild-in-progress	Rebuild in progress	Indicates if the XDPG currently performs a rebuild, and its progress, measured in percentage.
num-of-ssds	Number of SSDs	XDPG's total number of the SSDs
rg-ud-ssd-space-levels	XDPG user data SSD space levels	Event triggered for any change in this property
bw	Bandwidth	XDPG's total read and write bandwidth, in MB per second
wr-iops	Total realtime write input/output per second	Total write realtime input/output operations per second

Output Parameter	Counter Definition	Description
protection-state	Protection state	XDPG's protection state. If XDPG is currently under initial configuration, the property is initializing.
rd-iops	Read input/output per second	Total read realtime input/output operations per second
brick-id	X-Brick's index number	X-Brick's index number
ud-ssd-space-in-use	User data SSD space in use	The XDPG's SSD storage space is used for storing various types of metadata (MD), XDPG parity information, user data and spare capacity. At any given moment, the XDPG has a total space for user data, as reported by the `ud_ssd_space` property. The `ud_ssd_space_in_use` property specifies how much of this space is currently in use.
ud-ssd-space	User data SSD space	Total user data space on the SSDs
wr-bw	Write bandwidth	XDPG's total realtime write bandwidth in MB per second
useful-ssd-space	Useful SSD space	XDPG's total amount of useful SSD space on its unfailed SSDs (refer to the `useful_ssd_space_per_ssd` cluster property for more information)

Example request by index

```
GET /api/json/types/data-protection-groups/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/data-protection-groups/?name=X1-DPG HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "ssd-size": "19535569200",
        "ssd-preparation-progress": 0,
        "obj-severity": "information",
        "rd-bw": "0",
        "ssd-preparation-in-progress": false,
        "iops": "0",
        "available-rebuilds": 5,
        "rebuild-prevention-reason": "none",
        "rg-id": [
            "c76125abbb564bd693663e0020d9a460",
            "X1-DPG",
            1
        ],
        "index": 1,
        "num-of-nodes": 2,
        "rg-ud-ssd-percent-free-space": 0,
        "sys-id": [
            "a92d80f1153e41ea8c083ea603bd6c93",
            "xbrick267",
            1
        ],
        "integrating-slot-num": 0,
        "xms-id": [
            "23d7a35335d9427b8ba504d67a0bd5eb",
            "xms",
            1
        ],
        "rebuild-in-progress": false,
        "num-of-ssds": 25,
        "rg-ud-ssd-space-levels": "healthy",
        "bw": "0",
        "wr-iops": "0",
        "protection-state": "normal",
        "rd-iops": "0",
```

```
        "name": "X1-DPG",
        "brick-id": [
            "63265efd19b54b28803ff8d53f6c79cf",
            "X1",
            1
        ],
        "ud-ssd-space-in-use": "410482972",
        "rebalance-progress": 0,
        "ud-ssd-space": "15421213208",
        "rebalance-in-progress": false,
        "rebuild-progress": 0,
        "wr-bw": "0",
        "useful-ssd-space": "19535569200"
    },
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/data-
protection-groups/1",
            "rel": "self"
        }
    ]
}
```

Volumes

Viewing the Volumes List

GET /api/json/types/volumes

This command (GET /api/json/types/volumes) displays the list of all volumes and their defined properties.

Example request

```
GET /api/json/types/volumes HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "volumes": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/42",
            "name": "vol1"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/43",
            "name": "vol2"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/24",
            "name": "ARCHIVE-1.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/25",
            "name": "ORADATA-0.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/26",
            "name": "ARCHIVE-3.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/27",
            "name": "ORADATA-2.Master"
```

```
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/20",
            "name": "PROD-VOL4"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/21",
            "name": "PROD-VOL5"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/22",
            "name": "ARCHIVE-0.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/23",
            "name": "ARCHIVE-2.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/44",
            "name": "vol3"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/28",
            "name": "ORADATA-1.Master"
        },
```

Viewing the Details of a Volume

GET /api/json/types/volumes/<parameter (vol-id or ?name=vol-name)>

This command (GET /api/json/types/volumes/<parameter [vol-id or ?name=vol-name]>) displays details of the selected volume.

Input Parameter	Description	Mandatory
• vol-id OR • vol name	Volume's name or index number	Yes

Output Parameter	Counter Definition	Description
index	ID	Volume's index ID as defined by XMS upon its creation; a unique positive number
unaligned-io-alerts	Unaligned input/output alerts	When the volume property of `unaligned_io_alerts` is set to `disabled` (default), no alerts are sent for a high number of unaligned I/Os.
small-io-alerts	Small input/output alerts	When volume property of `small_io_alerts` is set to `disabled` (default), no alerts are sent for high number of small I/Os.
dest-snap-list	Destination snapshot list	Number of volumes directly snapshotted from volume, and list of their object IDs (if any).
vol-id	Volume index number	Volume's index number
obj-severity	Object severity	Volume's severity based on severity level of current alerts (alerts still uncleared) for that volume and its contained objects or members
num-of-lun-mappings	Number of LUN mappings	Number of LUN mappings defined for this volume
unaligned-rd-bw	Unaligned read bandwidth	Current bandwidth of unaligned input/output operations

Output Parameter	Counter Definition	Description
num-of-dest-snaps	Number of destination snapshots	Number of volumes directly snapshotted from this volume
iops	Input/output per second	Volume's total read and write realtime input/output operations per second
small-iops	Small input/output per second	Current IOPS of small input/output operations
creation-time	Creation time	Volume's creation timestamp
acc-num-of-small-wr	Accumulated number of small writes	Accumulated number of input/output operations recursively contained by this volume
alignment-offset	Alignment offset	The alignment offset range is between 0-15.
lb-size	Logical block size	Logical block size, inherited from the ancestor volume
logical-space-in-use	Logical space in use	Total user data space written to the volume before deduplication
unaligned-io-ratio-level	Unaligned input/output ratio level	Event triggered for any change in this property
acc-num-of-rd	Total cumulative read IOs	Total accumulative number of read operations having occurred during volume's lifespan
small-rd-bw	Small read bandwidth	Current bandwidth of small input/output operations, addressed at the volume
naa-name	NAA name	Volume's WWN/NAA, globally unique and unique over time, set by XMS (or by cluster) once a LUN is mapped to the snapshot for the first time
acc-size-of-wr	Total cumulative write size	Accumulative capacity size (in KB) of write operations having occurred during volume lifespan

Output Parameter	Counter Definition	Description
acc-num-of-small-rd	Accumulated number of small reads	Accumulated number input/output operations for the volume
unaligned-rd-iops	Unaligned read input/output per second	Current IOPS of unaligned input/output operations
wr-latency	Total realtime write latency	Total realtime average latency of write operations, in µs
snapgrp-id	Snapshot group object ID	The ID of the snapshot group object
ancestor-vol-id	Ancestor volume object ID	Holds volume snapshot source ID for the volume. If volume is not a snapshot, property is empty.
rd-bw	Total realtime read bandwidth	Total realtime read bandwidth in MB per second
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
small-wr-bw	Small write bandwidth	Volume's small write bandwidth
acc-num-of-unaligned-rd	Accumulated number of unaligned reads	Volume's accumulated number of I/Os since adding the initiator
unaligned-iops	Unaligned input/output per second	Unaligned input/output operations per second
unaligned-bw	Unaligned I/O bandwidth	Current IOPS of unaligned input/output operations
bw	Total realtime bandwidth	Total realtime read and write bandwidth in MB per second
small-io-ratio-level	Small input/output ratio level	Event triggered for any change in this property

Output Parameter	Counter Definition	Description
lun-mapping-list	LUN mapping list	List of LUN mappings currently associated with the volume, possibly empty, indicating that the volume is currently unexposed. Note: • The implementation forces a limit upon the maximum number of mappings for the volume. • There are various rules and constraints regarding LUN mappings. Refer to the `map_lun_to_volume` command definition for rule list.
vol-size	Total provisioned capacity	Volume size (in KB) as exposed to initiators
wr-iops	Total realtime write input/output per second	Total write realtime input/output operations per second
sys-id	Cluster name or index number	Cluster's name or index number
avg-latency	Total realtime latency	Total realtime average latency of read and write operations, in µs
rd-latency	Total realtime read latency	Total realtime average latency of read operations, in µs
rd-iops	Read input/output per second	Total read realtime input/output operations per second
wr-bw	Write bandwidth	Total realtime write bandwidth in MB per second

Example request by index

```
GET /api/json/types/volumes/42 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/volumes/?name=vol10 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "unaligned-io-alerts": "disabled",
        "small-io-alerts": "disabled",
        "small-iops": "0",
        "dest-snap-list": [],
        "vol-id": [
            "46ffa61154b14b4495c23233ebf72a43",
            "vol10",
            10
        ],
        "obj-severity": "information",
        "num-of-lun-mappings": 1,
        "unaligned-rd-bw": "0",
        "num-of-dest-snaps": 0,
        "iops": "0",
        "acc-num-of-small-wr": "0",
        "alignment-offset": 0,
        "lb-size": 512,
        "logical-space-in-use": "107368568",
        "unaligned-io-ratio-level": "ok",
        "acc-num-of-rd": "711737",
        "index": 10,
        "small-rd-bw": "0",
        "naa-name": "514f0c512dc00001",
        "acc-size-of-wr": "0",
        "acc-num-of-small-rd": "711737",
        "unaligned-rd-iops": "0",
        "wr-latency": "0",
        "snapgrp-id": [
            "7f93568088d34143b574d8a97eed0ede",
            "",
            10
        ],
        "ancestor-vol-id": [],
        "vaai-tp-alerts": "disabled",
        "creation-time": "2014-07-13 18:08:54",
```

```
"rd-bw": "0",
"xms-id": [
    "23d7a35335d9427b8ba504d67a0bd5eb",
    "xms",
    1
],
"compressible": "yes",
"small-wr-bw": "0",
"acc-num-of-unaligned-rd": "711351",
"lu-name": "",
"unaligned-iops": "0",
"unaligned-bw": "0",
"bw": "0",
"small-io-ratio-level": "ok",
"lun-mapping-list": [
    [
        [
            "2cb574d17bdf4dacb5935efeb53ce81d",
            "FCqadefault",
            1
        ],
        [
            "b599c21f1a004630a93f441d5386b398",
            "Default",
            1
        ],
        0
    ]
],
"vol-size": "1073741824",
"wr-iops": "0",
"sys-id": [
    "a92d80f1153e41ea8c083ea603bd6c93",
    "xbrick267",
    1
],
"avg-latency": "0",
"rd-latency": "0",
"small-wr-iops": "0",
"small-bw": "0",
"name": "vol10",
"acc-num-of-unaligned-wr": "0",
"unaligned-wr-iops": "0",
"acc-num-of-wr": "0",
"small-io-ratio": "100",
"acc-size-of-rd": "83576684",
"unaligned-wr-bw": "0",
"small-rd-iops": "0",
"unaligned-io-ratio": "99",
"rd-iops": "0",
```

```
        "wr-bw": "0"
    },
    "links": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/10",
            "rel": "self"
        }
    ]
}
```

Adding a New Volume

POST /api/json/types/volumes

This command (POST /api/json/types/volumes) enables you to create a new volume.

Input Parameter	Description	Mandatory
alignment-offset	The alignment offset for volumes of 512 LB size, between 0 and 7. If omitted, the offset value is 0. Volumes of logical block size 4096 must not be defined with an offset.	No
lb-size	Volumes logical block size: • 512 (default) • 4096 Once defined, size cannot be modified	No
sys-id	Cluster's name or index number. The value may be omitted if only one XtremIO cluster is defined.	No
vol-name	Volume's name	No
vol-size	• Volume's disk space size in: M (MB) / G (GB) / T (TB) / P (PB); limited to 2PB. • The minimum Volume size is 1 MB. • Volume size must be in multiples of 8 KB. • Reflects size of the Volume available to Initiators. • Does not indicate actual SSD space consumed by Volume. • Must be an integer greater than 0.	Yes
parent-folder-id	Identifies the volume folder to which the volume initially belongs. The folder's `folder_type` must be `volume` . If omitted, the volume is added to the root volume folder.	No

Example request

```
POST /api/json/types/volumes HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"vol-name":"Vol-181", "vol-size":"500k", "parent-folder-id":"/TG"}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/volumes/24",
            "rel": "self"
        }
    ]
}
```

Deleting a Volume

DELETE /api/json/types/volumes/<parameter (vol-id or ?name=vol-name)>

This command (DELETE /api/json/types/volumes/<parameter [vol-id or ?name=vol-name]>) enables you to delete a volume.

Input Parameter	Description	Mandatory
• vol-id OR • vol name	Volume's name or index number	Yes

Example request by index

```
DELETE /api/json/types/volumes/19 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Example request by name

```
DELETE /api/json/types/volumes/?name=DB10 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
200 OK
```

Modifying a Volume

PUT /api/json/types/volumes/<parameter (vol-id or ?name=vol-name)>

This command (PUT /api/json/types/volumes/<parameter [vol-id or ?name=vol-name]>) enables you to modify the selected volume.

Input Parameter	Description	Mandatory*
vol-id	Volume's index number	Yes
vol-name	Volume's name	One from Group 1
vol-size	Volume's size	One from Group 1
small-io-alerts	Enable or disable small input/output alerts.	One from Group 1
unaligned-io-alerts	Enable or disable unaligned input/output alerts.	One from Group 1
vaai-tp-alerts	Enable or disable VAAI TP alerts.	One from Group 1

Example request by index

```
PUT /api/json/types/volumes/10 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache

{"vol-name":"esx-100"}
```

Example request by name

```
PUT /api/json/types/volumes/?name=esx-90 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache

{"vol-name":"esx-100"}
```

Response

```
200 OK
```

*) Group 1: [' vol-name', 'small-io-alerts', 'unaligned-io-alerts', 'vaai-tp-alerts', 'vol-size']

Volume Folders

Viewing the List of Volume Folders

GET /api/json/types/volume-folders

This command (GET /api/json/types/volume-folders) displays the list of volume folders.

Example request

```
GET /api/json /types/volume-folders HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
{
    "folders": [
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders/1",
            "name": "/"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders/3",
            "name": "/ESX"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders/2",
            "name": "/Oracle"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders/5",
            "name": "/TTT"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders/4",
            "name": "/Oracle_Master"
        },
```

```
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders/7",
            "name": "/bbb"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders/6",
            "name": "/ttt"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of a Volume Folder

GET /api/json/types/volume-folders/<parameter (vol-id or ?name=vol-name)>

This command (GET /api/json/types/volume-folders/<parameter [folder-id or ?name=folder-name]>) displays details of the selected volume folder.

Input Parameter	Description	Mandatory
• folder-id OR • folder name	Volume folder's name or index number	Yes

Output Parameter	Counter Definition	Description
name	Name	Volume folder's name
index	ID	Volume folder's index ID as defined by XMS upon its creation; a unique positive number
small-iops	Small input/output per second	Current IOPS of small input/output operations
obj-severity	Object severity	Volume folder's severity based on severity level of current alerts (alerts still uncleared) for that volume folder and its contained objects or members
rd-bw	Read bandwidth	Total realtime read bandwidth in MB per second in this volume folder
unaligned-rd-bw	Unaligned read bandwidth	Current bandwidth of unaligned input/output operations folder
iops	Input/output per second	Volume folder's total read and write realtime input/output operations per second
acc-num-of-small-wr	Accumulated number of small writes	Accumulated number input/output operations contained by this folder

Output Parameter	Counter Definition	Description
parent-folder-id	Volume folder's name or ID	Volume folder's name or ID
acc-num-of-rd	Total cumulative read IOs	Total accumulative number of read operations having occurred during volume's lifespan
small-rd-bw	Small read bandwidth	Current bandwidth of small input/output operations, addressed at the volume
num-of-direct-objs	Number of direct objects	This folder's number of directly contained volumes
acc-size-of-wr	Total cumulative write size	Accumulative capacity size (in KB) of write operations having occurred during volume folder's lifespan
num-of-subfolders	Number of subfolders	This folder's number of directly contained folders. Must be subfolder of a volume folder.
acc-num-of-small-rd	Accumulated number of small reads	Accumulated number of input/output operations for the volume
unaligned-rd-iops	Unaligned read input/output per second	Current IOPS of unaligned input/output operations
empty-vol-blocks	Empty volume blocks	The aggregated values of the recursively contained volumes
num-of-vols	Cluster's total provisioned volumes	Number of volumes in the cluster
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
subfolder-list	Subfolder list	The number of folders that are within the current folder, and list of their object IDs
non-empty-vol-blocks	Non empty volume blocks	The aggregated values of the recursively contained volumes
unaligned-wr-iops	Unaligned write input/output per second	Current IOPS of unaligned input/output operations, addressed at the volume

Output Parameter	Counter Definition	Description
acc-num-of-unaligned-rd	Accumulated number of unaligned reads	Accumulated number of input/output operations that are recursively contained by this folder.
folder-id	Folder ID	Volume folder's ID
small-wr-bw	Small write bandwidth	Current bandwidth of small input/output operations, addressed at the volume
unaligned-iops	Unaligned input/output per second	Current IOPS of unaligned input/output operations
unaligned-bw	Unaligned I/O bandwidth	Current IOPS of unaligned input/output operations
bw	Bandwidth	Total read and write bandwidth in MB per second
vol-size	Total provisioned capacity	Volume size (in KB) as exposed to initiators
wr-iops	Total realtime write input/output per second	Total write realtime input/output operations per second
direct-list	Direct object list	Folder's number of volumes
small-wr-iops	Small write input/output per second	Current IOPS of small input/output operations
small-bw	Small I/O bandwidth	Current bandwidth of small input/output operations, addressed at the volume
acc-num-of-unaligned-wr	Accumulated number of unaligned writes	Accumulated number I/Os that are recursively contained by this folder
acc-num-of-wr	Total cumulative write IOs	Accumulative number of write operations having occurred during folder's lifespan
acc-size-of-rd	Total cumulative read size	Accumulative capacity size (in KB) of read operations having occurred during folder's lifespan

Output Parameter	Counter Definition	Description
caption	Folder's actual name	Folder's actual name (not the full path of the folder)
unaligned-wr-bw	Unaligned write bandwidth	Current bandwidth of unaligned input/output operations
small-rd-iops	Small read input/output per second	Current IOPS of small input/output operations
rd-iops	Read input/output per second	Total read realtime input/output operations per second
wr-bw	Write bandwidth	Total write bandwidth in MB per second

Example request by index

```
GET /api/json/types/volume-folders/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/volume-folders/?name=/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "small-iops": "0",
        "obj-severity": "information",
        "rd-bw": "0",
        "unaligned-rd-bw": "0",
        "iops": "0",
        "acc-num-of-small-wr": "295052",
        "parent-folder-id": [],
        "acc-num-of-rd": "764305",
        "index": 1,
        "small-rd-bw": "0",
        "num-of-direct-objs": 10,
        "acc-size-of-wr": "1180208",
        "num-of-subfolders": 0,
        "acc-num-of-small-rd": "764305",
```

```
        "unaligned-rd-iops": "0",
        "empty-vol-blocks": "0",
        "num-of-vols": 10,
        "xms-id": [
            "23d7a35335d9427b8ba504d67a0bd5eb",
            "xms",
            1
        ],
        "subfolder-list": [],
        "non-empty-vol-blocks": "0",
        "unaligned-wr-iops": "0",
        "acc-num-of-unaligned-rd": "764295",
        "folder-id": [
            "5c18e896ca414cbd9c5966205fda7584",
            "/",
            1
        ],
        "small-wr-bw": "0",
        "unaligned-iops": "0",
        "unaligned-bw": "0",
        "bw": "0",
        "vol-size": "9814671360",
        "wr-iops": "0",
        "direct-list": [
            [
                "76745de5cfe44453a31f0cec1b603680",
                "vol1",
                1
            ],
            [
                "3983f9e749f64c5fb9d7e3c6fd33277e",
                "vol2",
                2
            ],
            [
                "c929c24289fd43948760914c2a3a85e2",
                "vol3",
                3
            ],
            [
                "d4f72aabf73c4ade94905d76416836fe",
                "vol4",
                4
            ],
            [
                "88c39eb5b4c2479183ddb94ff65e4737",
                "vol5",
                5
            ],
            [
```

```
                "2841abad331b4d759cb48ef632f10c23",
                "vol6",
                6
            ],
            [
                "087332be9830463d9b73a52805cac08f",
                "vol7",
                7
            ],
            [
                "04ebafa6721049db9608abe8c6871c54",
                "vol8",
                8
            ],
            [
                "c119d83c6be64985aa30f7fbeb4ee79c",
                "vol9",
                9
            ],
            [
                "bc319b8afa4b4769b25aec4959e7bece",
                "vol10",
                10
            ]
        ],
        "small-wr-iops": "0",
        "small-bw": "0",
        "name": "/",
        "acc-num-of-unaligned-wr": "295052",
        "acc-num-of-wr": "295052",
        "acc-size-of-rd": "3057340",
        "caption": "/",
        "unaligned-wr-bw": "0",
        "small-rd-iops": "0",
        "rd-iops": "0",
        "wr-bw": "0"
    },
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders/1",
            "rel": "self"
        }
    ]
}
```

Creating a Volume Folder

POST /api/json/types/volume-folders

This command (POST /api/json/types/volume-folders) enables you to create a volume folder.

Input Parameter	Description	Mandatory
caption	Folder's actual name (not the full path of the folder)	Yes
• parent-folder-id OR • parent-folder-name	Name or ID of a parent folder ('1' is default first folder id)	Yes

Example

```
POST /api/json/types/volume-folders HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"caption":"Rack_test", "parent-folder-id":"/"}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/volume-
folders/5",
            "rel": "self"
        }
    ]
}
```

Renaming a Volume Folder

PUT /api/json/types/volume-folders/<parameter (parent-folder-id or ?name=folder-name)>

This command (PUT /api/json/types/volume-folders/<parameters [parent-folder-id or ?name=folder-name]>) enables you to rename the selected volume folder.

Input Parameter	Description	Mandatory
• parent-folder-id OR • folder-name	Volume folder's name or ID	Yes
• new-caption	New folder's actual name (not full path of folder)	Yes

Example request by index

```
PUT /api/json/types/volume-folders/11 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"new-caption":"Rack_3"}
```

Example request by name

```
PUT /api/json/types/volume-folders/?name=Rack_2 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"new-caption":"Rack_3"}
```

Response

```
200 OK
```

Deleting a Volume Folder

DELETE /api/json/types/volume-folders/<parameter (folder-id or ?name=folder-name)>

This command (DELETE /api/json/types/volume-folders/<parameter [folder-id or ?name=folder-name]>) enables you to delete a volume folder.

Input Parameter	Description	Mandatory
• folder-id OR • folder name	Folder's name or index number	Yes

Example request by index

```
DELETE /api/json/types/volume-folders/19 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Example request by name

```
DELETE /api/json/types/volume-folders/?name=ESX HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
200 OK
```

Snapshots

Viewing the List of Snapshots

GET /api/json/types/snapshots

This command (GET /api/json/types/snapshots) displays the list of all snapshots.

Example request

```
GET /api/json/types/snapshots HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "snapshots": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/24",
            "name": "ARCHIVE-1.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/25",
            "name": "ORADATA-0.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/26",
            "name": "ARCHIVE-3.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/27",
            "name": "ORADATA-2.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/22",
            "name": "ARCHIVE-0.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/23",
            "name": "ARCHIVE-2.Master"
```

```
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/28",
            "name": "ORADATA-1.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/29",
            "name": "UNDO-0.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/40",
            "name": "ORADATA-0.snap.03272014-11:18"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/39",
            "name": "ORADATA-1.snap.03272014-10:43"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/38",
            "name": "ORADATA-0.snap.03272014-10:43"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/33",
            "name": "REDO-0.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/32",
            "name": "UNDO-1.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/31",
            "name": "UNDO-2.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/30",
            "name": "ORADATA-3.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/37",
            "name": "REDO-3.Master"
```

```
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/36",
            "name": "REDO-1.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/35",
            "name": "REDO-2.Master"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/34",
            "name": "UNDO-3.Master"
        }
    ],
    "links": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of a Snapshot

GET /api/json/types/snapshots/<parameter (snapshot-id or ?name=snapshot-name)>

This command (GET /api/json/types/snapshots/<parameter [snapshot-id or ?name=snapshot-name]>) displays the selected snapshot's details.

Input Parameter	Description	Mandatory
• snapshot-id OR • snapshot-name	Snapshot's name or index number	Yes

Output Parameter	Counter Definition	Description
name	Name	Snapshot's name as defined by the user when creating the snapshot
index	ID	Snapshot's index ID as defined by XMS upon its creation; a unique positive number
unaligned-io-alerts	Unaligned input/output alerts	When snapshot property of `unaligned_io_alerts` is set to `disabled`, the value of the `volume_unaligned_io_ratio` is always set to `ok`. The default value is `enabled`.
small-io-alerts	Small input/output alerts	When snapshot property of `small_io_alerts` is set to `disabled`, the value of the `small_io_ratio` is always set to `ok`. The default value is `enabled`.
small-iops	Small input/output per second	Current IOPS of small input/output operations, addressed at the snapshot
dest-snap-list	Destination snapshot list	The number of volumes directly snapshotted from this snapshot, and list of their object IDs (if any).

Output Parameter	Counter Definition	Description
vol-id	Snapshot's index number	Snapshot's index number
obj-severity	Object severity	Snapshot's severity based on severity level of current alerts (alerts still uncleared) for that snapshot and its contained objects or members
num-of-lun-mappings	Number of LUN mappings	Number of LUN mappings defined for this snapshot
unaligned-rd-bw	Unaligned read bandwidth	Current bandwidth of unaligned input/output operations, addressed at the snapshot
num-of-dest-snaps	Number of destination snapshots	The number of volumes that were directly snapshotted from this volume, and list of their object IDs (if any).
iops	Input/output per second	Snapshot's total read and write realtime input/output operations per second
acc-num-of-small-wr	Accumulated number of small writes	Accumulated number of input/output operations recursively contained by folder
alignment-offset	Alignment offset	The alignment offset range is between 0-15.
lb-size	Logical block size	Logical block size, inherited from the ancestor volume
logical-space-in-use	Logical space in use	Total user data space written to the snapshot before deduplication
unaligned-io-ratio-level	Unaligned input/output ratio level	Event triggered for any change in this property
acc-num-of-rd	Total cumulative read IOs	Total accumulative number of read operations having occurred during volume's lifespan
small-rd-bw	Small read bandwidth	Current bandwidth of small input/output operations, addressed at the snapshot

Output Parameter	Counter Definition	Description
naa-name	NAA name	Snapshot's SCSI WWN/NAA name, globally unique and unique over time, set by XMS (or by the cluster) once a LUN is mapped to the snapshot for the first time.
acc-size-of-wr	Total cumulative write size	Accumulative capacity size (in KB) of write operations having occurred during snapshot's lifespan
acc-num-of-small-rd	Accumulated number of small reads	Accumulated number of input/output operations for the snapshot
unaligned-rd-iops	Unaligned read input/output per second	Current IOPS of unaligned input/output operations, addressed at the snapshot
wr-latency	Cluster's total realtime write latency	Realtime average latency of write operations, in µs
snapgrp-id	Snapshot group ID	Snapshot group's ID
ancestor-vol-id	Ancestor volume ID	Holds volume source ID for the snapshot.
vaai-tp-alerts	VAAI TP Limit	The VAAI Soft Limit warning for this volume is reported when monitoring is enabled. The threshold is a cluster-wide value as configured in the cluster `vaai_tp_limit`. The default is `disabled`.
creation-time	Creation time	Snapshot's creation timestamp
rd-bw	Read bandwidth	Total realtime read bandwidth in MB per second
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
small-wr-bw	Small write bandwidth	Current bandwidth of small input/output operations, addressed at the snapshot

Output Parameter	Counter Definition	Description
acc-num-of-unaligned-rd	Accumulated number of unaligned reads	Accumulated number of input/output operations recursively contained by this snapshot
unaligned-iops	Unaligned input/output per second	Current IOPS of unaligned input/output operations, addressed at the snapshot
unaligned-bw	Unaligned I/O bandwidth	Current bandwidth of unaligned input/output operations, addressed at the snapshot
bw	Total realtime bandwidth	Total read and write bandwidth in MB per second
small-io-ratio-level	Small input/output ratio level	Event triggered for any change in this property
lun-mapping-list	LUN mapping list	List of LUN mappings currently associated with the snapshot, possibly empty, indicating snapshot is currently unexposed: • The implementation forces a limit upon maximum number of mappings for the snapshot. • There are various rules and constraints regarding LUN mappings. Refer to the `map_lun_to_volume` command definition for rule list.
vol-size	Total provisioned capacity	Snapshot's size (in KB) as exposed to initiators
wr-iops	Total realtime write Input/output per second	Total write realtime input/output operations per second
sys-id	Cluster's name or index number	Cluster's name or index number
avg-latency	Total realtime latency	Realtime average latency of read and write operations, in µs
rd-latency	Total realtime read latency	Realtime average latency of read operations, in µs

Output Parameter	Counter Definition	Description
small-wr-iops	Small write Input/output per second	Current IOPS of small input/output operations, addressed at the snapshot
small-bw	Small I/O bandwidth	Current bandwidth of small input/output operations, addressed at the snapshot
acc-num-of-unaligned-wr	Accumulated number of unaligned writes	Accumulated number input/output operations recursively contained by this snapshot
unaligned-wr-iops	Unaligned write input/output per second	Current IOPS of unaligned input/output operations, addressed at the snapshot
acc-num-of-wr	Total cumulative write IOs	Accumulative number of write operations having occurred during snapshot's lifespan
small-io-ratio	Small input/output ratio level	Event triggered for any change in this property
acc-size-of-rd	Total cumulative read size	Accumulative capacity size (in KB) of read operations having occurred during snapshop's lifespan
unaligned-wr-bw	Unaligned write bandwidth	Current bandwidth of unaligned input/output operations, addressed at the snapshot
small-rd-iops	Small read input/output per second	Current IOPS of small input/output operations, addressed at the snapshot
unaligned-io-ratio	Unaligned input/output ratio level	Event triggered for any change in this property
rd-iops	Read input/output per second	Total read realtime input/output operations per second
wr-bw	Write bandwidth	Total write bandwidth in MB per second

Example request by index

```
GET /api/json/types/snapshots/24 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/snapshots/?name=vol7.snap.07152014-10:52 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "unaligned-io-alerts": "disabled",
        "small-io-alerts": "disabled",
        "small-iops": "0",
        "dest-snap-list": [],
        "vol-id": [
            "9182a14530454a55a5dbf98e8b91177a",
            "vol7.snap.07152014-10:52",
            13
        ],
        "obj-severity": "information",
        "num-of-lun-mappings": 0,
        "unaligned-rd-bw": "0",
        "num-of-dest-snaps": 0,
        "iops": "0",
        "acc-num-of-small-wr": "0",
        "alignment-offset": 0,
        "lb-size": 512,
        "logical-space-in-use": "373904",
        "unaligned-io-ratio-level": "ok",
        "acc-num-of-rd": "0",
        "index": 13,
        "small-rd-bw": "0",
        "naa-name": "",
        "acc-size-of-wr": "0",
        "acc-num-of-small-rd": "0",
        "unaligned-rd-iops": "0",
        "wr-latency": "0",
        "snapgrp-id": [
            "17abe3f13e114ec1ad20032a21a9e9b1",
            "",
            7
        ],
        "ancestor-vol-id": [
            "087332be9830463d9b73a52805cac08f",
            "vol7",
```

```
            7
        ],
        "vaai-tp-alerts": "disabled",
        "creation-time": "2014-07-15 10:52:12",
        "rd-bw": "0",
        "xms-id": [
            "23d7a35335d9427b8ba504d67a0bd5eb",
            "xms",
            1
        ],
        "compressible": "yes",
        "small-wr-bw": "0",
        "acc-num-of-unaligned-rd": "0",
        "lu-name": "",
        "unaligned-iops": "0",
        "unaligned-bw": "0",
        "bw": "0",
        "small-io-ratio-level": "ok",
        "lun-mapping-list": [],
        "vol-size": "1565523968",
        "wr-iops": "0",
        "sys-id": [
            "a92d80f1153e41ea8c083ea603bd6c93",
            "xbrick267",
            1
        ],
        "avg-latency": "0",
        "rd-latency": "0",
        "small-wr-iops": "0",
        "small-bw": "0",
        "name": "vol7.snap.07152014-10:52",
        "acc-num-of-unaligned-wr": "0",
        "unaligned-wr-iops": "0",
        "acc-num-of-wr": "0",
        "small-io-ratio": "0",
        "acc-size-of-rd": "0",
        "unaligned-wr-bw": "0",
        "small-rd-iops": "0",
        "unaligned-io-ratio": "0",
        "rd-iops": "0",
        "wr-bw": "0"
    },
    "links": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/13",
            "rel": "self"
        }
    ]
}
```

Creating a Snapshot of a Volume

POST /api/json/types/snapshots

This command (POST /api/json/types/snapshots) enables you to create a snapshot of a single volume.

Input Parameter	Description	Mandatory
ancestor-vol-id	Source volume's name	Yes
snap-vol-name	Snapshot's name	Yes
folder-id	Destination folder's name	No

Example request

```
POST /api/json/types/snapshots/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"ancestor-vol-id":"vol0","snap-vol-name":"tg3","folder-id":"/TG"}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/39",
            "rel": "self"
        }
    ]
}
```

Creating Snapshots from a Folder

POST /api/json/types/snapshots

This command (POST /api/json/types/snapshots) enables you to create snapshots from a folder.

Input Parameter	Description	Mandatory
source-folder-id	Source folder's name	Yes
suffix	Suffix added to volume name	Yes
folder-id	Destination folder's name	No

Example request

```
POST /api/json/types/snapshots/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"source-folder-id":"/TG","suffix":"TG_snap","folder-id":"/Snapshots"}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/40",
            "rel": "self"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/41",
            "rel": "self"
        }
    ]
}
```

Creating Snapshots of a Set of Volumes

POST /api/json/types/snapshots

This command (POST /api/json/types/snapshots) enables you to create snapshots on a set of volumes.

Input Parameter	Description	Mandatory
snap-list	Snapshot list [ancestor-vol-id=value snap-vol-name=value, ...]	Yes
folder-id	Destination folder's name	Yes

Example request

```
POST /api/json/types/snapshots/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"snap-list":[{"ancestor-vol-id":"ARCHIVE-0","snap-vol-name":"TEST-
0"},{"ancestor-vol-id":"ARCHIVE-1","snap-vol-name":"TEST-1"}], "folder-
id":"/TG"}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/42",
            "rel": "self"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/snapshots/43",
            "rel": "self"
        }
    ]
}
```

Deleting a Snapshot

DELETE /api/json/types/volumes/<parameter (vol-id or ?name=vol-name)>

This command (DELETE /api/json/types/volumes/< parameter [vol-id or ?name=vol-name]>) enables you to delete a snapshot.

Input Parameter	Description	Mandatory
• vol-id OR • vol-name	Snapshot's name or index number	Yes

Example request by index

```
DELETE /api/json/types/volumes/19 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Example request by name

```
DELETE /api/json/types/volumes/?name=DB10 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
200 OK
```

Initiators

Viewing the Initiators List

GET /api/json/types/initiators

This command (GET /api/json/types/initiators) displays the list of all initiators and their defined properties.

Example request

```
GET /api/json/types/initiators HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "initiators": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/initiators/1",
            "name": "lg0003-fc1"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/initiators/2",
            "name": "lg0003-fc2"
        }
    ],
    "links": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/initiators/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of an Initiator

GET /api/json/types/initiators/<parameter (initiator-id or ?name=initiator-name)>

This command (GET /api/json/types/initiators/<parameter [initiator-id or ?name=initiator-name]>) displays details of the selected initiator.

Input Parameter	Description	Mandatory
• initiator-id OR • initiator-name	Initiator's name or index number	Yes

Output Parameter	Counter Definition	Description
name	Name	Initiator's name as defined by the user when creating the initiator
index	ID	Initiator's index ID as defined by XMS upon its creation, a unique positive number
small-iops	Small input/output per second	Current IOPS of small input/output operations, addressed at the initiator
wr-latency	Initiator's total realtime write latency	Realtime average latency of write operations, in µs
chap-discovery-initiator-password	CHAP discovery initiator password	Password by which any initiator is identified during the discovery phase, at least 12 characters, valid for iSCSI ports when `chap_discovery_mode` is not `disabled`
obj-severity	Object severity	Initiator's severity based on severity level of current alerts (alerts still uncleared) for that initiator and its contained objects or members
rd-bw	Total realtime read bandwidth	Total read bandwidth in MB per second

Output Parameter	Counter Definition	Description
unaligned-rd-bw	Unaligned read bandwidth	Current bandwidth of unaligned input/output operations, addressed at the initiator
chap-discovery-initiator-user-name	CHAP discovery initiator user	User name by which an initiator is identified during the discovery phase, valid for iSCSI ports only when `chap_discovery_mode` is not `disabled`
chap-discovery-cluster-user-name	CHAP discovery cluster user name	• User name by which the cluster identifies itself to any initiator during discovery phase • Valid only if `chap_discovery_mode = initiator_and_target` • Applicable for iSCSI only
iops	Input/output per second	Initiator's total read and write realtime input/output operations per second
num-of-conn-tars	Number of connected targets	List containing the target object IDs via which the initiator is currently connected to the cluster
acc-num-of-small-wr	Accumulated number of small writes	Accumulated number of input/output operations recursively contained by initiator
chap-authentication-initiator-password	CHAP authentication initiator password	Both user name and password are mandatory when `chap_authentication_mode` is not `disabled`.
acc-num-of-rd	Accumulative number of reads	Initiator’s total lifespan cumulative read IOs

Output Parameter	Counter Definition	Description
port-address	Port address	The following input format variations are accepted for Fibre Channel initiators ("X" is a hexadecimal digit – uppercase or lower case are allowed): • "XX:XX:XX:XX:XX:XX:XX:XX" • "XXXXXXXXXXXXXXXX" • "0xXXXXXXXXXXXXXXXX" When the Initiator object port_address property is queried, the value is always returned in a single output format. IQN and EUI formats are allowed for iSCSI initiators.
small-rd-bw	Small read bandwidth	Current bandwidth of small input/output operations, addressed at the snapshot
chap-authentication-initiator-user-name	CHAP authentication initiator user name	• User name by which the initiator is identified when connecting to the target • Valid for iSCSI ports when chap_authentication_mode is not disabled
ig-id	Initiator Group object ID	ID of the Initiator Group to which the initiator object belongs
acc-size-of-wr	Total cumulative write size	Accumulative capacity size (in KB) of write operations having occurred during initiator's lifespan
acc-num-of-small-rd	Accumulated number of small reads	Accumulated number of input/output operations for the initiator
unaligned-rd-iops	Unaligned read input/output per second	Current IOPS of unaligned input/output operations, addressed at the initiator

Output Parameter	Counter Definition	Description
chap-discovery-cluster-password	CHAP discovery cluster password	• Password by which the cluster identifies itself to any initiator during the discovery phase • At least 12 characters long • Valid only if `chap_discovery_mode = initiator_and_target` • Applicable for iSCSI only
chap-authentication-cluster-password	CHAP authentication cluster password	• Password by which the cluster identifies itself to any initiator during the initial connection of the initiator to the target • Valid only if `chap_discovery_mode = initiator_and_target` • Applicable for iSCSI only
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
unaligned-wr-iops	Unaligned write input/output per second	Current IOPS of unaligned input/output operations, addressed at the initiator
acc-num-of-unaligned-rd	Accumulated number of unaligned reads	Accumulated number input/output operations recursively contained by this initiator
small-wr-bw	Small write bandwidth	Current bandwidth of small input/output operations, addressed at the initiator
unaligned-iops	Unaligned input/output per second	Current IOPS of unaligned input/output operations, addressed at the initiator
unaligned-bw	Unaligned I/O bandwidth	Current bandwidth of unaligned input/output operations, addressed at the initiator
bw	Total realtime bandwidth	Total read and write bandwidth in MB per second
wr-iops	Total realtime write input/output per second	Total write realtime input/output operations per second

Output Parameter	Counter Definition	Description
avg-latency	Total realtime latency	Realtime average latency of read and write operations, in µs
rd-latency	Total realtime read latency	Realtime average latency of read operations, in µs
small-wr-iops	Small write input/output per second	Current IOPS of small input/output operations, addressed at the initiator
chap-authentication-cluster-user-name	CHAP authentication cluster user name	• User name by which the cluster identifies itself to any initiator during the initial connection of the initiator to the target • Valid only if `chap_discovery_mode = initiator_and_target` • Applicable for iSCSI only
small-bw	Small I/O bandwidth	Current bandwidth of small input/output operations, addressed at the initiator
acc-num-of-unaligned-wr	Accumulated number of unaligned writes	Accumulated number input/output operations recursively contained by this initiator
acc-num-of-wr	Total cumulative write IOs	Accumulative number of write operations having occurred during initiator's lifespan
initiator-id	Initiator object ID	Initiator object's ID
acc-size-of-rd	Total cumulative read size	Accumulative capacity size (in KB) of read operations having occurred during initiator's lifespan
unaligned-wr-bw	Unaligned write bandwidth	Current bandwidth of unaligned input/output operations, addressed at the initiator
small-rd-iops	Small read input/output per second	Current IOPS of small input/output operations, addressed at the initiator
initiator-conn-state	Initiator connection state	Indicates whether the initiator is currently connected to the cluster via at least one target port.

Output Parameter	Counter Definition	Description
rd-iops	Read input/output per second	Total read realtime input/output operations per second
wr-bw	Write bandwidth	Total write bandwidth in MB per second
port-type	Port type	Port type (Fibre Channel or iSCSI) and port's address

Example request by index

```
GET /api/json/types/initiators/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/initiators?name=lg505-fc1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "small-iops": "0",
        "wr-latency": "0",
        "chap-discovery-initiator-password": "",
        "obj-severity": "information",
        "rd-bw": "0",
        "unaligned-rd-bw": "0",
        "chap-discovery-initiator-user-name": "",
        "chap-discovery-cluster-user-name": "",
        "iops": "0",
        "num-of-conn-tars": 0,
        "acc-num-of-small-wr": "1382378651",
        "chap-authentication-initiator-password": "",
        "acc-num-of-rd": "3894",
        "index": 1,
        "port-address": "50:01:43:80:21:e3:d2:58",
        "small-rd-bw": "0",
        "chap-authentication-initiator-user-name": "",
        "ig-id": [
            "99e14ecc638545d794e65f181d81ed29",
            "FCqadefault",
            1
```

```
        ],
        "small-bw": "0",
        "acc-size-of-wr": "14607374656",
        "acc-num-of-small-rd": "3894",
        "unaligned-rd-iops": "0",
        "chap-discovery-cluster-password": "",
        "chap-authentication-cluster-password": "",
        "xms-id": [
            "cd059db5d8c34c879b2141df3c2d32e0",
            "xms",
            1
        ],
        "unaligned-wr-iops": "0",
        "acc-num-of-unaligned-rd": "3884",
        "small-wr-bw": "0",
        "unaligned-iops": "0",
        "unaligned-bw": "0",
        "bw": "0",
        "wr-iops": "0",
        "avg-latency": "0",
        "rd-latency": "0",
        "small-wr-iops": "0",
        "chap-authentication-cluster-user-name": "",
        "name": "lg280-fc1",
        "acc-num-of-unaligned-wr": "0",
        "acc-num-of-wr": "1382378651",
        "initiator-id": [
            "f68f107e24004f23bb7d7f7e1023662d",
            "lg280-fc1",
            1
        ],
        "acc-size-of-rd": "15696",
        "unaligned-wr-bw": "0",
        "small-rd-iops": "0",
        "initiator-conn-state": "disconnected",
        "rd-iops": "0",
        "wr-bw": "0",
        "port-type": "fc"
    },
    "links": [
        {
            "href": "https://vxms-
xbrick65/api/json/types/initiators/1",
            "rel": "self"
        }
    ]
}
```

Adding an Initiator

POST /api/json/types/initiators

This command (POST /api/json/types/initiators) enables you to add a new initiator and associate it with an existing Initiator Group.

Input Parameter	Description	Mandatory *
• ig-id OR • ig-name	Volume's name or index number	Yes
initiator-name	Initiator's name	One from Group 1

port-address	Initiator's port address
	The following rules apply:
	• For FC initiators, any of the following formats are accepted ('X' is a hexadecimal digit – uppercase and lower case are allowed):
	  • XX:XX:XX:XX:XX:XX:XX:XX
	  • XXXXXXXXXXXXXXXX
	  • 0xXXXXXXXXXXXXXXXX
	• For iSCSI initiators, IQN and EUI formats are accepted.
	• Two initiators cannot share the same port address.
	• You cannot specify an FC address for an iSCSI target and vice-versa.
		One from Group 1

initiator-authentication-password	CHAP authentication password	One from Group 1
initiator-authentication-user-name	CHAP authentication user name	One from Group 1
initiator-discovery-password	CHAP discovery password	One from Group 1

*) Group 1: [' initiator-name', 'port-address', initiator-authentication-password', ' initiator-authentication-user-name, ' initiator-discovery-password', 'initiator-discovery-user-name', 'remove-chap-discovery-credentials']

Input Parameter	Description	Mandatory *
initiator-discovery-user-name	CHAP discovery user name	One from Group 1
remove-chap-discovery-credentials	Remove discovery credentials.	One from Group 1

Example request

```
POST /api/json/types/initiators HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"ig-id":2, "initiator-name":"lg0004-fc1", "port-
address":"50:01:43:80:24:21:df:ab"}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/initiators/3",
            "rel": "self"
        }
    ]
}
```

Modifying an Initiator

PUT /api/json/types/initiators/<parameter (initiator-id or ?name=initiator-name)>

This command (PUT /api/json/types/initiators/<parameter [initiator-id or ?name=initiator-name]>) enables you to modify an initiator.

Input Parameter	Description	Mandatory*
• initiator-id OR • initiator-name	Initiator's name, new name or index number	Yes
initiator-name	Initiator's new name	One from Group 1
initiator-authentication-password	CHAP authentication password	One from Group 1
initiator-authentication-user-name	CHAP authentication user name	One from Group 1
initiator-discovery-password	CHAP discovery password	One from Group 1
initiator-discovery-user-name	CHAP discovery user name	One from Group 1
remove-chap-discovery-credentials	Remove discovery credentials.	One from Group 1
remove-chap-authentication-credentials	Remove credentials of disabled or revoked user.	One from Group 1

*) Group 1: [' initiator-name', 'port-address', initiator-authentication-password', ' initiator-authentication-user-name, ' initiator-discovery-password', 'initiator-discovery-user-name', 'remove-chap-discovery-credentials' .'remove-chap-authentication-credentials']

Example request by index

```
PUT /api/json/types/initiators/1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache

{"initiator-name":"ig1"}
```

Example request by name

```
PUT /api/json/types/initiators/?name=ig2 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache

{"initiator-name":"ig1"}
```

Response

```
200 OK
```

Removing an Initiator

DELETE /api/json/types/initiators/<parameter (initiator-id or ?name=initiator-grp-name)>

This command (DELETE /api/json/types/initiators/<parameter [initiator-id or ?name=initiator-grp-name]>) enables you to remove an initiator.

Input Parameter	Description	Mandatory
• initiator-id OR • initiator-name	Initiator's name or index number	Yes

Example request by index

```
DELETE /api/json/types/initiators/1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Example request by name

```
DELETE /api/json/types/initiators/?name=i-1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
200 OK
```

Initiator Groups

Viewing the Initiator Groups List

GET /api/json/types/initiator-groups

This command (GET /api/json/types/initiator-groups) displays the list of all Initiator Groups.

Example request

```
GET /api/json/types/initiator-groups HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "initiator-groups": [
        {
            "href": "https://vxms-xbrick267/api/json/types/initiator-
groups/1",
            "name": "FCqadefault"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/initiator-
groups/2",
            "name": "testIG"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/initiator-
groups/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of an Initiator Group

GET /api/json/types/initiator-groups/<parameter (ini-grp-id or ?name=ini-grp-name)>

This command (GET /api/json/types/initiator-groups/<parameter [ini-grp-id or ?name=ini-grp-name]>) displays the name and index number of the selected Initiator Group.

Input Parameter	Description	Mandatory
• ini-grp-id OR • ini-grp-name	Initiator Group's name or index number	Yes

Output Parameter	Counter Definition	Description
name	Name	Initiator Group's name as defined by the user when creating the group
index	ID	Initiator Group's index ID as defined by XMS upon its creation; a unique positive number
small-iops	Small input/output per second	Current IOPS of small input/output operations, addressed at the Initiator Group
num-of-initiators	Number of initiators	The number of initiators belonging to this Initiator Group
obj-severity	Object severity	Initiator Group's severity based on severity level of current alerts (alerts still uncleared) for that Initiator Group and its contained objects or members
rd-bw	Total realtime read bandwidth	Total realtime read bandwidth in MB per second
unaligned-rd-bw	Unaligned read bandwidth	Current bandwidth of unaligned input/output operations
iops	Input/output per second	Initiator Group's total read and write realtime input/output operations per second

Output Parameter	Counter Definition	Description
acc-num-of-small-wr	Accumulated number of small writes	Accumulated number input/output operations that are recursively contained by this Initiator Group
acc-num-of-rd	Total cumulative read IOs	Total accumulative number of read operations having occurred during volume's lifespan
small-rd-bw	Small read bandwidth	Current bandwidth of small input/output operations, addressed at the Initiator Group
ig-id	Initiator Group object ID	The ID of the Initiator Group to which the initiator object belongs
acc-size-of-wr	Total cumulative write size	Accumulative capacity size (in KB) of write operations having occurred during Initiator Group's lifespan
acc-num-of-small-rd	Accumulated number of small reads	Accumulated number input/output operations for the Initiator Group
unaligned-rd-iops	Unaligned read Input/output per second	Current IOPS of unaligned input/output operations, addressed at the Initiator Group
num-of-vols	Cluster's total provisioned volumes	Number of volumes in the Initiator Group
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
unaligned-wr-iops	Unaligned write input/output per second	Current IOPS of unaligned input/output operations, addressed at the Initiator Group
acc-num-of-unaligned-rd	Accumulated number of unaligned reads	Accumulated number of input/output operations that are recursively contained by this Initiator Group
small-wr-bw	Small write bandwidth	Current bandwidth of small input/output operations, addressed at the Initiator Group

Output Parameter	Counter Definition	Description
unaligned-iops	Unaligned input/output per second	Current IOPS of unaligned input/output operations, addressed at the Initiator Group
unaligned-bw	Unaligned I/O bandwidth	Current bandwidth of unaligned input/output operations, addressed at the Initiator Group
small-rd-iops	Small read input/output per second	Current small IOPS of input/output operations, addressed at the Initiator Group
wr-iops	Total realtime write input/output per second	Total write realtime input/output operations per second
small-wr-iops	Small write input/output per second	Current small IOPS of input/output operations, addressed at the Initiator Group
small-bw	Small I/O bandwidth	Current bandwidth of small input/output operations, addressed at the Initiator Group
acc-num-of-unaligned-wr	Accumulated number of unaligned writes	Accumulated number input/output operations recursively contained by this Initiator Group
acc-num-of-wr	Total cumulative write IOs	Accumulative number of write operations having occurred during Initiator Group's lifespan
acc-size-of-rd	Total cumulative read size	Accumulative capacity size (in KB) of read operations having occurred during Initiator Group's lifespan
unaligned-wr-bw	Unaligned write bandwidth	Current bandwidth of unaligned input/output operations, addressed at the Initiator Group
bw	Total realtime bandwidth	Total read and write bandwidth in MB per second
rd-iops	Read input/output per second	Total read realtime input/output operations per second
wr-bw	Write bandwidth	Total write bandwidth in MB per second

Example request by index

```
GET /api/json/types/initiator-groups/2 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/initiator-groups/?name=testIG HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "small-iops": "0",
        "num-of-initiators": 0,
        "obj-severity": "information",
        "rd-bw": "0",
        "unaligned-rd-bw": "0",
        "iops": "0",
        "acc-num-of-small-wr": "0",
        "acc-num-of-rd": "0",
        "index": 2,
        "small-rd-bw": "0",
        "ig-id": [
            "00e2a2068dd84a4ba7963b131e2f8adc",
            "testIG",
            2
        ],
        "acc-size-of-wr": "0",
        "acc-num-of-small-rd": "0",
        "unaligned-rd-iops": "0",
        "num-of-vols": 0,
        "xms-id": [
            "8954c663826a43ccbd0bc50ed0ae1c64",
            "xms",
            1
        ],
        "unaligned-wr-iops": "0",
        "acc-num-of-unaligned-rd": "0",
        "small-wr-bw": "0",
        "unaligned-iops": "0",
        "unaligned-bw": "0",
        "small-rd-iops": "0",
        "wr-iops": "0",
```

```
        "small-wr-iops": "0",
        "small-bw": "0",
        "name": "testIG",
        "acc-num-of-unaligned-wr": "0",
        "acc-num-of-wr": "0",
        "acc-size-of-rd": "0",
        "unaligned-wr-bw": "0",
        "bw": "0",
        "rd-iops": "0",
        "wr-bw": "0"
    },
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/initiator-
groups/2",
            "rel": "self"
        }
    ]
}
```

Adding an Initiator Group

POST /api/json/types/initiator-groups

This command (POST /api/json/types/initiator-groups) enables you to add an Initiator Group and its initiators to the XtremIO cluster.

Input Parameter	Description	Mandatory
• ig-id OR • ig-name	Initiator Group's name or index number	Yes
initiator-list	Initiator name and port address for each initiator to be added to the group	No
parent-folder-id	Initiator Group's parent folder	No

Example request

```
POST /api/json/types/initiator-groups HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"ig-name":"itg", "parent-folder-id":1}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/initiator-
groups/2",
            "rel": "self"
        }
    ]
}
```

Renaming an Initiator Group

PUT /api/json/types/initiator-groups/<parameter (ini-grp-index or ?name=ini-grp- name)>

This command (PUT /api/json/types/initiator-groups/< parameter [ini-grp-index or ?name=ini-grp- name]>) enables you to rename an Initiator Group.

Input Parameter	Description	Mandatory
• ig-index OR • ig-name	Initiator Group's current name or index number	Yes
initiator-group-name	Initiator Group's new name	Yes

Example request by index

```
PUT /api/json/types/initiator-groups/1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache

{"initiator-group-name":"ig100"}
```

Example request by name

```
PUT /api/json/types/initiator-groups/?name=ig1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache

{"initiator-group-name":"ig100"}
```

Response

```
200 OK
```

Removing an Initiator Group

DELETE /api/json/types/initiator-groups/<parameter (ini-grp-id or ?name=ini-grp-name)>

This command (DELETE /api/json/types/initiator-groups/<parameter [ini-grp-id or ?name=ini-grp-name]>) enables you to remove an Initiator Group and its associated initiators.

Input Parameter	Description	Mandatory
• ini-grp-id OR • ini-grp-name	Initiator Group's name or index number	Yes

Example request by index

```
DELETE /api/json/types/initiator-groups/2 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Example request by name

```
DELETE /api/json/types/initiator-groups/?name=ig2 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
200 OK
```

Initiator Group Folders

Viewing the List of Initiator Group Folders

GET /api/json/types/ig-folders

This command (GET /api/json/types/ig-folders) displays the list of Initiator Group folders.

Example request

```
GET /api/json/types/ig-folders HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
{
    "folders": [
        {
            "href": "https://vxms-xbrick267/api/json/types/ig-
folders/1",
            "name": "/"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ig-
folders/3",
            "name": "/Exchange"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ig-
folders/2",
            "name": "/RAC_Cluster"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ig-
folders/4",
            "name": "/Test"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/ig-
folders/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of an Initiator Group Folder

GET /api/json/types/ig-folders/<parameter (folder-ig-id or ?name=folder-ig-name)>

This command (GET /api/json/types/initiator-groups-folders/< parameter [folder-group-id or ?name=folder-group-name]>) displays details of the selected Initiator Group folder.

Input Parameter	Description	Mandatory
• folder-ig-id OR • folder-ig-name	Initiator Groups folder's name or index number	Yes

Output Parameter	Counter Definition	Description
name	Name	Initiator Group folder's name as defined by the user when creating the group
index	ID	Initiator Group folder's index ID as defined by XMS upon its creation; a unique positive number
small-iops	Small input/output per second	Current small IOPS of input/output operations, addressed at the Initiator Group folder
obj-severity	Object severity	Initiator Groups folder's severity based on severity level of current alerts (alerts still uncleared) for that Initiator Group folder and its contained objects or members.
rd-bw	Total realtime read bandwidth	Total read bandwidth in MB per second
unaligned-rd-bw	Unaligned read bandwidth	Current bandwidth of unaligned input/output operations, addressed at the Initiator Group folder

Output Parameter	Counter Definition	Description
iops	Input/output per second	Initiator Group folder's total read and write realtime input/output operations per second
acc-num-of-small-wr	Accumulated number of small writes	Accumulated number of input/output operations recursively contained by this Initiator Group folder
parent-folder-id	Parent folder object ID	ID of the folder containing this folder; `null` for a root folder
acc-num-of-rd	Total cumulative read IOs	Total accumulative number of read operations having occurred during Initiator Group folder's lifespan
small-rd-bw	Small read bandwidth	Current bandwidth of small input/output operations, addressed at the Initiator Group folder
num-of-direct-objs	Number of direct objects	Initiator Group folder's number of directly contained volumes
acc-size-of-wr	Total cumulative write size	Accumulative capacity size (in KB) of write operations having occurred during Initiator Group folder's lifespan
num-of-subfolders	Number of subfolders	This folder's number of directly contained folders. Must be subfolder of an Initiator Group folder.
acc-num-of-small-rd	Accumulated number of small reads	Accumulated number of input/output operations for the Initiator Group folder
unaligned-rd-iops	Unaligned read input/output per second	Current IOPS of unaligned input/output operations, addressed at the Initiator Group folder
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number

Output Parameter	Counter Definition	Description
subfolder-list	Subfolder list	The number of folders directly contained by this Initiator Group folder, and list of their object IDs
unaligned-wr-iops	Unaligned write input/output per second	Current IOPS of unaligned input/output operations, addressed at the Initiator Group folder
acc-num-of-unaligned-rd	Accumulated number of unaligned reads	Accumulated number of input/output operations recursively contained by this Initiator Group folder
folder-id	Folder's name or index number	Initiator Group's folder's name or index number
small-wr-bw	Small write bandwidth	Current bandwidth of small input/output operations, addressed at the Initiator Group folder
unaligned-iops	Unaligned input/output per second	Current IOPS of unaligned input/output operations, addressed at the Initiator Group folder
unaligned-bw	Unaligned I/O bandwidth	Current bandwidth of unaligned input/output operations, addressed at the Initiator Group folder
bw	Total realtime bandwidth	Total read and write bandwidth in MB per second
wr-iops	Initiator Group's total realtime write input/output per second	Total write realtime input/output operations per second
direct-list	Direct object list	The number of volumes directly contained by this Initiator Group folder
small-wr-iops	Small write input/output per second	Current IOPS of small input/output operations, addressed at the Initiator Group folder

Output Parameter	Counter Definition	Description
rd-iops	Cluster's read input/output per second	Total read realtime input/output operations per second
acc-num-of-unaligned-wr	Accumulated number of unaligned writes	Accumulated number of input/output operations recursively contained by this Initiator Group folder
acc-num-of-wr	Initiator Group's total cumulative write IOs	Accumulative number of write operations having occurred during Initiator Group's lifespan
acc-size-of-rd	Total cumulative read size	Accumulative capacity size (in KB) of read operations having occurred during Initiator Group's lifespan
caption	Initiator Group's actual name	Initiator Group's actual name (not the full path of the folder)
unaligned-wr-bw	Unaligned write bandwidth	Current bandwidth of unaligned input/output operations, addressed at the Initiator Group folder
small-rd-iops	Small read input/output per second	Current IOPS of small input/output operations, addressed at the Initiator Group folder
small-bw	Small I/O bandwidth	Current bandwidth of small input/output operations, addressed at the Initiator Group folder
wr-bw	Initiator Group's write bandwidth	Total write bandwidth in MB per second

Example request by index

```
GET /api/json/types/ig-folders/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/ig-folders/?name=/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "small-iops": "0",
        "obj-severity": "information",
        "rd-bw": "0",
        "unaligned-rd-bw": "0",
        "iops": "0",
        "acc-num-of-small-wr": "1779928958",
        "parent-folder-id": [],
        "acc-num-of-rd": "147348399",
        "index": 1,
        "small-rd-bw": "0",
        "num-of-direct-objs": 1,
        "acc-size-of-wr": "32965002008",
        "num-of-subfolders": 0,
        "acc-num-of-small-rd": "147348399",
        "unaligned-rd-iops": "0",
        "xms-id": [
            "0c2e6400d23e4b8caec944a8b6382822",
            "xms",
            1
        ],
        "subfolder-list": [],
        "unaligned-wr-iops": "0",
        "acc-num-of-unaligned-rd": "56149",
        "folder-id": [
            "89b1819c3cc14ac5a5302b87049f563f",
            "/",
            1
        ],
        "small-wr-bw": "0",
        "unaligned-iops": "0",
        "unaligned-bw": "0",
        "bw": "0",
```

```
        "wr-iops": "0",
        "direct-list": [
            [
                "502c0472e4054e55b7bae0248b67a0a6",
                "FCqadefault",
                1
            ]
        ],
        "small-wr-iops": "0",
        "rd-iops": "0",
        "name": "/",
        "acc-num-of-unaligned-wr": "0",
        "acc-num-of-wr": "1779928958",
        "acc-size-of-rd": "1688596044",
        "caption": "/",
        "unaligned-wr-bw": "0",
        "small-rd-iops": "0",
        "small-bw": "0",
        "wr-bw": "0"
    },
    "links": [
        {
            "href": "https://vxms-xbrick238/api/json/types/ig-
folders/1",
            "rel": "self"
        }
    ]
}
```

Adding an Initiator Group Folder

POST /api/json/types/ig-folders

This command (POST /api/json/types/ig-folders) enables you to add an Initiator Group folder to the XtremIO cluster.

Input Parameter	Description	Mandatory
• parent-folder-id OR • parent-folder-name	Parent folder's name or ID ('1' is the default value for the first folder)	Yes
caption	Folder's actual name (not the folder's full path)	Yes

Example request

```
POST /api/json/types/ig-folders/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"caption":"RAC", "parent-folder-id":"/"}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/ig-
folders/4",
            "rel": "self"
        }
    ]
}
```

Renaming an Initiator Group Folder

PUT /api/json/types/ig-folders/<parameter (parent-folder-id or ?name=folder-name)>

This command (PUT /api/json/types/ig-folders/<parameter [parent-folder-id or ?name=folder-name] >) enables you to rename the selected Initiator Group folder.

Input Parameter	Description	Mandatory
• parent-folder-id OR • parent-folder-name	Parent folder's name or ID	Yes
new-caption	New folder's actual name (not the folder's full path)	Yes

Example request by index

```
PUT /api/json/types/ig-folders/5 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"new-caption":"Rack_test_1"}
```

Example request by name

```
PUT /api/json/types/initiator-groups-folders/?name=Rack_test HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"new-caption":"Rack_test_1"}
```

Response

```
200 OK
```

Removing an Initiator Group Folder

DELETE /api/json/types/ig-folders/<parameter (ig-folder-id or ?name=ig-folder-name)>

This command (DELETE /api/json/types/ig-folders/< parameter [ig-id or ?name=ig-folder-name]>) enables you to remove an initiator-group folder.

Input Parameter	Description	Mandatory
• ig-folder-id OR • ig-folder-name	Initiator Group folder's name or index number	Yes

Example request by index

```
DELETE /api/json/types/ig-folders/3 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
DELETE /api/json/types/ig-folders/?name=/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
200 OK
```

Targets

Viewing the Targets List

GET /api/json/types/targets

This command (GET /api/json/types/targets) displays the list of all targets and their properties.

Example request

```
GET /api/json/types/targets HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "targets": [
        {
            "href": "https://vxms-
xbrick267/api/json/types/targets/11",
            "name": "X1-SC2-fc1"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/targets/12",
            "name": "X1-SC2-fc2"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/targets/15",
            "name": "X1-SC2-iscsi1"
        },
        {
            "href": "https://vxms-
xbrick267/api/json/types/targets/16",
            "name": "X1-SC2-iscsi2"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/targets/1",
            "name": "X1-SC1-fc1"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/targets/2",
            "name": "X1-SC1-fc2"
        },
        {
```

```
            "href": "https://vxms-xbrick267/api/json/types/targets/5",
            "name": "X1-SC1-iscsi1"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/targets/6",
            "name": "X1-SC1-iscsi2"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/targets/",
            "rel": "self"
        }
    ]
}
```

Viewing the details of a Target

GET /api/json/types/targets/<parameter (target-id or ?name=target-name)>

This command (GET /api/json/types/targets/<parameter [target-id or ?name=target-name]>) displays details of the selected target.

Input Parameter	Description	Mandatory
• target-id OR • target-name	Target's name or index number	Yes

Output Parameter	Counter Definition	Description
name	Name	Target's name as defined by the user when creating the target
index	ID	Target's index ID as defined by XMS upon its creation; a unique positive number
small-iops	Small input/output per second	Current IOPS of small input/output operations, addressed at the Initiator Group
wr-latency	Target's total realtime write latency	Realtime average latency of write operations, in µs
port-state	Port state	State of the target port (Fibre Channel or iSCSI)
obj-severity	Object severity	Target's severity based on severity level of current alerts (alerts still uncleared) for that target and its contained objects or members
rd-bw	Total realtime read bandwidth	Total read bandwidth in MB per second
unaligned-rd-bw	Unaligned read bandwidth	Current bandwidth of unaligned input/output operations, addressed at the target
driver-version	Driver version	Driver version of the target object

Output Parameter	Counter Definition	Description
fc-dumped-frames	Fibre Channel dumped frames	Fibre Channel ports diagnostic counter. Impacts the `port_health_level`.
iops	Input/output per second	Target's total read and write realtime input/output operations per second
small-wr-iops	Small write input/output per second	Current IOPS of small input/output operations, addressed at the target
acc-num-of-small-wr	Accumulated number of small writes	Accumulated number input/output operations recursively held by this target
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
fc-loss-of-signal-count	Fibre Channel loss of signal count	Fibre Channel ports diagnostic counter. Impacts the `port_health_level`.
acc-num-of-rd	Total cumulative read IOs	Total accumulative number of read operations having occurred during target's lifespan
port-address	Port address	The following input format variations are accepted for Fibre Channel initiators ("X" is a hexadecimal digit – uppercase or lower case are allowed): • "`XX:XX:XX:XX:XX:XX:XX`" • "`XXXXXXXXXXXXXXXX`" • "`0xXXXXXXXXXXXXXXXX`" When the Initiator object `port_address` property is queried, the value is always returned in a single output format. IQN and EUI formats are allowed for iSCSI initiators.
small-rd-bw	Small read bandwidth	Current bandwidth of small input/output operations, addressed at the target

Output Parameter	Counter Definition	Description
port-health-level	Target health level	• When any of the port diagnosis properties get an unexpected value (i.e. a counter is non-0 or if the port is removed from the system) • The highest severity for all the properties that contribute to port health level Note: Since any non-zero value is an error, no mechanism is used to indicate the threshold, or which counter is out of range.
fc-loss-of-sync-count	Fibre Channel loss of sync count	Fibre Channel ports diagnostic counter. Impacts the `port_health_level`.
acc-size-of-wr	Total cumulative write size	Accumulative capacity size (in KB) of write operations having occurred during target's lifespan.
acc-num-of-small-rd	Accumulated number of small reads	Accumulated number input/output operations for the target
unaligned-rd-iops	Unaligned read input/output per second	Current IOPS of unaligned input/output operations, addressed at the target
fc-invalid-crc-count	Fibre Channel invalid crc count	Fibre Channel ports diagnostic counter. Impacts the `port_health_level`.

Output Parameter	Counter Definition	Description
portal-list	Portal list	• List of all portals (VLAN, IP, Port) associated with target. • Relevant only for iSCSI ports. • List is `null` for Fibre Channel ports. • For iSCSI ports, when empty, the port does not accept iSCSI traffic. • When the cluster is initialized, list shows no targets (there are no non-empty default values to eliminate IP conflict risks). • Implementation forces a limit upon the maximum number of target portals. • XMS and managed clusters enforce the uniqueness of all the exposed IP addresses.
tar-error-reason	Target error reason	Failure type that causes the target's `target_health_state` to not be `clear`.
unaligned-wr-iops	Unaligned write input/output per second	Current IOPS of unaligned input/output operations, addressed at the target
acc-num-of-unaligned-rd	Accumulated number of unaligned reads	Accumulated number of input/output operations recursively contained by this target
small-wr-bw	Small write bandwidth	Current bandwidth of small input/output operations, addressed at the target
unaligned-iops	Unaligned input/output per second	Current IOPS of unaligned input/output operations, addressed at the target

Output Parameter	Counter Definition	Description
tar-id	Target's name or the index number	Target's name or the index number
unaligned-bw	Unaligned I/O bandwidth	Current bandwidth of unaligned input/output operations, addressed at the target
bw	Total realtime bandwidth	Total read and write bandwidth in MB per second
fw-version	Freeware version	Currnet version of freeware
tg-id	Target group object ID	ID of the Target Group this target object belongs to, if any (and NULL otherwise).
wr-iops	Total realtime write input/output per second	Total write realtime input/output operations per second
port-speed	Port speed	The negotiated speed of the port (some applicable for Ethernet and some for Fibre Channel)
avg-latency	Total realtime latency	Realtime average latency of read and write operations, in µs
rd-latency	Total realtime read latency	Realtime average latency of read operations, in µs
fc-prim-seq-prot-err-count	Fibre Channel prim seq prot err count	Fibre Channel ports diagnostic counter. Impacts the `port_health_level`.
small-bw	Small I/O bandwidth	Current bandwidth of small input/output operations, addressed at the target
acc-num-of-unaligned-wr	Accumulated number of unaligned writes	Accumulated number of input/output operations recursively contained by this target
brick-id	X-Brick's index number	X-Brick's index number
acc-num-of-wr	Initiator Group's total cumulative write IOs	Accumulative number of write operations having occurred during target's lifespan

Output Parameter	Counter Definition	Description
mtu	Maximum transmission unit	Maximum valid values for maximum transmission unit sizes are 1500 for non-jumbo are enabled and 9216 when jumbo frames are enabled for iSCSI targets.
acc-size-of-rd	Total cumulative read size	Accumulative capacity size (in KB) of read operations having occurred during target's lifespan
unaligned-wr-bw	Unaligned write bandwidth	Current bandwidth of unaligned input/output operation, addressed at the target
small-rd-iops	Small read input/output per second	Current IOPS of small input/output operations, addressed at the target
fc-link-failure-count	Fibre Channel link failure count	Fibre Channel ports diagnostic counter. Impacts the `port_health_level`.
port-index	Port index	• The port number for both Fibre Channel and iSCSI • Value will be either 1 or 2 • Assigned by discovery
jumbo-enabled	Jumbo enabled	• Determines whether jumbo frames are supported for this target. • The default value is `false`. • Property is computed based on the MTU value.
rd-iops	Read input/output per second	Total read realtime input/output operations per second
wr-bw	Write bandwidth	Total write bandwidth in MB per second
node-id	Storage Controller object ID	Storage Controller's ID
port-type	Port type	Port type (Fibre Channel or iSCSI) and port's address

Example request by index

```
GET /api/json/types/targets/11 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/targets/?name=X1-SC2-fc1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "small-iops": "0",
        "wr-latency": "0",
        "port-state": "up",
        "obj-severity": "information",
        "rd-bw": "0",
        "unaligned-rd-bw": "0",
        "driver-version": "v8.02.01-k4-tgt",
        "fc-dumped-frames": "0",
        "iops": "0",
        "small-wr-iops": "0",
        "acc-num-of-small-wr": "1398003339",
        "xms-id": [
            "cd059db5d8c34c879b2141df3c2d32e0",
            "xms",
            1
        ],
        "fc-loss-of-signal-count": "0",
        "acc-num-of-rd": "3871",
        "index": 11,
        "port-address": "50:01:43:80:21:e1:93:dc",
        "small-rd-bw": "0",
        "port-health-level": "level_1_clear",
        "fc-loss-of-sync-count": "0",
        "acc-size-of-wr": "14725167000",
        "acc-num-of-small-rd": "3871",
        "unaligned-rd-iops": "0",
        "fc-invalid-crc-count": "0",
        "portal-list": [],
        "tar-error-reason": "none",
        "unaligned-wr-iops": "0",
        "acc-num-of-unaligned-rd": "3841",
        "small-wr-bw": "0",
        "unaligned-iops": "0",
        "tar-id": [
```

```
            "1a296d3437d64e3aa05a36afb27c2d8a",
            "X1-SC2-fc1",
            11
        ],
        "unaligned-bw": "0",
        "bw": "0",
        "fw-version": "v5.08.01",
        "tg-id": [
            "e82c0cc7573f4d93acc3066ab8e9a17a",
            "Default",
            1
        ],
        "wr-iops": "0",
        "port-speed": "8GFC",
        "avg-latency": "0",
        "rd-latency": "0",
        "fc-prim-seq-prot-err-count": "0",
        "small-bw": "0",
        "name": "X1-SC2-fc1",
        "acc-num-of-unaligned-wr": "0",
        "brick-id": [
            "f6762de0091f4a199d190e78996ce781",
            "X1",
            1
        ],
        "acc-num-of-wr": "1398003339",
        "mtu": 1500,
        "acc-size-of-rd": "15844",
        "unaligned-wr-bw": "0",
        "small-rd-iops": "0",
        "fc-link-failure-count": "0",
        "port-index": 1,
        "jumbo-enabled": false,
        "rd-iops": "0",
        "wr-bw": "0",
        "node-id": [
            "bf7d9ee2b8a7450da7b2074eb938986f",
            "X1-SC2",
            2
        ],
        "port-type": "fc"
    },
    "links": [
        {
            "href": "https://vxms-xbrick65/api/json/types/targets/11",
            "rel": "self"
        }
    ]
}
```

Target Groups

Viewing the List of Target Groups

GET /api/json/types/target-groups

This command (GET /api/json/types/target-groups) displays the list of all Target Groups.

Example request

```
GET /api/json/types/target-groups HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "target-groups": [
        {
            "href": "https://vxms-xbrick267/api/json/types/target-
groups/1",
            "name": "Default"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/target-
groups/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of a Target Group

GET /api/json/types/target-groups/<parameter (tg-id or ?name=tg-name)>

This command (GET /api/json/types/target-groups/< parameter [tg-id or ?name=tg-name]>) displays details of the selected Target Group.

Input Parameter	Description	Mandatory
• tg-id OR • tg-name	Target group's name or Index number	Yes

Output Parameter	Counter Definition	Description
name	Name	Target group 's name as defined by the user when creating the group
index	Index number	Target Group 's index ID as defined by XMS upon its creation; a unique positive number
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
obj-severity	Object severity	Target Group's severity based on severity level of current alerts (alerts still uncleared) for that Target Group and its contained objects or members
tg-id	Target group object ID	ID of the Target Group this target object belongs to, if any (and NULL otherwise)
sys-id	Cluster's name or index number	Cluster's name or index number

Example request by index

```
GET /api/json/types/target-groups/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/target-groups/?name=Default HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "index": 1,
        "xms-id": [
            "0c2e6400d23e4b8caec944a8b6382822",
            "xms",
            1
        ],
        "name": "Default",
        "obj-severity": "information",
        "tg-id": [
            "77f7749dd90b4d6185b423d863284577",
            "Default",
            1
        ],
        "sys-id": [
            "ec7e3ab932474bc6b3e1fbf6fc7cc26b",
            "xbrick238",
            1
        ]
    },
    "links": [
        {
            "href": "https://vxms-xbrick238/api/json/types/target-
groups/1",
            "rel": "self"
        }
    ]
}
```

iSCSI Portals and Routes

Viewing the List of iSCSI Portals

GET /api/json/types/iscsi-portals

This command (GET /api/json/types/iscsi-portals) displays the list of all iSCSI portals and their properties.

Example request

```
GET /api/json/types/iscsi-portals HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "iscsi-portals": [
        {
            "href": "https://vxms-xbrick267/api/json/types/iscsi-
portals/1",
            "name": "10.205.38.16/16"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/iscsi-
portals/2",
            "name": "10.206.38.6/16"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/iscsi-
portals/",
            "rel": "self"
        }
    ]
}
```

Viewing the List of iSCSI Routes

GET /api/json/types/iscsi-routes

This command (GET /api/json/types/iscsi-routes) displays the list of all iSCSI routes and their properties.

Example request

```
GET /api/json/types/iscsi-routes HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "iscsi-routes": [],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/iscsi-
routes/",
            "rel": "self"
        }
    ]
}
```

Viewing a Specific iSCSI Route

GET /api/json/types/iscsi-routes/<parameter (route-id or ?name=route-name)>

This command (GET /api/json/types/iscsi-routes/< parameter [route-id or ?name=route-name]>) displays a specific iSCSI route and its properties.

Input Parameter	Description	Mandatory
• route-id OR • route-name	iSCSI route's name or index number	Yes

Output Parameter	Counter Definition	Description
name	Name	iSCSI route's name as defined by the user when creating the group
index	Index number	iSCSI route's index ID as defined by XMS upon its creation; a unique positive number
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
obj-severity	Object severity	iSCSI route's severity based on severity level of current alerts (alerts still uncleared) for that iSCSI route and its contained objects or members accordingly

Example request by index

```
GET /api/json/types/iscsi-routes/1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/iscsi-routes/?name=route1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
{
    "content": {
        "index": 1,
        "xms-id": [
            "0c2e6400d23e4b8caec944a8b6382822",
            "xms",
            1
        ],
        "name": "RiSCSI",
        "obj-severity": "information"
    },
    "links": [
        {
            "href": "https://vxms-xbrick238/api/json/types/iscsi-
routes/1",
            "rel": "self"
        }
    ]
}
```

Viewing a Specific iSCSI Portal

GET /api/json/types/iscsi-portals/<parameter (iscsi-portal-id or ?name=iscsi-name)>

This command (GET /api/json/types/iscsi-portals/< parameter [iscsi-portal-id or ?name=iscsi-name]>) displays a specific iSCSI portal and its properties.

Input Parameter	Description	Mandatory
• iscsi-portal-id OR • iscsi-portal-name	iSCSI portal name or ID number of target port to be viewed	Yes

Output Parameter	Counter Definition	Description
name	Name	iSCSI portal's name as defined by the XMS when creating the index
index	ID	iSCSI portal's index ID as defined by XMS upon its creation; a unique positive number
port-address	Port address	The following input format variations are accepted for iSCSI portal initiators ('X' is a hexadecimal digit – uppercase or lower case are allowed): • "XX:XX:XX:XX:XX:XX:XX:XX" • "XXXXXXXXXXXXXXXX" • "0xXXXXXXXXXXXXXXXX" When the Initiator object port_address property is queried, the value is always returned in a single output format. IQN and EUI formats are allowed for iSCSI initiators.
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number

Output Parameter	Counter Definition	Description
obj-severity	Object severity	iSCSI portal's severity based on severity level of current alerts (alerts still uncleared) for that iSCSI portal and its contained objects or members
certainty	Certainty	Indicates confidence that the XMS is synchronized with the cluster. The value changes from `ok` if the XMS sends a request to the cluster and is unable to determine the request 's success.
vlan	VLAN	The portal information. If not in use, VLAN is 0.
tar-id	Target's name or the index number	Target's name or the index number
ip-port	IP port	Display of global `iscsi_tcp_port` property
ip-addr	Target port's IP address (cannot be used for another portal)	iSCSI portal's IP address (cannot be used for another portal)

Example request by index

```
GET /api/json/types/iscsi-portals/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/iscsi-portals/?name=10.206.38.6/16 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "index": 1,
        "port-address": "iqn.2008-05.com.xtremio:001e675ae630",
        "xms-id": [
            "0c2e6400d23e4b8caec944a8b6382822",
            "xms",
            1
        ],
        "name": "10.20.30.40/16",
        "obj-severity": "information",
        "certainty": "ok",
        "vlan": 0,
        "tar-id": [
            "3ca5186bbb064eac86c6aee9b0b06b2e",
            "X1-SC1-iscsi1",
            5
        ],
        "ip-port": 3260,
        "ip-addr": "10.20.30.40/16",
        "guid": "9b7d88fc9e334662a8292881ee648473"
    },
    "links": [
        {
            "href": "https://vxms-xbrick238/api/json/types/iscsi-
portals/1",
            "rel": "self"
        }
    ]
}
```

Adding an iSCSI Route

POST /api/json/types/iscsi-routes

This command (POST /api/json/types/iscsi-routes) enables you to create an iSCSI route.

Input Parameter	Description	Mandatory
destination-subnet	Destination network and subnet noted as IP Address/subnet bits	Yes
gateway	Gateway's IP address	Yes
iscsi-route-name	iSCSI's route name	No

Example request

```
POST /api/json/types/iscsi-routes/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"destination-subnet":"255.255.0.0/17", "gateway":"192.168.10.254"}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/iscsi-
routes/2",
            "rel": "self"
        }
    ]
}
```

Adding an iSCSI Portal

POST /api/json/types/iscsi-portals

This command (POST /api/json/types/iscsi-portals) enables you to map a portal (which is a combination of an IP address and an IP port) to a target.

This allows the target port to accept iSCSI traffic via the portal.

Input Parameter	Description	Mandatory
ip-addr	Target port's IP address (cannot be used for another portal)	Yes
• tar-id OR • tar-name	Target's name or the index number	Yes

Example request

```
POST /api/json/types/iscsi-portals/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"ip-addr":"152.62.109.59/24", "tar-id":6}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/iscsi-
portals/1",
            "rel": "self"
        }
    ]
}
```

Note: Although the response indicates an error, the cluster performs the command.

Removing an iSCSI Portal

DELETE /api/json/types/iscsi-portals/<parameter (iscsi-portal-id or ?name=iscsi-portal-name)>

This command (DELETE /api/json/types/iscsi-portals/<parameter [iscsi-portal-id or ?name=iscsi-portal-name]>) enables you to remove an iSCSI portal mapping from a target.

After the removal, the target will stop accepting iSCSI traffic via the portal.

Input Parameter	Description	Mandatory
• iscsi-portal-id OR • iscsi-portal-name	iSCSI portal name or ID number of target port to be removed	Yes

Example request by index

```
DELETE /api/json/types/iscsi-portals/1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Example request by name

```
DELETE /api/json/types/iscsi-portals/?name=portal1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
200 OK
```

Removing an iSCSI Route

DELETE /api/json/types/iscsi-routes/<parameter (route-id or ?name=route-name)>

This command (DELETE /api/json/types/iscsi-routes/<parameter [route-id or ?name=route-name]>) enables you to remove an iSCSI route.

Input Parameter	Description	Mandatory
• iscsi-route-id OR • iscsi-route-name	iSCSI route's name or index number	Yes

Example request by index

```
DELETE /api/json/types/iscsi-routes/1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Example request by name

```
DELETE /api/json/types/iscsi-routes/?name=route1 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
200 OK
```

LUN Mapping

Viewing the LUN Mappings List

GET /api/json/types/lun-maps

This command (GET /api/json/types/lun-maps) displays a list of all LUN mappings between volumes and Initiator Groups.

Example request

```
GET /api/json/types/lun-maps HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response

```
{
    "lun-maps": [
        {
            "href": "https://vxms-xbrick267/api/json/types/lun-
maps/1",
            "name": "41_1_1"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/lun-
maps/3",
            "name": "43_1_1"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/lun-
maps/2",
            "name": "42_1_1"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/lun-
maps/4",
            "name": "44_1_1"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/lun-maps/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of a LUN Mapping

GET /api/json/types/lun-maps/<parameter (lun-maps id or ?name=lun-maps-name)>

This command (POST /api/json/types/lun-maps<parameter [lun-maps id or ?name=lun-maps-name]>) displays a LUN mapping's details.

Input Parameter	Description	Mandatory
• lun-maps-id OR • lun-maps-name	LUN map's name or index number	Yes

Output Parameter	Counter Definition	Description
tg-name	Target's group's name	Name of the LUN map
ig-index	Initiator Group index number	Initiator Group index number
xms-id	XtremIO Management Server ID	XtremIO Management Server's index number
mapping-index	Mapping ID	LUN mapping's index number
obj-severity	Object severity	LUN map's severity based on severity level of current alerts (alerts still uncleared) for that LUN map and its contained objects or members
tg-index	Target group ID	Target's group's index number
lun	Unique LUN identification	Unique LUN identification, exposing the volume to the host (16K LUN mappings are currently supported)
ig-name	Initiator Group name	Initiator Group's name
vol-index	Volume ID	Volume's index number
vol-name	Volume name	Volume's name
mapping-id	Mapping ID	Internal XMS LUN mapping's index number

Example request by index

```
GET /api/json/types/lun-maps/1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/lun-maps/?name=3_1_1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "tg-name": "Default",
        "ig-index": 1,
        "xms-id": [
            "0c2e6400d23e4b8caec944a8b6382822",
            "xms",
            1
        ],
        "mapping-index": 1,
        "obj-severity": "information",
        "tg-index": 1,
        "lun": 0,
        "ig-name": "FCqadefault",
        "vol-index": 1,
        "vol-name": "vol0",
        "mapping-id": [
            "420fc7cefbb04040ad233de72d30ddd4",
            "1_1_1",
            1
        ]
    },
    "links": [
        {
            "href": "https://vxms-xbrick238/api/json/types/lun-
maps/1",
            "rel": "self"
        }
```

Creating a LUN Mapping

POST /api/json/types/lun-maps

This command (POST /api/json/types/lun-maps) enables you to create LUN mapping between volumes and Initiator Groups.

Input Parameter	Description	Mandatory
• vol-id OR • vol-name	Volume's name or index number	Yes
ig-id	Initiator Group's name or index number	Yes
lun	Unique LUN identification, exposing the volume to the host (16K LUN mappings are currently supported)	No
• tg-id OR • tg-name	Target's group's name or index number	No

Example request

```
POST /api/json/types/lun-maps/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"lun":8, "ig-id":1, "vol-id":1}
```

Response

```
{
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/lun-
maps/6",
            "rel": "self"
        }
    ]
}
```

Removing a LUN Mapping

DELETE /api/json/types/lun-maps/<parameter (lun-maps-id or ?name=lun-maps-name)>

This command (DELETE /api/json/types/lun-maps/<parameter [lun-maps-id or ?name=lun-maps-name]>) enables you to remove a volume's LUN mapping.

Input Parameter	Description	Mandatory
• lun-maps-id OR • lun-maps-name	LUN map's name or index number	Yes

Example request by index

```
DELETE /api/json/types/lun-maps/20 HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Example request by name

```
DELETE /api/json/types/lun-maps/?name=20_1_1 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache

{"destination-subnet":"255.255.0.0/17", "gateway":"192.168.10.254"}
```

Response

```
200 OK
```

SSDs

Viewing the List of SSDs

GET /api/json/types/ssds

This command (GET /api/json/types/ssds) displays the list of SSDs.

Example request

```
GET /api/json/types/ssds/ HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "ssds": [
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/24",
            "name": "wwn-0x5000cca0131228b4"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/25",
            "name": "wwn-0x5000cca013124b24"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/20",
            "name": "wwn-0x5000cca013118e5c"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/21",
            "name": "wwn-0x5000cca0131185f8"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/22",
            "name": "wwn-0x5000cca013125bdc"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/23",
            "name": "wwn-0x5000cca013121770"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/1",
            "name": "wwn-0x5000cca013100ee8"
        },
```

```
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/3",
            "name": "wwn-0x5000cca013118260"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/2",
            "name": "wwn-0x5000cca0131009a8"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/5",
            "name": "wwn-0x5000cca01311839c"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/4",
            "name": "wwn-0x5000cca013118828"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/7",
            "name": "wwn-0x5000cca013100348"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/6",
            "name": "wwn-0x5000cca013118be0"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/9",
            "name": "wwn-0x5000cca013118a9c"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/8",
            "name": "wwn-0x5000cca013118e64"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/11",
            "name": "wwn-0x5000cca013100a70"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/10",
            "name": "wwn-0x5000cca0131181cc"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/13",
            "name": "wwn-0x5000cca013118df8"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/12",
            "name": "wwn-0x5000cca013118950"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/15",
            "name": "wwn-0x5000cca013100898"
        },
```

```
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/14",
            "name": "wwn-0x5000cca0131016f4"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/17",
            "name": "wwn-0x5000cca013117ef0"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/16",
            "name": "wwn-0x5000cca0131008a4"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/19",
            "name": "wwn-0x5000cca01311865c"
        },
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/18",
            "name": "wwn-0x5000cca013118990"
        }
    ],
    "links": [
        {
            "href": "https://vxms-xbrick267/api/json/types/ssds/",
            "rel": "self"
        }
    ]
}
```

Viewing the Details of an SSD

GET /api/json/types/ssds/<parameter (ssd-id or ?name=ssd-name)>

This command (GET /api/json/types/ssds/< parameter (ssd-id or ?name=ssd-name)>) displays the details of the selected SSD.

Input Parameter	Description	Mandatory
• ssd-id OR • ssd-name	SSD's name or index number	Yes

Output Parameter	Counter Definition	Description
name	Name	SSD's name
index	ID	SSD's index ID as defined by XMS upon its creation; a unique positive number
ssd-size	SSD Size	Overall size of non-failed SSDs, value shown only when the `slot state` is either a resident SSD, uninitialized SSD or a foreign XtremIO SSD. Otherwise `null`.
fru-lifecycle-state	SSD's health state, using generic FRU transition states	SSD's FRU state using the generic FRU transition states
ssd-failure-reason	Reason for SSD failure	Reasons for SSD failure
percent-endurance-remaining	Percentage endurance remaining	Percentage of SSD endurance remaining
obj-severity	Object severity	SSD's severity based on severity level of current alerts (alerts still uncleared) for that SSD and its contained objects or members
rd-bw	Total realtime read bandwidth	Total read bandwidth in MB per second

Output Parameter	Counter Definition	Description
wr-iops	Total realtime write input/output per second	Total write realtime input/output operations per second
iops	Input/output per second	SSD's total read and write realtime input/output operations per second
rg-id	XDPG object ID	ID of XDPG associated with this Storage Controller
health-state	SSD's health state	`level_1_clear` is used when the counter is a valid, healthy value.
ssd-id	ID	SSD object's identification
fw-version-error	Firmware version error	Reason for FRU (Field Replacable Unit) diagnosis failure when a firmware problem exists
sas-diag-counter-array	SAS diagnostic counters array	An array containing information about all the SAS counters
ssd-space-in-use	SSD's total used capacity	SSD space in use in KB
slot-num	SSD slot number	Slot index in which SSD currently resides, or slot index into which the currently-disconnected SSD was previously inserted.
identify-led	Identification LED	Reflects the Light-emitting diode (LED) state indicating identification of the SSD power supply unit (PSU). The property value is reflected in the UI LED icon. Note: In the current PSU there is no identification LED.
hw-revision	Hardware revision	• Hardware level of the power supply unit. • The value is not always available. • GUI and CLI do not display the value when unavailable.

Output Parameter	Counter Definition	Description
ssd-link2-health-state	SSD link2 health state	• Reflects the SSD health state. • Relates to the ports and connected link of the SSD. • Relates to the second port, which should be connected to SC-2.
xms-id	XMS object ID	Object ID of the XMS
discrete-diagnostic-array	Discrete sensor array	• An array containing information about all the discrete diagnostics. • Includes ASC/ASCQ, last IO ASC/ASCQ and SMART. • The ASC (additional sense code) and ASCQ (additional sense code qualifier) are known as SCSI additional sense data codes, as defined by SCSI standards. • SMART adds monitoring and troubleshooting functionality by automatically checking a disk drive's health and reporting potential problems.
ssd-link1-health-state	SSD link1 health state	• Reflects the SSD health state. • Relates to the ports and connected link of the SSD. • Relates to the first port, which should be connected to SC-1.
percent-endurance-remaining-level	Percent endurance remaining level	Event triggerered for any change in this property
bw	Total realtime bandwidth	Total read and write bandwidth in MB per second
fw-version	Freeware version	Currnet version of freeware
part-number	Part number	A string assigned by EMC identifying the part.

Output Parameter	Counter Definition	Description
swap-led	Swap LED status description	Defines whether a replacement procedure is to be activated when a new SSD is inserted into the DAE.
sys-id	Cluster ID	Cluster's name or index number
diagnostic-health-state	Diagnostic health state	Reflects the health of the SSD device itself
brick-id	X-Brick's index number	X-Brick's index number
serial-number	Serial number	SSD's serial number
ssd-size-in-kb	SSD's total physical size	SSD size in KB
status-led	Status LED	LED state indicating SSD object faults
enabled-state	Enabled state	Indicates whether SSD is currently enabled or disabled, either by the user or cluster.
encryption-status	Encryption Status	SSD's encryption (Data at Rest) status
ssd-rg-state	SSD XDPG state	Describes SSD's logical state from XDPG perspective.
ssd-uid	SSD UID number	• UID (uniqiue identification) of the SSD that is inserted into the slot. • Property contains a value only if the `slot state` is: `resident SSD`, `uninitialized SSD`, or `foreign XtremAPP SSD`. Otherwise it is `null`.
model-name	Model name	Vendor-assigned model name
wr-bw	Write bandwidth	Total write bandwidth in MB per second
useful-ssd-space	Useful SSD space	XDPG's total amount of useful SSD space on its unfailed SSDs
rd-iops	Read input/output per second	Total read realtime input/output operations per second

Example request by index

```
GET /api/json/types/ssds/24 HTTP/1.1
Host: vxms-xbrick267
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Example request by name

```
GET /api/json/types/ssds?name=wwn-0x5000cca0131228b4 HTTP/1.1
Host: vxms-xbrick238
Authorization: Basic YWRtaW46WHRyZW0xMA==
Cache-Control: no-cache
```

Response


```
{
    "content": {
        "ssd-size": "390625000",
        "fru-lifecycle-state": "healthy",
        "ssd-failure-reason": "none",
        "percent-endurance-remaining": 99,
        "obj-severity": "information",
        "rd-bw": "0",
        "wr-iops": "0",
        "iops": "0",
        "rg-id": [
            "23e7dc31e6a34453bc5368c127115ad9",
            "X1-DPG",
            1
        ],
        "health-state": "healthy",
        "index": 24,
        "ssd-id": [
            "096f07cb8fd748d6ac0d5cfcc7c273b6",
            "wwn-0x5000cca0131228b4",
            24
        ],
        "fw-version-error": "no_error",
        "sas-diag-counter-array": null,
        "ssd-space-in-use": "192986266",
        "slot-num": 23,
        "identify-led": "off",
        "hw-revision": "",
        "ssd-link2-health-state": "level_1_clear",
        "xms-id": [
            "0c2e6400d23e4b8caec944a8b6382822",
            "xms",
            1
        ],
        "discrete-diagnostic-array": null,
        "ssd-link1-health-state": "level_1_clear",
```

```
        "percent-endurance-remaining-level": "ok",
        "bw": "0",
        "fw-version": "C337",
        "part-number": "005-050-377",
        "swap-led": "off",
        "ssd-position-state": "good",
        "sys-id": [
            "ec7e3ab932474bc6b3e1fbf6fc7cc26b",
            "xbrick238",
            1
        ],
        "diagnostic-health-state": "level_1_clear",
        "name": "wwn-0x5000cca0131228b4",
        "brick-id": [
            "4f25c60e47b54abf8aa011e32ab1fac8",
            "X1",
            1
        ],
        "serial-number": "0x5000cca0131228b4",
        "ssd-size-in-kb": 390625000,
        "status-led": "off",
        "enabled-state": "enabled",
        "encryption-status": "enc_not_supported",
        "ssd-rg-state": "in_rg",
        "ssd-uid": "wwn-0x5000cca0131228b4",
        "model-name": "HITACHI  HUSML404 CLAR400",
        "wr-bw": "0",
        "useful-ssd-space": "390625000",
        "rd-iops": "0"
    },
    "links": [
        {
            "href": "https://vxms-xbrick238/api/json/types/ssds/24",
            "rel": "self"
        }
    ]
}
```

Events

Viewing all Events in the Cluster

GET /api/json/types/events

This command (GET /api/json/types/events) displays the list of all events in the cluster.

Input Parameter	Description	Mandatory
from-date-time	Date and time from which to filter events. Format: “yyyy-mm-dd hh:mm:ss” Example: “2014-04-15 10:00:00”	No
to-date-time	Date and time until which to filter events. Format: “yyyy-mm-dd hh:mm:ss” Example: “2014-04-15 10:00:00”	No

Example request

```
GET api/json/types/events HTTP/1.1
Host: vxms-xbrick267:42503
Authorization: Basic b3BlcmF0aW9uOm9wZXJhdGlvbg==
Cache-Control: no-cache
```

Response

```
{
    "events": [
        {
            "entity_details": "test1 [31]",
            "severity": "information",
            "classification": "activity",
            "timestamp": "2014-03-26 13:07:16.488775",
            "entity": "Volume",
            "event_code": "5000200",
            "id": 3386,
            "description": "Added Volume test1 [31] Snapshot Group
[34]"
        },
        {
            "entity_details": null,
            "severity": "information",
            "classification": "audit",
```

```
            "timestamp": "2014-03-26 13:07:15.865606",
            "entity": null,
            "event_code": "5000100",
            "id": 3385,
            "description": "User: admin, Command: addvolume,
Arguments: {sys_obj_id=[], vol_size=\"104857600\",
vol_obj_name=\"test1\", snapgrp_obj_name=\"\", lb_size=512,
alignment_offset=0, folder_id=[]}"
        },
        {
            "entity_details": "Tamir [30]",
            "severity": "information",
            "classification": "activity",
            "timestamp": "2014-03-26 13:06:08.767859",
            "entity": "Volume",
            "event_code": "5000200",
            "id": 3384,
            "description": "Added Volume Tamir [30] Snapshot Group
[31]"
        }
```

RESTful API Changes from Previous Versions

Changes from Ver. 2.4.1 to Ver. 3.0

The following tables list the XtremIO Storage Array RESTful API parameters that have changed from version 2.4.1 to version 3.0.

Table 1: Cluster

Parameter	Added	Removed	Changed
max-snapshots-per-volume	No	Yes	N/A
meta-data-utilization-level	No	Yes	N/A
meta-data-utilization	No	Yes	N/A
vamd-memory	No	Yes	N/A
vamd-memory-in-use	No	Yes	N/A
max-cgs-per-volume	No	Yes	N/A
max-cgs	No	Yes	N/A
num-of-r-mdls	No	Yes	N/A
max-snapsets-per-cg	No	Yes	N/A
max-vol-per-cg	No	Yes	N/A
num-of-d-mdls	No	Yes	N/A
min-num-of-ssds-per-healthy-rg	No	Yes	N/A
num-of-c-mdls	No	Yes	N/A
compression-factor-text	Yes	No	N/A
compression-factor	Yes	No	N/A
compression-factor-last-sample	Yes	No	N/A
compression-mode	Yes	No	N/A
data-reduction-ratio	Yes	No	N/A
data-reduction-ratio-text	Yes	No	N/A

Table 2: Storage Controllers

Parameter	Added	Removed	Changed
`eth-link-health-level`	No	Yes	N/A
`mgmt-port-speed`	Yes	No	N/A
`journal-state`	Yes	No	N/A
`active-ipmi-port`	Yes	No	N/A
`dedicated-ipmi-port-speed`	Yes	No	N/A
`mgmt-port-state`	Yes	No	N/A
`dedicated-ipmi-port-state`	Yes	No	N/A
`dedicated-ipmi-link-conn-state`	Yes	No	N/A
`mgmt-link-health-level`	Yes	No	N/A

Table 3: Snapshots

Parameter	Added	Removed	Changed
`compressible`	Yes	No	N/A
`Creating Snapshots of a Set of Volumes`	N/A	N/A	Yes (see below)

Syntax change: Ver. 2.4.1 required this commands' values to include the prefix \" and the suffix \". This is not required in Ver. 3.0.

Table 4: Volumes

Parameter	Added	Removed	Changed
`compressible`	Yes	No	N/A

Table 5: Initiators

Parameter	Added	Removed	Changed
chap-discovery-initiator-password	Yes	No	N/A
chap-discovery-initiator-user-name	Yes	No	N/A
chap-discovery-cluster-user-name	Yes	No	N/A
chap-discovery-cluster-password	Yes	No	N/A
chap-authentication-cluster-password	Yes	No	N/A
chap-authentication-cluster-user-name	Yes	No	N/A
chap-discovery-initiator-password	Yes	No	N/A
chap-discovery-initiator-user-name	Yes	No	N/A
chap-discovery-cluster-user-name	Yes	No	N/A

Changes from Ver. 3.0 to Ver. 3.0.1

Table 6 lists the XtremIO Storage Array RESTful API parameters that have changed from version 3.0 to version 3.0.1.

Table 6: Storage Controller

Parameter	Added	Removed	Changed
hw-revision	No	Yes	N/A
sas-port-conn-wrong-lcc	Yes	No	N/A

Troubleshooting and Getting Help

EMC support, product, and licensing information can be obtained as follows:

Product information

For documentation, release notes, software updates, or for information about EMC products, licensing, and service, go to EMC Online Support (registration required) at: http://Support.EMC.com.

Troubleshooting

Go to EMC Online Support. After logging in, locate the appropriate Support by Product page.

Technical support

For technical support and service requests, go to EMC Online Support. After logging in, locate the appropriate Support by Product page and choose either Live Chat or Create a service request. To open a service request through EMC Online Support, you must have a valid support agreement. Contact your EMC Sales Representative for details about obtaining a valid support agreement or to answer any questions about your account.