

IBM Hyper-Scale Manager  
Version 5.1.1

*REST API Specifications*



**Note**

Before using this information and the product it supports, read the information in "Notices" on page 59.

**Edition Notice**

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## About this guide

The purpose of this guide is to provide the specifications of the IBM Hyper-Scale Manager REST application programming interface (API).

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## Who should use this guide

This guide is for software developers who are coding control applications for XIV, Spectrum Accelerate, FlashSystem A9000, and FlashSystem A9000R systems.

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## Conventions used in this guide

These notices are used to highlight key information.

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**Note:** These notices provide important tips, guidance, or advice.

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- IBM FlashSystem® A9000 on IBM Knowledge Center ([ibm.com/support/knowledgecenter/STJKMM](http://ibm.com/support/knowledgecenter/STJKMM))
- IBM FlashSystem A9000R on IBM Knowledge Center ([ibm.com/support/knowledgecenter/STJKN5](http://ibm.com/support/knowledgecenter/STJKN5))
- IBM Spectrum Accelerate on IBM Knowledge Center ([ibm.com/support/knowledgecenter/STZSWD](http://ibm.com/support/knowledgecenter/STZSWD))
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## Chapter 1. Introduction

The Hyper-Scale Manager REST API allows the end user to process two main types of requests:

- **Query requests:** Requests that return states, for either a single resource or a list of resources. These are object entities managed by Hyper-Scale Manager (for example, all volumes of a specific supported storage system).
- **Update requests:** Requests that update states – that create, delete, or update the object entity state (for example, one that creates a new pool on a specific supported storage system).

The API uses HTTP as the transport protocol and relies on HTTP for some features, such as security.

There are two resource types that requests may call:

- **Single resource:** Volume, port, or host.
- **List of resources:** All pools of a specific supported storage system.

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### Protocol version

The current protocol version is v3. This is indicated in the URL by adding the /v3 path to all of the URLs (for example, /xiv/v3/volumes).

The current protocol version supports IBM XIV Storage System Gen4. As opposed to v2, this version:

- Supports performance classes.
- Discontinues support of volume compression and decompression.

---

### HTTP methods

The protocol relies on HTTP methods to support CRUD operations (Create/Read/Update/Delete):

- HTTP POST: Mapped to create/update/delete operations.
- HTTP GET: Mapped to query (read) operations.
- HTTP DELETE: Mapped to delete operations. The HTTP URL specifies the resource to which the request applies.

---

### URL scope specifiers and resource names

Request URLs are built from scope specifiers and resource names, prefixed with :, for example:

```
/xiv/v3/:xiv2/ports/:10000000C9926DCA
```

In the above example:

- /xiv specifies the main API scope.
- v3 specifies the protocol version. (Should be v1 for version one.)
- :xiv2 specifies the system IP/DNS name.
- /ports defines the ports scope. For example, we are looking at ports in xiv1.

- 10000000C9926DCA is the port name.

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**Note:** The request and response format is JSON. All of the examples shown in the document are formatted as JSON.

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## Chapter 2. General requests

The following general query requests are supported.

Generate a capacity report for all of the systems in your inventory:

```
GET /xiv/v3/systems/capacityReport
```

Generate a capacity report for a specific system in your inventory:

```
GET /xiv/v3/systems/:<system-name>/capacityReport
```

A download bar appears at the bottom of your screen with a link to the containing folder of the zip file. Open the zip folder and click on the PDF to display the report.



---

## Chapter 3. Query requests

A query is run by issuing the HTTP GET command on a URL, representing either:

- A collection of resources where a list of resources and their properties is returned (for example, `/xiv/v3/:xiv1/volumes`).
- A single resource where single resource properties are returned (for example, `/xiv/v3/:xiv1/volumes/:vol1`).

Query requests may contain additional URL parameters, for filtering. Requests that use filtering parameters return only resources that match the filtering criteria. For example, `/xiv/v3/:xiv1/volumes?pool=mypool` would return only volumes that exist in the **mypool** pool.

All queries listed in this document (excluding system queries), which return collections of resources, will support "by domain" filtering. For example: `/xiv/v3/:xiv1/volumes?domain=d1` would return all volumes on a given system (**xiv1**) that belong to the specified domain (**d1**). This functionality is optional and will be implemented on a "best effort basis."

The following topics are covered in this chapter:

- "Query paging support"
- "System query requests" on page 6
- "Volume query requests" on page 6
- "Host query requests" on page 7
- "Cluster query requests" on page 7
- "System Fiber Channel (FC) port query requests" on page 7
- "System iSCSI port query requests" on page 8
- "Host port query requests" on page 8
- "Mapping query requests" on page 8
- "Pool query requests" on page 9
- "Volume snapshot query requests" on page 9
- "Performance class query requests" on page 9
- "Event query requests" on page 10
- "Query response format" on page 11

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### Query paging support

A query request can return a huge list of resources. For example, a request for all volumes from all supported storage systems can contain tens of thousands of volume resources. A client may only be interested in requesting a subset/page from the query. The following two parameters support this requirement:

- **offset**: Defines the index of the first resource that should be returned in the query. (All resources are numbered, starting from 0.) If an **offset** parameter is omitted, an offset of 0 is assumed. If the offset is larger than the number of resources, a response with no resources is returned.
- **limit**: Defines the maximum count of resources that should be returned in the query. The actual count of resources in the response is less than or equal to the requested limit. If the **limit** parameter is omitted, the server returns up to

`max_limit` amount of resources (defaults to 1000). If the limit parameter is higher than the amount of resources, the request will fail with a 400 Bad Request error.

By default, the list of returned objects is sorted by name.

---

**Note:** System and event queries do not support paging.

---

**Examples:**

- `/xiv/v3/volumes`: Returns all of the volumes from all of the XIV systems (up to `max_limit`).
- `/xiv/v3/volumes?limit=400`: Returns the first 400 volumes from all of the XIV systems.
- `/xiv/v3/volumes?offset=10&limit=40`: Returns 40 volumes, starting from volume 11.
- `/xiv/v3/volumes?offset=101`: Returns all volumes (up to `max_limit`), starting from volume 102.

---

## System query requests

The following system query requests are supported:

List all of the systems on which the user is authorized:

```
GET /xiv/v3/systems
```

List specific system properties (xiv1 – system IP/DNS):

```
GET /xiv/v3/systems/:xiv1
```

---

## Volume query requests

The following volume query requests are supported:

List all of the volumes from all of the systems on which the user is authorized:

```
GET /xiv/v3/volumes
```

List all of the volumes from specific machine:

```
GET /xiv/v3/:xiv1/volumes
```

List all of the volumes from specific machine and pool (where p1 is the pool name):

```
GET /xiv/v3/:xiv1/volumes?pool=p1
```

List specific volume properties:

```
GET /xiv/v3/:xiv1/volumes/:vol1
```

---

## Host query requests

The following host query requests are supported:

List all of the hosts from all of the systems on which the user is authorized:

```
GET /xiv/v3/hosts
```

List all of the hosts from a specific machine:

```
GET /xiv/v3/:xiv1/hosts
```

List all of the hosts from a specific machine that belong to a specific cluster (where c1 is the cluster name):

```
GET /xiv/v3/:xiv1/hosts?cluster=c1
```

List specific host properties: (where h1 is the host name)

```
GET /xiv/v3/:xiv1/hosts/:h1
```

---

## Cluster query requests

The following cluster query requests are supported:

List all of the clusters from all of the systems on which the user is authorized:

```
GET /xiv/v3/clusters
```

List all of the clusters from a specific machine:

```
GET /xiv/v3/:xiv1/clusters
```

List specific cluster properties: (where c1 is the cluster name)

```
GET /xiv/v3/:xiv1/clusters/:c1
```

---

## System Fiber Channel (FC) port query requests

The following system Fiber Channel (FC) port query requests are supported:

List all of the FC ports from a specific machine:

```
GET /xiv/v3/:xiv1/fc_ports
```

List specific FC port properties: (where p1 is the port name)

```
GET /xiv/v3/:xiv1/fc_ports/:p1
```

---

## System iSCSI port query requests

The following system iSCSI port query requests are supported:

List all of the system iSCSI ports from a specific machine:

```
GET /xiv/v3/:xiv1/iscsi_ports
```

List specific iSCSI port properties: (where p1 is the port name)

```
GET /xiv/v3/:xiv1/iscsi_ports/:p1
```

---

## Host port query requests

Host ports are ports that belong to hosts, not to systems. The following system host port query requests are supported:

List all of the ports of a specific host (where h1 is the host name):

```
GET /xiv/v3/:xiv1/host_ports?host=h1
```

List the host to which the specific port is assigned (where p1 is the port name):

```
GET /xiv/v3/:xiv1/host_ports?port=p1
```

List the specific FC port on a host (where h1 is the host name, and p1 is the port name):

```
GET /xiv/v3/:xiv1/host_ports/:fc:h1:p1
```

List the specific iSCSI port on a host (where h1 is the host name, and p1 is the port name):

```
GET /xiv/v3/:xiv1/host_ports/:iscsi:h1:p1
```

---

## Mapping query requests

The following host, cluster, and volume mapping query requests are supported:

List all of the mappings of the host (where h1 is the host name):

```
GET /xiv/v3/:xiv1/vol_maps?host=h1
```

List all of the mappings of the cluster (where c1 is the cluster name):

```
GET /xiv/v3/:xiv1/vol_maps?cluster=c1
```

List all of the mappings of the volume (where vol1 is the volume name):

```
GET /xiv/v3/:xiv1/vol_maps?volume=vol1
```

List specific host mapping properties (where h1 is the host name, and vol1 is the volume name):

```
GET /xiv/v3/:xiv1/vol_maps/:host:h1:vol1
```

List specific cluster mapping properties (where c1 is the host name, and vol1 is the volume name):

```
GET /xiv/v3/:xiv1/vol_maps/:cluster:c1:vol1
```

---

## Pool query requests

The following pool query requests are supported:

List all of the pools from all of the systems on which the user is authorized:

```
GET /xiv/v3/pools
```

List all of the pools from a specific machine:

```
GET /xiv/v3/:xiv1/pools
```

List specific pool properties (where p1 is the pool name):

```
GET /xiv/v3/:xiv1/pools/:p1
```

---

## Volume snapshot query requests

The following volume snapshot query requests are supported:

List all of the snapshots from all of the systems on which the user is authorized:

```
GET /xiv/v3/snapshots
```

List all of the snapshots from a specific machine:

```
GET /xiv/v3/:xiv1/snapshots
```

List all of the snapshots of the specified volume (where vol1 is the volume name):

```
GET /xiv/v3/:xiv1/snapshots?volume=vol1
```

List specific snapshot properties (where sn1 is the snapshot name):

```
GET /xiv/v3/:xiv1/snapshots/:sn1
```

---

## Performance class query requests

The following performance class query requests are supported:

List all of the performance classes from all of the systems on which the user is authorized:

```
GET /xiv/v3/perf_classes
```

List all of the performance classes from a specific machine:

```
GET /xiv/v3/:xiv1/perf_classes
```

List the properties of a specific performance class (where `silver` is the performance class name):

```
GET /xiv/v3/perf_classes/:silver
```

List all volumes that are a part of a specific performance class:

```
GET /xiv/v3/:xiv1/volumes?perf_class=silver
```

List all hosts that are part of a specific performance class

```
GET /xiv/v3/:xiv1/hosts?perf_class=silver
```

List all pools that are part of a specific performance class

```
GET /xiv/v3/:xiv1/pools?perf_class=silver
```

---

## Event query requests

An event query request fetches events from a specific supported storage system. Event queries are different from the rest of the queries since events are currently not managed by the Hyper-Scale Manager.

Since events are not managed by the Hyper-Scale Manager, paging is not supported for this query. The following query parameters can be used to filter the events:

- **min\_severity**: Defines the minimum event severity. Possible values include `Informational`, `Minor`, `Major`, `Warning`, or `Critical`. If omitted, the minimum severity defaults to `Informational`.
- **after**: Only returns events that occur after the specified timestamp.
- **before**: Only returns events that occur before the specified timestamp.

The syntax for the `before` and `after` fields is as follows: `Y-M-D[. [h[:m[:s]]]]`, where the ranges are as follows:

- `Y`: year (four digits)
- `M`: month (01-12)
- `D`: day (01-31)
- `h`: hour (00-23, with 00 as the default)
- `m`: minute (00-59 with 00 as the default)
- `s`: second (00-59 with 00 as the default)

If filtering parameters are omitted, the last 300 events are returned.

**Example event query:**

```
GET /xiv/v3/:xiv1/events?min_severity=Warning&after=2013-03-07
```

**Example event query response:**

```
HTTP/1.1 200 OK
... {
  "status": {
    "server": {"status": "0", "message": "OK" }
    "failed_systems": []
  }
  "response": {
    "counts": { "data_count": "300", "total_count": "300" }
    "data": {
      }
    }
  }
}
```

---

**Note:** Since events are not managed by the server and paging is not supported, the data count returned in response is always equal to the total count.

---

---

## Query response format

The query response is defined as an object having the following fields:

- **status:** The response status.
  - **server:** Application level status and status message.
  - **failed\_systems:** Array of machine errors that were encountered during the request. This field is used during multi-machine queries or updates to indicate that some machines had issues (such as disconnected, not-authorized, invalid state, etc.) during the query and that the returned data may not contain all resources, or the required operation had only partial success.
- **response:** The query response result.
  - **counts:** The response count and total count of objects.
    - **data\_count:** The number of objects in this response data.
    - **total\_count:** The number of total objects.
  - **data:** The response data. Can be either:
    - A list of objects for queries on object collections (for example: /xiv/volumes).
    - A single object for queries on a specific object (for example: /xiv/:xiv1/volumes/:vol1).
    - Null, if there was some error in query processing.

**Notes regarding format of query response details:**

- All of the storage capacity properties in the query responses are given as integers, in bytes. For example: capacity attributes of system resources, size attributes of volume resources, size attributes of pool resources, etc.
- Boolean attributes are given as true/false, such as for the mirrored attribute of volume resources, etc.
- Time stamps are displayed in milliseconds, since the Unix epoch (example: 1970-01-01 00:00:00).

### Example of a successful response:

```
Request - GET /xiv/v3:/xiv1/volumes/:vol1
...
Response - HTTP/1.1 200 OK
...
{
  "status": {
    "server": {"status": "0", "message": "OK" }
    "failed_systems": []
  }
  "response": {
    "counts": { "data_count": "1", "total_count": "1" }
    "data": {
      "volume": {
        "name": "vol1"
        ...
      }
    }
  }
}
```

### Example of a partially successful response:

```
Request - GET /xiv/v3/volumes
...
Response - HTTP/1.1 200 OK
...
{
  "status": {
    "server": {"status": "0", "message": "OK" }
    "failed_systems": [ {"name": "mn44", "status": "1", "message": "The system is disconnected"} ]
  }
  "response": {
    "counts": { "data_count": "10", "total_count": "1000" }
    "data": {
      "volume": [ {
        "name": "vol1"
        ...
      }
      ...
      {
        "name": "vol10"
        ...
      }
    ]
  }
}
```

### Example of a response to an invalid request:

```
Request - GET /xiv/v3/myvolumes
... Response -
HTTP/1.1 400 Bad Request
...
{
  "status": {
    "server": {"status": "6", "message": "Invalid request - myvolumes path is undefined" }
    "failed_systems": []
  }
  "response": {
    "counts": { "data_count": "0", "total_count": "0" }
    "data": {}
  }
}
```

---

## Chapter 4. Update requests

Update requests include creation, deletion, or modification of managed resources. Since the Hyper-Scale Manager only reflects the state of objects managed by the supported storage systems, all such requests should be passed by the Hyper-Scale Manager to the supported storage systems to handle, using CLI commands internally. Here a new generic protocol format is introduced, decoupled from the CLI syntax.

Since update requests require some data to be provided by clients (for example, a new volume size in the volume resize operation), how this data is transferred must be defined. One alternative is to provide this data as HTTP URL parameters; however, this means that the protocol is strictly coupled with the transport protocol (HTTP in this case) and cannot be reused easily with other transport protocols that do not support the URL parameters feature. The only other option is to deliver the required data inside an HTTP body in JSON format.

Define the update request object with the following generic fields:

- **action:** The required action. Possible values include create and delete. Additional actions are possible, based on the resource type.
- **params:** Contains the parameters required for the action.

Updates are done using the HTTP POST request on a URL representing a collection of resources (for example, POST on `/xiv/v3/:xiv1/volumes`), while the body contains the exact action to perform (create/delete/update). Each such request can carry a list of update requests to support bulk operations. Additionally, the following shortcuts are allowed:

- HTTP DELETE request on a full URL (for example, `/xiv/v3/:xiv1/volumes/:vol1`) with no body, in order to delete it.
- HTTP POST request on a full URL in order to update/delete it. The body contains a single request object with all of the required parameters, except **name** (since it appears in URL).

---

**Note:** This release does not support multiple requests in the body. Only a single update request in the body is supported.

---

The following topics are covered in this chapter:

- “Volume update requests” on page 14
- “Host update requests” on page 19
- “Cluster update requests” on page 21
- “Host port update requests” on page 24
- “Volume mapping update requests” on page 25
- “Pool update requests” on page 27
- “Volume snapshot update requests” on page 30
- “Performance class update requests” on page 33
- “Update response format” on page 41

---

## Volume update requests

The following types of volume update requests are supported.

- Volume creation requests
- Volume resize requests
- Volume lock requests
- Volume unlock requests
- Volume rename requests
- Volume copy requests
- Volume move to a pool
- Volume delete requests

## Volume creation requests

Volume creation requests include the following components:

- An **action** parameter with a value of create.
- A **params** parameter, containing the following parameters:
  - **name**: The volume name.
  - **pool**: The pool name where volume should be created.
  - **size**: The volume size.
  - **size\_units**: The size units. Possible values include GB and BLOCKS.

### Example:

```
POST /xiv/v3/:xiv1/volumes
{
  "request": [
    {
      "action": "create",
      "params": {
        "name": "vol1",
        "pool": "pool1",
        "size": "17",
        "size_units": "GB"
      }
    }
  ]
}
```

## Volume resize requests

Volume resize requests (to increase or decrease the volume size) include the following components:

- An **action** parameter with a value of resize.
- A **params** parameter, containing the following parameters:
  - **name**: The volume name.
  - **size**: The new volume size.
  - **size\_units**: The size units. Possible values include GB and BLOCK.

### Example:

```

POST /xiv/v3/:xiv1/volumes
{
  "request": [
    {
      "action": "resize",
      "params": {
        "name": "vol1",
        "size": "170",
        "size_units": "GB"
      }
    }
  ]
}

```

Alternatively, a volume can be resized with the following request:

```

POST /xiv/v3/:xiv1/volumes/:vol1
{
  "request": [
    {
      "action": "resize",
      "params": {
        "size": "170",
        "size_units": "GB"
      }
    }
  ]
}

```

## Volume lock requests

Volume lock requests include the following components:

- An **action** parameter with a value of lock.
- A **params** parameter, containing the following parameter:
  - **name**: The volume name.

**Example:**

```

POST /xiv/v3/:xiv1/volumes
{
  "request": [
    {
      "action": "lock",
      "params": {
        "name": "vol1"
      }
    }
  ]
}

```

Alternatively, a volume can be locked with the following request:

```

POST /xiv/v3/:xiv1/volumes/:vol1
{
  "request": {
    "action": "lock"
  }
}

```

## Volume unlock requests

Volume unlock requests include the following components:

- An **action** parameter with a value of unlock.
- A **params** parameter, containing the following parameter:
  - **name**: The volume name.

### Example:

```
POST /xiv/v3/:xiv1/volumes
{
  "request": [
    {
      "action": "unlock",
      "params": {
        "name": "vol1"
      }
    }
  ]
}
```

Alternatively, a volume can be unlocked with the following request:

```
POST /xiv/v3/:xiv1/volumes/:vol1
{
  "request": {
    "action": "unlock"
  }
}
```

## Volume rename requests

Volume rename requests include the following components:

- An **action** parameter with a value of rename.
- A **params** parameter, containing the following parameters:
  - **name**: The volume name.
  - **new\_name**: The new name of the volume.

### Example:

```
POST /xiv/v3/:xiv1/volumes
{
  "request": [
    {
      "action": "rename",
      "params": {
        "name": "vol1",
        "new_name": "vol2"
      }
    }
  ]
}
```

Alternatively, a volume can be renamed with the following request:

```

POST /xiv/v3/:xiv1/volumes/:vol1
{
  "request": {
    "action": "rename",
    "params": {
      "new_name": "vol2"
    }
  }
}

```

## Volume copy requests

Volume copy requests include the following components:

- An **action** parameter with a value of copy.
- A **params** parameter, containing the following parameters:
  - **name**: The volume name.
  - **target**: The name of the target volume.

### Example:

```

POST /xiv/v3/:xiv1/volumes
{
  "request": [
    {
      "action": "copy",
      "params": {
        "name": "vol1",
        "target": "vol2"
      }
    }
  ]
}

```

Alternatively, a volume can be copied with the following request:

```

POST /xiv/v3/:xiv1/volumes/:vol1
{
  "request": {
    "action": "copy",
    "params": {
      "target": "vol2"
    }
  }
}

```

## Volume move requests

A request to move a volume to a new pool includes the following components:

- An **action** parameter with a value of move.
- A **params** parameter, containing the following parameters:
  - **name**: The volume name.
  - **pool**: The name of the target pool.

### Example:

```

POST /xiv/v3/:xiv1/volumes
{
  "request": [
    {
      "action": "move",
      "params": {
        "name": "vol1",
        "pool": "pool1"
      }
    }
  ]
}

```

Alternatively, a volume can be moved to a new pool with the following request:

```

POST /xiv/v3/:xiv1/volumes/:vol1
{
  "request": {
    "action": "move",
    "params": {
      "pool": "pool1"
    }
  }
}

```

## Volume deletion requests

Volume deletion requests include the following components:

- An **action** parameter with a value of delete.
- A **params** parameter, containing the following parameters:
  - **name**: The volume name.

### Example:

```

POST /xiv/v3/:xiv1/volumes
{
  "request": [
    {
      "action": "delete",
      "params": {
        "name": "vol1"
      }
    }
  ]
}

```

Alternatively, a volume can be deleted using either of the following requests, where `vol1` is the volume name:

```

POST /xiv/v3/:xiv1/volumes/:vol1
{
  "request": [
    {
      "action": "delete"
    }
  ]
}

```

```

DELETE /xiv/v3/:xiv1/volumes/:vol1

```

---

## Host update requests

The following types of host update requests are supported.

- “Host creation requests”
- “Host rename requests”
- “Host deletion requests” on page 20

### Host creation requests

Host creation requests include the following components:

- An **action** parameter with a value of create.
- A **params** parameter, containing the following parameters:
  - **name**: The host name.
  - **cluster** (optional parameter): The cluster name. If not provided, the stand-alone host is defined.
  - **type** (optional parameter): The host type. Possible values include standard, hpux, and zvm. If omitted, the default value is standard.
  - **domains** (optional parameter): The domain. If omitted, the host will not be associated with any domain. Use "\*" to associate the host with all domains.

---

#### Note:

- The type and cluster parameters are exclusive; that is, only one of them can be provided in the request. The type parameter can only be specified for stand-alone hosts. If the cluster parameter is provided, the host type is derived from the cluster.
  - If the parameter cluster is defined, and the target system supports domains, then the parameter domains should be defined.
- 

#### Example:

```
POST /xiv/v3/:xiv1/hosts
{
  "request": [
    {
      "action": "create",
      "params": {
        "name": "host1",
        "type": "hpux",
        "domains": "domain1"
      }
    }
  ]
}
```

### Host rename requests

Host rename requests include the following components:

- An **action** parameter with a value of rename.
- A **params** parameter, containing the following parameters:
  - **name**: The host name.
  - **new\_name**: The new name of the host.

#### Example:

```

POST /xiv/v3/:xiv1/hosts
{
  "request": [
    {
      "action": "rename",
      "params": {
        "name": "host1",
        "new_name": "host2"
      }
    }
  ]
}

```

Alternatively, a host can be renamed with the following request:

```

POST /xiv/v3/:xiv1/hosts/:host1
{
  "request": {
    "action": "rename",
    "params": {
      "new_name": "host2"
    }
  }
}

```

## Host deletion requests

Host deletion requests include the following components:

- An **action** parameter with a value of delete.
- A **params** parameter, containing the following parameter:
  - **name**: The host name.

### Example:

```

POST /xiv/v3/:xiv1/hosts
{
  "request": [
    {
      "action": "delete",
      "params": {
        "name": "host1"
      }
    }
  ]
}

```

Alternatively, a host can be deleted with either of the following requests:

```

POST /xiv/v3/:xiv1/hosts/:h1
{
  "request": [
    {
      "action": "delete"
    }
  ]
}

```

```

DELETE /xiv/v3/:xiv1/hosts/:h1

```

---

## Cluster update requests

The following types of cluster update requests are supported.

- “Cluster creation requests”
- “Cluster add host requests”
- “Cluster remove host requests” on page 22
- “Cluster rename requests” on page 23
- “Cluster deletion requests” on page 23

### Cluster creation requests

Cluster creation requests include the following components:

- An **action** parameter with a value of create.
- A **params** parameter, containing the following parameters:
  - **name**: The cluster name.
  - **type** (optional parameter): The cluster type. Possible values include standard, hpux, and zvm. If omitted, the default value is standard.
  - **domains** (optional parameter): The domain. If omitted, the cluster will not be associated with any domain. Use "\*" to associate the cluster with all domains.

#### Example:

```
POST /xiv/v3/:xiv1/clusters
{
  "request": [
    {
      "action": "create",
      "params": {
        "name": "c1",
        "type": "zvm",
        "domains": "domain1"
      }
    }
  ]
}
```

### Cluster add host requests

Cluster add host requests include the following components:

- An **action** parameter with a value of add\_host.
- A **params** parameter, containing the following parameters:
  - **name**: The cluster name.
  - **host**: The name of the host.
  - **map**: Indicates the type of mapping. Possible values include host and cluster.

#### Example:

```

POST /xiv/v3/:xiv1/clusters
{
  "request": [
    {
      "action": "add_host",
      "params": {
        "name": "cluster1",
        "host": "host1",
        "map": "cluster"
      }
    }
  ]
}

```

Alternatively, a host can be added to a cluster with the following request:

```

POST /xiv/v3/:xiv1/clusters/:cluster1
{
  "request": {
    "action": "add_host",
    "params": {
      "host": "host1",
      "map": "cluster"
    }
  }
}

```

## Cluster remove host requests

Cluster remove host requests include the following components:

- An **action** parameter with a value of `remove_host`.
- A **params** parameter, containing the following parameters:
  - **name**: The cluster name.
  - **host**: The name of the host.

### Example:

```

POST /xiv/v3/:xiv1/clusters
{
  "request": [
    {
      "action": "remove_host",
      "params": {
        "name": "cluster1",
        "host": "host1"
      }
    }
  ]
}

```

Alternatively, a host can be removed from a cluster with the following request:

```

POST /xiv/v3/:xiv1/clusters/:cluster1
{
  "request": {
    "action": "remove_host",
    "params": {
      "host": "host1"
    }
  }
}

```

## Cluster rename requests

Cluster rename requests include the following components:

- An **action** parameter with a value of `rename`.
- A **params** parameter, containing the following parameters:
  - **name**: The cluster name.
  - **new\_name**: The new name of the cluster.

### Example:

```
POST /xiv/v3/:xiv1/clusters
{
  "request": [
    {
      "action": "rename",
      "params": {
        "name": "cluster1",
        "new_name": "cluster2"
      }
    }
  ]
}
```

Alternatively, a cluster can be renamed with the following request:

```
POST /xiv/v3/:xiv1/clusters/:cluster1
{
  "request": {
    "action": "rename",
    "params": {
      "new_name": "cluster2"
    }
  }
}
```

## Cluster deletion requests

Cluster deletion requests include the following components:

- An **action** parameter with a value of `delete`.
- A **params** parameter, containing the following parameters:
  - **name**: The cluster name.

### Example:

```
POST /xiv/v3/:xiv1/clusters
{
  "request": [
    {
      "action": "delete",
      "params": {
        "name": "c1"
      }
    }
  ]
}
```

Alternatively, a cluster can be deleted with either of the following requests:

```

POST /xiv/v3/:xiv1/clusters/:cluster1
{
  "request": [
    {
      "action": "delete"
    }
  ]
}

```

```

DELETE /xiv/v3/:xiv1/clusters/:c1

```

---

## Host port update requests

Host ports represent ports that are defined on the host/client side. A single host port name is created by concatenating the port **type** (fc or iscsi), host name (**host**), and port name (**port**), as follows:

- **For FC ports:** fc:h1:p1, where h1 is the host name, and p1 is the port name.
- **For iSCSI ports:** iscsi:h1:p1, where h1 is the host name, and p1 is the port name

The following types of host port update requests are supported.

- Host port creation requests
- Host port deletion requests

## Host port creation requests

Host port creation requests include the following components:

- An **action** parameter with a value of create.
- A **params** parameter, containing the following parameters:
  - **port:** The port name.
  - **host:** The host name.
  - **type:** The port type. Possible values include iscsi and fc.

### Example:

```

POST /xiv/v3/:xiv1/host_ports
{
  "request": [
    {
      "action": "create",
      "params": {
        "port": "10000000C9926DCA",
        "host": "h1",
        "type": "fc"
      }
    }
  ]
}

```

## Host port deletion requests

Host port deletion requests include the following components:

- An **action** parameter with a value of delete.
- A **params** parameter, containing the following parameters:
  - **port:** The port name.
  - **host:** The host name.

- **type**: The port type. Possible values include `iscsi` and `fc`.

**Example:**

```
POST /xiv/v3/:xiv1/host_ports
{
  "request": [
    {
      "action": "delete",
      "params": {
        "port": "10000000C9926DCA",
        "host": "h1",
        "type": "fc"
      }
    }
  ]
}
```

Alternatively, deleting FC port mappings can be done using either of the following requests (where `h1` is the host name and `p1` is the port name):

```
POST /xiv/v3/:xiv1/host_ports/:fc:h1:p1
{
  "request": [
    {
      "action": "delete"
    }
  ]
}
```

```
DELETE /xiv/v2/:xiv1/host_ports/:fc:h1:p1
```

Likewise, deleting iSCSI port mappings can be done using either of the following requests (where `h1` is the host name and `p1` is the port name):

```
POST /xiv/v3/:xiv1/host_ports/:iscsi:h1:p1
{
  "request": [
    {
      "action": "delete"
    }
  ]
}
```

```
DELETE /xiv/v3/:xiv1/host_ports/:iscsi:h1:p1
```

---

## Volume mapping update requests

Volume mapping is an artificial/virtual object; it represents relations/mappings between hosts (or clusters) and volumes. A single mapping name is created by concatenating the type (cluster or host) with the cluster/host name and volume name. For example, `host:h1:v1` represents host volume mapping, while `cluster:c1:v1` represents cluster volume mapping.

The following types of volume mapping update requests are supported.

- “Volume mapping creation requests” on page 26
- “Volume mapping deletion requests” on page 26

## Volume mapping creation requests

Volume mapping creation requests include the following components:

- An **action** parameter with a value of create.
- A **params** parameter, containing the following parameters:
  - **volume**: The volume name.
  - **host\_cluster\_name**: The host name for host mappings or cluster name for cluster mappings.
  - **map\_type**: The mapping type. Possible values include host (for host mappings) and cluster (for cluster mappings).
  - **lun**: The LUN ID.

### Example of host mapping creation:

```
POST /xiv/v3/:xiv1/vol_maps
{
  "request": [
    {
      "action": "create",
      "params": {
        "volume": "vol1",
        "host_cluster_name": "h1",
        "map_type": "host",
        "lun": "3"
      }
    }
  ]
}
```

### Example of cluster mapping creation:

```
POST /xiv/v3/:xiv1/vol_maps
{
  "request": [
    {
      "action": "create",
      "params": {
        "volume": "vol1",
        "host_cluster_name": "c1",
        "map_type": "cluster",
        "lun": "3"
      }
    }
  ]
}
```

## Volume mapping deletion requests

Volume mapping deletion requests include the following components:

- An **action** parameter with a value of delete.
- A **params** parameter, containing the following parameters:
  - **volume**: The volume name.
  - **host\_cluster\_name**: The host name for host mappings or cluster name for cluster mappings.
  - **map\_type**: The mapping type. Possible values include host (for host mappings) and cluster (for cluster mappings).

### Example of host mapping deletion:

```

POST /xiv/v3/:xiv1/vol_maps
{
  "request": [
    {
      "action": "delete",
      "params": {
        "volume": "vol1",
        "host_cluster_name": "h1",
        "map_type": "host"
      }
    }
  ]
}

```

#### Example of cluster mapping deletion:

```

POST /xiv/v3/:xiv1/vol_maps
{
  "request": [
    {
      "action": "delete",
      "params": {
        "volume": "vol1",
        "host_cluster_name": "c1",
        "map_type": "cluster"
      }
    }
  ]
}

```

---

## Pool update requests

The following types of pool update requests are supported.

- “Pool creation requests”
- “Pool resize requests” on page 28
- “Pool resize snapshot size requests” on page 28
- “Pool rename requests” on page 29
- “Pool deletion requests” on page 30

### Pool creation requests

Pool creation requests include the following components:

- An **action** parameter with a value of create.
- A **params** parameter, containing the following parameters:
  - **name**: The pool name.
  - **size**: Virtual capacity of the storage pool, in GB.
  - **snap\_size**: The size, in GB, reserved for snapshots.
  - **domain** (optional): The name of the domain to associate. If this parameter is omitted, then the pool will not be associated with any domain.

#### Example:

```

POST /xiv/v3/:xiv1/pools
{
  "request": [
    {
      "action": "create",
      "params": {
        "name": "p1",
        "size": "1700",
        "snap_size": "170",
        "domain": "domain1"
      }
    }
  ]
}

```

## Pool resize requests

Pool resize requests include the following components:

- An **action** parameter with a value of `resize_pool_size`.
- A **params** parameter, containing the following parameters:
  - **name**: The pool name.
  - **size**: Virtual capacity of the storage pool, in GB.

### Example:

```

POST /xiv/v3/:xiv1/pools
{
  "request": [
    {
      "action": "resize_pool_size",
      "params": {
        "name": "p1",
        "size": "1700"
      }
    }
  ]
}

```

Alternatively, a pool can be resized using the following request:

```

POST /xiv/v3/:xiv1/pools/:p1
{
  "request": {
    "action": "resize_pool_size",
    "params": {
      "size": "1700"
    }
  }
}

```

## Pool resize snapshot size requests

Pool resize snapshot size requests include the following components:

- An **action** parameter with a value of `resize_snapshot_size`.
- A **params** parameter, containing the following parameters:
  - **name**: The pool name.
  - **snap\_size**: The new size, in GB, reserved for snapshots.

### Example:

```

POST /xiv/v3/:xiv1/pools
{
  "request": [
    {
      "action": "resize_snapshot_size",
      "params": {
        "name": "p1",
        "snap_size": "170"
      }
    }
  ]
}

```

Alternatively, the snapshot size can be resized using the following request:

```

POST /xiv/v3/:xiv1/pools/:p1
{
  "request": {
    "action": "resize_snapshot_size",
    "params": {
      "snap_size": "170"
    }
  }
}

```

## Pool rename requests

Pool rename requests include the following components:

- An **action** parameter with a value of `rename`.
- A **params** parameter, containing the following parameters:
  - **name**: The pool name.
  - **new\_name**: The new name of the pool.

### Example:

```

POST /xiv/v3/:xiv1/pools
{
  "request": [
    {
      "action": "rename",
      "params": {
        "name": "pool1",
        "new_name": "pool2"
      }
    }
  ]
}

```

Alternatively, a pool can be renamed using the following request:

```

POST /xiv/v3/:xiv1/pools/:pool1
{
  "request": {
    "action": "rename",
    "params": {
      "new_name": "pool2"
    }
  }
}

```

## Pool deletion requests

Pool deletion requests include the following components:

- An **action** parameter with a value of delete.
- A **params** parameter, containing the following parameter:
  - **name**: The pool name.

### Example:

```
POST /xiv/v3/:xiv1/pools
{
  "request": [
    {
      "action": "delete",
      "params": {
        "name": "pool1"
      }
    }
  ]
}
```

Alternatively, a pool can be deleted using either of the the following requests, where p1 is the pool name:

```
POST /xiv/v3/:xiv1/pools/:p1
{
  "request": [
    {
      "action": "delete"
    }
  ]
}
```

```
DELETE /xiv/v3/:xiv1/pools/:p1
```

---

## Volume snapshot update requests

The following types of volume snapshot update requests are supported.

- “Volume snapshot creation requests”
- “Volume snapshot overwrite requests” on page 31
- “Volume snapshot lock requests” on page 31
- “Volume snapshot unlock requests” on page 32
- “Volume snapshot deletion requests” on page 32

## Volume snapshot creation requests

Volume snapshot creation requests include the following components:

- An **action** parameter with a value of create.
- A **params** parameter, containing the following parameters:
  - **source**: The name of the volume.
  - **target** (optional): The snapshot name.
  - **delete\_priority** (optional): The priority. Possible values are integers 0–4, and the default value is 1.

### Example:

```

POST /xiv/v3/:xiv1/snapshots
{
  "request": [
    {
      "action": "create",
      "params": {
        "source": "vol1",
        "target": "snapshot1",
        "delete_priority": "2"
      }
    }
  ]
}

```

## Volume snapshot overwrite requests

Volume snapshot overwrite requests include the following components:

- An **action** parameter with a value of `overwrite`.
- A **params** parameter, containing the following parameters:
  - **source**: The name of the volume.
  - **target**: The snapshot name.

**Example:**

```

POST /xiv/v3/:xiv1/snapshots
{
  "request": [
    {
      "action": "overwrite",
      "params": {
        "source": "vol1",
        "target": "snapshot1"
      }
    }
  ]
}

```

Alternatively, the volume snapshot may be overwritten using the following update request, where the snapshot name is used as a part of the URL:

```

POST /xiv/v3/:xiv1/snapshots/snapshot1
{
  "request": [
    {
      "action": "overwrite",
      "params": {
        "source": "vol1"
      }
    }
  ]
}

```

## Volume snapshot lock requests

Volume snapshot lock requests include the following components:

- An **action** parameter with a value of `lock`.
- A **params** parameter, containing the following parameter:
  - **name**: The snapshot name.

**Example:**

```

POST /xiv/v3/:xiv1/snapshots
{
  "request": [
    {
      "action": "lock",
      "params": {
        "name": "snapshot1"
      }
    }
  ]
}

```

Alternatively, a snapshot may be locked using the following update request, where `snapshot1` is the volume snapshot name:

```

POST /xiv/v3/:xiv1/snapshots/snapshot1
{
  "request": {
    "action": "lock"
  }
}

```

## Volume snapshot unlock requests

Volume snapshot unlock requests include the following components:

- An **action** parameter with a value of `unlock`.
- A **params** parameter, containing the following parameter:
  - **name**: The snapshot name.

### Example:

```

POST /xiv/v3/:xiv1/snapshots
{
  "request": [
    {
      "action": "unlock",
      "params": {
        "name": "snapshot1"
      }
    }
  ]
}

```

Alternatively, a snapshot may be un locked using the following update request, where `snapshot1` is the volume snapshot name:

```

POST /xiv/v3/:xiv1/snapshots/snapshot1
{
  "request": {
    "action": "unlock"
  }
}

```

## Volume snapshot deletion requests

Volume snapshot deletion requests include the following components:

- An **action** parameter with a value of `delete`.
- A **params** parameter, containing the following parameter:
  - **name**: The snapshot name.

### Example:

```
POST /xiv/v3/:xiv1/snapshots
{
  "request": [
    {
      "action": "delete",
      "params": {
        "name": "snapshot1"
      }
    }
  ]
}
```

Alternatively, a snapshot can also be deleted using either of the following update requests, where `snapshot1` is the volume snapshot name:

```
POST /xiv/v3/:xiv1/snapshots/snapshot1
{
  "request": [
    {
      "action": "delete"
    }
  ]
}
```

```
DELETE /xiv/v3/:xiv1/snapshots/:snapshot1
```

---

## Performance class update requests

The following types of performance class update requests are supported.

- “Performance class creation requests”
- “Performance class update IOPS limit requests” on page 34
- “Performance class update bandwidth limit requests” on page 35
- “Performance class rename requests” on page 35
- “Performance class add volume requests” on page 36
- “Performance class remove volume requests” on page 37
- “Performance class add pool requests” on page 37
- “Performance class remove pool requests” on page 38
- “Performance class add host requests” on page 40
- “Performance class remove host requests” on page 40
- “Performance class deletion requests” on page 41

## Performance class creation requests

Performance class creation requests include the following components:

- An **action** parameter with a value of `create`.
- A **params** parameter, containing the following parameters:
  - **name**: The performance class name.
  - **interface\_ops\_limit**: The IOPS limit for this performance class
  - **interface\_bw\_limit**: The bandwidth limit for this performance class.
  - **type**: The performance class type. Possible values are `SHARED` and `INDEPENDENT`. Selecting `SHARED`, enables the transparent and dynamic sharing of data between multiple entities. If `INDEPENDENT` is selected, multiple entities do

not share data. For example, if **interface\_ops\_limit** is set to 100, and 2 volumes are attached to the performance class, selecting SHARED will split the IOPS of 100 between the 2 volumes. Selecting INDEPENDENT will allocate the IOPS of 100 to each volume.

```
POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "create",
      "params": {
        "name": "gold",
        "interface_iops_limit": "1500",
        "interface_bw_limit": "5000",
        "type": "SHARED"
      }
    }
  ]
}
```

Alternatively, the performance class can be created by using the following request (where *gold* is the name of the performance class). For example:

```
POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": [
    {
      "action": "create",
      "params": {
        "interface_iops_limit": "1500",
        "interface_bw_limit": "5000",
        "type": "SHARED"
      }
    }
  ]
}
```

## Performance class update IOPS limit requests

Performance class update IOPS limit requests include the following components:

- An **action** parameter with a value of `update_iops_limit`.
- A **params** parameter, containing the following parameters:
  - **name**: The performance class name.
  - **interface\_iops\_limit**: The new iops limit for this performance class.

### Example:

```
POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "update_iops_limit",
      "params": {
        "name": "gold",
        "interface_iops_limit": "1700"
      }
    }
  ]
}
```

Alternatively, an iops limit can be updated using the following request:

```

POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "update_iops_limit",
    "params": {
      "interface_iops_limit": "1700"
    }
  }
}

```

## Performance class update bandwidth limit requests

Performance class update bandwidth limit requests include the following components:

- An **action** parameter with a value of `update_bw_limit`.
- A **params** parameter, containing the following parameters:
  - **name**: The performance class name.
  - **interface\_bw\_limit**: The new bandwidth limit for this performance class.

```

POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "update_bw_limit",
      "params": {
        "name": "gold",
        "interface_bw_limit": "5000"
      }
    }
  ]
}

```

Alternatively, a bandwidth limit can be updated by using the following request:

```

POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "update_bw_limit",
    "params": {
      "interface_bw_limit": "1700"
    }
  }
}

```

## Performance class rename requests

Performance class rename requests include the following components:

- An **action** parameter with a value of `rename`.
- A **params** parameter, containing the following parameters:
  - **name**: The performance class name.
  - **new\_name**: The new name of the performance class.

```

POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "rename",
      "params": {
        "name": "gold",
        "new_name": "silver"
      }
    }
  ]
}

```

Alternatively, a performance class can be renamed by using the following request:

```

POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "rename",
    "params": {
      "new_name": "silver"
    }
  }
}

```

## Performance class add volume requests

Performance class add volume requests include the following components:

- An **action** parameter with a value of `add_volume`.
- A **params** parameter, containing the following parameters:
  - **name**: The name of the performance class to which the volume is added.
  - **volume**: The name of the volume to add.

```

POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "add_volume",
      "params": {
        "name": "gold",
        "volume": "vol1"
      }
    }
  ]
}

```

Alternatively, adding a volume to a performance class can be done by using the following request:

```

POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "add_volume",
    "params": {
      "volume": "vol1"
    }
  }
}

```

## Performance class remove volume requests

Performance class "remove volume" requests include the following components:

- An **action** parameter with a value of `remove_volume`.
- A **params** parameter, containing the following parameters:
  - **volume**: The name of the volume to remove.

```
POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "remove_volume",
      "params": {
        "volume": "vol1"
      }
    }
  ]
}
```

Alternatively, removing a volume to a performance class can be done by using the following request:

```
POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "remove_volume",
    "params": {
      "volume": "vol1"
    }
  }
}
```

## Performance class add pool requests

Performance class add pool requests include the following components:

- An **action** parameter with a value of `add_pool`.
- A **params** parameter, containing the following parameters:
  - **name**: The name of the performance class to which the pool is added.
  - **pool**: The name of the pool to add.

```
POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "add_pool",
      "params": {
        "name": "gold",
        "pool": "pool1"
      }
    }
  ]
}
```

Alternatively, adding a pool to a performance class can be done by using the following request:

```

POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "add_pool",
    "params": {
      "pool": "pool1"
    }
  }
}

```

## Performance class remove pool requests

Performance class remove pool requests include the following components:

- An **action** parameter with a value of `remove_pool`.
- A **params** parameter, containing the following parameters:
  - **pool**: The name of the pool to remove.

### Example:

```

POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "remove_pool",
      "params": {
        "pool": "pool1"
      }
    }
  ]
}

```

Alternatively, removing a pool from a performance class can be done using the following request:

```

POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "remove_pool",
    "params": {
      "pool": "pool1"
    }
  }
}

```

## Performance class add domain requests

Performance class add domain requests include the following components:

- An **action** parameter with a value of `add_domain`.
- A **params** parameter, containing the following parameters:
  - **name**: The name of the performance class to which the domain is added.
  - **domain**: The name of the domain to add.

```

POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "add_domain",
      "params": {
        "name": "gold",
        "domain": "domain1"
      }
    }
  ]
}

```

Alternatively, adding a domain to a performance class can be done by using the following request:

```

POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "add_domain",
    "params": {
      "domain": "domain1"
    }
  }
}

```

## Performance class remove domain requests

Performance class remove domain requests include the following components:

- An **action** parameter with a value of `remove_domain`.
- A **params** parameter, containing the following parameters:
  - **domain**: The name of the domain to remove.

### Example:

```

POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "remove_domain",
      "params": {
        "domain": "domain1"
      }
    }
  ]
}

```

Alternatively, removing a domain from a performance class can be done using the following request:

```

POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "remove_domain",
    "params": {
      "domain": "domain1"
    }
  }
}

```

## Performance class add host requests

Performance class add host requests include the following components:

- An **action** parameter with a value of `add_host`.
- A **params** parameter, containing the following parameters:
  - **name**: The name of the performance class to which the host is added.
  - **host**: The name of the host to add.

### Example:

```
POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "add_host",
      "params": {
        "name": "gold",
        "host": "host1"
      }
    }
  ]
}
```

Alternatively, adding a host to a performance class can be done using the following request:

```
POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "add_host",
    "params": {
      "host": "host1"
    }
  }
}
```

## Performance class remove host requests

Performance class remove host requests include the following components:

- An **action** parameter with a value of `remove_host`.
- A **params** parameter, containing the following parameters:
  - **host**: The name of the host to remove.

### Example:

```
POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "remove_host",
      "params": {
        "host": "host1"
      }
    }
  ]
}
```

Alternatively, removing a host from a performance class can be done using the following request:

```
POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": {
    "action": "remove_host",
    "params": {
      "host": "host1"
    }
  }
}
```

## Performance class deletion requests

Performance class creation requests include the following components:

- An **action** parameter with a value of delete.
- A **params** parameter, containing the following parameters:
  - **name**: The performance class name.

### Example:

```
POST /xiv/v3/:xiv1/perf_classes
{
  "request": [
    {
      "action": "delete",
      "params": {
        "name": "gold"
      }
    }
  ]
}
```

Alternatively, the performance class may be deleted using the following request (where **gold** is the name of the performance class). For example:

```
POST /xiv/v3/:xiv1/perf_classes/:gold
{
  "request": [
    {
      "action": "delete"
    }
  ]
}
```

```
DELETE /xiv/v3/:xiv1/perf_classes/:gold
```

---

## Update response format

The update response is defined as an object that has a status field only, as defined in the query response format.

See Query response format.

**Example of a successful response to an update request:**

```
Request - GET /xiv/v3/:xiv1/volumes/:vol1
...
Response - HTTP/1.1 200 OK
...
{
  "status": {
    "server": {"status": "0", "message": "OK" }
    "failed_systems": []
  }
}
```

#### **Example of a failed request:**

```
Request - DELETE/xiv/v3/:xiv1/volumes/:vol1
...
Response - HTTP/1.1 500 Internal Server Error
...
{
  "status": {
    "server": {"status": "5", "message": "Update request
              failed with reason: Volume 'vol1' does not exist" }
    "failed_systems": []
  }
}
```

---

## Chapter 5. Request URL definitions

The following groups of request URLs are defined:

- “System request URLs”
- “Volume request URLs”
- “Cluster request URLs” on page 44
- “System FC port request URLs” on page 44
- “System iSCSI port request URLs” on page 44
- “Host port request URLs” on page 44
- “Volume mapping request URLs” on page 44
- “Pool request URLs” on page 44
- “Event request URLs” on page 45
- “Volume snapshot request URLs” on page 45

---

### System request URLs

The following system request URLs are defined:

- GET `/xiv/v3/systems`: Lists all system properties managed by the Hyper-Scale Manager.
- GET `/xiv/v3/systems/:xiv1`: Lists all specific system properties.
- GET `/xiv/v3/systems/capacityReport`: Generates capacity report for all systems in your inventory.
- GET `/xiv/v3/systems/:<system-name>/capacityReport`: Generates capacity report for a specific system in your inventory.

---

### Volume request URLs

The following volume request URLs are defined:

- GET `/xiv/v3/volumes`: Lists all volumes on all authorized systems.
- GET/POST `/xiv/v3/:xiv1/volumes`: Lists all volumes on a specific system; creates / updates / deletes volumes.
- GET `/xiv/v3/:xiv1/volumes?pool=x`: Lists all volumes in a specific pool.
- GET/POST/DELETE `/xiv/v3/:xiv1/volumes/:vol1`: Lists specific volume properties; updates / deletes a volume.

---

### Host request URLs

The following host request URLs are defined:

- GET `/xiv/v3/hosts`: Lists all hosts' properties on all authorized systems.
- GET/POST `/xiv/v3/:xiv1/hosts`: Lists all hosts on a specific system; creates / updates / deletes hosts.
- GET/POST/DELETE `/xiv/v3/:xiv1/hosts/:h1`: Lists specific host properties; deletes a host.

---

## Cluster request URLs

The following cluster request URLs are defined:

- GET `/xiv/v3/clusters`: Lists all clusters on all authorized systems.
- GET/POST `/xiv/v3/:xiv1/clusters`: Lists all hosts on a specific system; creates / updates / deletes clusters.
- GET/POST/DELETE `/xiv/v3/:xiv1/clusters/:cl1`: Lists specific cluster properties; updates / deletes a cluster.

---

## System FC port request URLs

The following system FC port request URLs are defined:

- GET `/xiv/v3/:xiv1/fc_ports`: Lists all FC ports on a specific machine.
- GET `/xiv/v3/:xiv1/fc_ports/:p1`: Lists properties for a specific FC port.

---

## System iSCSI port request URLs

The following system iSCSI port request URLs are defined:

- GET `/xiv/v3/:xiv1/iscsi_ports`: Lists all iSCSI ports on a specific machine.
- GET `/xiv/v3/:xiv1/iscsi_ports/:p1`: Lists properties for a specific iSCSI port.

---

## Host port request URLs

The following host port request URLs are defined:

- POST `/xiv/v3/:xiv1/host_ports`: Add/remove ports to/from a specific host.
- GET `/xiv/v3/:xiv1/host_ports?host=x`: Lists all ports of a specific host.
- GET `/xiv/v3/:xiv1/host_ports?port=x`: Lists the host of a specific port.
- GET/DELETE `/xiv/v3/:xiv1/host_ports/:h1:p1`: Lists properties of a specific port; removes port from a host.

---

## Volume mapping request URLs

The following volume mapping request URLs are defined:

- POST `/xiv/v3/:xiv1/vol_maps`: Creates / deletes mappings.
- GET `/xiv/v3/:xiv1/vol_maps?host=x`: Lists all mappings of a specific host.
- GET `/xiv/v3/:xiv1/vol_maps?cluster=x`: Lists all mappings of a specific cluster.
- GET `/xiv/v3/:xiv1/vol_maps?volume=x`: Lists all mappings of a specific volume.
- GET/DELETE `/xiv/v3/:xiv1/vol_maps/:cluster:c1:vol1`: Lists properties of a specific mapping; deletes the mapping.
- GET/DELETE `/xiv/v3/:xiv1/vol_maps/:host:h1:vol1`: Lists properties of a specific mapping; deletes the mapping.

---

## Pool request URLs

The following pool request URLs are defined:

- GET `/xiv/v3/pools`: Lists all pools on all authorized systems.
- GET/POST `/xiv/v3/:xiv1/pools`: Lists all pools on a specific system; creates / updates / deletes pools.
- GET/POST/DELETE `/xiv/v3/:xiv1/hosts/:h1`: Lists properties of a specific pool; deletes a pool.

---

## Event request URLs

The following event request URL is defined:

- GET /xiv/v3/:xiv1/events/: Lists events from a specific system.

---

## Volume snapshot request URLs

The following volume snapshot request URLs are defined:

- GET /xiv/v3/snapshots: Lists all snapshots on all authorized systems.
- GET /xiv/v3/:xiv1/snapshots?volume=vol1: Lists all snapshots of a specific volume.
- GET/POST /xiv/v3/:xiv1/snapshots: Lists all snapshots on a specific system; creates / updates / deletes snapshots.
- GET/POST/DELETE /xiv/v3/:xiv1/snapshots/:sn1: Lists properties of a specific snapshot; deletes a snapshot.

---

## Performance class request URLs

The following performance class request URLs are defined:

- GET /xiv/v3/perf\_classes : Lists all performance classes on all authorized systems.
- GET/POST /xiv/v3/:xiv1/perf\_classes: Lists all performance classes on a specific system; creates / updates / deletes performance classes.
- GET/POST/DELETE /xiv/v3/:xiv1/perf\_classes/:gold: Lists properties of a specific performance class; updates a performance class or deletes a performance class.
- GET /xiv/v3/:xiv1/volumes?perf\_class=gold: Lists all of the volumes that are a part of a specific performance class.
- GET /xiv/v3/:xiv1/hosts?perf\_class=gold: Lists all of the hosts that are a part of a specific performance class.
- GET /xiv/v3/:xiv1/pools?perf\_class=gold: Lists all of the pools that are a part of a specific performance class.



---

## Chapter 6. Resource definitions

The resource formats that are returned by the REST API are defined in the following sections:

- “System resource definitions”
- “Volume resource definitions” on page 48
- “Host resource definitions” on page 48
- “Cluster resource definitions” on page 49
- “System FC port resource definitions” on page 49
- “System iSCSI port resource definitions” on page 50
- “Host port resource definitions” on page 50
- “Volume mapping resource definitions” on page 50
- “Pool resource definitions” on page 51
- “Event resource definitions” on page 51
- “Volume snapshot resource definitions” on page 51

---

### System resource definitions

The system resource formats that are returned by the REST API are as follows:

```
{
  "system": {
    "hard_capacity": ""
    "ip_addresses": [1]
    -0: {
      "ip": "gen4d-64b"
    }
    "safe_mode": "false"
    "system_state": "on"
    "soft_capacity": ""
    "compression_state": ""
    "free_soft_capacity": ""
    "ref": "/xiv/v3/systems/:gen4d-64b"
    "target_state": "on"
    "name": "gen4d-64b"
    "physical_free": "1937000000000"
    "redundancy_status": "Fully Protected"
    "id": "XIV gen4d-64b:6013794:9835:415"
    "physical_size": "1963000000000"
  }
}
```

**Note:** The system resource format is the same for both Gen3 and Gen4 systems. However, in Gen3 systems, the values for `physical_size` and `physical_free` are empty. While in Gen4 systems, the values for `hard_capacity`, `soft_capacity`, and `free_soft_capacity` are empty.

---

## Volume resource definitions

The volume resource formats that are returned by the REST API are as follows:

```
{
  "volume": {
    "size_on_disk": "103000000000",
    "pool_ref": "/xiv/v3/:6011947b/pools/:Pool_DM",
    "size": "103249084416",
    "wwn": "001738002EAB3AAB",
    "capacity_used_by_snapshots": "0",
    "id": "6d5d14d03ab5",
    "ref": "/xiv/v3/:6011947b/volumes/:Vol_RTC_004",
    "system": "6011947b",
    "pool": "Pool_DM",
    "name": "Vol_RTC_004",
    "mirrored": "false",
    "cg": "",
    "locked": "false",
    "used_capacity": "12000000000",
    "perf_class_ref": "/xiv/v3/:gen4d-54c/perf_classes/:TaylorS",
    "perf_class": "TaylorS",
    "estimated_min_delete_size": "0"
  }
}
```

**Note:** The `perf_class_ref` parameter is applicable only to objects limited by QOS.

---

## Host resource definitions

The host resource formats that are returned by the REST API are as follows:

```
{
  "host": {
    "ports": [
      {
        "type": "fc"
        "name": "1234567890123001"
        "ref": "/xiv/v3/:mn44/host_ports/:rest-host-sa-def:1234567890123001",
      },
      {
        "type": "iscsi"
        "name": "rest-host-sa-def_1"
        "ref": "/xiv/v3/:mn44/host_ports/:rest-host-sa-def: rest-host-sa-def_1",
      }
    ],
    "perf_class": "none",
    "ref": "/xiv/v3/:mn44/hosts/:rest-host-sa-def",
    "type": "standard",
    "cluster": "",
    "id": "101255",
    "name": "rest-host-sa-def",
    "system": "mn44",
    "perf_class_ref": "/xiv/v3/:gen4d-54c/perf_classes/:TaylorS",
    "perf_class": "TaylorS",
    "domains": [
      {
        "domain": "domain1"
      },
      {
        "domain": "domain2"
      }
    ]
  }
}
```

**Note:** The `perf_class_ref` parameter is applicable only to objects limited by QOS.

---

## Cluster resource definitions

The cluster resource formats that are returned by the REST API are as follows:

```
{
  "cluster": {
    "ref": "/xiv/v3/mn44/clusters/:rest-cluster-def",
    "type": "standard",
    "id": "101239",
    "name": "rest-cluster-def",
    "hosts": [
      {
        "name": "rest-host-cd-def-1",
        "ref": "/xiv/v3/mn44/hosts/:rest-host-cd-def-1"
      },
      {
        "name": "rest-host-cd-def-2",
        "ref": "/xiv/v3/mn44/hosts/:rest-host-cd-def-2"
      }
    ],
    "system": "mn44",
    "domains": [
      {
        "domain": "domain1"
      },
      {
        "domain": "domain2"
      }
    ]
  }
}
```

---

## System FC port resource definitions

The system FC port resource formats that are returned by the REST API are as follows:

```
{
  "fc_port": {
    "ref": "/xiv/v3/mn44/ fc_ports/:1234567890123001",
    "id": "101280",
    "wwpn": "1234567890123001",
    "module": "6",
    "port_number": "1",
    "status": "OK",
    "role": "Target",
    "state": "Online",
    "user_enabled": "true",
    "configured_rate": "Auto",
    "current_rate": "4",
    "error_count": "0",
    "system": "mn44"
  }
}
```

---

## System iSCSI port resource definitions

The system iSCSI port resource formats that are returned by the REST API are as follows:

```
{
  "iscsi_port": {
    "ref": "/xiv/v3/mn44/iscsi_ports/myport",
    "id": "101280",
    "name": "myport",
    "address": "1.1.1.13",
    "netmask": "255.255.255.0",
    "gateway": "1.1.1.1",
    "mtu": "4500",
    "module": "7",
    "port_number": "1",
    "system": "mn44"
  }
}
```

---

## Host port resource definitions

The host port resource formats that are returned by the REST API are as follows:

```
{
  "host_port": {
    "ref": "/xiv/v3/mn44/host_ports/rest-host-sa-def:1234567890123001",
    "host": "rest-host-sa-def",
    "type": "fc",
    "id": "101280",
    "name": "1234567890123001",
    "system": "mn44"
  }
}
```

---

## Volume mapping resource definitions

The volume mapping resource formats that are returned by the REST API are as follows:

```
{
  "vol_map": {
    "ref": "/xiv/v3/mn44/vol_maps/host:host_rest-host-sa-def:rest-vol-rpnoio_001",
    "lun": "2",
    "host": "rest-host-sa-def",
    "cluster": "",
    "volume": "rest-vol-rpnoio_001",
    "id": "101215",
    "system": "mn44"
  }
}
```

---

## Pool resource definitions

The pool resource formats that are returned by the REST API are as follows:

```
{ "pool": {
    "used_by_snapshots": "0",
    "snapshot_size": "309000000000",
    "size": "2305000000000",
    "id": "6dc714800006",
    "ref": "/xiv/v3/6011947b/pools/:Clippers",
    "system": "6011947b",
    "used_by_volumes": "860000000000",
    "name": "Clippers",
    "domain": "no-domain",
    "locked": "false",
    "perf_class_ref": "/xiv/v3/gen4d-54c/perf_classes/:TaylorS",
    "perf_class": "TaylorS"
}
```

**Note:** The `perf_class_ref` parameter is applicable only to objects limited by QOS.

---

## Event resource definitions

The event resource formats that are returned by the REST API are as follows:

```
{
  "event": {
    "ref": "/xiv/mn44/events/111111 ",
    "id": "111111", "code": "USER_LOGIN_HAS_SUCCEEDED",
    "severity": "Informational",
    "timestamp": "1234567890",
    "description": "User 'admin' from IP 'X.X.X.X' successfully logged into the system.",
    "system": "mn44"
  }
}
```

---

## Volume snapshot resource definitions

The volume snapshot resource formats that are returned by the REST API are as follows:

```
{
  "snapshot": {
    "source_ref": "/xiv/v3/6010625a/volumes/:vol1",
    "estimated_min_delete_size": "0",
    "delete_priority": "1",
    "sg": "",
    "pool_ref": "/xiv/v3/6010625a/pools/:pool-a",
    "creator": "admin",
    "size": "17000000000",
    "id": "581145000d",
    "wwn": "001738002981000D",
    "ref": "/xiv/v3/6010625a/snapshots/:vol1.snapshot_00001",
    "system": "6010625a",
    "source": "vol1",
    "pool": "pool-a",
    "name": "vol1.snapshot_00001",
    "cg": "",
    "locked": "true",
    "perf_class_ref": "/xiv/v3/gen4d-54c/perf_classes/:TaylorS",
    "perf_class": "TaylorS"
  }
}
```

**Note:** The `perf_class_ref` parameter is applicable only to objects limited by QoS.

---

## Performance class resource definitions

The performance class resource formats that are returned by the REST API are as follows:

```
{
  "performanceClass": {
    "ref": "/xiv/v3/Gen4D64a/perf_classes/:ClassQoS",
    "system": "gen4d-54c",
    "name": "AnotherQoS",
    "interface_iops_limit": 0,
    "interface_bw_limit": 500,
    "id": "10d61720000b",
    "type": SHARED
  }
}
```

---

## Chapter 7. Error handling

Each request to the REST API receives a response with two types of status codes:

- **HTTP (transport) status code:** A quick indication of whether or not the request succeeded. Some automation scripts may not parse the full response in case of error, so it is helpful to have a quick indication at the HTTP level.
- **server status code:** Provides a more detailed application level status to allow troubleshooting in case of errors.

The following topics are covered in this chapter:

- “HTTP status codes”
- “Server status codes” on page 54
- “Failed system status codes” on page 55

---

### HTTP status codes

The following tables lists the HTTP status codes and messages returned by the REST API:

*Table 1. HTTP status codes and messages*

HTTP status code	HTTP message	Description
200	OK	The request succeeded. The response contains either a list of resources (in response to a query) or is empty.
400	Bad Request	The request contains invalid scope keywords or invalid URL parameters. Examples of invalid URL parameters are: non-numeric values, redundant parameters, etc.
401	Unauthorized	The user credentials provided are not valid.
404	Not Found	The request addresses non-existing resource(s). The server status code contains more details about what resource was not found.
500	Internal Server Error	The request is valid, but some application level error occurred. See server status for more information.

## Server status codes

The following tables lists the server status codes and messages returned by the REST API:

Table 2. Server status codes, correlated to HTTP status codes

HTTP status code	Server status code	Server message	Description
200	0	OK	The request succeeded. The response contains either a list of resources (in response to a query) or is empty.
500	1	Robot authentication failed	The server cannot connect to a supported storage system with robot user credentials. Most likely, the robot user password is not set on the server.
401	2	Unauthorized	Invalid user credentials were supplied for a query or update operation.
500	3	No systems connected	All supported storage systems that are addressed in the request are disconnected.
404	4	Resource named X of type Y not found	The query request addressed a non-existent resource. The server message contains the missing resource name and type. This is useful for troubleshooting complex requests, such as mapping of the system's host.
500	5	Request failed	The request execution failed. The <b>failed_systems</b> part contains the reason.
400	6	Invalid Request. <Reason>	The request is invalid. The message contains the exact reason.
500	8	No managed systems configured	No supported storage systems are managed by the server.
500	9	Server general error	Some general error occurred during processing.

---

## Failed system status codes

When performing multi-system queries, some supported storage systems may be in an error state (such as disconnected, not authenticated, etc.). This indicates to the user that the query response does not contain resources from these systems. To address this situation, there is the **failed\_systems** field in the response. The field is a list that contains systems that are in error, according to the following table:

*Table 3. Failed system status codes*

Failed system status code	Message	Description
1	Robot user authentication failed	Robot user credentials are not defined on the system, or the robot password is not set on the server.
2	Unauthorized	Invalid user credentials were supplied.
3	System is disconnected	The server cannot connect to the specific supported storage system.
4	The system is not managed by the server	The specific supported storage system is not managed by the server.
5	Request failed. <Reason>	The request failed. Reason contains CLI command response + error code.
6	System is suspended	The specific storage system is suspended.

If there is a multi-system request when all of the systems are inaccessible, the following rules apply:

- If all systems are in an Unauthorized state, the response is HTTP 401 , server status 2.
- If all systems are in a Robot user authentication failed state, the response is HTTP 500, server status 1.
- For all other cases, the response is HTTP 500, server status 3.



---

## Chapter 8. Security

The REST API protocol does not have any built-in security features, so it strongly relies on the transport protocol (HTTP) to provide security. Specifically, the following HTTP features are used:

- **HTTP/S:** Provides an encrypted HTTP channel between client and server.
- **HTTP basic authentication:** Used for carrying client provided credentials to the server / supported storage systems.



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