

REST API 1.19

This guide describes how to use the Pure Storage® REST API. The guide is divided into two sections: Overview and Resources. The Overview section describes high-level concepts while the Resources section contains a comprehensive list of resources and endpoints.

What's new? We are working on a new REST API document. Click on the "What's New?" link to learn more.

What's New?

We are working on new REST API reference documentation. The documentation contains a list of endpoints that you can use with the FlashArray 2.2 REST API. We will be adding new endpoints at each release.

Click here for a preview of the [FlashArray 2.2 REST API reference](#) and [let us know](#) what you think!

-
- [Overview](#)
 - [Resources](#)

REST API Overview

The Pure Storage REST API provides simple interfaces for many Purity commands.

What is REST?

REpresentational State Transfer (REST) uses HTTP requests to interact with resources within Pure Storage. REST is an architectural style that describes the following constraints:

- **Uniform Interface.** Individual resources are identified in requests using URIs as resource identifiers. For example:

```
volume
volume/v1
```

Clients manipulate resources through request methods, such as:

Method	Description	Example
GET	List resources.	GET volume
POST	Create a resource.	POST volume/v1
PUT	Modify a resource.	PUT volume/v1
DELETE	Delete a resource.	DELETE volume/v1

Requests can include additional parameters, either in the URL or as JSON post data. For example, the snap parameter is included in the following request to list all snapshots:

```
GET volume?snap=true
```

Responses return a response code and data (represented in JSON). For example, the following GET volume/v1 request returns a response code 200 OK and the attribute details for a volume named "v1":

```
>> GET volume/v1

<< 200 OK
{
  "created": "Tue Jan 28 06:15:23 2014",
  "name": "v1",
  "serial": "CEE061D3B3B23499000101E1",
  "size": 1073741824,
  "source": null
}
```

- **Stateless.** The necessary state to handle a request is contained in the request itself.
- **Cacheable.** The responses must implicitly or explicitly define themselves as cacheable.
- **Client-Server.** The uniform interface creates separation between client and server. Clients can be more portable, servers do not need to know anything about user interface or state.
- **Layered System.** A client cannot tell if it is connected directly to the server; intermediary servers can be used to improve scalability or enforce security policies.

Pure Storage REST API

The Pure Storage REST API provides simple interfaces for many Purity commands.

In the following example, the Purity CLI command `purearray list` returns the attributes for the array:

```
$ purearray list
Name      ID                      Version  Revision
pure-001  9d2c3325-c5b9-14ad-43b8-1c773a6406b90  4.8.0    201510290821+a1af0ba
```

The equivalent REST API request GET `https://pure-001.example.com/api/1.19/array` produces the same results:

```
>> GET https://pure-001.example.com/api/1.19/array

<< 200 OK

{
  "array_name": "pure-001",
  "id": "9d2c3325-c5b9-14ad-43b8-1c773a6406b9",
  "revision": "201510290821+a1af0ba",
  "version": "4.8.0"
}
```

Using the REST API consists of the following steps:

1. Generate the API token. This is a one-time step.
2. Create the REST session.
3. Submit REST API requests.
4. Invalidate the REST session.

Generating an API Token

The REST API uses [authentication](#) tokens to create sessions. All Purity users can generate their own API tokens.

Generate the API token through the Purity GUI (System > Users > Create API Token) or CLI (pureadmin create --api-token).

API tokens can also be generated through the [REST API](#). Generating API tokens through the REST API may be convenient during development, but is discouraged in production environments as it exposes usernames and passwords.

Once generated, the API token is valid until it is deleted or recreated.

Creating a REST Session

After the API token has been generated, use the token to create a REST session.

To create a REST session, send the following request and payload:

```
>> POST https://pure-001.example.com/api/1.19/auth/session
<< 200 OK
{
  "api_token": "a00bcd9e-f3gh-20i7-j51k-7013515mn300"
}
```

The session is valid until it is explicitly deleted (invalidated) or experiences 30 minutes of inactivity.

Submitting REST API Requests

REST API requests can be performed within a REST session.

The user's [authorization](#) role in Purity determines which requests the client can perform within the session.

Each REST API request is comprised of a complete URL. The complete URL used to make a Pure Storage REST request includes the following components:

- Method (GET, POST, PUT, or DELETE)
- Purity array
- [REST API version](#)
- URI

For example, the following request lists all volumes and their attributes:

```
GET https://pure-001.example.com/api/1.19/volume
```

Some REST API requests include additional parameters.

Parameters for GET methods may be specified as query parameters in the URL. For example, the following request, with space specified as a query parameter, lists array space usage:

```
GET https://pure-001.example.com/api/1.19/array?space=true
```

All other methods (POST, PUT, and DELETE) must be specified as JSON post data. Refer to the <http://www.json.org/> website for more information about the JSON interchange format.

The following are examples of how different data types are formatted in JSON:

Data Type	Examples
boolean	{"eradicate": true}
object	{"replicate_blackout": {"end": 14400, "start": 7200}}
list	{"nameservers": ["192.168.1.1", "192.168.0.1"]}
number	{"per_day": 12}
string	{"domain": "example.com"}

For example the following request and payload, with the source parameter specified as JSON post data, creates a new volume named v6 by copying volume v1.

```
>> POST https://pure-001.example.com/api/1.19/volume/v6
<< 200 OK
{
  "source": "v1"
}
```

Refer to [Resources](#) for a list of all available Pure Storage REST requests.

Each REST API request returns a [response code](#). Successful requests return the response code 200 OK. Scripts must be prepared to handle responses with codes other than 200 OK.

In the following example, the client is attempting to list alert information for email recipient support_@purestorage.com. The request returns a response code 400 BAD REQUEST, stating that recipient support_@purestorage.com does not exist.

```
>> GET http://lt14/api/1.19/alert/support_@purestorage.com

<< 400 BAD REQUEST
{
  msg: "Address does not exist."
  ctx: "support_@purestorage.com"
}
```

Refer to the [Response Codes](#) table for a description of each response code.

Every request that modifies a resource is logged in the Purity [audit trail](#). These requests include most POST, PUT, and DELETE requests. The logged events can be viewed through the Purity GUI (Messages > Audit Trail) and CLI (`puremessage list --audit`).

Invalidating a REST Session

A REST session is valid until it is explicitly deleted (invalidated) or experiences 30 minutes of inactivity.

To manually invalidate a REST session, send the following request:

```
>> DELETE https://{array}/api/1.19/auth/session

<< 200 OK
{
  "username": "pureuser"
}
```

REST API Version

The REST API consists of a major and minor version.

Major releases modify or remove existing functionality and are not backward compatible.

Minor releases add new functionality only. Minor releases are backward compatible, with exceptions listed in the REST API release notes. For example, users on REST API version 1.2 can submit any of the requests available in REST API versions 1.0 through 1.2.

To determine the supported REST API versions for the current release, enter the URL `https://{array}/api/api_version`. The supported version numbers are returned as a list. For example,

```
{"version": ["1.0", "1.1", "1.2", "1.3", "1.4", "1.5", "1.6", "1.7", "1.8", "1.9", "1.10", "1.11", "1.12", "1.13", "1.14"]}
```

To determine the supported REST API versions for the current release, enter the URL `https://{array}/api/api_version`.

For information about the Purity//FA REST API releases, including changes and enhancements between release versions, refer to the Purity//FA REST API Release Notes on the Knowledge site at <https://support.purestorage.com>.

Authentication vs. Authorization

The REST API uses authentication tokens instead of credentials to create sessions, while authorization roles determine which requests can be performed within a session.

Authentication

Purity clients must use an API token in order to securely create REST API sessions. By using API tokens to authenticate, scripts do not have to expose usernames and passwords. The Purity username and password are required initially to create the API token.

API tokens are unique to the Purity user for whom it was created. Each Purity user can generate and view only their own API token. Once created, an API token is valid until it is deleted or recreated.

API tokens can be created and recreated through the Purity GUI (System > Users > Create API Token), CLI (`pureadmin create --api-token`) or REST API.

After obtaining an API token, clients can create REST API sessions and start sending requests. Since REST API service sessions are completely separate from Purity GUI sessions, REST requests cannot be accessed through the Purity GUI.

API token management does not affect Purity usernames and passwords. For example, invalidating an API token does not invalidate the Purity username or password that was used to create the token. Likewise, changing the Purity username or password does not affect the API token.

Authorization

Authorization determines what the client is permitted to do within a REST session.

If Purity is integrated with a directory service, such as Microsoft Active Directory or OpenLDAP, the REST service leverages role-based access control (RBAC) to determine permission levels. In other words, the roles that are assigned to the users in a directory service are the same roles that are used in Purity and in the REST API.

Once you have created a REST API session, the requests that the client is authorized to make depend on the role of the user associated with the API token (as system administrator, storage administrator, or read-only user).

The integration of RBAC in the REST API with directory services is dynamic. The API token permissions are integrated with the Active Directory permissions. Changes made to a user's Active Directory permissions affect the associated API token permissions.

For example, if a user is moved to a different directory services group and the permission level changes from read-only user to storage administrator, the associated API token permissions change as well. Permission changes made in the directory server are cached on the array and may take 30 minutes to affect the API token.

Response Codes

The Pure Storage REST API returns the following HTTP response status codes for the GET, POST, PUT, and DELETE operations:

Code	Description
200 OK	The request is successful.
400 BAD REQUEST	The request includes an invalid action or invalid or missing data. Refer to the REST API response for more information.
401 UNAUTHORIZED	The REST API session has not been created or has expired. Create a new session.
403 FORBIDDEN	The request is valid, but the client is not authorized to perform the action. For example, a read-only client is not allowed to create volumes.
404 NOT FOUND	The URI is not valid.
405 METHOD NOT ALLOWED	The method is not valid for the URI specified. Enter a GET, POST, PUT, or DELETE method that is valid for the URI specified.
450 VERSION NOT SUPPORTED	The request is not valid for the REST API version specified.
500 SERVER ERROR	The request generated an internal error. Contact Pure Technical Services for help.

Sorting, Filtering, and Pagination

When submitting GET requests that return a large amount of data, include filtering, sorting, and pagination query parameters to help you better manage the results.

The Pure Storage REST API supports filtering, sorting, and pagination for the following GET methods: GET volume, GET host, GET hgroup, GET pgroup, and GET port.

Sorting

The sort query parameter returns the response objects of a GET request in the order specified. Sorting can be performed on any of the fields in the response, and the response objects can be sorted in ascending or descending order.

Syntax

?sort=**field_name**

field_name

Name of the field to sort. **Field_name** can be any of the fields in the response. To sort in descending order, append the minus sign (-) to the field name. To sort on multiple field names, list the field names as comma-separated values.

Examples

Example 1: Get a list of all protection groups sorted in ascending order by protection group name.

```
GET https://pure01.example.com/api/1.19/pgroup?sort=name
```

Example 2: Get a list of all host groups sorted in descending order by host group name.

```
GET https://pure01.example.com/api/1.19/hgroup?sort=name-
```

Example 3: Get a list of all volumes sorted in descending order by volume size, and then sorted in ascending order by volume name.

```
GET https://pure01.example.com/api/1.19/volume?sort=size-,name
```

Filtering

The filter query parameter narrows down the results of a GET request to only the response objects that satisfy the filter criteria.

Filtering With Operators

Pure Storage REST API filter queries support common comparison operators.

Syntax

?filter=**field_name operator field_value**

field_name

Name of the field on which to create the filter. **Field_name** can be any of the fields in the response.

operator

Type of filter match used to compare **field_name** to **field_value**. Filters support the following operators:

REST 1.19

Operator	Description	Examples
=	Equals	Get a list of all volumes with volume names that include v1. /volume?filter=name='*v1*'
!=	Does not equal	Get a list of all volumes with volume names that do not include v1. /volume?filter=name!='*v1*'
<	Less than	Get a list of all volumes that are less than 100 gigabytes in size. /volume?filter=size<107374182400
>	Greater than	Get a list of all volumes that are greater than 100 gigabytes in size. /volume?filter=size>107374182400 Get a list of all volumes that were created after 2016-04-25T23:02:23Z. /volume?filter=created>'2016-04-25T23:02:23Z'
<=	Less than or equal to	Get a list of all volumes that are less than or equal to 100 gigabytes in size. /volume?filter=size<=107374182400 Get a list of all volumes that were created on or before 2016-04-25T23:02:23Z. /volume?filter=created<='2016-04-25T23:02:23Z'
>=	Greater than or equal to	Get a list of all volumes that are greater than or equal to 100 gigabytes in size. /volume?filter=size>=107374182400

field_value

Search value (number, date, or string) that determines the fields to be included in or excluded from the response.

Literal strings must be wrapped in quotes.

To refine the filter, include the asterisk (*) symbol as a wildcard character in the field value to represent zero or more characters. Field_value can include multiple asterisks, and the asterisks can appear anywhere in the value. For example, the request GET /host?filter=name='*cat*' lists all hosts with names that contain cat, including ones that begin or end with cat, such as cat, catnap, happycats, and lolcat. If the asterisks were not included, only the host named cat would be returned.

Examples

Example 1: Get the volume with serial number 31F52075433543110001103F.

```
GET https://pure01.example.com/api/1.19/volume?filter=serial='31F52075433543110001103F'
```

Example 2: Get a list of hosts that are associated with host group ESXi-IT-Cluster02-hg2.

```
GET https://pure01.example.com/api/1.19/host?filter=hgroup='ESXi-IT-Cluster02-hg2'
```

Example 3: Get a list of all Fibre Channel ports on controller ct0.

```
GET https://pure01.example.com/api/1.19/port?filter=name='ct0.fc*'
```

Example 4: Get a list of all volumes that have been destroyed and will be eradicated within the next 2 hours (7200 seconds).

```
GET https://pure01.example.com/api/1.19/volume?pending_only=true&filter=time_remaining<='7200'
```

Filtering With Functions

Pure Storage REST API filter queries support the CONTAINS and NOT functions.

Syntax

?filter=function(parameters)

Filters support the following functions:

Function	Description	Examples
contains(field_name,string)	Contains the enclosed string. Takes exactly two parameters, where field_name represents the name of the field on which to create the filter, and string represents the string to search within field_name.	Get a list of all host groups with names that include cluster02. /host?filter=contains(hgroup,'cluster02')
not(expression)	Inverse of the enclosed expression.	Get a list of all host groups with names that do not include cluster02. /host?filter=not(hgroup='cluster02')

Examples

Example 1: Get a list of all hosts that are associated with host groups that include hg3 in the host group name.

```
GET https://pure01.example.com/api/1.19/host?filter=contains(hgroup,'hg3')
```

Example 2: Get a list of all volumes with names that do not include vol01.

```
GET https://pure01.example.com/api/1.19/volume?filter=not(contains(name,'vol01'))
```

Existence Checks

The REST API supports existence checks. For example, the request GET /volume?filter=name checks to see if "name" field name exists in the volume resource.

Examples

Example 1: Get a list of all hosts that are associated with a host group.

```
GET https://pure01.example.com/api/1.19/host?filter=hgroup
```

Example 2: Get a list of all volumes that were not created from another source.

```
GET https://pure01.example.com/api/1.19/volume?filter=not(source)
```

Example 3: Get a list of all hosts that are not associated with Fibre Channel WWNs. (Sample response included.)

```
>> GET https://pure01.example.com/api/1.19/host?filter=not(wwn)

<< {
  "iqn": [],
  "wwn": [],
  "name": "ESXi-Cluster02-v7",
  "hgroup": null
},
{
  "iqn": [],
  "wwn": [],
  "name": "ESXi-Cluster02-v8",
  "hgroup": "ESXHGroup1"
},
{
  "iqn": [],
  "wwn": [],
  "name": "ESXi-Cluster02-v9",
  "hgroup": null
},
{
  "iqn": [],
  "wwn": [],
  "name": "ESXi-Cluster02-v10",
  "hgroup": null
}
```

Example 4: Get a list of all protection groups that do not contain volume or host group members.

```
GET https://pure01.example.com/api/1.19/pgroup?filter=not(volumes) and not(hgroups)
```

Pagination

Pagination controls the amount of data returned by displaying response objects (items) as page-by-page lists.

Pagination only applies if the total number of items returned is greater than the limit specified. To determine the total number of items returned, see the x-total-item-count header field of the response.

The Pure Storage REST API offers two methods of pagination: page by index, and page by continuation token.

Page by Index

Page by index enables clients to control the size and starting point of a page. Use page by index, such as in GUI implementations, to navigate through response objects page by page, jump to specific pages, and jump to the first or last page. For example, to page through all results with 20 results per page, begin with start=0&limit=20.

With page by index pagination, consistency may not be guaranteed in that some data may be duplicated or missing across pages. If consistency is important, use continuation tokens.

Syntax

start=starting_index&limit=items_returned

starting_index

Index number of the first item you want results for.

items_returned

Maximum number of response objects returned per page.

Examples

Example 1: Get all volumes starting at the very first volume.

```
GET https://pure01.example.com/api/1.19/volume?start=0
```

Example 2: Get 10 volumes at a time.

```
GET https://pure01.example.com/api/1.19/volume?limit=10
```

Example 3: Get 10 volumes with index 0 to 9.

```
GET https://pure01.example.com/api/1.19/volume?start=0&limit=10
```

Example 4: Get 1 host with index 100.

```
GET https://pure01.example.com/api/1.19/hosts?start=100&limit=1
```

Page by Continuation Token

The REST API supports continuation tokens, giving clients the ability to paginate with some consistency guaranteed.

Page by continuation token requires the `limit` and `token` query parameters.

The `limit` parameter determines how many response objects (items) are returned on each page.

The `token` parameter is a Base64 encoded value that is used to get the next page of data. The token is taken from the `x-next-token` header field of the response. A query has reached its last page when the response does not include a token.

Syntax

`limit=items_returned&token=token`

`items_returned`

Maximum number of response objects returned per page.

`token`

Token of the last/first item returned in the current paginated request. The token is used in the next submit to determine the first item that should appear on the next page. The token appears in the response header. To ensure consistent paging, the `token` parameter must always be used with the `sort` parameter.

Examples

Example 1: Use token `awQgPSA50DA1Mg==` to get the next 10 volumes.

```
GET https://pure01.example.com/api/1.19/volume?limit=10&token=awQgPSA50DA1Mg==
```

Example 2: Use token `c3jX2FwdCA9IDY2LG1kID0gMQ==` to get the next 10 protection groups.

```
GET https://pure01.example.com/api/1.19/pgroup?limit=10&token=c3jX2FwdCA9IDY2LG1kID0gMQ==
```

Example 3: Get 2 volumes with index 5 to 9, and then use the token returned (`awQgPSA20TY1NA==`) to get the next 2 volumes.

```
>> GET https://pure01.example.com/api/1.19/volume?start=5&limit=2
<< x-next-token → awQgPSA20TY1NA==
    x-total-item-count →21
<< {
  {
    "source": null,
    "serial": "122E64ABC3FE4BA100011015",
    "created": "2016-04-28T20:30:56Z",
    "name": "ESXi-Cluster02-vol005",
    "size": 107374182400
  },
  {
    "source": null,
    "serial": "122E64ABC3FE4BA100011016",
    "created": "2016-04-28T20:30:56Z",
    "name": "ESXi-Cluster02-vol007",
    "size": 107374182400
  }
}
>> GET https://pure01.example.com/api/1.19/volume?limit=2&token=awQgPSA20TY1NA==
<< x-next-token → awQgPSA20TY2MQ==
<< {
  {
    "source": null,
    "serial": "122E64ABC3FE4BA10001101C",
    "created": "2016-04-28T20:30:56Z",
    "name": "ESXi-Cluster02-vol006",
    "size": 107374182400
  },
  {
    "source": null,
    "serial": "122E64ABC3FE4BA10001101D",
    "created": "2016-04-28T20:30:56Z",
    "name": "ESXi-Cluster01-vol001",
    "size": 107374182400
  }
}
```

Example 4: Get one protection group at a time using the token returned each time to get the next protection group.

```
>> GET https://pure01.example.com/api/1.19/pgroup?limit=1

<< x-next-token → c3JjX2FwdCA9IDY2LG1kID0gMQ==
x-total-item-count → 10
<< {
  "name": "PG001",
  "hgroups": null,
  "source": "pure001",
  "hosts": [
    "ESXi-PROD-Cluster01-h2",
    "ESXi-STG-Cluster03-h2"
  ],
  "volumes": null,
  "targets": null
}

>> GET https://pure01.example.com/api/1.19/pgroup?limit=1&token=c3JjX2FwdCA9IDY2LG1kID0gMQ==

<< x-next-token → c3JjX2FwdCA9IDY2LG1kID0gMQ==
<< {
  "name": "PG002",
  "hgroups": null,
  "source": "pure001",
  "hosts": [
    "ESXi-GRP-Cluster02-h2",
    "ESXi-GRP-Cluster02-h3"
  ],
  "volumes": null,
  "targets": null
}

>> GET https://pure01.example.com/api/1.19/volume?limit=1&token=c3JjX2FwdCA9IDY2LG1kID0gMQ==

<< x-next-token → c3JjX2FwdCA9IDY2LG1kID0gMQ==
<< {
  "name": "PG003",
  "hgroups": null,
  "source": "pure005",
  "hosts": null,
  "volumes": [
    "ESXi-Cluster01-vol007",
    "ESXi-Cluster01-vol010",
    "ESXi-Cluster01-vol009",
    "ESXi-Cluster01-vol008"
  ],
  "targets": null
}
```

Combining Sorting, Filtering, and Pagination

Follow these guidelines when combining sorting, filtering, and pagination:

- Sort queries can be combined. A single request can be sorted on multiple field names. For example, you can sort all volumes from largest to smallest volume size, and then sort volumes of the same size in ascending order by volume name. To sort on multiple field names, list the field names as comma-separated values.
- Filter queries can be combined using the AND and OR operators. The AND operator displays response objects that meet the criteria of all filter queries in the request. The OR operator displays response objects that meet the criteria of at least one of the filter queries in the request.
- The sort, filter, limit, and start filters can all be combined together.

Examples

Example 1: Get a list of all volumes sorted in descending order by volume size, and then sorted in ascending order by volume name.

```
GET https://pure01.example.com/api/1.19/volume?sort=size-,name
```

Example 2: Get a list of all hosts with names that include h2 and are associated with host groups with names that include hg3.

```
GET https://pure01.example.com/api/1.19/host?filter=(contains(name,'h2') and contains(hgroup,'hg3'))
```

Example 3: Get a list of all volumes that are greater than 10 gigabytes in size and were created after 2016-04-25T23:02:23Z.

```
GET https://pure01.example.com/api/1.19/volume?filter=size>10737418240 and created>'2016-04-25T23:02:23Z'
```

Example 4: Get a list of all volumes that begin with v1, and sort the list in descending order by name.

```
GET https://pure01.example.com/api/1.19/volume?filter=name='v1*&sort=name-
```

Example 5: Get a list of either all volumes with names that include 123 and are greater than or equal to 10 gigabytes in size, or all volumes with names that include abc and are less than or equal to 10 gigabytes in size.

```
GET https://pure01.example.com/api/1.19/volume?filter=(contains(name,'123') and size >= 10737418240)
or (contains(name,'abc') and size <= 10737418240)
```

Audit Trail

Every request that creates, modifies, or deletes a resource will be logged in the audit trail, which can be viewed through the Purity GUI (Messages > Audit Trail) and CLI (puremessage). For example, if the client sends the following request to create a snapshot of volume v1, the action, including the username of the user associated with the API token, is logged in the audit trail:

```
>> POST https://pure-001.example.com/api/1.19/volume

<< 200 OK

{
  "snap": true,
  "source": [
    "v1"
  ]
}
```

REST API and Scripting

Session Management

The client that makes the REST API requests will need to store a cookie returned by the REST service in order to continue to use the session. When using Python to create REST scripts, the CookieJar library can be used to manipulate session cookies. For example,

```
cj = CookieJar()
opener = urllib2.build_opener(urllib2.HTTPCookieProcessor(cj))
urllib2.install_opener(opener)
```

Refer to the cookielib module at docs.python.org for more information about cookie handling. Refer to RFC 2109 for protocol standards and recommendations about setting cookies.

Content Type

The request header must be set to the "application/json" content type. When using Python to create REST scripts, set the content-type header value to application/json. For example,

```
headers = {"Content-Type": "application/json"}
req = urllib2.Request(url, headers=headers)
```

[Back to top](#)

Resources

[Authentication](#)
[Array](#)
[Volumes and Snapshots](#)
[Hosts](#)
[Host Groups](#)
[Pods](#)
[Protection Groups](#)
[Volume Groups](#)
[Connection Ports](#)
[Alerts and Messages](#)
[SMTP Alert Routing](#)
[SNMP Manager Connections](#)
[SSL Certificate](#)
[Network Interface](#)
[Hardware Components](#)
[Apps](#)
[Offload](#)
[Users](#)

1. Authentication

Create and destroy REST sessions.

1.1 POST auth/apitoken

Generates a REST API token that can be used to create a REST session.

API tokens are tied to a particular administrative account. Each administrator has permission to manage their own API token. Administrators cannot manage tokens on behalf of other users.

Parameters

Parameter	Type	Description
password	string	Purity user login password used to generate the REST API token. Required.
username	string	Purity user login name used to generate the REST API token. Sometimes referred to as sAMAccountName. Required.

Example 1: Create an API token

Request:

```
POST https://pure01.example.com/api/1.19/auth/apitoken
{
  "password": "pureuser",
  "username": "pureuser"
}
```

Response:

```
{
  "api_token": "e701be70-14fe-8e83-c2a3-a872eaf46da"
}
```

1.2 POST auth/session

Creates a REST session using the REST API token.

Parameters

Parameter	Type	Description
api_token	string	REST API token used to create a REST session. Required.

Example 1: Create a REST session

Request:

```
POST https://pure01.example.com/api/1.19/auth/session
{
  "api_token": "$APITOKEN"
}
```

Response:

```
{
  "username": "os76"
}
```

1.3 DELETE auth/session

Deletes (invalidates) the REST session.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Delete (invalidate) a REST session

Request:

```
DELETE https://pure01.example.com/api/1.19/auth/session
```

Response:

```
{
  "username": "os76"
}
```

2. Array

View and manage the array, and administer the phonehome and remote assist features.

2.1 GET array

Lists the attributes for the array, including the array name, Purity version and Purity revision number. Can also display historical performance or capacity data.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. • <code>local_queue_usec_per_op</code> - average number of queued I/O requests for all volumes. • <code>queue_depth</code> - average number of queued I/O requests. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
banner	boolean	Displays the "message of the day" (MOTD) text that is sent to all Purity users. The banner message is displayed in the login pane of the Purity GUI and via SSH after users log in. Optional.
connection_key	boolean	Displays a connection key that can be used to connect to this array. Optional.
controllers	boolean	Displays the mode and status of each controller on the array. For arrays to which a second controller has never been connected, only a single controller mode is displayed. Once an additional controller has been connected, its information is always shown. Optional.
historical	string	If the <code>action</code> parameter is set to monitor, set this parameter to display historical performance data over the specified range of time. If the <code>space</code> parameter is set to true, set this parameter to display historical space data over the specified range of time. Valid historical values are: 1h, 3h, 24h, 7d, 30d, 90d, and 1y. Optional.
idle_timeout	boolean	Displays the idle time limit, in minutes, of the Purity GUI and CLI sessions. Users are automatically logged out a session that exceeds the idle timeout limit. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information across the entire array: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of bandwidth limits reached on one or more volumes. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of bandwidth limits reached on one or more volumes. Include the <code>mirrored</code> parameter to display real-time latency information for mirrored writes. Optional.
mirrored	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information for mirrored writes (i.e., writes to volumes in stretched pods): Latency

REST 1.19

- `usec_per_mirrored_write_op` - average time, measured in microseconds, it takes the array to process a mirrored I/O write request.

IOPS

- `mirrored_input_per_sec` - number of mirrored bytes written per second.
- `mirrored_writes_per_sec` - number of mirrored writes per second.

If one array of a stretched pod is offline, the writes processed on the other array are reported as local writes rather than mirrored ones. Once the pod is back online, in sync, and processing each write on both sides, the writes to its volumes are reported as mirrored writes again.

Optional.

<code>ntpserver</code>	boolean	Displays the hostnames or IP addresses of the NTP servers currently being used by the array to maintain reference time. Optional.
<code>phonehome</code>	boolean	Displays the current state of the Purity phonehome automatic hourly log transmission facility as enabled or disabled. Optional.
<code>proxy</code>	boolean	Displays the proxy host for the phonehome facility when HTTPS is the phonehome protocol (the phonehome facility itself determines which protocol to use). Optional.
<code>relayhost</code>	boolean	Displays the hostname or IP address of the electronic mail relay server currently being used as a forwarding point for email alerts generated by the array. Optional.
<code>scsi_timeout</code>	boolean	Displays the amount of time (in seconds) that can lapse during an I/O interruption before the target ports log out of the fabric. The default timeout value is 60 seconds. Optional.
<code>senderdomain</code>	boolean	Displays domain name from which Purity sends email alert messages. Optional.
<code>size</code>	boolean	If the action parameter is set to monitor, set this parameter to display the following average I/O sizes: • <code>bytes_per_read</code> - average I/O size per read. • <code>bytes_per_write</code> - average I/O size per write. • <code>bytes_per_op</code> - average I/O size for both read and write (all) operations. Optional.
<code>space</code>	boolean	Displays the amount of usable physical storage on the array and the amount of storage occupied by data and metadata. Optional.
<code>syslogserver</code>	boolean	Displays remote syslog servers for delivering notifications. Optional.

Example 1: List array attributes

Request:

```
GET https://pure01.example.com/api/1.19/array
```

Response:

```
{
  "array_name": "pure01",
  "id": "f92a1da2-f8c9-4297-83a2-056c61bec96a",
  "revision": "201605051959+15e6056",
  "version": "4.6.7"
}
```

Example 2: List array controllers

Request:

```
GET https://pure01.example.com/api/1.19/array?controllers=true
```

Response:

```
[
  {
    "mode": "primary",
    "model": "VMware",
    "name": "CT0",
    "status": "ready",
    "version": "4.6.7"
  }
]
```

Example 3: List array space usage

Request:

```
GET https://pure01.example.com/api/1.19/array?space=true
```

Response:

```
{
  "capacity": 3774649344,
  "data_reduction": 1.0,
  "hostname": "pure01",
  "shared_space": 0,
  "snapshots": 0,
  "system": 0,
  "thin_provisioning": 1.0,
  "total": 0,
  "total_reduction": 1.0,
  "volumes": 0
}
```

Example 4: List real-time performance data for the array

Request:

```
GET https://pure01.example.com/api/1.19/array?action=monitor
```

Response:

```
[
  {
    "input_per_sec": 0,
    "output_per_sec": 0,
    "queue_depth": 0,
    "reads_per_sec": 0,
    "time": "2016-05-11T20:35:48Z",
    "usec_per_read_op": 0,
    "usec_per_write_op": 0,
    "writes_per_sec": 0
  }
]
```

Example 5: List historical performance data for the array at resolution '1h'

Request:

```
GET https://pure01.example.com/api/1.19/array?action=monitor&historical=1h
```

Response:

```
[
  {
    "input_per_sec": 0,
    "output_per_sec": 0,
    "queue_depth": 0,
    "reads_per_sec": 0,
    "time": "2016-05-11T20:34:21Z",
    "usec_per_read_op": 0,
    "usec_per_write_op": 0,
    "writes_per_sec": 0
  },
  {
    "input_per_sec": 0,
    "output_per_sec": 0,
    "queue_depth": 0,
    "reads_per_sec": 0,
    "time": "2016-05-11T20:34:26Z",
    "usec_per_read_op": 0,
    "usec_per_write_op": 0,
    "writes_per_sec": 0
  },
  {
    "input_per_sec": 0,
    "output_per_sec": 0,
    "queue_depth": 0,
    ...
    "usec_per_write_op": 0,
    "writes_per_sec": 0
  }
]
```

2.2 GET array/connection

Lists connected arrays.

Parameters

Parameter	Type	Description
throttle	boolean	Displays (true) outgoing bandwidth throttling information. Optional.

Example 1: List connected arrays

Request:

```
GET https://pure01.example.com/api/1.19/array/connection
```

Response:

```
[ ]
```

2.3 GET array/console_lock

Displays the status of the console lock.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Displays the console lock status

Request:

```
GET https://pure01.example.com/api/1.19/array/console_lock
```

Response:

```
{
  "console_lock": "disabled"
}
```

2.4 GET array/eula

Displays the terms and acceptance details of the Pure Storage End User Agreement.

Parameters

Parameter	Type	Description
None	n/a	n/a

2.5 GET array/phonehome

Lists information about the status of the transmission logs for the phonehome facility.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Display phonehome status

Request:

```
GET https://pure01.example.com/api/1.19/array/phonehome
```

Response:

```
{
  "action": "",
  "status": ""
}
```

2.6 GET array/remotessist

Lists information about the status (enabled or disabled) of a remote assist session.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Display remotessist status

Request:

```
GET https://pure01.example.com/api/1.19/array/remotessist
```

Response:

```
{
  "name": "pure01-ct0",
  "port": "",
  "status": "disabled"
}
```

2.7 POST array/connection

Creates a connection between the current array and the specified array.

Parameters

Parameter	Type	Description
connection_key	string	The connection_key of the array to be connected. Required.
management_address	string	The management address of the array to be connected. Required.
replication_address	string	The replication address of the array to be connected. Optional.
type	list	The type(s) of connection desired. The only option supported in this version is 'replication'. Required.

2.8 PUT array

Modifies the attributes for the array.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
banner	string	Sets a common "message of the day" (MOTD) that is sent to all Purity users. The banner message is displayed in the login pane of the Purity GUI and via SSH after users log in. Optional.
idle_timeout	number	Sets the idle time limit, in minutes, of the Purity GUI and CLI sessions. Valid values are between 5 and 180 minutes. The default timeout value is 30 minutes. Specifying a value of zero disables the automatic log-off feature. Changes made to the <code>idle_timeout</code> value do not apply to existing Purity sessions. Optional.
name	string	Renames the array. Optional.
ntpserver	list	Specifies alternate NTP servers, by IP address or hostname, assigned as the array source for reference time. Supersedes any previous NTP server assignments. Note: This parameter is not supported on Cloud Block Store. If specifying an IP address, for IPv4, specify the IP address in the form <code>ddd.ddd.ddd.ddd</code>, where <code>ddd</code> is a number ranging from 0 to 255 representing a group of 8 bits. For IPv6, specify the IP address in the form <code>xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx</code>, where <code>xxxx</code> is a hexadecimal number representing a group of 16 bits. When specifying an IPv6 address, consecutive fields of zeros can be shortened by replacing the zeros with a double colon (<code>::</code>). Optional.
proxy	string	Sets the proxy host for the phonehome facility when HTTPS is the phonehome protocol (the phonehome facility itself determines which protocol to use). The format for the value is <code>https://HOSTNAME:PORT</code>, where <code>HOSTNAME</code> is the name of the proxy host and <code>PORT</code> is the TCP/IP port number used by the proxy host. Optional.
relayhost	string	Sets the hostname or IP address of the electronic mail relay server currently being used as a forwarding point for email alerts generated by the array. If specifying an IP address, enter the IPv4 or IPv6 address. For IPv4, specify the IP address in the form <code>ddd.ddd.ddd.ddd</code>, where <code>ddd</code> is a number ranging from 0 to 255 representing a group of 8 bits. If a port number is also specified, append it to the end of the address in the format <code>ddd.ddd.ddd.ddd:PORT</code>, where <code>PORT</code> represents the port number. For IPv6, specify the IP address in the form <code>xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx</code>, where <code>xxxx</code> is a hexadecimal number representing a group of 16 bits. Consecutive fields of zeros can be shortened by replacing the zeros with a double colon (<code>::</code>). If a port number is also specified, enclose the entire address in square brackets (<code>[]</code>) and append the port number to the end of the address. For example, <code>[xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx]:PORT</code>, where <code>PORT</code> represents the port number. Optional.
scsi_timeout	number	Changes the amount of time, in seconds, that can lapse during an I/O interruption before the target ports log out of the fabric. The default timeout value is 60 seconds. Changing the default timeout value may cause an initiator to mistakenly interpret the status of the FlashArray as failed or generate a host timeout. Contact the Pure Technical Services team before you change the <code>scsi_timeout</code> value. Optional.
senderdomain	string	Sets the domain name from which Purity sends email alert messages. Optional.
syslogserver	list	Specifies the remote syslog servers for delivering notifications. For example, <code>tcp://MyHost.com</code>. Specify the URI in the format <code>PROTOCOL://HOSTNAME:PORT</code>. <code>PROTOCOL</code> is "tcp", "tls", or "udp". <code>HOSTNAME</code> is the syslog server hostname or IP address. If specifying an IP address, for IPv4, specify the IP address in the form <code>ddd.ddd.ddd.ddd</code>, where <code>ddd</code> is a number ranging from 0 to 255 representing a group of 8 bits. For IPv6, specify the IP address in the form <code>[xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx]</code>, where <code>xxxx</code> is a hexadecimal number representing a group of 16 bits. Enclose the entire address in square brackets (<code>[]</code>). Consecutive fields of zeros can be shortened by replacing the zeros with a double colon (<code>::</code>). <code>PORT</code> is the port at which the server is listening. If a port number is specified, append it to the end of the address. If the port is not specified, it defaults to 514. Optional.

2.9 PUT array/connection/{connection}

Modifies the bandwidth throttling attributes for a connected array.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
default_limit	number or string	Default maximum bandwidth threshold for outbound traffic. Once exceeded, bandwidth throttling occurs. Enter the size as a number (bytes) or as a string with a single character unit symbol. Valid unit symbols are K, M, G, representing KiB, MiB, GiB, respectively, where "Ki" denotes 2¹⁰, "Mi" denotes 2²⁰, and so on. If the unit symbol is not specified, the unit defaults to bytes. Optional.
window	object	Range of time during which --window_limit threshold is in effect. The start and end times must be set on the hour. Enter the time range with the start and end attributes, both measured in seconds, where start represents the window start time and end represents the window end time. Optional.
window_limit	number or string	Maximum bandwidth threshold for outbound traffic during the specified window_limit time range. Once exceeded, bandwidth throttling occurs. Enter the size as a number (bytes) or as a string with a single character unit symbol. Valid unit symbols are K, M, G, representing KiB, MiB, GiB, respectively, where "Ki" denotes 2¹⁰, "Mi" denotes 2²⁰, and so on. If the unit symbol is not specified, the unit defaults to bytes. Optional.

2.10 PUT array/console_lock

Enables or disables root login through the console.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
enabled	boolean	Enables (true) or disables (false) the console lock which prevents the root user from logging in through the system console. Optional.

Example 1: Enable console lock

Request:

```
PUT https://pure01.example.com/api/1.19/array/console_lock
{
  "enabled": true
}
```

Response:

```
{
  "console_lock": "enabled"
}
```

Example 2: Disable console lock

Request:

```
PUT https://pure01.example.com/api/1.19/array/console_lock
{
  "enabled": false
}
```

Response:

```
{
  "console_lock": "disabled"
}
```

2.11 PUT array/eula

Modifies the acceptance details of the Pure Storage End User Agreement.

Parameters

Parameter	Type	Description
company	string	Specifies the full legal name of the entity. The value must be between 1 and 64 characters in length. Required.
name	string	Specifies the full legal name of the individual at the company who has the authority to accept the terms of the agreement. The value must be between 1 and 64 characters in length. Required.
title	string	Specifies the individual's job title at the company. The value must be between 1 and 64 characters in length. Required.

2.12 PUT array/phonehome

Performs phonehome actions.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
action	string	Transmits event logs stored in the array to the Pure Technical Services team via the phonehome channel. Specify the phonehome log time period as any of the following: send_all, send_today, send_yesterday, cancel. Optional.
enabled	boolean	Enables (true) or disables (false) the automatic hourly transmission of array logs to the Pure Technical Services team. Optional.

Example 1: Enable phonehome

Request:

```
PUT https://pure01.example.com/api/1.19/array/phonehome
{
  "enabled": true
}
```

Response:

```
{
  "phonehome": "enabled"
}
```

Example 2: Disable phonehome

Request:

```
PUT https://pure01.example.com/api/1.19/array/phonehome
{
  "enabled": false
}
```

Response:

```
{
  "phonehome": "disabled"
}
```

2.13 PUT array/remoteassist

Enables or disables a remote assist session.

Parameters

Parameter	Type	Description
action	string	Enables ("connect") or disables ("disconnect") a remote assist session. Required.

2.14 DELETE array/connection/{connection}

Disconnects the current array from the specified array.

Parameters

Parameter	Type	Description
None	n/a	n/a

3. Volumes and Snapshots

View and manage volumes and snapshots.

3.1 GET volume

Lists volumes and snapshots and their attributes.

Created time is displayed in Greenwich Mean Time (GMT) and size is displayed in bytes.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
array	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display performance data by the array to which the I/O is directed. If the <code>historical</code> parameter is set, set this parameter to true to display historical performance data by the array to which the I/O is directed. Optional.
connect	boolean	Displays all host-volume connections, either private or shared, and the LUNs used by the hosts to address the volumes. Optional.
historical	string	If the <code>action</code> parameter is set to monitor, set this parameter to display historical performance data over the specified range of time. If the <code>space</code> parameter is set to true, set this parameter to display historical space data over the specified range of time. Valid historical values are: 1h, 3h, 24h, 7d, 30d, 90d, and 1y. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information for all volumes: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. Include the <code>mirrored</code> parameter to display real-time latency information for mirrored writes. Optional.
mirrored	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information for mirrored writes (i.e., writes to volumes in stretched pods): Latency • <code>usec_per_mirrored_write_op</code> - average time, measured in microseconds, it takes the array to process a mirrored I/O write request. IOPS • <code>mirrored_input_per_sec</code> - number of mirrored bytes written per second. • <code>mirrored_writes_per_sec</code> - number of mirrored writes per second. If one array of a stretched pod is offline, the writes processed on the other array are reported as local writes rather than mirrored ones. Once the pod is back online, in sync, and processing each write on both sides, the writes to its volumes are reported as mirrored writes again.

		Optional.
names	list	Displays specified volumes. Enter multiple volume names in comma-separated format. Volume names can include asterisk (*) wildcard characters to represent zero or more characters.
		Optional.
on	string	Displays a list of volume snapshots (generated from protection group snapshots) both local and remote to the array that have been replicated and retained on the specified Azure Blob, NFS, or S3 offload target. Set on to the name of the Azure Blob, NFS, or S3 offload target. Only valid if the snap parameter is set to true.
		Optional.
pending	boolean	Includes (true) destroyed volumes that are in the eradication pending state. Time remaining is displayed in seconds. If a volume is not in the eradication pending state, a time remaining of null is displayed.
		Optional.
pending_only	boolean	Lists (true) destroyed volumes that are in the eradication pending state. Time remaining is displayed in seconds.
		Optional.
pgrouplist	list	Displays specified protection groups or protection group snapshots. Only valid if the snap parameter is set to true. Enter multiple names in comma-separated format. Names can include asterisk (*) wildcard characters to represent zero or more characters.
		Optional.
private	boolean	Used with the connect parameter to display (true) private host-volume connections.
		Optional.
protect	boolean	Displays (true) all protected volumes and their associated protection groups.
		Optional.
protocol_endpoint	boolean	Displays the protocol endpoints used to form connections between FlashArray virtual volumes and VMware ESXi hosts and host groups. Note that the response output does not include the size field.
		For more information about virtual volumes, including configuration steps, refer to the Pure Storage vSphere Web Client Plugin for vSphere User Guide on the Knowledge site at http://support.purestorage.com .
		Optional.
qos	boolean	Displays (true) the QoS information for each volume. A bandwidth limit of null represents unlimited throughput.
		Optional.
shared	boolean	Used with the connect parameter to display (true) shared host-volume connections.
		Optional.
size	boolean	If the action parameter is set to monitor, set this parameter to display the following average I/O sizes: - bytes_per_read - average I/O size per read. - bytes_per_write - average I/O size per write. - bytes_per_op - average I/O size for both read and write (all) operations.
		Optional.
snap	boolean	Lists all snapshots (true).
		Optional.
space	boolean	Lists size and space consumption attributes for each volume.
		Optional.
total	boolean	If the action parameter is set to monitor, set this parameter to display (true) performance totals across all volumes. Performance totals appear at the end of the response.
		Optional.

Example 1: List all volumes

Request:

GET <https://pure01.example.com/api/1.19/volume>

Response:

```
[
  {
    "created": "2016-05-11T20:35:46Z",
    "name": "v1",
    "serial": "F92A1DA2F8C9429700011010",
    "size": 1073741824,
    "source": null
  },
  {
    "created": "2016-05-11T20:35:46Z",
    "name": "v2",
    "serial": "F92A1DA2F8C9429700011011",
    "size": 2147483648,
    "source": null
  },
  {
    "created": "2016-05-11T20:35:46Z",
    "name": "v3",
    "serial": "F92A1DA2F8C9429700011012",
    "size": 3221225472,
    "source": null
  }
]
```

Example 2: List all volumes including those pending eradication

Request:

```
GET https://pure01.example.com/api/1.19/volume?pending=true
```

Response:

```
[
  {
    "created": "2016-05-11T20:35:46Z",
    "name": "v1",
    "serial": "F92A1DA2F8C9429700011010",
    "size": 1073741824,
    "source": null,
    "time_remaining": null
  },
  {
    "created": "2016-05-11T20:35:46Z",
    "name": "v2",
    "serial": "F92A1DA2F8C9429700011011",
    "size": 2147483648,
    "source": null,
    "time_remaining": null
  },
  {
    "created": "2016-05-11T20:35:46Z",
    "name": "v3",
    "serial": "F92A1DA2F8C9429700011012",
    "size": 3221225472,
    "source": null,
    "time_remaining": null
  },
  ...
  {
    "source": null,
    "time_remaining": 86400
  }
]
```

Example 3: List all volumes pending eradication

Request:

```
GET https://pure01.example.com/api/1.19/volume?pending_only=true
```

Response:

```
[
  {
    "created": "2016-05-11T20:35:46Z",
    "name": "v4",
    "serial": "F92A1DA2F8C9429700011013",
    "size": 4294967296,
    "source": null,
    "time_remaining": 86400
  }
]
```

Example 4: List all snapshots

Request:

```
GET https://pure01.example.com/api/1.19/volume?snap=true
```

Response:

```
[
  {
    "created": "2016-05-11T20:35:47Z",
    "name": "pg1.monday.v1",
    "serial": "F92A1DA2F8C9429700011016",
    "size": 1073741824,
    "source": "v1"
  },
  {
    "created": "2016-05-11T20:35:47Z",
    "name": "pg2.1.v1",
    "serial": "F92A1DA2F8C9429700011018",
    "size": 1073741824,
    "source": "v1"
  },
  {
    "created": "2016-05-11T20:35:47Z",
    "name": "pg1.2.v1",
    "serial": "F92A1DA2F8C9429700011017",
    "size": 1073741824,
    "source": "v1"
  },
  {
    "created": "2016-05-11T20:35:46Z",
    "name": "v3.snap1",
    "size": 3221225472,
    "source": "v3"
  }
]
```

Example 5: List per volume space usage

Request:

```
GET https://pure01.example.com/api/1.19/volume?space=true
```

Response:

```
[
  {
    "data_reduction": 1.0,
    "name": "v1",
    "shared_space": null,
    "size": 1073741824,
    "snapshots": 0,
    "system": null,
    "thin_provisioning": 1.0,
    "total": 0,
    "total_reduction": 1.0,
    "volumes": 0
  },
  {
    "data_reduction": 1.0,
    "name": "v2",
    "shared_space": null,
    "size": 2147483648,
    "snapshots": 0,
    "system": null,
    "thin_provisioning": 1.0,
    "total": 0,
    "total_reduction": 1.0,
    "volumes": 0
  },
  ...
  {
    "total_reduction": 1.0,
    "volumes": 0
  }
]
```

Example 6: List all volume snapshots that were created as part of protection group snapshots for protection groups pg1 and pg2.

Request:

```
GET https://pure01.example.com/api/1.19/volume?snap=true&pgrouplist=pg1,pg2
```

Response:

```
[
  {
    "created": "2016-05-11T20:35:47Z",
    "name": "pg1.monday.v1",
    "serial": "F92A1DA2F8C9429700011016",
    "size": 1073741824,
    "source": "v1"
  },
  {
    "created": "2016-05-11T20:35:47Z",
    "name": "pg2.1.v1",
    "serial": "F92A1DA2F8C9429700011018",
    "size": 1073741824,
    "source": "v1"
  },
  {
    "created": "2016-05-11T20:35:47Z",
    "name": "pg1.2.v1",
    "serial": "F92A1DA2F8C9429700011017",
    "size": 1073741824,
    "source": "v1"
  }
]
```

3.2 GET volume/{volume}

Lists the attributes for the specified volume or snapshot.

If listing volume snapshot attributes, the snap parameter must be specified.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
array	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display performance data by the array to which the I/O is directed. If the <code>historical</code> parameter is set, set this parameter to true to display historical performance data by the array to which the I/O is directed. Optional.
historical	string	If the <code>action</code> parameter is set to monitor, set this parameter to display historical performance data over the specified range of time. If the <code>space</code> parameter is set to true, set this parameter to display historical space data over the specified range of time. Valid historical values are: 1h, 3h, 24h, 7d, 30d, 90d, and 1y. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information for the specified volume: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. Include the <code>mirrored</code> parameter to display real-time latency information for mirrored writes. Optional.
mirrored	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information for mirrored writes (i.e., writes to volumes in stretched pods): Latency • <code>usec_per_mirrored_write_op</code> - average time, measured in microseconds, it takes the array to process a mirrored I/O write request. IOPS • <code>mirrored_input_per_sec</code> - number of mirrored bytes written per second. • <code>mirrored_writes_per_sec</code> - number of mirrored writes per second. If one array of a stretched pod is offline, the writes processed on the other array are reported as local writes rather than mirrored ones. Once the pod is back online, in sync, and processing each write on both sides, the writes to its volumes are reported as mirrored writes again. Optional.
pending	boolean	Displays (true) the details of the volume, regardless of its pending state (destroyed or not). If the volume is pending eradication, time remaining is displayed in seconds. If the volume is not in the eradication pending

REST 1.19

state, a time remaining of null is displayed.

Optional.

pending_only	boolean	If the volume is in the eradication pending state, set pending to true to display the attributes for the destroyed volume, including the time remaining before the volume is permanently eradicated. Time remaining is displayed in seconds. Optional.
pgrouplist	list	Displays specified protection groups or protection group snapshots. Only valid if snap is true. Only valid if the snap parameter is set to true. Enter multiple names in comma-separated format. Names can include asterisk (*) wildcard characters to represent zero or more characters. Optional.
protect	boolean	Displays (true) the names of all protection groups associated with the specified volume. If the volume is not protected, returns an empty response. Optional.
protocol_endpoint	boolean	Displays (true) the attributes for the specified protocol endpoint. Note that the response output does not include the size field. For more information about virtual volumes, including configuration steps, refer to the Pure Storage vSphere Web Client Plugin for vSphere User Guide on the Knowledge site at http://support.purestorage.com. Optional.
qos	boolean	Displays (true) the QoS bandwidth limit of the specified volume. A bandwidth limit of null represents unlimited throughput. Optional.
size	boolean	If the action parameter is set to monitor, set this parameter to display the following average I/O sizes: - bytes_per_read - average I/O size per read. - bytes_per_write - average I/O size per write. - bytes_per_op - average I/O size for both read and write (all) operations. Optional.
snap	boolean	If listing the attributes for a specified volume, set snap to true to list all snapshots within the volume. If listing the attributes for a specified volume snapshot, always set snap to true. Optional if listing attributes for a specified volume. Required if listing attributes for a specified volume snapshot.
space	boolean	Lists size and space consumption attributes for the specified volume. Optional.
total	boolean	If the action parameter is set to monitor, set this parameter to display (true) performance totals for all specified volumes. Performance totals appear at the end of the response. Optional.

Example 1: List details for volume v1

Request:

```
GET https://pure01.example.com/api/1.19/volume/v1
```

Response:

```
{
  "created": "2016-05-11T20:35:46Z",
  "name": "v1",
  "serial": "F92A1DA2F8C9429700011010",
  "size": 1073741824,
  "source": null
}
```

Example 2: List snapshots of volume v3

Request:

```
GET https://pure01.example.com/api/1.19/volume/v3?snap=true
```

Response:

```
[
  {
    "created": "2016-05-11T20:35:46Z",
    "name": "v3.snap1",
    "serial": "F92A1DA2F8C9429700011015",
    "size": 3221225472,
    "source": "v3"
  },
  {
    "created": "2016-05-11T20:35:46Z",
    "name": "v3.4116",
    "serial": "F92A1DA2F8C9429700011014",
    "size": 3221225472,
    "source": "v3"
  }
]
```

Example 3: List real-time performance data for volume v3.

Request:

```
GET https://pure01.example.com/api/1.19/volume/v3?action=monitor
```

Response:

```
[
  {
    "input_per_sec": 0,
    "name": "v3",
    "output_per_sec": 0,
    "reads_per_sec": 0,
    "time": "2016-05-11T20:35:49Z",
    "usec_per_read_op": 0,
    "usec_per_write_op": 0,
    "writes_per_sec": 0
  }
]
```

Example 4: List volume snapshots of v1 that were created as part of protection group snapshots for protection groups pg1 and pg2.

Request:

```
GET https://pure01.example.com/api/1.19/volume/v1?snap=true&pgrouplist=pg1,pg2
```

Response:

```
[
  {
    "created": "2016-05-11T20:35:47Z",
    "name": "pg1.monday.v1",
    "serial": "F92A1DA2F8C9429700011016",
    "size": 1073741824,
    "source": "v1"
  },
  {
    "created": "2016-05-11T20:35:47Z",
    "name": "pg2.1.v1",
    "serial": "F92A1DA2F8C9429700011018",
    "size": 1073741824,
    "source": "v1"
  },
  {
    "created": "2016-05-11T20:35:47Z",
    "name": "pg1.2.v1",
    "serial": "F92A1DA2F8C9429700011017",
    "size": 1073741824,
    "source": "v1"
  }
]
```

3.3 GET volume/{volume}/diff

Lists block differences for the specified volume snapshot.

Parameters

Parameter	Type	Description
base	string	Snapshot name to be used as the base for the diff. If a base snapshot is not specified, all mapped blocks for the volume are returned. Optional.
block_size	number or string	Granularity, in bytes, at which to compare. Required.
length	number or string	Length of the region, in bytes, to compare. Required.
offset	number or string	Absolute offset, in bytes, of the region to compare. Must be a multiple of block_size. Optional.

3.4 GET volume/{volume}/hgroup

Lists shared connections for the specified volume.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List shared connections for volume v2

Request:

```
GET https://pure01.example.com/api/1.19/volume/v2/hgroup
```

Response:

```
[
  {
    "hgroup": "hg2",
    "host": null,
    "lun": 15,
    "name": "v2",
    "size": 2147483648
  }
]
```

3.5 GET volume/{volume}/host

Lists private connections for the specified volume.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List private connections for volume v3

Request:

```
GET https://pure01.example.com/api/1.19/volume/v3/host
```

Response:

```
[
  {
    "host": "h2",
    "lun": 7,
    "name": "v3",
    "size": 3221225472
  }
]
```

3.6 POST volume/{volume}

Creates a volume, virtual volume, or protocol endpoint, or copies a volume or snapshot.

The protocol_endpoint, size or source parameter must be specified.

Parameters

Parameter	Type	Description
bandwidth_limit	number or string	When used with size, creates a volume with the specified QoS bandwidth limit. Whenever throughput exceeds the bandwidth limit, throttling occurs. If the bandwidth limit is set, it must be between 1 MB/s and 512 GB/s. Enter the size as a number (bytes) or as a string with a single character unit symbol. Valid unit symbols are K, M, G, T, P, representing KiB, MiB, GiB, TiB, and PiB, respectively, where "Ki" denotes 2¹⁰, "Mi" denotes 2²⁰, and so on. If the unit symbol is not specified, the unit defaults to bytes. Optional.
overwrite	boolean	When used with source, overwrites (true) an existing volume. Optional.
protocol_endpoint	boolean	Creates a protocol endpoint, which is used to form connections between FlashArray virtual volumes and VMware ESXi hosts and host groups. For more information about virtual volumes, including configuration steps, refer to the Pure Storage vSphere Web Client Plugin for vSphere User Guide on the Knowledge site at http://support.purestorage.com. Optional.
size	number or string	Creates a volume with the specified provisioned size. Enter the size as a number (bytes) or as a string with a single character unit symbol. Valid unit symbols are K, M, G, T, P, representing KiB, MiB, GiB, TiB, and PiB, respectively, where "Ki" denotes 2¹⁰, "Mi" denotes 2²⁰, and so on. If the unit symbol is not specified, the unit defaults to bytes. Optional.
source	string	Copies a volume or snapshot to create a new volume or replace an existing one. Specify the name of a volume or snapshot whose data is copied to the volume specified. If the volume or snapshot replaces an existing volume, the overwrite parameter must also be specified. If the volume or snapshot replaces an existing volume, an undo snapshot is automatically taken (providing a 24-hour window during which the previous contents can be retrieved). Optional.

Example 1: Create a new volume

Request:

```
POST https://pure01.example.com/api/1.19/volume/v5
{
  "size": "5G"
}
```

Response:

```
{
  "created": "2016-05-11T20:35:50Z",
  "name": "v5",
  "serial": "F92A1DA2F8C942970001101D",
  "size": 5368709120,
  "source": null
}
```

Example 2: Create v6 by copying v1

Request:

```
POST https://pure01.example.com/api/1.19/volume/v6
{
  "source": "v1"
}
```

Response:

```
{
  "created": "2016-05-11T20:35:50Z",
  "name": "v6",
  "serial": "F92A1DA2F8C942970001101E",
  "size": 1073741824,
  "source": "v1"
}
```

Example 3: Overwrite v6 by copying v1

Request:

```
POST https://pure01.example.com/api/1.19/volume/v6
{
  "overwrite": true,
  "source": "v1"
}
```

Response:

```
{
  "created": "2016-05-11T20:35:50Z",
  "name": "v6",
  "serial": "F92A1DA2F8C942970001101E",
  "size": 1073741824,
  "source": "v1"
}
```

3.7 POST volume

Creates snapshots of one or more volumes. Also restores a volume snapshot from an offload target.

Parameters

Parameter	Type	Description
on	string	Restores a volume snapshot from an offload target. Set on to the name of the Azure Blob, NFS, or S3 offload target from where the snapshot is begin restored. Must be used with the snap and source parameters. Optional.
snap	boolean	Must be set to true to signify that a snapshot is being created or restored. Required.
source	list	If creating a snapshot of one or more volumes, specify the name of one or more volumes to snapshot. If restoring a volume snapshot from an offload target, specify the name of one or more volume snapshots to restore. Specify the full snapshot name, including the array name. Required.
suffix	string	Specify a custom suffix that is added to the snapshot name. Optional.

Example 1: Create snapshots of v5 and v6

Request:

```
POST https://pure01.example.com/api/1.19/volume
{
  "snap": true,
  "source": [
    "v5",
    "v6"
  ]
}
```

Response:

```
[
  {
    "created": "2016-05-11T20:35:50Z",
    "name": "v5.4128",
    "serial": "F92A1DA2F8C9429700011020",
    "size": 5368709120,
    "source": "v5"
  },
  {
    "created": "2016-05-11T20:35:50Z",
    "name": "v6.4129",
    "serial": "F92A1DA2F8C9429700011021",
    "size": 1073741824,
    "source": "v6"
  }
]
```

Example 2: Create snapshots of v5 and v6 with a custom suffix

Request:

```
POST https://pure01.example.com/api/1.19/volume
{
  "snap": true,
  "source": [
    "v5",
    "v6"
  ],
  "suffix": "crackle"
}
```

Response:

```
[
  {
    "created": "2016-05-11T20:35:50Z",
    "name": "v5.crackle",
    "serial": "F92A1DA2F8C9429700011022",
    "size": 5368709120,
    "source": "v5"
  },
  {
    "created": "2016-05-11T20:35:50Z",
    "name": "v6.crackle",
    "serial": "F92A1DA2F8C9429700011023",
    "size": 1073741824,
    "source": "v6"
  }
]
```

3.8 POST volume/{volume}/pgroup/{pgroup}

Adds a volume to a protection group.

You can only add members of the same object type to a protection group. For example, you cannot add hosts or host groups to a protection group that contains volumes.

Parameters

Parameter	Type	Description
None	n/a	n/a

3.9 PUT volume/{volume}

Recovers and renames the specified volume or volume snapshot, changes the attributes of the specified volume, or moves volumes between storage containers.

The action, bandwidth_limit, container, name, or size parameter must be specified.

Parameters

Parameter	Type	Description
action	string	If set to recover, recovers the contents of the specified volume or volume snapshot. Optional.
bandwidth_limit	number or string	Changes the QoS bandwidth limit of the specified volume. Whenever throughput exceeds the bandwidth limit, throttling occurs. If the bandwidth limit is set, it must be between 1 MB/s and 512 GB/s Enter the size as a number (bytes) or as a string with a single character unit symbol. Valid unit symbols are K, M, G, T, P, representing KiB, MiB, GiB, TiB, and PiB, respectively, where "Ki" denotes 2 ¹⁰ , "Mi" denotes 2 ²⁰ , and so on. If the unit symbol is not specified, the unit defaults to bytes. To clear the bandwidth limit, giving the volume unlimited throughput, set to an empty string (""). Optional.
container	string	Moves the volume to this storage container. A storage container can be the root of the array, a pod, or a volume group. To move a volume to the root of the array, set to null. You can move volumes between pods or volume groups, but you cannot move volumes between pods and volume groups. To move a volume between a pod and a volume group, first move the volume to the root of the array, and then move the volume from the root of the array to the destination storage container. Optional.
name	string	Renames the specified volume or volume snapshot. When renaming a snapshot, only the suffix can be changed. Optional.
requested_promotion_state	string	Specifies whether a volume can receive I/O write requests. Valid values are promoted and demoted. The default is promoted. If set to promoted, the specified volume is promoted and can receive I/O write requests. The promotion_status field changes to promoted. If set to demoted, the specified volume is demoted and can no longer receive I/O write requests. The promotion_status field changes to demoted. Optional.
size	number or string	Changes the provisioned size of the volume. If the new volume size is smaller than the original, then the truncate parameter needs to be set to true. Enter the size as a number (bytes) or as a string with a single character unit symbol. Valid unit symbols are K, M, G, T, P, representing KiB, MiB, GiB, TiB, and PiB, respectively, where "Ki" denotes 2 ¹⁰ , "Mi" denotes 2 ²⁰ , and so on. If the unit symbol is not specified, the unit defaults to bytes. Optional.
truncate	boolean	Truncates (true) the volume. When a volume is truncated, Purity automatically takes an undo snapshot, providing a 24-hour window during which the previous contents can be retrieved. After truncating a volume, its provisioned size can be subsequently increased, but the data in truncated sectors cannot be retrieved. Required if the volume size is set to a size that is smaller than the original.

Example 1: Set the provisioned size for volume v5 to 10G

Request:

```
PUT https://pure01.example.com/api/1.19/volume/v5
{
  "size": "10G"
}
```

Response:

```
{
  "name": "v5",
  "size": 10737418240
}
```

Example 2: Truncate volume v5 to 1073741824 bytes

Request:

```
PUT https://pure01.example.com/api/1.19/volume/v5
{
  "size": 1073741824,
  "truncate": true
}
```

Response:

```
{
  "name": "v5",
  "size": 1073741824
}
```

Example 3: Rename volume v5 to v5_renamed

Request:

```
PUT https://pure01.example.com/api/1.19/volume/v5
{
  "name": "v5_renamed"
}
```

Response:

```
{
  "name": "v5_renamed"
}
```

Example 4: Rename suffix of volume snapshot v5.snap from snap to snap2

Request:

```
PUT https://pure01.example.com/api/1.19/volume/v3.snap1
{
  "name": "v3.snap2"
}
```

Response:

```
{
  "name": "v3.snap2"
}
```

3.10 DELETE volume/{volume}

Destroys or eradicates the specified volume or snapshot.

If destroying or eradicating a volume, its snapshots are also destroyed or eradicated.

Parameters

Parameter	Type	Description
eradicate	boolean	If set to true, eradicates the destroyed volume or snapshot. The volume or snapshot must be destroyed before it can be eradicated. Once eradication has begun, the volume or snapshot can no longer be recovered. If set to false (or if not set at all), destroys the specified volume or snapshot. The destroyed volume or snapshot undergoes a 24-hour eradication pending period during which time the volume or snapshot and its data can be fully recovered. After the 24-hour pending period, Purity eradicates the destroyed volume or snapshot. After destroying a volume or snapshot, you can eradicate it to immediately terminate the 24-hour eradication period and begin storage reclamation. Optional.

Example 1: Destroy volume v6

Request:

```
DELETE https://pure01.example.com/api/1.19/volume/v6
```

Response:

```
{
  "name": "v6"
}
```

Example 2: Eradicate volume v6

Request:

```
DELETE https://pure01.example.com/api/1.19/volume/v6?eradicate=true
```

Response:

```
{
  "name": "v6"
}
```

3.11 DELETE volume/{volume}/pgroup/{pgroup}

Removes a volume member from a protection group.

Parameters

Parameter	Type	Description
None	n/a	n/a

4. Hosts

View, create, and manage hosts.

4.1 GET host

Lists all hosts on the array.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
all	boolean	Displays all visible attributes of the specified hosts, including associated worldwide names, host groups, connected volumes and the LUNs used to address them, preferred arrays in the case of synchronous replication uniform storage access, and array port worldwide names through which the volumes are visible. Optional.
array	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display performance data by the array to which the I/O is directed. If the <code>historical</code> parameter is set, set this parameter to true to display historical performance data by the array to which the I/O is directed. Optional.
chap	boolean	Displays host and target user names and indicates whether host and target passwords have been set. Optional.
connect	boolean	Displays all host-volume connections, either private or shared, and the LUNs used by the hosts to address the volumes. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. Include the <code>mirrored</code> parameter to display real-time latency information for mirrored writes. Optional.
mirrored	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information for mirrored writes (i.e., writes to volumes in stretched pods): Latency • <code>usec_per_mirrored_write_op</code> - average time, measured in microseconds, it takes the array to process a mirrored I/O write request. IOPS • <code>mirrored_input_per_sec</code> - number of mirrored bytes written per second. • <code>mirrored_writes_per_sec</code> - number of mirrored writes per second. If one array of a stretched pod is offline, the writes processed on the other array are reported as local writes rather than mirrored ones. Once the pod is back online, in sync, and processing each write on both sides, the writes to its volumes are reported as mirrored writes again.

		Optional.
names	list	Displays specified hosts. Enter multiple host names in comma-separated format. Host names can include asterisk (*) wildcard characters to represent zero or more characters. Optional.
personality	boolean	Displays the personality setting associated with the specified hosts. Optional.
preferred_array	list	Displays the preferred array or arrays for the new host. In the case of synchronous replication and uniform storage access, in which a host has access to multiple arrays within a pod, one array might be preferred for efficiency reasons such as shorter distance and lower latency. Optional.
private	boolean	Used with the connect parameter to display (true) private host-volume connections. Optional.
protect	boolean	Displays all protected hosts and their associated protection groups. Optional.
shared	boolean	Used with the connect parameter to display (true) shared host-volume connections. Optional.
size	boolean	If the action parameter is set to monitor, set this parameter to display the following average I/O sizes: - bytes_per_read - average I/O size per read. - bytes_per_write - average I/O size per write. - bytes_per_op - average I/O size for both read and write (all) operations. Optional.
space	boolean	Displays information about provisioned (virtual) size and physical storage consumption for each volume connected to the specified hosts. Optional.
total	boolean	If the action parameter is set to monitor, set this parameter to display (true) performance totals across all hosts. Performance totals appear at the end of the response. Optional.

Example 1: List all hosts

Request:

GET https://pure01.example.com/api/1.19/host

Response:

```
[
  {
    "hgroup": "hg1",
    "iqn": [],
    "name": "h1",
    "wwn": [
      "0000111122223333"
    ]
  },
  {
    "hgroup": "hg1",
    "iqn": [],
    "name": "h2",
    "wwn": []
  },
  {
    "hgroup": null,
    "iqn": [],
    "name": "h3",
    "wwn": []
  }
]
```

Example 2: Display I/O performance for all hosts

Request:

GET https://pure01.example.com/api/1.19/host?action=monitor

Response:

```
[
  {
    "input_per_sec": 0,
    "name": "h1",
    "output_per_sec": 0,
    "reads_per_sec": 0,
    "time": "2016-05-11T20:35:51Z",
    "usec_per_read_op": 0,
    "usec_per_write_op": 0,
    "writes_per_sec": 0
  },
  {
    "input_per_sec": 0,
    "name": "h2",
    "output_per_sec": 0,
    "reads_per_sec": 0,
    "time": "2016-05-11T20:35:51Z",
    "usec_per_read_op": 0,
    "usec_per_write_op": 0,
    "writes_per_sec": 0
  },
  {
    "input_per_sec": 0,
    "name": "h3",
    "output_per_sec": 0,
    ...
    "usec_per_write_op": 0,
    "writes_per_sec": 0
  }
]
```

4.2 GET host/{host}

Lists the attributes for the specified host.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
all	boolean	Displays all visible attributes of the specified host. Display includes associated worldwide names, host groups, connected volumes and the LUNs used to address them, preferred arrays in the case of synchronous replication uniform storage access, and array port worldwide names through which the volumes are visible. Optional.
array	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display performance data by the array to which the I/O is directed. If the <code>historical</code> parameter is set, set this parameter to true to display historical performance data by the array to which the I/O is directed. Optional.
chap	boolean	Displays host and target user names and indicates whether host and target passwords have been set. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. Include the <code>mirrored</code> parameter to display real-time latency information for mirrored writes. Optional.
mirrored	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information for mirrored writes (i.e., writes to volumes in stretched pods): Latency • <code>usec_per_mirrored_write_op</code> - average time, measured in microseconds, it takes the array to process a mirrored I/O write request. IOPS • <code>mirrored_input_per_sec</code> - number of mirrored bytes written per second. • <code>mirrored_writes_per_sec</code> - number of mirrored writes per second. If one array of a stretched pod is offline, the writes processed on the other array are reported as local writes rather than mirrored ones. Once the pod is back online, in sync, and processing each write on both sides, the writes to its volumes are reported as mirrored writes again. Optional.
personality	boolean	Displays the personality setting associated with the specified host.

		Optional.
protect	boolean	Displays the names of all protection groups associated with the specified host. If the host is not protected, returns an empty response.
		Optional.
size	boolean	If the action parameter is set to monitor, set this parameter to display the following average I/O sizes: - bytes_per_read - average I/O size per read. - bytes_per_write - average I/O size per write. - bytes_per_op - average I/O size for both read and write (all) operations.
		Optional.
space	boolean	Displays information about provisioned (virtual) size and physical storage consumption for each volume connected to the specified host.
		Optional.
total	boolean	If the action parameter is set to monitor, set this parameter to display (true) performance totals across all specified hosts. Performance totals appear at the end of the response.
		Optional.

Example 1: List space usage for host h1

Request:

```
GET https://pure01.example.com/api/1.19/host/h1?space=true
```

Response:

```
{
  "data_reduction": 1.0,
  "name": "h1",
  "size": 1073741824,
  "snapshots": 0,
  "thin_provisioning": 1.0,
  "total": 0,
  "total_reduction": 1.0,
  "volumes": 0
}
```

Example 2: List CHAP attributes for host h1

Request:

```
GET https://pure01.example.com/api/1.19/host/h1?chap=true
```

Response:

```
{
  "host_password": null,
  "host_user": null,
  "name": "h1",
  "target_password": null,
  "target_user": null
}
```

Example 3: List personality attribute for host h1

Request:

```
GET https://pure01.example.com/api/1.19/host/h1?personality=true
```

Response:

```
{
  "name": "h1",
  "personality": null
}
```

Example 4: Display I/O performance for host h1

Request:

```
GET https://pure01.example.com/api/1.19/host/h1?action=monitor
```

Response:

```
{
  "input_per_sec": 0,
  "name": "h1",
  "output_per_sec": 0,
  "reads_per_sec": 0,
  "time": "2016-05-11T20:35:51Z",
  "usec_per_read_op": 0,
  "usec_per_write_op": 0,
  "writes_per_sec": 0
}
```

4.3 GET host/{host}/volume

Lists volumes associated with the specified host and the LUNs used to address them.

Parameters

Parameter	Type	Description
private	boolean	Restricts (true) the display list to volumes with private connections. Optional.
shared	boolean	Restricts (true) the display list to volumes with shared connections. Optional.

Example 1: List private and shared connections for host h2

Request:

```
GET https://pure01.example.com/api/1.19/host/h2/volume
```

Response:

```
[
  {
    "hgroup": null,
    "lun": 7,
    "name": "h2",
    "vol": "v3"
  },
  {
    "hgroup": "hg1",
    "lun": 10,
    "name": "h2",
    "vol": "v1"
  }
]
```

Example 2: List private connections for host h2

Request:

```
GET https://pure01.example.com/api/1.19/host/h2/volume?private=true
```

Response:

```
[
  {
    "lun": 7,
    "name": "h2",
    "vol": "v3"
  }
]
```

Example 3: List shared connections for host h2

Request:

```
GET https://pure01.example.com/api/1.19/host/h2/volume?shared=true
```

Response:

```
[
  {
    "hgroup": "hg1",
    "lun": 10,
    "name": "h2",
    "vol": "v1"
  }
]
```

4.4 POST host/{host}

Creates a host with the specified name.

Parameters

Parameter	Type	Description
iqnlist	list	Sets the list of iSCSI qualified names (IQNs) for the new host. Optional.
nqnlist	list	Sets the list of NVMe qualified names (NQN) for the new host. Optional.
preferred_array	list	Sets the list of preferred arrays for the new host. Optional.
wwnlist	list	Sets the list of Fibre Channel worldwide names (WWNs) for the new host. Note: This parameter is not supported on Cloud Block Store. Optional.

Example 1: Create host h4 with one wwn

Request:

```
POST https://pure01.example.com/api/1.19/host/h4
{
  "wwnlist": [
    "0000999900009999"
  ]
}
```

Response:

```
{
  "iqn": [],
  "name": "h4",
  "wwn": [
    "0000999900009999"
  ]
}
```

4.5 POST host/{host}/pgroup/{pgroup}

Adds a host to a protection group.

You can only add members of the same object type to a protection group. For example, you cannot add hosts or host groups to a protection group that contains volumes.

Parameters

Parameter	Type	Description
None	n/a	n/a

4.6 POST host/{host}/volume/{volume}

Connects a volume, virtual volume, or protocol endpoint to the host.

Parameters

Parameter	Type	Description
lun	number	Assigns the same LUN to each connection. The connection fails for any host for which the specified LUN is already in use. Optional.
use_protocol_endpoint	boolean	Connects a virtual volume to the VMware ESXi host. For more information about virtual volumes, including configuration steps, refer to the Pure Storage vSphere Web Client Plugin for vSphere User Guide on the Knowledge site at http://support.purestorage.com . Optional.

Example 1: Create a private connection between host h4 and volume v5_renamed

Request:

```
POST https://pure01.example.com/api/1.19/host/h4/volume/v5_renamed
```

Response:

```
{
  "lun": 1,
  "name": "h4",
  "vol": "v5_renamed"
}
```

4.7 PUT host/{host}

Modifies the attributes for the host.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
addiqnlist	list	Adds the list of iSCSI qualified names (IQNs) to the specified host. Optional.
addqnlist	list	Adds the list of NVMe qualified names (NQNs) to the specified host. Optional.
addwwnlist	list	Adds the list of Fibre Channel worldwide names (WWNs) to the specified host. Note: This parameter is not supported on Cloud Block Store. Optional.
host_password	string	Sets the host password for CHAP authentication. Optional.
host_user	string	Sets the host user name for CHAP authentication. Optional.
iqnlist	list	Assigns a list of iSCSI qualified names (IQNs) to the specified host. Optional.
name	string	Changes the name of the host to the specified name. Optional.
nqnlist	list	Assigns a list of NVMe qualified names (NQNs) to the specified host. Optional.
personality	string	Determines how the Purity system tunes the protocol used between the array and the initiator. To ensure the array works optimally with the host, set the personality to the name of the host operating or virtual memory system. Valid values are <code>aix</code> , <code>esxi</code> , <code>hitachi-vsp</code> , <code>hpux</code> , <code>oracle-vm-server</code> , <code>solaris</code> , and <code>vms</code> . If your system is not listed as one of the valid host personalities, do not set the option. By default, the host personality is not set. To clear the host personality setting, set to an empty string (<code>""</code>). Optional.
preferred_array	list	Adds a list of preferred arrays, completely replacing any existing preferred arrays that are already set for the host. Optional.
remiqnlist	list	Removes the list of iSCSI qualified names (IQNs) from the specified host. Optional.
remnqnlist	list	Removes the list of NVMe qualified names (NQNs) from the specified host. Optional.
remwwnlist	list	Removes the list of Fibre Channel worldwide names (WWNs) from the specified host. Note: This parameter is not supported on Cloud Block Store. Optional.
target_password	string	Sets the target password for CHAP authentication. Optional.
target_user	string	Sets the target user name for CHAP authentication. Optional.
wwnlist	list	Assigns a list of Fibre Channel worldwide names (WWNs) to the specified host. Note: This parameter is not supported on Cloud Block Store. Optional.

Example 1: Replace list of wwns

Request:

```
PUT https://pure01.example.com/api/1.19/host/h4
{
  "wwnlist": [
    "1111222233334444",
    "2222333344445555"
  ]
}
```

Response:

```
{
  "hgroup": null,
  "iqn": [],
  "name": "h4",
  "wwn": [
    "111122233334444",
    "222333344445555"
  ]
}
```

Example 2: Add two more wwns to list

Request:

```
PUT https://pure01.example.com/api/1.19/host/h4
{
  "addwwnlist": [
    "444433332221111",
    "555544443333222"
  ]
}
```

Response:

```
{
  "hgroup": null,
  "iqn": [],
  "name": "h4",
  "wwn": [
    "111122233334444",
    "222333344445555",
    "444433332221111",
    "555544443333222"
  ]
}
```

Example 3: Remove one wwn from list

Request:

```
PUT https://pure01.example.com/api/1.19/host/h4
{
  "remwwnlist": [
    "222333344445555"
  ]
}
```

Response:

```
{
  "hgroup": null,
  "iqn": [],
  "name": "h4",
  "wwn": [
    "111122233334444",
    "444433332221111",
    "555544443333222"
  ]
}
```

Example 4: Rename a host

Request:

```
PUT https://pure01.example.com/api/1.19/host/h4
{
  "name": "h5"
}
```

Response:

```
{
  "name": "h5"
}
```

4.8 DELETE host/{host}/pgroup/{pgroup}

Removes a host member from a protection group.

Parameters

Parameter	Type	Description
None	n/a	n/a

4.9 DELETE host/{host}/volume/{volume}

Breaks the connection between a host and volume.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Disconnect host h5 and volume v5_renamed

Request:

```
DELETE https://pure01.example.com/api/1.19/host/h5/volume/v5_renamed
```

Response:

```
{
  "name": "h5",
  "vol": "v5_renamed"
}
```

4.10 DELETE host/{host}

Removes the specified host.

Hosts cannot be deleted while they have private connections to volumes or while they are associated with host groups.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Delete host h5

Request:

```
DELETE https://pure01.example.com/api/1.19/host/h5
```

Response:

```
{
  "name": "h5"
}
```

5. Host Groups

View, create, and manage host groups.

5.1 GET hgroup

Lists or monitors all host groups.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
array	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display performance data by the array to which the I/O is directed. If the <code>historical</code> parameter is set, set this parameter to true to display historical performance data by the array to which the I/O is directed. Optional.
connect	boolean	Displays all volumes associated with host groups, and the LUNs used by the associated hosts to address them. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. Include the <code>mirrored</code> parameter to display real-time latency information for mirrored writes. Optional.
mirrored	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information for mirrored writes (i.e., writes to volumes in stretched pods): Latency • <code>usec_per_mirrored_write_op</code> - average time, measured in microseconds, it takes the array to process a mirrored I/O write request. IOPS • <code>mirrored_input_per_sec</code> - number of mirrored bytes written per second. • <code>mirrored_writes_per_sec</code> - number of mirrored writes per second. If one array of a stretched pod is offline, the writes processed on the other array are reported as local writes rather than mirrored ones. Once the pod is back online, in sync, and processing each write on both sides, the writes to its volumes are reported as mirrored writes again. Optional.
names	list	Displays specified host groups. Enter multiple host group names in comma-separated format. Host group names can include asterisk (*) wildcard characters to represent zero or more characters. Optional.
protect	boolean	Displays (true) all protected host groups and their associated protection groups. Optional.

size	boolean	If the action parameter is set to monitor, set this parameter to display the following average I/O sizes: - bytes_per_read - average I/O size per read. - bytes_per_write - average I/O size per write. - bytes_per_op - average I/O size for both read and write (all) operations. Optional.
space	boolean	Displays size and space consumption information for each volume associated with each specified host group. Optional.
total	boolean	If the action parameter is set to monitor, set this parameter to display (true) performance totals across all host groups. Performance totals appear at the end of the response. Optional.

Example 1: List all host groups

Request:

```
GET https://pure01.example.com/api/1.19/hgroup
```

Response:

```
[
  {
    "hosts": [
      "h1",
      "h2"
    ],
    "name": "hg1"
  },
  {
    "hosts": [],
    "name": "hg2"
  }
]
```

Example 2: List all host groups' space usage

Request:

```
GET https://pure01.example.com/api/1.19/hgroup?space=true
```

Response:

```
[
  {
    "data_reduction": 1.0,
    "name": "hg1",
    "size": 1073741824,
    "snapshots": 0,
    "thin_provisioning": 1.0,
    "total": 0,
    "total_reduction": 1.0,
    "volumes": 0
  },
  {
    "data_reduction": 1.0,
    "name": "hg2",
    "size": 2147483648,
    "snapshots": 0,
    "thin_provisioning": 1.0,
    "total": 0,
    "total_reduction": 1.0,
    "volumes": 0
  }
]
```

Example 3: Monitor I/O performance of all host groups

Request:

```
GET https://pure01.example.com/api/1.19/hgroup?action=monitor
```

Response:

```
[
  {
    "input_per_sec": 0,
    "name": "hg1",
    "output_per_sec": 0,
    "reads_per_sec": 0,
    "time": "2016-05-11T20:35:52Z",
    "usec_per_read_op": 0,
    "usec_per_write_op": 0,
    "writes_per_sec": 0
  },
  {
    "input_per_sec": 0,
    "name": "hg2",
    "output_per_sec": 0,
    "reads_per_sec": 0,
    "time": "2016-05-11T20:35:52Z",
    "usec_per_read_op": 0,
    "usec_per_write_op": 0,
    "writes_per_sec": 0
  }
]
```

5.2 GET hgroup/{hgroup}

Lists or monitors a single host group.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
array	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display performance data by the array to which the I/O is directed. If the <code>historical</code> parameter is set, set this parameter to true to display historical performance data by the array to which the I/O is directed. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. Include the <code>mirrored</code> parameter to display real-time latency information for mirrored writes. Optional.
mirrored	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information for mirrored writes (i.e., writes to volumes in stretched pods): Latency • <code>usec_per_mirrored_write_op</code> - average time, measured in microseconds, it takes the array to process a mirrored I/O write request. IOPS • <code>mirrored_input_per_sec</code> - number of mirrored bytes written per second. • <code>mirrored_writes_per_sec</code> - number of mirrored writes per second. If one array of a stretched pod is offline, the writes processed on the other array are reported as local writes rather than mirrored ones. Once the pod is back online, in sync, and processing each write on both sides, the writes to its volumes are reported as mirrored writes again. Optional.
protect	boolean	Displays (true) the names of all protection groups associated with the specified host group. If the host group is not protected, returns an empty response. Optional.
size	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to display the following average I/O sizes: • <code>bytes_per_read</code> - average I/O size per read. • <code>bytes_per_write</code> - average I/O size per write. • <code>bytes_per_op</code> - average I/O size for both read and write (all) operations.

		Optional.
space	boolean	Displays size and space consumption information for each volume associated with the specified host group.
		Optional.
total	boolean	If the action parameter is set to monitor, set this parameter to display (true) performance totals across all specified host groups. Performance totals appear at the end of the response.
		Optional.

Example 1: List host group hg1

Request:

```
GET https://pure01.example.com/api/1.19/hgroup/hg1
```

Response:

```
{
  "hosts": [
    "h1",
    "h2"
  ],
  "name": "hg1"
}
```

Example 2: List space usage for host group hg1

Request:

```
GET https://pure01.example.com/api/1.19/hgroup/hg1?space=true
```

Response:

```
{
  "data_reduction": 1.0,
  "name": "hg1",
  "size": 1073741824,
  "snapshots": 0,
  "thin_provisioning": 1.0,
  "total": 0,
  "total_reduction": 1.0,
  "volumes": 0
}
```

Example 3: Monitor I/O performance for host group hg1

Request:

```
GET https://pure01.example.com/api/1.19/hgroup/hg1?action=monitor
```

Response:

```
{
  "input_per_sec": 0,
  "name": "hg1",
  "output_per_sec": 0,
  "reads_per_sec": 0,
  "time": "2016-05-11T20:35:52Z",
  "usec_per_read_op": 0,
  "usec_per_write_op": 0,
  "writes_per_sec": 0
}
```

5.3 GET hgroup/{hgroup}/volume

Lists volumes associated with the specified host groups and the LUNs used to address them.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List volumes connected to host group hg1

Request:

```
GET https://pure01.example.com/api/1.19/hgroup/hg1/volume
```

Response:

```
[
  {
    "lun": 10,
    "name": "hg1",
    "vol": "v1"
  }
]
```

5.4 POST hgroup/{hgroup}

Creates a host group with the specified name.

Parameters

Parameter	Type	Description
hostlist	list	List of member hosts.
		Optional.

Example 1: Create host group hg3

Request:

```
POST https://pure01.example.com/api/1.19/hgroup/hg3
```

Response:

```
{
  "hosts": [],
  "name": "hg3"
}
```

5.5 POST hgroup/{hgroup}/pgroup/{pgroup}

Adds a host group to a protection group.

You can only add members of the same object type to a protection group. For example, you cannot add hosts or host groups to a protection group that contains volumes.

Parameters

Parameter	Type	Description
None	n/a	n/a

5.6 POST hgroup/{hgroup}/volume/{volume}

Connects a volume, virtual volume, or protocol endpoint to all hosts in the specified host group.

If the LUN is not specified, when the volume is connected to the host group, Purity assigns the same LUN to each connection. All hosts in the group use this LUN to communicate with the volume.

Parameters

Parameter	Type	Description
lun	number	Assigns the specified LUN to each connection.
		Optional.
use_protocol_endpoint	boolean	Connects a virtual volume to the VMware ESXi host group.
		For more information about virtual volumes, including configuration steps, refer to the Pure Storage vSphere Web Client Plugin for vSphere User Guide on the Knowledge site at http://support.purestorage.com .
		Optional.

Example 1: Connect volume v3 to host group hg3

Request:

```
POST https://pure01.example.com/api/1.19/hgroup/hg3/volume/v3
```

Response:

```
{
  "lun": 10,
  "name": "hg3",
  "vol": "v3"
}
```

5.7 PUT hgroup/{hgroup}

Adds, removes, or modifies host members of the host group.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
addhostlist	list	Adds a list of hosts to the existing list. Optional.
hostlist	list	Replaces the list of member hosts. Optional.
name	string	Changes the name of the host group to the specified name. Optional.
remhostlist	list	Removes the list of hosts from the existing list. Optional.

Example 1: Rename host group

Request:

```
PUT https://pure01.example.com/api/1.19/hgroup/hg3
{
  "name": "hg4"
}
```

Response:

```
{
  "hosts": [],
  "name": "hg4"
}
```

Example 2: Set host members for hgroup hg4

Request:

```
PUT https://pure01.example.com/api/1.19/hgroup/hg4
{
  "hostlist": [
    "h3"
  ]
}
```

Response:

```
{
  "hosts": [
    "h3"
  ],
  "name": "hg4"
}
```

Example 3: Remove host members

Request:

```
PUT https://pure01.example.com/api/1.19/hgroup/hg4
{
  "remhostlist": [
    "h3"
  ]
}
```

Response:

```
{
  "hosts": [],
  "name": "hg4"
}
```

5.8 DELETE hgroup/{hgroup}/pgroup/{pgroup}

Removes a host group member from a protection group.

Parameters

Parameter	Type	Description
None	n/a	n/a

5.9 DELETE hgroup/{hgroup}/volume/{volume}

Breaks the connections between all hosts associated with the host group and the specified volume.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Disconnect volume v3 from host group hg4

Request:

```
DELETE https://pure01.example.com/api/1.19/hgroup/hg4/volume/v3
```

Response:

```
{
  "name": "hg4",
  "vol": "v3"
}
```

5.10 DELETE hgroup/{hgroup}

Deletes the specified host group. You must disconnect all volumes and remove all hosts from the host group before deleting the host group.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Delete host group hg4

Request:

```
DELETE https://pure01.example.com/api/1.19/hgroup/hg4
```

Response:

```
{
  "name": "hg4"
}
```

6. Pods

View, create, and manage pods for synchronous replication.

6.1 GET pod

Lists the attributes, such as pod name, promotion status, linked target count, and linked source count, or displays the performance monitoring details and replication information for each pod.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
array	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following details: • Performance data by the array to which the I/O is directed. • Replication information by the array when the replication parameter is set to true. If the <code>historical</code> parameter is set, set this parameter to true to display the following details: • Historical performance data by the array to which the I/O is directed. • Historical replication information by the array over the specified range of time when the replication parameter is set to true. Optional.
failover_preference	boolean	Displays which array within a stretched pod should be given priority to stay online, should the arrays ever lose contact with each other. If both arrays are online and can reach the mediator, <code>failover_preference</code> determines which of those two arrays should be given priority to stay online. If, however, only one of the two arrays can reach the mediator, that array stays online regardless of failover preference. A failover preference of <code>(auto)</code> means that no arrays have been configured for failover preference. In such cases, if both arrays within a stretched pod can reach the mediator after losing contact with each other, either array will have an opportunity of staying online for the given pod. Optional.
footprint	boolean	Displays the maximum amount of physical space the pod would take up on any array. The footprint metric is mostly used for capacity planning. Optional.
historical	string	If the <code>action</code> parameter is set to monitor, set this parameter to display the following details: • Historical performance data over the specified range of time. • Historical replication information over the specified range of time when the replication parameter is set to true. If the <code>space</code> parameter is set to true, set this parameter to display historical space data over the specified range of time. Valid historical values are: 1h, 3h, 24h, 7d, 30d, 90d, and 1y. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit.

Include the `mirrored` parameter to display real-time latency information for mirrored writes.

Optional.

mediator	list	Includes mediator details for the local array and all peer arrays. Optional.
mirrored	boolean	If the <code>action</code> parameter is set to <code>monitor</code>, set this parameter to <code>true</code> to display the following real-time latency information for mirrored writes (i.e., writes to volumes in stretched pods): Latency <code>usec_per_mirrored_write_op</code> - average time, measured in microseconds, it takes the array to process a mirrored I/O write request. IOPS <code>mirrored_input_per_sec</code> - number of mirrored bytes written per second. <code>mirrored_writes_per_sec</code> - number of mirrored writes per second. If one array of a stretched pod is offline, the writes processed on the other array are reported as local writes rather than mirrored ones. Once the pod is back online, in sync, and processing each write on both sides, the writes to its volumes are reported as mirrored writes again. Optional.
names	list	Displays specified pods. Enter multiple pod names in comma-separated format. Pod names can include asterisk (*) wildcard characters to represent zero or more characters. Optional.
on	string	Displays a list of pods that are on the specified remote arrays but not stretched to this array. Pods that are stretched to this array will not appear in the list. Enter multiple remote array names in comma-separated format. The remote array name can be set to asterisk (*) to represent all remote arrays. Optional.
pending	boolean	Includes (true) destroyed pods that are in the eradication pending state. Time remaining is displayed in seconds. The <code>pending</code> option can also be used with the <code>space</code> option. Optional.
pending_only	boolean	Lists (true) destroyed pods that are in the eradication pending state. Time remaining is displayed in seconds. The <code>pending_only</code> option can also be used with the <code>space</code> option. Optional.
replication	boolean	If the <code>action</code> parameter is set to <code>monitor</code>, set this parameter to <code>true</code> to display the following real-time or historical replication information: Continuous replication <code>continuous_bytes_per_sec_to_remote</code> - number of bytes of continuous replication data transmitted per second to the remote pod. <code>continuous_bytes_per_sec_from_remote</code> - number of bytes of continuous replication data received per second from the remote pod. <code>continuous_bytes_per_sec_total</code> - total number of bytes of continuous replication data transmitted to and received from the remote pod per second. Synchronous replication <code>sync_bytes_per_sec_to_remote</code> - number of bytes of synchronous replication data transmitted per second to the remote pod. <code>sync_bytes_per_sec_from_remote</code> - number of bytes of synchronous replication data received per second from the remote pod. <code>sync_bytes_per_sec_total</code> - total number of bytes of synchronous replication data transmitted to and received from the remote pod per second. Resync replication <code>resync_bytes_per_sec_to_remote</code> - number of bytes of resync replication data transmitted per second to the remote pod. <code>resync_bytes_per_sec_from_remote</code> - number of bytes of resync replication data received per second from the remote pod. <code>resync_bytes_per_sec_total</code> - total number of bytes of resync replication data transmitted to and received from the remote pod per second. Optional.
space	boolean	Displays (true) size and space consumption information for each pod. Optional.

6.2 GET pod/{pod}

Lists the attributes, such as pod name, promotion status, linked target count, and linked source count, or displays the performance monitoring details for the specified pod.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
array	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display performance data by the array to which the I/O is directed. If the <code>historical</code> parameter is set, set this parameter to true to display historical performance data by the array to which the I/O is directed. Optional.
footprint	boolean	Displays the maximum amount of physical space the pod would take up on any array. The footprint metric is mostly used for capacity planning. Optional.
historical	list	If the <code>action</code> parameter is set to monitor, set this parameter to display historical performance data over the specified range of time. If the <code>space</code> parameter is set to true, set this parameter to display historical space data over the specified range of time. Valid historical values are: 1h, 3h, 24h, 7d, 30d, 90d, and 1y. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. Include the <code>mirrored</code> parameter to display real-time latency information for mirrored writes. Optional.
mediator	list	Includes mediator details for the local array and all peer arrays. Optional.
mirrored	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information for mirrored writes (i.e., writes to volumes in stretched pods): Latency • <code>usec_per_mirrored_write_op</code> - average time, measured in microseconds, it takes the array to process a mirrored I/O write request. IOPS • <code>mirrored_input_per_sec</code> - number of mirrored bytes written per second. • <code>mirrored_writes_per_sec</code> - number of mirrored writes per second.

If one array of a stretched pod is offline, the writes processed on the other array are reported as local writes rather than mirrored ones. Once the pod is back online, in sync, and processing each write on both sides, the writes to its volumes are reported as mirrored writes again.

Optional.

on	string	Displays the details of the specified pod on the specified remote arrays, so long as the pod is not stretched to these arrays. Pods that are stretched to these arrays will not appear in the list. Enter multiple remote array names in comma-separated format. The remote array name can be set to asterisk (*) to represent all remote arrays. Optional.
pending	boolean	Displays (true) the details of the pod, regardless of its pending state (destroyed or not). If the pod is pending eradication, time remaining is displayed in seconds. If the pod is not in the eradication pending state, a time remaining of null is displayed. Optional.
pending_only	boolean	If the pod is in the eradication pending state, set pending to true to display the attributes for the destroyed pod, including the time remaining before the pod is permanently eradicated. Time remaining is displayed in seconds. Optional.
space	boolean	Displays (true) size and space consumption information for each pod. Optional.

6.3 POST pod/{pod}

Creates a new pod.

Parameters

Parameter	Type	Description
failover_preference	list	Specifies which array within a stretched pod should be given priority to stay online, should the arrays ever lose contact with each other. If both arrays are online and can reach the mediator, <code>failover_preference</code> determines which of those two arrays should be given priority to stay online. If, however, only one of the two arrays can reach the mediator, that array stays online regardless of failover preference. A failover preference of (auto) means that no arrays have been configured for failover preference. In such cases, if both arrays within a stretched pod can reach the mediator after losing contact with each other, either array will have an opportunity of staying online for the given pod. The current array and any peer arrays that are connected to the current array for synchronous replication can be added to the pod for failover preference. Optional.
source	string	Source pod used to create the new pod. Optional.

6.4 POST pod/{pod}/array/{array}

Stretches a pod to a peer array.

Parameters

Parameter	Type	Description
None	n/a	n/a

6.5 PUT pod/{pod}

Modifies a pod or changes the promotion status of a pod.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
abort_quiesce	boolean	If the requested_promotion_state parameter is set to promoted, setting the abort_quiesce parameter to true promotes the pod while the replica-link status is quiescing without waiting for the quiescing operation to complete. Optional.
action	string	If set to recover, recovers a destroyed pod. Optional.
failover_preference	list	Adds a list of arrays to the pod as failover preferences, completely replacing any existing arrays that are already set for failover preference. Failover preference specifies which array within a stretched pod should be given priority to stay online, should the arrays ever lose contact with each other. If both arrays are online and can reach the mediator, failover_preference determines which of those two arrays should be given priority to stay online. If, however, only one of the two arrays can reach the mediator, that array stays online regardless of failover preference. A failover preference of (auto) means that no arrays have been configured for failover preference. In such cases, if both arrays within a stretched pod can reach the mediator after losing contact with each other, either array will have an opportunity to stay online for the given pod. The current array and any peer arrays that are connected to the current array for synchronous replication can be added to the pod for failover preference. To clear the list of failover preferences, set to empty square brackets ([]). Optional.
name	string	Renames a pod. Optional.
promote_from	string	Name of the undo-demote pod associated with the pod, which should be used as a source to promote the pod. Optional.
quiesce	boolean	If the requested_promotion_state parameter is set to demoted, setting the quiesce parameter to true demotes the pod and allows it to become a target pod after the replica-link status changes to quiesced. Specifying this setting ensures that all local data has been replicated to the remote pod before the demotion process. Optional.
requested_promotion_state	string	Specifies whether a pod can receive I/O write requests. Valid values are promoted and demoted. The default is promoted. If set to promoted, the specified pod is promoted when the promotion_status field of the pod transitions from promoting to promoted, indicating that the promotion process is complete. The pod can now receive I/O write requests. If set to demoted, the specified pod is demoted when the promotion_status field of the pod transitions from demoting to demoted, indicating that the demotion process is complete. The pod can no longer receive I/O write requests. Optional.
skip_quiesce	boolean	If the requested_promotion_state parameter is set to demoted, setting the skip_quiesce parameter to true demotes the pod and allows it to become a target pod without waiting for the quiesced replica-link status. Specifying this setting loses all pending data to be replicated to the remote pod. Optional.

6.6 DELETE pod/{pod}

Destroys or eradicates the specified pod.

Parameters

Parameter	Type	Description
eradicate	boolean	If set to true, eradicates the destroyed pod. The pod must be destroyed before it can be eradicated. Once eradication has begun, the pod can no longer be recovered. The destroyed pod undergoes a 24-hour eradication pending period during which time the pod can be fully recovered. After the 24-hour pending period, Purity eradicates the destroyed pod. Optional.

6.7 DELETE pod/{pod}/array/{array}

Unstretches a pod from a peer array.

Parameters

Parameter	Type	Description
None	n/a	n/a

6.8 GET pod/replica-link

Displays replica-link information, including status, direction, lag, local pod name, remote array, remote pod name, and recovery point, of all linked pods on the array.

Parameters

Parameter	Type	Description
action	boolean	If the replication parameter is set to true, set this parameter to monitor to display the following real-time or historical replica-link information: - local_pod_name - name of the local pod. - direction - direction of the replica link. - remote_pod_name - name of the remote pod. - remote_names - name of the remote array. - bytes_per_sec_to_remote - number of bytes of continuous replication data transmitted per second to the remote pod. - bytes_per_sec_from_remote - number of bytes of continuous replication data received per second from the remote pod. - bytes_per_sec_total - total number of bytes of continuous replication data transmitted to and received from the remote pod per second. Optional.
historical	string	If the action parameter is set to monitor and the replication parameter is set to true, set this parameter to display historical replica-link information over the specified range of time. Valid historical values are: 1h, 3h, 24h, 7d, 30d, 90d, and 1y. Optional.
lag	boolean	When set to true, the replica-link information shows the following details: - lag.avg - average lag measured in microseconds. - lag.max - maximum lag measured in microseconds. - local_pod_name - name of the local pod. - recovery_point - timestamp in milliseconds of the most recent changes that can be recovered. - remote_names - name of the remote array. - remote_pod_name - name of the remote pod. - status - status for replica link. Valid values are baselining, paused, quiescing, quiesced, replicating, and unhealthy. Optional.

6.9 POST pod/replica-link

Creates a replica link between the specified local and remote pods to initiate continuous replication.

Parameters

Parameter	Type	Description
local_pod_name	string	Name of the local pod for the replica link to be created. Required.
remote_name	string	Name of the remote array for the replica link to be created. Optional.
remote_pod_name	string	Name of the remote pod for the replica link to be created. Required.

6.10 PUT pod/replica-link

Specifies to pause or resume continuous replication between the specified local and remote pods. You can run this API call from either the source or target array.

Parameters

Parameter	Type	Description
local_pod_name	string	Specifies the name of the local pod for the replica link to be paused or resumed. Required.
paused	boolean	Specifies to pause or resume replication between the specified local and remote pods. To pause the replication, set this parameter to <code>true</code> . To resume the replication, set this parameter to <code>false</code> . Required.
remote_pod_name	string	Specifies the name of the remote pod for the replica link to be paused or resumed. Required.

6.11 DELETE pod/replica-link

Deletes the replica link between the specified local and remote pods.

Parameters

Parameter	Type	Description
local_pod_name	string	Specifies the name of the local pod for the replica link to be deleted. Required.
remote_pod_name	string	Specifies the name of the remote pod for the replica link to be deleted. Required.

7. Protection Groups

View, create, and manage protection groups.

7.1 GET pgroup

Lists protection groups and protection group snapshots and their attributes.

Parameters

Parameter	Type	Description
array	boolean	If the <code>historical</code> parameter is set, set this parameter to <code>true</code> to display historical performance data by the array to which the I/O is directed. Optional.
names	list	Displays specified protection groups. Enter multiple protection group names in comma-separated format. Protection group names can include asterisk (*) wildcard characters to represent zero or more characters. Optional.
on	string	Displays a list of protection groups with the specified Azure Blob, NFS, or S3 offload target. Set <code>on</code> to the name of the Azure Blob, NFS, or S3 offload target. Optional.
pending	boolean	Includes (<code>true</code>) destroyed protection groups that are in the eradication pending state. Time remaining is displayed in seconds. The <code>pending</code> option can also be used with the <code>schedule</code> , <code>retention</code> , <code>space</code> , or <code>snap</code> options to include a list of pending protection groups or snapshots. Optional.
pending_only	boolean	Lists (<code>true</code>) destroyed protection groups that are in the eradication pending state. Time remaining is displayed in seconds. The <code>pending</code> option can also be used with the <code>schedule</code> , <code>retention</code> , <code>space</code> , or <code>snap</code> options to include a list of pending protection groups or snapshots. Optional.
retention	boolean	Displays (<code>true</code>) the source/target retention policy. Optional.
schedule	boolean	Displays (<code>true</code>) the snapshot/replication schedule. Optional.
snap	boolean	Lists all snapshots (<code>true</code>). Can be used with the <code>space</code> parameter to list space consumption for all snapshots. Optional.
source	boolean	Lists (<code>true</code>) protection groups and snapshots created on this array. The <code>source</code> option can be used with the <code>schedule</code> , <code>retention</code> , <code>space</code> , or <code>snap</code> options. Optional.
space	boolean	Displays (<code>true</code>) size and space consumption information for each volume associated with each specified protection group. Optional.
target	boolean	Lists (<code>true</code>) protection groups and snapshots replicated to this array. The <code>target</code> option can be used with the <code>schedule</code> , <code>retention</code> , <code>space</code> , or <code>snap</code> options. Optional.
total	boolean	Displays (<code>true</code>) the total snapshot space consumption for all protection groups. Must be used with the <code>space</code> parameter. Optional.
transfer	boolean	Used with the <code>snap</code> parameter to display (<code>true</code>) replication data transfer statistics, including data transfer start time, data transfer end time, data transfer progress, and amount of logical/physical data transferred. Optional.

Example 1: List all protection groups.

Request:

GET https://pure01.example.com/api/1.19/pgroup

Response:

```
[
  {
    "hgroups": null,
    "hosts": null,
    "name": "pg1",
    "source": "pure01",
    "targets": null,
    "volumes": [
      "v1"
    ]
  },
  {
    "hgroups": null,
    "hosts": null,
    "name": "pg2",
    "source": "pure01",
    "targets": null,
    "volumes": [
      "v1"
    ]
  }
]
```

Example 2: List all protection groups created on this array.

Request:

```
GET https://pure01.example.com/api/1.19/pgroup?source=true
```

Response:

```
[
  {
    "hgroups": null,
    "hosts": null,
    "name": "pg1",
    "source": "pure01",
    "targets": null,
    "volumes": [
      "v1"
    ]
  },
  {
    "hgroups": null,
    "hosts": null,
    "name": "pg2",
    "source": "pure01",
    "targets": null,
    "volumes": [
      "v1"
    ]
  }
]
```

Example 3: List all protection groups and their schedules.

Request:

```
GET https://pure01.example.com/api/1.19/pgroup?schedule=true
```

Response:

```
[
  {
    "name": "pg1",
    "replicate_at": null,
    "replicate_blackout": null,
    "replicate_enabled": false,
    "replicate_frequency": 14400,
    "snap_at": null,
    "snap_enabled": false,
    "snap_frequency": 3600
  },
  {
    "name": "pg2",
    "replicate_at": null,
    "replicate_blackout": null,
    "replicate_enabled": false,
    "replicate_frequency": 14400,
    "snap_at": null,
    "snap_enabled": false,
    "snap_frequency": 3600
  }
]
```

Example 4: List all protection groups and their retention policies.

Request:

```
GET https://pure01.example.com/api/1.19/pgroup?retention=true
```

Response:

```
[
  {
    "all_for": 86400,
    "days": 7,
    "name": "pg1",
    "per_day": 4,
    "target_all_for": 86400,
    "target_days": 7,
    "target_per_day": 4
  },
  {
    "all_for": 86400,
    "days": 7,
    "name": "pg2",
    "per_day": 4,
    "target_all_for": 86400,
    "target_days": 7,
    "target_per_day": 4
  }
]
```

Example 5: List all protection groups including protection pgroups in the eradication pending state.

Request:

```
GET https://pure01.example.com/api/1.19/pgroup?pending=true
```

Response:

```
[
  {
    "hgroups": null,
    "hosts": null,
    "name": "pg1",
    "source": "pure01",
    "targets": null,
    "time_remaining": null,
    "volumes": [
      "v1"
    ]
  },
  {
    "hgroups": null,
    "hosts": null,
    "name": "pg2",
    "source": "pure01",
    "targets": null,
    "time_remaining": null,
    "volumes": [
      "v1"
    ]
  },
  {
    "hgroups": null,
    ...
    "v3"
  }
]
```

Example 6: List all protection groups in the eradication pending state.

Request:

```
GET https://pure01.example.com/api/1.19/pgroup?pending_only=true
```

Response:

```
[
  {
    "hgroups": null,
    "hosts": null,
    "name": "pg3",
    "source": "pure01",
    "targets": null,
    "time_remaining": 86395,
    "volumes": [
      "v2",
      "v3"
    ]
  }
]
```

Example 7: List all protection groups and their space usage.

Request:

```
GET https://pure01.example.com/api/1.19/pgroup?space=true
```

Response:

```
[
  {
    "name": "pg1",
    "snapshots": 0
  },
  {
    "name": "pg2",
    "snapshots": 0
  }
]
```

7.2 GET pgroup/{pgroup}

Lists the attributes for the specified protection group or protection group snapshot.

If listing protection group snapshot attributes, the `snap` parameter must be specified.

Parameters

Parameter	Type	Description
array	boolean	If the <code>historical</code> parameter is set, set this parameter to <code>true</code> to display historical performance data by the array to which the I/O is directed. Optional.
on	string	Displays the details for the specified protection group with the specified Azure Blob, NFS, or S3 offload target. Specify the full protection group name, including the array name. Set <code>on</code> to the name of the Azure Blob, NFS, or S3 offload target. Optional.
pending	boolean	Displays (<code>true</code>) the details of the protection group, regardless of its pending state (destroyed or not). If the protection group is pending eradication, time remaining is displayed in seconds. If the protection group is not in the eradication pending state, a time remaining of <code>null</code> is displayed. Optional.
pending_only	boolean	Used with the <code>snap</code> parameter to list (<code>true</code>) destroyed protection group snapshots that are in the eradication pending state. Time remaining is displayed in seconds. Optional.
retention	boolean	Displays (<code>true</code>) the source/target retention policy. Optional.
schedule	boolean	Displays (<code>true</code>) the snapshot/replication schedule. Optional.
snap	boolean	If listing the attributes for a specified protection group, set <code>snap</code> to <code>true</code> to list all snapshots within the protection group. If listing the attributes for a specified protection group snapshot, always set <code>snap</code> to <code>true</code> . Can be used with the <code>space</code> parameter to list space consumption for all snapshots. Optional if listing attributes for a specified protection group. Required if listing attributes for a specified protection group snapshot.
space	boolean	Displays (<code>true</code>) size and space consumption information for each volume associated with each specified protection group. Optional.
total	boolean	Used with the <code>snap</code> parameter to display (<code>true</code>) the performance data across all snapshots of this protection group. Must be used with the <code>space</code> parameter. Optional.
transfer	boolean	Used with the <code>snap</code> parameter to display (<code>true</code>) replication data transfer statistics, including data transfer start time, data transfer end time, data transfer progress, and amount of logical/physical data transferred. Optional.

Example 1: List protection group pg1.

Request:

```
GET https://pure01.example.com/api/1.19/pgroup/pg1
```

Response:

```
{
  "hgroups": null,
  "hosts": null,
  "name": "pg1",
  "source": "pure01",
  "targets": null,
  "volumes": [
    "v1"
  ]
}
```

Example 2: List protection group pg3 even if it is in eradication pending state.

Request:

```
GET https://pure01.example.com/api/1.19/pgroup/pg3?pending=true
```

Response:

```
{
  "hgroups": null,
  "hosts": null,
  "name": "pg3",
  "source": "pure01",
  "targets": null,
  "time_remaining": 86394,
  "volumes": [
    "v2",
    "v3"
  ]
}
```

Example 3: List space usage for protection group pg1.

Request:

```
GET https://pure01.example.com/api/1.19/pgroup/pg1?space=true
```

Response:

```
{
  "name": "pg1",
  "snapshots": 0
}
```

Example 4: List schedule for protection group pg1.

Request:

```
GET https://pure01.example.com/api/1.19/pgroup/pg1?schedule=true
```

Response:

```
{
  "name": "pg1",
  "replicate_at": null,
  "replicate_blackout": null,
  "replicate_enabled": false,
  "replicate_frequency": 14400,
  "snap_at": null,
  "snap_enabled": false,
  "snap_frequency": 3600
}
```

7.3 POST pgroup

Creates snapshots of one or more protection groups.

Parameters

Parameter	Type	Description
apply_retention	boolean	Applies the retention schedule settings of the protection group to the snapshot. Optional.
replicate	boolean	Queues this snapshot for replication to all targets. Purity will begin replicating data to each allowed target when all earlier replication sessions for the same protection group have been completed to that target, excluding those started with <code>replicate_now</code> . May not be used with <code>replicate_now</code> . Optional.
replicate_now	boolean	Replicates this snapshot immediately to all targets. May not be used with <code>replicate</code> . Optional.
snap	boolean	Must be set to true to signify that a snapshot is being created. Required.
source	list	Generates a snapshot for each of the protection groups specified. Required.
suffix	string	Specifies a name suffix for the snapshot to be created. Optional.

Example 1: Create a snapshot of protection group pg1.

Request:

```
POST https://pure01.example.com/api/1.19/pgroup
{
  "snap": true,
  "source": [
    "pg1"
  ]
}
```

Response:

```
[
  {
    "created": "2016-05-11T20:35:53Z",
    "name": "pg1.3",
    "source": "pg1"
  }
]
```

Example 2: Create a snapshot of protection group pg1 with a custom suffix and apply pg1's retention policy to it.

Request:

```
POST https://pure01.example.com/api/1.19/pgroup
{
  "apply_retention": true,
  "snap": true,
  "source": [
    "pg1"
  ],
  "suffix": "crackle"
}
```

Response:

```
[
  {
    "created": "2016-05-11T20:35:53Z",
    "name": "pg1.crackle",
    "source": "pg1"
  }
]
```

7.4 POST pgroup/{pgroup}

Creates a protection group with the specified name or copies a protection group.

When copying a protection group, the destination protection group is created if it did not exist previously.

Parameters

Parameter	Type	Description
hgrouplist	list	List of one or more host groups to be included in the new protection group. Optional.
hostlist	list	List of one or more hosts to be included in the new protection group. Optional.
overwrite	boolean	When copying a protection group, <code>overwrite</code> (<code>true</code>) volumes in the destination protection group that have the same name as the volumes in the source protection group. Without the <code>overwrite=true</code> parameter, the copy command fails if any volume name collisions are found. With the <code>overwrite=true</code> parameter, both the source and destination protection groups must contain exactly the same volumes (volume names), otherwise the entire copy command fails. Optional.
source	string	The source pgroup or pgroup snapshot to copy from. Optional.
targetlist	list	List of one or more targets to be included in the new protection group. Optional.
vollist	list	List of one or more volumes to be included in the new protection group. Optional.

Example 1: Create protection group pg4.

Request:

```
POST https://pure01.example.com/api/1.19/pgroup/pg4
```

Response:

```
{
  "hgroups": null,
  "hosts": null,
  "name": "pg4",
  "source": "pure01",
  "targets": null,
  "volumes": null
}
```

Example 2: Create protection group pg5 with host h1.

Request:

```
POST https://pure01.example.com/api/1.19/pgroup/pg5
{
  "hostlist": [
    "h1"
  ]
}
```

Response:

```
{
  "hgroups": null,
  "hosts": [
    "h1"
  ],
  "name": "pg5",
  "source": "pure01",
  "targets": null,
  "volumes": null
}
```

7.5 PUT pgroup/{pgroup}

Modifies a protection group, its snapshot/replication schedule or its retention policy. Also recovers protection groups and protection group snapshots.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
action	string	If set to recover, recovers a destroyed protection group or snapshot. If recovering a destroyed protection group snapshot that was on an offload target, also include the on parameter. Optional.
addhgrouplist	list	Adds a list of host groups to the existing list. Optional.
addhostlist	list	Adds a list of hosts to the existing list. Optional.
addtargetlist	list	Adds a list of targets to the existing list. Optional.
addvollist	list	Adds a list of volumes to the existing list. Optional.
all_for	number	Modifies the retention policy of the protection group. Specifies the length of time to keep the snapshots on the source array before they are eradicated. Optional.
allowed	boolean	Allows (true) or disallows (false) a protection group from being replicated. Optional.
days	number	Modifies the retention policy of the protection group. Specifies the number of days to keep the per_day snapshots beyond the all_for period before they are eradicated. Optional.
hgrouplist	list	Replaces the list of member host groups. Optional.
hostlist	list	Replaces the list of member hosts. Optional.
name	string	Renames a protection group. Optional.
on	string	Specifies the offload target to where the destroyed protection group snapshot is to be recovered. Set on to the name of the Azure Blob, NFS, or S3 offload target. Only valid if the action parameter is set to recover. Optional.
per_day	number	Modifies the retention policy of the protection group. Specifies the number of per_day snapshots to keep beyond the all_for period. Optional.
remhgrouplist	list	Removes a list of host groups from the existing list. Optional.
remhostlist	list	Removes a list of hosts from the existing list. Optional.
remtargetlist	list	Removes a list of targets from the existing list. Optional.
remvollist	list	Removes a list of volumes from the existing list. Optional.
replicate_at	number	Modifies the replication schedule of the protection group. Specifies the preferred time, on the hour, at which to replicate the snapshots. Optional.
replicate_blackout	object	Modifies the replication schedule of the protection group. Specifies the range of time at which to pause replication. See the example for the dictionary format. Optional.
replicate_enabled	boolean	Used to enable (true) or disable (false) the protection group replication schedule. Optional.
replicate_frequency	number	Modifies the replication schedule of the protection group. Specifies the replication frequency.

		Optional.
snap_at	number	Modifies the snapshot schedule of the protection group. Specifies the preferred time, on the hour, at which to generate the snapshot.
		Optional.
snap_enabled	boolean	Used to enable (true) or disable (false) the protection group snapshot schedule.
		Optional.
snap_frequency	number	Modifies the snapshot schedule of the protection group. Specifies the snapshot frequency.
		Optional.
target_all_for	number	Modifies the retention policy of the protection group. Specifies the length of time to keep the replicated snapshots on the targets.
		Optional.
target_days	number	Modifies the retention policy of the protection group. Specifies the number of days to keep the target_per_day replicated snapshots beyond the target_all_for period before they are eradicated.
		Optional.
target_per_day	number	Modifies the retention policy of the protection group. Specifies the number of per_day replicated snapshots to keep beyond the target_all_for period.
		Optional.
targetlist	list	Replaces the list of member targets.
		Optional.
vollist	list	Replaces the list of member volumes.
		Optional.

Example 1: Rename protection group

Request:

```
PUT https://pure01.example.com/api/1.19/pgroup/pg2
{
  "name": "pg6"
}
```

Response:

```
{
  "name": "pg6"
}
```

Example 2: Set host members

Request:

```
PUT https://pure01.example.com/api/1.19/pgroup/pg4
{
  "hostlist": [
    "h3"
  ]
}
```

Response:

```
{
  "hgroups": null,
  "hosts": [
    "h3"
  ],
  "name": "pg4",
  "source": "pure01",
  "targets": null,
  "volumes": null
}
```

Example 3: Enables the replication schedule for pg4

Request:

```
PUT https://pure01.example.com/api/1.19/pgroup/pg4
{
  "replicate_enabled": true
}
```

Response:

```
{
  "name": "pg4",
  "replicate_at": null,
  "replicate_blackout": null,
  "replicate_enabled": true,
  "replicate_frequency": 14400,
  "snap_at": null,
  "snap_enabled": false,
  "snap_frequency": 3600
}
```

Example 4: Sets a replication blackout window from 2am to 4am (in seconds) for pg4

Request:

```
PUT https://pure01.example.com/api/1.19/pgroup/pg4
{
  "replicate_blackout": {
    "end": 14400,
    "start": 7200
  }
}
```

Response:

```
{
  "name": "pg4",
  "replicate_at": null,
  "replicate_blackout": [
    {
      "end": 14400,
      "start": 7200
    }
  ],
  "replicate_enabled": true,
  "replicate_frequency": 14400,
  "snap_at": null,
  "snap_enabled": false,
  "snap_frequency": 3600
}
```

Example 5: Sets a retention policy to retain all snapshots for 3 days (in minutes), and keep 12 snapshots per day after the all_for period ends

Request:

```
PUT https://pure01.example.com/api/1.19/pgroup/pg4
{
  "all_for": 4320,
  "per_day": 12
}
```

Response:

```
{
  "all_for": 4320,
  "days": 7,
  "name": "pg4",
  "per_day": 12,
  "target_all_for": 86400,
  "target_days": 7,
  "target_per_day": 4
}
```

7.6 DELETE pgroup/{pgroup}

Destroys or eradicates the specified protection group or protection group snapshot.

Parameters

Parameter	Type	Description
eradicate	boolean	If set to true, eradicates the destroyed protection group or protection group snapshot. If destroying or eradicating a protection group, its protection group snapshots are also destroyed or eradicated. The protection group or protection group snapshot must be destroyed before it can be eradicated. Once eradication has begun, the protection group or protection group snapshot can no longer be recovered. The destroyed protection group undergoes a 24-hour eradication pending period during which time the protection group can be fully recovered. After the 24-hour pending period, Purity eradicates the destroyed protection group. Optional.
on	string	Include this parameter if destroying or eradicating a protection group snapshot that is on an offload target. Specify the full protection group snapshot name, including the array name. Set on to the name of the Azure Blob, NFS, or S3 offload target. Optional.

Example 1: Destroys protection group pg5

Request:

```
DELETE https://pure01.example.com/api/1.19/pgroup/pg5
```

Response:

```
{
  "name": "pg5"
}
```

Example 2: Eradicates protection group pg5

Request:

```
DELETE https://pure01.example.com/api/1.19/pgroup/pg5
{
  "eradicate": true
}
```

Response:

```
{
  "name": "pg5"
}
```

8. Volume Groups

View, create, and manage volume groups.

8.1 GET vgroup

Lists volume groups and their volumes.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
historical	string	If the <code>action</code> parameter is set to monitor, set this parameter to display historical performance data over the specified range of time. If the <code>space</code> parameter is set to true, set this parameter to display historical space data over the specified range of time. Valid <code>historical</code> values are: 1h, 3h, 24h, 7d, 30d, 90d, and 1y. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. Include the <code>historical</code> parameter to display historical latency data at the specified resolution. Optional.
names	list	Displays specified volume groups. Enter multiple volume group names in comma-separated format. Volume group names can include asterisk (*) wildcard characters to represent zero or more characters. Optional.
pending	boolean	Includes (true) destroyed volume groups that are in the eradication pending state. Time remaining is displayed in seconds. Optional.
pending_only	boolean	Lists (true) destroyed volume groups that are in the eradication pending state. Time remaining is displayed in seconds. Optional.
qos	boolean	Displays (true) the QoS information for each volume group. A bandwidth limit of null represents unlimited throughput. Optional.
size	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to display the following average I/O sizes: • <code>bytes_per_read</code> - average I/O size per read. • <code>bytes_per_write</code> - average I/O size per write. • <code>bytes_per_op</code> - average I/O size for both read and write (all) operations. Optional.

REST 1.19

space	boolean	Lists size and space consumption attributes for each volume group. Optional.
total	boolean	If the action parameter is set to monitor, set this parameter to display (true) performance totals across all volumes within all volume groups. Performance totals appear at the end of the response. Optional.

8.2 GET vgroup/{vgroup}

Lists the attributes for the specified volume group.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time or historical performance data: Latency • <code>usec_per_read_op</code> - average time, measured in microseconds, it takes the array to process an I/O read request. • <code>usec_per_write_op</code> - average time, measured in microseconds, it takes the array to process an I/O write request. IOPS • <code>reads_per_sec</code> - number of read requests processed per second. • <code>writes_per_sec</code> - number of write requests processed per second. Bandwidth • <code>input_per_sec</code> - number of bytes written per second. • <code>output_per_sec</code> - number of bytes read per second. Optional.
historical	string	If the <code>action</code> parameter is set to monitor, set this parameter to display historical performance data over the specified range of time. If the <code>space</code> parameter is set to true, set this parameter to display historical space data over the specified range of time. Valid <code>historical</code> values are: 1h, 3h, 24h, 7d, 30d, 90d, and 1y. Optional.
latency	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to true to display the following real-time latency information: • <code>san_usec_per_read_op</code> - average time, measured in microseconds, required to transfer data from the array to the initiator. • <code>san_usec_per_write_op</code> - average time, measured in microseconds, required to transfer data from the initiator to the array. • <code>queue_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in the array waiting to be served. • <code>queue_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in the array waiting to be served. • <code>qos_rate_limit_usec_per_read_op</code> - average time, measured in microseconds, that a read I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. • <code>qos_rate_limit_usec_per_write_op</code> - average time, measured in microseconds, that a write I/O request spends in queue as a result of the volume reaching its QoS bandwidth limit. Include the <code>historical</code> parameter to display historical latency data at the specified resolution. Optional.
pending	boolean	Displays (true) the details of the volume group, regardless of its pending state (destroyed or not). If the volume group is pending eradication, time remaining is displayed in seconds. If the volume group is not in the eradication pending state, a time remaining of null is displayed. Optional.
pending_only	boolean	If the volume group is in the eradication pending state, set <code>pending</code> to true to display the attributes for the destroyed volume group, including the time remaining before the volume group is permanently eradicated. Time remaining is displayed in seconds. Optional.
qos	boolean	Displays (true) the QoS information for the specified volume group. A bandwidth limit of null represents unlimited throughput. Optional.
size	boolean	If the <code>action</code> parameter is set to monitor, set this parameter to display the following average I/O sizes: • <code>bytes_per_read</code> - average I/O size per read. • <code>bytes_per_write</code> - average I/O size per write. • <code>bytes_per_op</code> - average I/O size for both read and write (all) operations. Optional.
space	boolean	Lists size and space consumption attributes for each volume group. Optional.

total	boolean	If the action parameter is set to monitor, set this parameter to display (true) performance totals across all volumes in the specified volume groups. Performance totals appear at the end of the response. Optional.
-------	---------	--

8.3 POST vgroup/{vgroup}

Creates a volume group.

Parameters

Parameter	Type	Description
bandwidth_limit	number or string	Creates a volume group with the specified QoS bandwidth limit. Whenever throughput exceeds the bandwidth limit, throttling occurs. If the bandwidth limit is set, it must be between 1 MB/s and 512 GB/s. Enter the size as a number (bytes) or as a string with a single character unit symbol. Valid unit symbols are K, M, G, T, P, representing KiB, MiB, GiB, TiB, and PiB, respectively, where "Ki" denotes 2 ¹⁰ , "Mi" denotes 2 ²⁰ , and so on. If the unit symbol is not specified, the unit defaults to bytes. Optional.

8.4 PUT vgroup/{vgroup}

Recovers and renames the specified volume group, or changes the attributes of the specified volume group.

The action or name parameter must be specified.

Parameters

Parameter	Type	Description
action	string	If set to recover, recovers the destroyed volume group. Optional.
bandwidth_limit	number or string	Changes the QoS bandwidth limit of the specified volume group. Whenever throughput exceeds the bandwidth limit, throttling occurs. If the bandwidth limit is set, it must be between 1 MB/s and 512 GB/s. Enter the size as a number (bytes) or as a string with a single character unit symbol. Valid unit symbols are K, M, G, T, P, representing KiB, MiB, GiB, TiB, and PiB, respectively, where "Ki" denotes 2 ¹⁰ , "Mi" denotes 2 ²⁰ , and so on. If the unit symbol is not specified, the unit defaults to bytes. To clear the bandwidth limit, giving the volume unlimited throughput, set to an empty string (""). Optional.
name	string	Renames the volume group. Optional.

8.5 DELETE vgroup/{vgroup}

Destroys or eradicates the specified volume or snapshot.

Once a volume group has been destroyed, you can immediately eradicate it.

Parameters

Parameter	Type	Description
eradicate	boolean	If set to true, eradicates the destroyed volume group. The volume group must be destroyed before it can be eradicated. Once eradication has begun, the volume group can no longer be recovered. If set to false (or if not set at all), destroys the specified volume group. The destroyed volume group undergoes a 24-hour eradication pending period during which time the volume group can be fully recovered. After the 24-hour pending period, Purity eradicates the destroyed volume group. Optional.

9. Connection Ports

View array host connection port attributes.

9.1 GET port

Lists array ports and the worldwide names assigned to each port.

Parameters

Parameter	Type	Description
initiators	boolean	Displays host worldwide names (both those discovered by Purity and those assigned by administrators) and the array ports (targets) on which they are eligible to communicate. Optional.

Example 1: List all ports

Request:

GET https://pure01.example.com/api/1.19/port

Response:

```
[
  {
    "iqn": null,
    "name": "CT0.FC0",
    "portal": null,
    "wwn": "5001500150015080"
  },
  {
    "iqn": null,
    "name": "CT0.FC1",
    "portal": null,
    "wwn": "5001500150015081"
  },
  {
    "iqn": null,
    "name": "CT0.FC2",
    "portal": null,
    "wwn": "5001500150015090"
  },
  {
    "iqn": null,
    "name": "CT0.FC3",
    "portal": null,
    "wwn": "5001500150015091"
  }
]
```

Example 2: List all initiator ports

Request:

GET https://pure01.example.com/api/1.19/port?initiators=true

Response:

```
[
  {
    "iqn": null,
    "portal": null,
    "target": "CT0.FC0",
    "target_iqn": null,
    "target_portal": null,
    "target_wwn": "5001500150015080",
    "wwn": "0000000000000000"
  },
  {
    "iqn": null,
    "portal": null,
    "target": "CT0.FC1",
    "target_iqn": null,
    "target_portal": null,
    "target_wwn": "5001500150015081",
    "wwn": "0000000000000000"
  },
  {
    "iqn": null,
    "portal": null,
    "target": "CT0.FC2",
    "target_iqn": null,
    "target_portal": null,
    ...
    "target_wwn": "5001500150015091",
    "wwn": "0009000900090009"
  }
]
```

10. Alerts and Messages

View a list of email addresses designated to receive Purity alerts, test the alert feature, enable or disable alert notifications, designate email addresses to receive Purity alerts, and remove email addresses from the list of designated alert recipients. View a list of alert events, audit records, and user login sessions. Flag alert and audit messages.

10.1 GET alert

Lists email recipients that are designated to receive Purity alert messages.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List all alert recipients

Request:

```
GET https://pure01.example.com/api/1.19/alert
```

Response:

```
[
  {
    "enabled": false,
    "name": "flasharray-alerts@purestorage.com"
  }
]
```

10.2 GET alert/{address}

Lists information about the specified email recipient.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List a single alert recipient

Request:

```
GET https://pure01.example.com/api/1.19/alert/flasharray-alerts@purestorage.com
```

Response:

```
{
  "enabled": false,
  "name": "flasharray-alerts@purestorage.com"
}
```

10.3 POST alert/{address}

Designates any valid email address to receive Purity alert messages.

Up to 20 addresses can be designated in an array (19 in addition to the built-in flasharray-alerts@purestorage.com address.)

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Add a new alert recipient

Request:

```
POST https://pure01.example.com/api/1.19/alert/admin@example.com
```

Response:

```
{
  "enabled": true,
  "name": "admin@example.com"
}
```

10.4 PUT alert

Tests the ability of the array to send alert messages to all of the designated email addresses.

Parameters

Parameter	Type	Description
action	string	Set the parameter to "test" to test the ability of the array to send alert messages to all of the designated email addresses. Verification of successful test message transmission is done at the destination. Required.

10.5 PUT alert/{address}

Tests, enables, and disables the transmission of alert messages to the specified email address.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
action	string	Set the parameter to "test" to test the ability of the array to send alert messages to the specified email address, designated or not. Verification of successful test message transmission is done at the destination. Optional.
enabled	boolean	Enables (true) or disables (false) the transmission of alert messages to the specified email address. Optional.

Example 1: Disable a single alert recipient

Request:

```
PUT https://pure01.example.com/api/1.19/alert/admin@example.com
{
  "enabled": false
}
```

Response:

```
{
  "enabled": false,
  "name": "admin@example.com"
}
```

10.6 DELETE alert/{address}

Deletes an email address from the list of addresses designated to receive Purity alert messages. You cannot delete the built-in flasharray-alerts@purestorage.com address.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Delete a single alert recipient

Request:

```
DELETE https://pure01.example.com/api/1.19/alert/admin@example.com
```

Response:

```
{
  "name": "admin@example.com"
}
```

10.7 GET message

Lists alert events, audit records, and user login sessions.

Parameters

Parameter	Type	Description
audit	boolean	Lists audit records instead of alerts (default). May not be used with login or open. Optional.
flagged	boolean	Lists flagged messages only. The array automatically flags warnings and critical alerts. Optional.
login	boolean	Lists user session logs instead of alerts (default). May not be used with audit or open. Optional.
open	boolean	Lists open messages. May not be used with audit or login. Optional.
recent	boolean	Lists recent messages. An audit record is considered recent if it relates to a command issued within the past 24 hours. An alert is considered recent if the situation that triggered it is unresolved, or has only been resolved within the past 24 hours. A user session log event is considered recent if the login, logout, or authentication event occurred within the past 24 hours. Optional.
user	string	When audit is set to true, user can be used to list audit records for a specific user. When login is set to true, user can be used to list user session logs for a specific user. Optional.

Example 1: List all alert messages

Request:

```
GET https://pure01.example.com/api/1.19/message
```

Response:

```
[ ]
```

Example 2: List all audit trail messages

Request:

```
GET https://pure01.example.com/api/1.19/message?audit=true
```

Response:

```
[
  {
    "component_name": null,
    "component_type": "puredns",
    "details": "--domain example.com --nameservers 192.168.0.1,192.168.1.1",
    "event": "setattr",
    "id": 2,
    "opened": "2016-05-11T20:34:29Z",
    "user": "root"
  },
  {
    "component_name": "ct0.eth1",
    "component_type": "purenetwork",
    "details": "--addservicelist iscsi",
    "event": "setattr",
    "id": 3,
    "opened": "2016-05-11T20:34:29Z",
    "user": "root"
  },
  {
    "component_name": "os76",
    "component_type": "pureadmin",
    "details": "--api-token",
    "event": "create",
    "id": 4,
    ...
    "opened": "2016-05-11T20:35:54Z",
    "user": "os76"
  }
]
```

10.8 PUT message/{id}

Flags or unflags a message.

Parameters

Parameter	Type	Description
flagged	boolean	Flags (true) or unflags (false) a message. If set to true, flags the message with the specified ID. If set to false, unflags the message. Required.

11. SMTP Alert Routing

View and set SMTP manager attributes and sender domain name.

11.1 GET smtp

Displays SMTP manager attributes and sender domain name.

If the SMTP password parameter is set, its value is displayed in masked form. If the SMTP user name and password parameters are not set, the value of null is displayed.

Parameters

Parameter	Type	Description
None	n/a	n/a

11.2 PUT smtp

Modifies the attributes of the SMTP manager and sender domain name.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
password	string	Sets the SMTP password used to authenticate into the relay host SMTP server. For SMTP servers that require authentication, specify the user name and password. Must be used with the user_name parameter. To clear the SMTP user name and password, set both parameters to an empty string (""). Optional.
relay_host	string	Displays or sets the hostname or IP address of the email relay server currently being used as a forwarding point for email alerts generated by the array. If specifying an IP address, enter the IPv4 or IPv6 address. If a relay host is not configured, Purity//FA sends alert email messages directly to recipient addresses rather than route them via the relay (mail forwarding) server. For IPv4, specify the IP address in the form ddd.ddd.ddd.ddd, where ddd is a number ranging from 0 to 255 representing a group of 8 bits. If a port number is also specified, append it to the end of the address in the format ddd.ddd.ddd.ddd:PORT, where PORT represents the port number. For IPv6, specify the IP address in the form xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx, where xxxx is a hexadecimal number representing a group of 16 bits. Consecutive fields of zeros can be shortened by replacing the zeros with a double colon (: :). If a port number is also specified, enclose the entire address in square brackets ([]) and append the port number to the end of the address. For example, [xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx]:PORT, where PORT represents the port number. Optional.
sender_domain	string	Displays or sets the domain name. The domain name determines how Purity//FA logs are parsed and treated by Pure Technical Services and Escalations. The domain name is also appended to alert email messages. The default domain name is please-configure.me. If this is not a Pure Storage test array, set the sender domain to the actual customer domain name. Optional.
user_name	string	Sets the SMTP user name used to authenticate into the relay host SMTP server. For SMTP servers that require authentication, specify the user name and password. Must be used with the password parameter. To clear the SMTP user name and password, set both parameters to an empty string (""). Optional.

12. SNMP Manager Connections

View and set SNMP manager and trap message attributes.

12.1 GET snmp

Lists designated SNMP managers and their communication and security attributes.

Parameters

Parameter	Type	Description
engine_id	boolean	SNMP v3 only. If set to true, displays the SNMP v3 engine ID generated by Purity for the array. Optional.

Example 1: List all SNMP managers

Request:

GET https://pure01.example.com/api/1.19/snmp

Response:

```
[
  {
    "auth_passphrase": null,
    "auth_protocol": null,
    "community": null,
    "host": "localhost",
    "name": "localhost",
    "privacy_passphrase": null,
    "privacy_protocol": null,
    "user": null,
    "version": "v2c"
  }
]
```

Example 2: List SNMP v3 engine ID

Request:

GET https://pure01.example.com/api/1.19/snmp?engine_id=true

Response:

```
{
  "engine_id": "80009e2205600b7a0eaadae9080abf96"
}
```

12.2 GET snmp/{manager}

Lists communication and security attributes for the specified SNMP manager.

Parameters

Parameter	Type	Description
None	n/a	n/a

12.3 POST snmp/{manager}

Creates a Purity SNMP manager object that identifies a host (SNMP manager) and specifies the protocol attributes for communicating with it.

Once a manager object is created, the transmission of SNMP traps is immediately enabled.

Parameters

Parameter	Type	Description
auth_passphrase	string	SNMP v3 only. Passphrase used by Purity to authenticate the array with the specified managers. The value must be between 1 and 32 characters in length and from the set {[A-Z], [a-z], [0-9], _ (underscore), and - (hyphen)}. Required if the auth_protocol value is set.
auth_protocol	string	SNMP v3 only. Hash algorithm used to validate the authentication passphrase. Valid values are MD5 or SHA. Optional.
community	string	SNMP v2c only. Manager community ID under which Purity is to communicate with the specified managers. The value must be between 1 and 32 characters in length and from the set {[A-Z], [a-z], [0-9], _ (underscore), and - (hyphen)}. Required if the version parameter is set to v2c.
host	string	DNS hostname or IP address of a computer that hosts an SNMP manager to which Purity is to send trap messages when it generates alerts. If specifying an IP address, enter the IPv4 or IPv6 address. For IPv4, specify the IP address in the form ddd.ddd.ddd.ddd, where ddd is a number ranging from 0 to 255 representing a group of 8 bits. If a port number is also specified, append it to the end of the address in the format ddd.ddd.ddd.ddd:PORT, where PORT represents the port number. For IPv6, specify the IP address in the form xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx, where xxxx is a hexadecimal number representing a group of 16 bits. Consecutive fields of zeros can be shortened by replacing the zeros with a double colon (: :). If a port number is also specified, enclose the entire address in square brackets ([]) and append the port number to the end of the address. For example, [xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx]:PORT, where PORT represents the port number. Required.
privacy_passphrase	string	SNMP v3 only. Passphrase used to encrypt SNMP messages. The value must be between 8 and 63 non-space ASCII characters in length. Required if the privacy_protocol value is set.
privacy_protocol	string	SNMP v3 only. Encryption protocol for SNMP messages. Valid values are AES or DES. Optional.
user	string	SNMP v3 only. User ID recognized by the specified SNMP managers which Purity is to use in communications with them. The value must be between 1 and 32 characters in length and from the set {[A-Z], [a-z], [0-9], _ (underscore), and -(hyphen)}. Optional.
version	string	Version of the SNMP protocol to be used by Purity in communications with the specified manager(s). The version value is case sensitive. Valid values are v2c (default) and v3. Optional.

12.4 PUT snmp/{manager}

Changes name or the protocol attributes of the specified SNMP manager.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
action	string	Set the parameter to "test" to send a test trap to the specified SNMP manager. Optional.
auth_passphrase	string	SNMP v3 only. Passphrase used by Purity to authenticate the array with the specified managers. The value must be between 1 and 32 characters in length and from the set {[A-Z], [a-z], [0-9], _ (underscore), and - (hyphen)}. Required if the auth_protocol value is set.
auth_protocol	string	SNMP v3 only. Hash algorithm used to validate the authentication passphrase. Valid values are MD5 or SHA. Optional.
community	string	SNMP v2c only. Manager community ID under which Purity is to communicate with the specified managers. The value must be between 1 and 32 characters in length and from the set {[A-Z], [a-z], [0-9], _ (underscore), and - (hyphen)}. Required if the version parameter is set to v2c.
host	string	DNS hostname or IP address of a computer that hosts an SNMP manager to which Purity is to send trap messages when it generates alerts. If specifying an IP address, enter the IPv4 or IPv6 address. For IPv4, specify the IP address in the form ddd.ddd.ddd.ddd, where ddd is a number ranging from 0 to 255 representing a group of 8 bits. If a port number is also specified, append it to the end of the address in the format ddd.ddd.ddd.ddd:PORT, where PORT represents the port number. For IPv6, specify the IP address in the form xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx, where xxxx is a hexadecimal number representing a group of 16 bits. Consecutive fields of zeros can be shortened by replacing the zeros with a double colon (: :). If a port number is also specified, enclose the entire address in square brackets ([]) and append the port number to the end of the address. For example, [xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx]:PORT, where PORT represents the port number. Optional.
name	string	New name of the SNMP manager. SNMP manager names are used in Purity administrative commands, and have no external significance. Changing the name of the SNMP manager does not change the protocol and security attributes of the manager object. Optional.
privacy_passphrase	string	SNMP v3 only. Passphrase used to encrypt SNMP messages. The value must be between 8 and 63 non-space ASCII characters in length. Required if the privacy_protocol value is set.
privacy_protocol	string	SNMP v3 only. Encryption protocol for SNMP messages. Valid values are AES or DES. Optional.
user	string	SNMP v3 only. User ID recognized by the specified SNMP managers which Purity is to use in communications with them. The value must be between 1 and 32 characters in length and from the set {[A-Z], [a-z], [0-9], _ (underscore), and - (hyphen)}. Optional.
version	string	Version of the SNMP protocol to be used by Purity in communications with the specified manager(s). The version value is case sensitive. Valid values are v2c (default) and v3. Optional.

12.5 DELETE snmp/{manager}

Stops communication with the specified managers and deletes the SNMP manager object.

Parameters

Parameter	Type	Description
None	n/a	n/a

13. SSL Certificate

View and manage SSL certificates.

13.1 GET cert

Lists all available certificates.

The REST API call returns the attributes of all certificates.

Parameters

Parameter	Type	Description
None	n/a	n/a

13.2 GET cert/{certificate}

Lists attributes or exports the specified certificate.

If the request does not include parameters, the REST API call returns the attributes of the certificate. Include parameters to export the respective certificates. Note: the name 'management' refers to the single certificate which this command managed in versions 1.11 and older.

Parameters

Parameter	Type	Description
ca_certificate	boolean	If set to true, exports the current CA certificate. Optional.
certificate	boolean	If set to true, exports the current certificate. Optional.
intermediate_certificate	boolean	If set to true, exports the current intermediate certificate. Optional.

13.3 GET cert/certificate_signing_request/{certificate}

Constructs a certificate signing request (CSR) for signing by a certificate authority (CA).

Parameters

Parameter	Type	Description
common_name	string	Sets the common name of the CSR. The common name must be the fully qualified domain name of the current array. For example, for https://purearray.example.com, the common name must be purearray.example.com or *.example.com for a wildcard certificate. It can also be the management IP address of the array or the short name of the current array. It can't have more than 64 characters. Optional.
country	string	Sets the country name of the CSR. The country name represents the two-letter ISO code for the country where your organization is located. Optional.
email	string	Sets the email address used to contact your organization. Optional.
locality	string	Sets the name of the city where your organization is located. Optional.
organization	string	Sets the name of your organization. Enter the full and exact legal name of your organization. The organization name should not be abbreviated and should include suffixes such as Inc, Corp, or LLC. For example, 'Pure Storage, Inc.' Optional.
organizational_unit	string	Sets the name of the department within your organization that you want to appear in the certificate. Optional.
state	string	Sets the name of the state or province where your organization is located. Optional.

13.4 PUT cert/{certificate}

Creates a self-signed certificate or imports a certificate signed by a certificate authority (CA).

Creating a self-signed certificate or importing a certificate replaces the existing certificate. The certificate or self-signed parameter must be specified.

Parameters

Parameter	Type	Description
ca_certificate	string	Used with the certificate parameter to specify the CA certificate to import. Optional.
certificate	string	Imports a certificate signed by a certificate authority. Optional.
common_name	string	Used with the self-signed parameter to specify the common name. The common name represents the qualified domain name of the current array. For example, for https://purearray.example.com, the common name must be purearray.example.com or *.example.com for a wildcard certificate. It can also be the management IP address of the array or the short name of the current array. It can't have more than 64 characters. Optional.
country	string	Used with the self-signed parameter to specify the country name. The country name represents the two-letter ISO code for the country where your organization is located. Optional.
days	int	Used with the self-signed parameter to specify the number of valid days for the self-signed certificate being generated. Optional.
email	string	Used with the self-signed parameter to specify the email address used to contact your organization. Optional.
intermediate_certificate	string	Used with the certificate parameter to specify the intermediate certificate to import. Optional.
key	string	Used with the certificate parameter to specify the private key to import. Optional.
key-size	int	Used with the new_key parameter to specify the key size in bits. Valid values are 512, 1024, 2048 (default) or 4096. A key size smaller than 2048 is considered insecure. Optional.
locality	string	Used with the self-signed parameter to specify the city where your organization is located. Optional.
new_key	boolean	Used with the self-signed parameter to create a new key when creating the self-signed certificate. If a new private key is not generated, the certificate uses the existing private key. Optional.
organization	string	Used with the self-signed parameter to specify the full and exact legal name of your organization. The organization name should not be abbreviated and should include suffixes such as Inc, Corp, or LLC. For example, 'Pure Storage, Inc.' Optional.
organizational_unit	string	Used with the self-signed parameter to specify the department within your organization that you want to appear in the certificate. Optional.
passphrase	string	Used with the key parameter to decrypt the private key. Optional.
self_signed	boolean	Generates a self-signed certificate. self_signed or certificate must be set. Optional.
state	string	Used with the self-signed parameter to specify the state or province where your organization is located. Optional.

13.5 POST cert/{certificate}

Creates (and optionally initializes) a new certificate.

Creating a new self-signed certificate or importing a certificate does not affect existing certificates, and there may not already be a certificate with the same name. The certificate or self-signed parameter must be specified.

Parameters

Parameter	Type	Description
ca_certificate	string	Used with the certificate parameter to specify the CA certificate to import. Optional.
certificate	string	Imports a certificate signed by a certificate authority. Optional.
common_name	string	Used with the self-signed parameter to specify the common name. The common name represents the qualified domain name of the current array. For example, for https://purearray.example.com, the common name must be purearray.example.com or *.example.com for a wildcard certificate. It can also be the management IP address of the array or the short name of the current array. It can't have more than 64 characters. Optional.
country	string	Used with the self-signed parameter to specify the country name. The country name represents the two-letter ISO code for the country where your organization is located. Optional.
days	int	Used with the self-signed parameter to specify the number of valid days for the self-signed certificate being generated. Optional.
email	string	Used with the self-signed parameter to specify the email address used to contact your organization. Optional.
intermediate_certificate	string	Used with the certificate parameter to specify the intermediate certificate to import. Optional.
key	string	Used with the certificate parameter to specify the private key to import. Optional.
key-size	int	Used with the new_key parameter to specify the key size in bits. Valid values are 512, 1024, 2048 (default) or 4096. A key size smaller than 2048 is considered insecure. Optional.
locality	string	Used with the self-signed parameter to specify the city where your organization is located. Optional.
new_key	boolean	Used with the self-signed parameter to create a new key when creating the self-signed certificate. If a new private key is not generated, the certificate uses the existing private key. Optional.
organization	string	Used with the self-signed parameter to specify the full and exact legal name of your organization. The organization name should not be abbreviated and should include suffixes such as Inc, Corp, or LLC. For example, 'Pure Storage, Inc.' Optional.
organizational_unit	string	Used with the self-signed parameter to specify the department within your organization that you want to appear in the certificate. Optional.
passphrase	string	Used with the key parameter to decrypt the private key. Optional.
self_signed	boolean	Generates a self-signed certificate. self_signed or certificate must be set. Optional.
state	string	Used with the self-signed parameter to specify the state or province where your organization is located. Optional.

13.6 DELETE cert/{certificate}

Delete a certificate. The 'management' certificate may not be deleted.

The REST API call returns the name of the certificate that was deleted.

Parameters

Parameter	Type	Description
None	n/a	n/a

14. Network Interface

View and set DNS and network interface attributes.

14.1 GET dns

Lists DNS attributes for the array administrative network.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List DNS settings

Request:

```
GET https://pure01.example.com/api/1.19/dns
```

Response:

```
{
  "domain": "example.com",
  "nameservers": [
    "192.168.0.1",
    "192.168.1.1"
  ]
}
```

14.2 PUT dns

Sets the DNS attributes for the array administrative network.

Note: This resource is not supported on Cloud Block Store.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
domain	string	Domain suffix to be appended by the array when performing DNS lookups. Optional.
nameservers	list	A list of up to three DNS server IP addresses that replace the current list of name servers. For IPv4, specify the IP address in the form ddd.ddd.ddd.ddd, where ddd is a number ranging from 0 to 255 representing a group of 8 bits. For IPv6, specify the IP address in the form xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx, where xxxx is a hexadecimal number representing a group of 16 bits. When specifying an IPv6 address, consecutive fields of zeros can be shortened by replacing the zeros with a double colon (::). Optional.

Example 1: Modify DNS settings

Request:

```
PUT https://pure01.example.com/api/1.19/dns
{
  "domain": "example.com",
  "nameservers": [
    "192.168.1.1",
    "192.168.0.1"
  ]
}
```

Response:

```
{
  "domain": "example.com",
  "nameservers": [
    "192.168.0.1",
    "192.168.1.1"
  ]
}
```

14.3 GET subnet

Lists subnets and their statuses (enabled or disabled) and attributes.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List subnets

Request:

```
GET https://pure01.example.com/api/1.19/subnet
```

Response:

```
[
  {
    "enabled": true,
    "gateway": null,
    "interfaces": [],
    "mtu": 1500,
    "name": "subnet100",
    "prefix": "192.168.0.0/24",
    "services": [],
    "vlan": 100
  }
]
```

14.4 GET subnet/{subnet}

Lists the attributes of the specified subnet.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List settings for subnet subnet100

Request:

```
GET https://pure01.example.com/api/1.19/subnet/subnet100
```

Response:

```
{
  "enabled": true,
  "gateway": null,
  "interfaces": [],
  "mtu": 1500,
  "name": "subnet100",
  "prefix": "192.168.0.0/24",
  "services": [],
  "vlan": 100
}
```

14.5 POST subnet/{subnet}

Creates a subnet with the specified name.

Note: This resource is not supported on Cloud Block Store.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
gateway	string	Sets the IP address of the gateway through which the specified subnet is to communicate with the network. For IPv4, specify the gateway IP address in the form ddd.ddd.ddd.ddd. For IPv6, specify the gateway IP address in the form xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx/xxx. When specifying an IPv6 address, consecutive fields of zeros can be shortened by replacing the zeros with a double colon (::). Optional.
mtu	number	Specifies the maximum message transfer unit (packet) size for the subnet in bytes. Valid values are integers between 568 and 9000 (inclusive). The default value is 1500. Optional.
prefix	string	Sets the IP address to be associated with the specified subnet. Specify the the subnet prefix and prefix length. For IPv4, specify the subnet prefix in the form ddd.ddd.ddd.ddd/dd. For IPv6, specify the subnet prefix in the form xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx/xxx. When specifying an IPv6 address, consecutive fields of zeros can be shortened by replacing the zeros with a double colon (::). Optional.
vlan	number	VLAN ID. Optional.

Example 1: Create subnet mgmt with the specified gateway address and prefix

Request:

```
POST https://pure01.example.com/api/1.19/subnet/mgmt
{
  "gateway": "192.168.100.1",
  "prefix": "192.168.100.0/24"
}
```

Response:

```
{
  "enabled": true,
  "gateway": "192.168.100.1",
  "interfaces": null,
  "mtu": 1500,
  "name": "mgmt",
  "prefix": "192.168.100.0/24",
  "services": null,
  "vlan": null
}
```

14.6 PUT subnet/{subnet}

Modifies the attributes of the subnet.

Note: This resource is not supported on Cloud Block Store.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
enabled	boolean	Enables or disables a subnet. Optional. Cannot be used with any other parameters.
gateway	string	Sets the IP address of the gateway through which the specified subnet is to communicate with the network. For IPv4, specify the gateway IP address in the form ddd.ddd.ddd.ddd. For IPv6, specify the gateway IP address in the form xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx/xxx. When specifying an IPv6 address, consecutive fields of zeros can be shortened by replacing the zeros with a double colon (::). Optional.
mtu	number	Specifies the maximum message transfer unit (packet) size for the subnet in bytes. Valid values are integers between 568 and 9000 (inclusive). The default value is 1500. Optional.
name	string	Renames the specified subnet. Optional. Cannot be used with any other parameters.
prefix	string	Sets the IP address to be associated with the specified subnet. Specify the the subnet prefix and prefix length. For IPv4, specify the subnet prefix in the form ddd.ddd.ddd.ddd/dd. For IPv6, specify the subnet prefix in the form xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx/xxx. When specifying an IPv6 address, consecutive fields of zeros can be shortened by replacing the zeros with a double colon (::). Optional.
vlan	number	VLAN ID. Optional.

Example 1: Change VLAN ID for subnet mgmt

Request:

```
PUT https://pure01.example.com/api/1.19/subnet/mgmt
{
  "vlan": 100
}
```

Response:

```
{
  "enabled": true,
  "gateway": "192.168.100.1",
  "interfaces": [],
  "mtu": 1500,
  "name": "mgmt",
  "prefix": "192.168.100.0/24",
  "services": [],
  "vlan": 100
}
```

Example 2: Clear gateway for subnet mgmt

Request:

```
PUT https://pure01.example.com/api/1.19/subnet/mgmt
{
  "gateway": null
}
```

Response:

```
{
  "enabled": true,
  "gateway": null,
  "interfaces": [],
  "mtu": 1500,
  "name": "mgmt",
  "prefix": "192.168.100.0/24",
  "services": [],
  "vlan": 100
}
```

Example 3: Disable subnet mgmt

Request:

```
PUT https://pure01.example.com/api/1.19/subnet/mgmt
{
  "enabled": false
}
```

Response:

```
{
  "enabled": false,
  "gateway": null,
  "interfaces": [],
  "mtu": 1500,
  "name": "mgmt",
  "prefix": "192.168.100.0/24",
  "services": [],
  "vlan": 100
}
```

Example 4: Rename subnet mgmt

Request:

```
PUT https://pure01.example.com/api/1.19/subnet/mgmt
{
  "name": "managementSubnet"
}
```

Response:

```
{
  "enabled": false,
  "gateway": null,
  "interfaces": [],
  "mtu": 1500,
  "name": "managementSubnet",
  "prefix": "192.168.100.0/24",
  "services": [],
  "vlan": 100
}
```

14.7 DELETE subnet/{subnet}

Deletes the specified subnet.

Note: This resource is not supported on Cloud Block Store.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Delete subnet managementSubnet

Request:

```
DELETE https://pure01.example.com/api/1.19/subnet/managementSubnet
```

Response:

```
{
  "name": "managementSubnet"
}
```

14.8 GET network

Lists the details of array's network interfaces, their statuses (enabled or disabled), attributes, and operational statistics.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time network statistics: - received_bytes_per_sec - number of bytes received per second. - received_packets_per_sec - number of packets received per second. - transmitted_bytes_per_sec - number of bytes transmitted per second. - transmitted_packets_per_sec - number of packets transmitted per second. - total_errors_per_sec - total number of received packets and transmitted packets per second with errors. Optional.
error	boolean	If the action parameter is set to monitor, set this parameter to true to display the following network errors: - received_crc_errors_per_sec - number of received packets per second with cyclic redundancy check (CRC) errors. - received_frame_errors_per_sec - number of received packets per second with frame errors. - transmitted_carrier_errors_per_sec - number of transmitted packets per second with carrier errors. - transmitted_dropped_errors_per_sec - number of transmitted packets that were dropped per second. - other_errors_per_sec - number of received packets and transmitted packets per second with other types of errors. Optional.
total	boolean	If the action parameter is set to monitor, set this parameter to true to display the aggregated data of each statistic across all network interfaces. Network statistics totals appear at the end of the response. If the action parameter is set to monitor and the error parameter is set to true, set this parameter to true to display the total errors of each network error type across all network interfaces. Network error totals appear at the end of the response. Optional.

Example 1: List network interfaces

Request:

GET https://pure01.example.com/api/1.19/network

Response:

```
[
  {
    "address": "10.14.225.100",
    "enabled": true,
    "gateway": "10.14.224.1",
    "hwaddr": "00:50:56:83:1a:db",
    "mtu": 1500,
    "name": "ct0.eth0",
    "netmask": "255.255.240.0",
    "services": [
      "management"
    ],
    "slaves": [],
    "speed": 10000000000,
    "subnet": null
  },
  {
    "address": null,
    "enabled": true,
    "gateway": "10.124.2.1",
    "hwaddr": "00:50:56:83:1d:7f",
    "mtu": 1500,
    "name": "ct0.eth1",
    "netmask": "255.255.255.0",
    "services": [
      "management"
    ],
    "slaves": [],
    "speed": 10000000000,
    "subnet": null
  },
  ...
]
```

14.9 GET network/{network_component}

Lists the attributes and network statistics for the specified network component. Note: Specify the network component in lowercase.

Parameters

Parameter	Type	Description
action	string	If set to monitor, displays the following real-time network statistics: - received_bytes_per_sec - number of bytes received per second. - received_packets_per_sec - number of packets received per second. - transmitted_bytes_per_sec - number of bytes transmitted per second. - transmitted_packets_per_sec - number of packets transmitted per second. - total_errors_per_sec - total number of received packets and transmitted packets per second with errors. Optional.
error	boolean	If the action parameter is set to monitor, set this parameter to true to display the following network errors: - received_crc_errors_per_sec - number of received packets per second with cyclic redundancy check (CRC) errors. - received_frame_errors_per_sec - number of received packets per second with frame errors. - transmitted_carrier_errors_per_sec - number of transmitted packets per second with carrier errors. - transmitted_dropped_errors_per_sec - number of transmitted packets that were dropped per second. - other_errors_per_sec - number of received packets and transmitted packets per second with other types of errors. Optional.

Example 1: List settings for a single network interface

Request:

```
GET https://pure01.example.com/api/1.19/network/ct0.eth0
```

Response:

```
{
  "address": "10.14.225.100",
  "enabled": true,
  "gateway": "10.14.224.1",
  "hwaddr": "00:50:56:83:1a:db",
  "mtu": 1500,
  "name": "ct0.eth0",
  "netmask": "255.255.240.0",
  "services": [
    "management"
  ],
  "slaves": [],
  "speed": 1000000000,
  "subnet": null
}
```

14.10 POST network/vif/{vlan_interface}

Creates a VLAN interface.

Note: This resource is not supported on Cloud Block Store.

Parameters

Parameter	Type	Description
address	string	Sets the IP address to be associated with the specified interface. The IP address must match the subnet prefix. For IPv4, enter the address in CIDR notation ddd.ddd.ddd.ddd/dd. For example, 10.20.20.210/24. Alternatively, specify the address ddd.ddd.ddd.ddd with a netmask. The netmask is set through the netmask parameter. For IPv6, enter the address and prefix length in the form xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx/xxx. For example, 2001:0db8:85a3::ae26:8a2e:0370:7334/64. Consecutive fields of zeros can be shortened by replacing the zeros with a double colon (::). Alternatively, specify the address xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx with a prefix length. The prefix length is set through the netmask parameter. Optional.
subnet	string	Sets the subnet associated with the specified interface. Required.

Example 1: Create a VLAN interface and associate it with subnet subnet100.

Request:

```
POST https://pure01.example.com/api/1.19/network/vif/ct0.eth1.100
{
  "address": "192.168.0.100",
  "subnet": "subnet100"
}
```

Response:

```
{
  "address": "192.168.0.100",
  "enabled": true,
  "gateway": null,
  "hwaddr": "00:50:56:83:1d:7f",
  "mtu": 1500,
  "name": "ct0.eth1.100",
  "netmask": "255.255.255.0",
  "services": [
    "iscsi",
    "management"
  ],
  "slaves": [],
  "speed": 10000000000,
  "subnet": "subnet100"
}
```

14.11 PUT network/{network_component}

Performs network interface actions and sets the administrative network component attributes.

Note: This resource is not supported on Cloud Block Store.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
address	string	Sets the IP address to be associated with the specified Ethernet interface. For IPv4, enter the address in CIDR notation <code>ddd.ddd.ddd.ddd/dd</code>. For example, <code>10.20.20.210/24</code>. Alternatively, specify the address <code>ddd.ddd.ddd.ddd</code> with a netmask. The netmask is set through the <code>netmask</code> parameter. For IPv6, enter the address and prefix length in the form <code>xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx/xxx</code>. For example, <code>2001:0db8:85a3::ae26:8a2e:0370:7334/64</code>. Consecutive fields of zeros can be shortened by replacing the zeros with a double colon (<code>::</code>). Alternatively, specify the address <code>xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx</code> with a prefix length. The prefix length is set through the <code>netmask</code> parameter. Required if the <code>netmask</code> parameter is set.
addsubinterfacelist	list	Add subinterfaces to the existing list. May only be used on network bond subinterfaces. Optional.
enabled	boolean	Enables (<code>true</code>) or disables (<code>false</code>) communication between the specified Ethernet interface and the administrative network. Do not disable the interface through which the administrative session is being conducted. Optional.
gateway	string	Sets the IP address of the gateway through which the specified interface is to communicate with the network. For IPv4, specify the gateway IP address in the form <code>ddd.ddd.ddd.ddd</code>. For IPv6, specify the gateway IP address in the form <code>xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx/xxx</code>. When specifying an IPv6 address, consecutive fields of zeros can be shortened by replacing the zeros with a double colon (<code>::</code>). Optional.
mtu	number	Specifies the maximum message transfer unit (packet) size for the interface in bytes. Valid values are integers between 568 and 9000 (inclusive). The default value is 1500. Optional.
netmask	string	Used with the <code>address</code> parameter to define the range of IP addresses that make up a group of IP addresses on the same network. For IPv4, if the address is not entered in CIDR notation, enter the subnet mask in the form <code>ddd.ddd.ddd.ddd</code>. For example, <code>255.255.255.0</code>. For IPv6, if the address entered does not include a prefix length, specify the prefix length. For example, <code>64</code>. Optional.
remsubinterfacelist	list	Removes the list of subinterfaces from the existing list. May only be used on network bond subinterfaces. Optional.
subinterfacelist	list	Replaces the existing subinterface list. May only be used on network bond subinterfaces. Optional.
subnet	string	Associates a subnet with the specified VLAN interface. Optional.

Example 1: Disable network interface ct0.eth1

Request:

```
PUT https://pure01.example.com/api/1.19/network/ct0.eth1
{
  "enabled": false
}
```

Response:

```
{
  "address": null,
  "enabled": false,
  "gateway": "10.124.2.1",
  "hwaddr": "00:50:56:83:1d:7f",
  "mtu": 1500,
  "name": "ct0.eth1",
  "netmask": "255.255.255.0",
  "services": [
    "iscsi",
    "management"
  ],
  "slaves": [],
  "speed": 1000000000,
  "subnet": null
}
```

Example 2: Enable network interface ct0.eth1

Request:

```
PUT https://pure01.example.com/api/1.19/network/ct0.eth1
{
  "enabled": true
}
```

Response:

```
{
  "address": null,
  "enabled": true,
  "gateway": "10.124.2.1",
  "hwaddr": "00:50:56:83:1d:7f",
  "mtu": 1500,
  "name": "ct0.eth1",
  "netmask": "255.255.255.0",
  "services": [
    "iscsi",
    "management"
  ],
  "slaves": [],
  "speed": 10000000000,
  "subnet": null
}
```

14.12 DELETE network/{vlan_interface}

Deletes a VLAN interface.

Note: This resource is not supported on Cloud Block Store.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: Delete VLAN network interface ct0.eth1.100.

Request:

```
DELETE https://pure01.example.com/api/1.19/network/ct0.eth1.100
```

Response:

```
{
  "name": "ct0.eth1.100"
}
```

15. Hardware Components

View and manage array hardware components.

15.1 GET hardware

Lists array hardware component information.

Returns information about array hardware components that are capable of reporting their status. The display is primarily useful for diagnosing hardware-related problems.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List all hardware devices

Request:

```
GET https://pure01.example.com/api/1.19/hardware
```

Response:

```
[
  {
    "details": null,
    "identify": "off",
    "index": 0,
    "name": "CT0",
    "slot": null,
    "speed": null,
    "status": "ok",
    "temperature": null
  },
  {
    "details": null,
    "identify": null,
    "index": 0,
    "name": "CT0.ETH0",
    "slot": 0,
    "speed": 1000000000,
    "status": "ok",
    "temperature": null
  },
  {
    "details": null,
    "identify": null,
    "index": 1,
    ...
    "status": "ok",
    "temperature": 25
  }
]
```

15.2 GET hardware/{component}

Lists the attributes for the specified hardware component.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List a single hardware device

Request:

```
GET https://pure01.example.com/api/1.19/hardware/SH0.BAY0
```

Response:

```
{
  "details": null,
  "identify": "off",
  "index": 0,
  "name": "SH0.BAY0",
  "slot": null,
  "speed": null,
  "status": "ok",
  "temperature": null
}
```

15.3 PUT hardware/{component}

Controls the visual identification of the specified chassis, controllers, flash module bays, NVRAM module bays, and storage shelves.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
identify	string	Turns the LED light on or off to identify the specified component. Valid for chassis, controllers, flash module bays, NVRAM module bays, and storage shelves. Set identify to "on" to turn on the LED and identify the specified component. Set identify to "off" to turn off the LED. Note: This parameter is not supported on Cloud Block Store. Optional.
index	string	Displays the specified number on the identifying component. Optional.

Example 1: Turn off ID light

Request:

```
PUT https://pure01.example.com/api/1.19/hardware/SH0.BAY0
{
  "identify": "off"
}
```

Response:

```
{
  "identify": "off",
  "index": 0,
  "name": "SH0.BAY0",
  "slot": null
}
```

15.4 GET drive

Lists flash modules, NVRAM modules, and their attributes.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List all flash and NVRAM devices

Request:

```
GET https://pure01.example.com/api/1.19/drive
```

Response:

```
[
  {
    "capacity": 494927872,
    "degraded": 0,
    "details": null,
    "last_evac_completed": "1970-01-01T00:00:00Z",
    "last_failure": "1970-01-01T00:00:00Z",
    "name": "SH0.BAY0",
    "status": "healthy",
    "type": "SSD"
  },
  {
    "capacity": 494927872,
    "degraded": 0,
    "details": null,
    "last_evac_completed": "1970-01-01T00:00:00Z",
    "last_failure": "1970-01-01T00:00:00Z",
    "name": "SH0.BAY1",
    "status": "healthy",
    "type": "SSD"
  },
  {
    "capacity": 494927872,
    "degraded": 0,
    "details": null,
    ...
    "status": "healthy",
    "type": "NVRAM"
  }
]
```

15.5 GET drive/{drive}

Lists the attributes for the specified flash module or NVRAM module.

Parameters

Parameter	Type	Description
None	n/a	n/a

Example 1: List a single flash module or NVRAM module.

Request:

```
GET https://pure01.example.com/api/1.19/drive/SH0.BAY0
```

Response:

```
{
  "capacity": 494927872,
  "degraded": 0,
  "details": null,
  "last_evac_completed": "1970-01-01T00:00:00Z",
  "last_failure": "1970-01-01T00:00:00Z",
  "name": "SH0.BAY0",
  "status": "healthy",
  "type": "SSD"
}
```

16. Apps

View and manage apps.

16.1 GET app

Lists installed apps and their attributes.

Parameters

Parameter	Type	Description
None	n/a	n/a

16.2 GET app/nodes

Lists the node details of installed apps.

Parameters

Parameter	Type	Description
None	n/a	n/a

16.3 GET app/{app}/nodes

Lists the node details of the specified app.

Parameters

Parameter	Type	Description
None	n/a	n/a

16.4 PUT app/{app}

Enables or disables the specified app and VNC access for the app.

Parameters

Parameter	Type	Description
enabled	boolean	Enables (true) or disables (false) an app. Optional.
vnc_enabled	boolean	Enables (true) or disables (false) VNC access for an app. Optional.

16.5 GET software/app

Lists installed apps and their installation statuses.

Parameters

Parameter	Type	Description
catalog	boolean	When set to true, displays a list of apps, both available and installed on the array. Note: Setting this parameter to true always returns null on Cloud Block Store. Optional.

16.6 POST software/app/{app}

Installs the specified app.

Parameters

Parameter	Type	Description
None	n/a	n/a

16.7 DELETE software/app/{app}

Uninstalls the specified app.

Parameters

Parameter	Type	Description
None	n/a	n/a

17. Offload

View and manage offload targets.

17.1 GET offload

Lists offload targets connected to the array and the space consumption information of the individual offload targets.

Parameters

Parameter	Type	Description
space	boolean	If set to true, displays the size and space consumption details of individual offload targets.
total	boolean	If the space parameter is set to true, set this parameter to true to display the total space consumption of all offload targets.

17.2 GET azure_offload

Lists the connection details of Azure Blob offload targets that are connected to the array.

Parameters

Parameter	Type	Description
None	n/a	n/a

17.3 GET azure_offload/{offload_target}

Lists the connection details of the specified Azure Blob offload target that is connected to the array.

Parameters

Parameter	Type	Description
None	n/a	n/a

17.4 GET nfs_offload

Lists NFS offload targets connected to the array.

Parameters

Parameter	Type	Description
None	n/a	n/a

17.5 GET s3_offload

Lists S3 offload targets connected to the array.

Parameters

Parameter	Type	Description
None	n/a	n/a

17.6 POST azure_offload/{offload_target}

Creates a connection between the current array and the specified Azure Blob offload target.

Parameters

Parameter	Type	Description
account_name	string	Name of the Azure Blob storage account. Required.
container_name	string	Name of the Azure Blob container. If you do not specify a container name, the default is offload. Optional.
initialize	boolean	Initializes (true) the Azure Blob container to prepare it for offloading. Only required if this is the first time a FlashArray array is connecting to the Azure Blob container. The array will only initialize an Azure Blob container if it is empty. Optional.
secret_access_key	string	Secret access key of the Azure Blob account used to authenticate requests between the array and the Azure Blob container. Required.

17.7 POST nfs_offload/{offload_target}

Creates a connection between the current array and the specified NFS offload target.

Note: This resource is not supported on Cloud Block Store.

Parameters

Parameter	Type	Description
address	string	Sets the hostname or IP address of the NFS server. For IPv4, enter the address in CIDR notation ddd.ddd.ddd.ddd/dd. For example, 10.20.20.210/24. For IPv6, enter the address and prefix length in the form xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx/xxx. For example, 2001:0db8:85a3::ae26:8a2e:0370:7334/64. Consecutive fields of zeros can be shortened by replacing the zeros with a double colon (::). Required.
mount_options	string	List mount options in comma-separated value (CSV) format. Supported mount options include port, rsize, wsize, nfsvers, andtcp or udp and are common options available to all NFS file systems. Optional.
mount_point	string	Sets the NFS export on the NFS server. For example, /mnt. Required.
name	string	Name given to this connection to the NFS offload target. Required.

17.8 POST s3_offload/{offload_target}

Creates a connection between the current array and the specified Amazon S3 offload target.

Parameters

Parameter	Type	Description
access_key	string	Access key ID of the AWS account. The access key is 20 characters in length. Required.
bucket	string	Name of the S3 bucket. Required.
initialize	string	Initializes (true) the S3 bucket to prepare it for offloading. Only required if this is the first time a FlashArray array is connecting to the S3 bucket. The array will only initialize an S3 bucket if it is empty. Optional.
secret_access_key	string	Secret access key of the AWS account used to authenticate requests between the array and S3 bucket. The secret access key is 40 characters in length. Required.

17.9 DELETE azure_offload/{offload_target}

Disconnects the current array from the specified Azure Blob offload target.

Parameters

Parameter	Type	Description
None	n/a	n/a

17.10 DELETE nfs_offload/{offload_target}

Disconnects the current array from the specified NFS offload target.

Parameters

Parameter	Type	Description
None	n/a	n/a

18. Users

View and manage users and directory service configurations.

18.1 GET admin

Lists public key and API token information for all users.

Set at least one parameter to true.

Parameters

Parameter	Type	Description
api_token	boolean	If set to true, displays a list of users that have REST API access and the dates in which the API tokens were created. Optional.
expose	boolean	If api_token is set to true, set the expose parameter to true to unmask the current user's API token. Does not unmask other users' tokens. Optional.
publickey	boolean	If set to true, displays a list of users that have public key access. Optional.

Example 1: List users who have public keys

Request:

```
GET https://pure01.example.com/api/1.19/admin?publickey=true
```

Response:

```
[ ]
```

Example 2: List users who have API tokens

Request:

```
GET https://pure01.example.com/api/1.19/admin?api_token=true
```

Response:

```
[
  {
    "api_token": "****",
    "created": "2016-05-11T20:34:42Z",
    "name": "os76"
  },
  {
    "api_token": "****",
    "created": "2016-05-11T20:35:16Z",
    "name": "pureuser"
  }
]
```

18.2 GET admin/{user}

Lists public key information for the specified user.

Parameters

Parameter	Type	Description
publickey	boolean	If set to true, displays the public key information for the specified user. Required.

18.3 GET admin/{user}/apitoken

Lists the API token for the specified user.

Parameters

Parameter	Type	Description
None	n/a	n/a

18.4 POST admin/{user}

Creates a new local user.

Parameters

Parameter	Type	Description
password	string	Sets the password for the specified user. By default, the new password must be at least 1 character and cannot exceed 100 characters in length. Required.
role	string	Sets the local user's access level to the array. Valid values are readonly, ops_admin, storage_admin, and array_admin. Users with the Read-Only (readonly) role can perform operations that convey the state of the array. Read Only users cannot alter the state of the array. Users with the Ops Admin (ops_admin) role can perform the same operations as Read Only users plus enable and disable remote assistance sessions. Ops Admin users cannot alter the state of the array. Users with the Storage Admin (storage_admin) role can perform the same operations as Read Only users plus storage related operations, such as administering volumes, hosts, and host groups. Storage Admin users cannot perform operations that deal with global and system configurations. Users with the Array Admin (array_admin) role can perform the same operations as Storage Admin users plus array-wide changes dealing with global and system configurations. In other words, Array Admin users can perform all operations. Required.

18.5 POST admin/{user}/apitoken

Creates an API token for the specified user.

Parameters

Parameter	Type	Description
None	n/a	n/a

18.6 PUT admin

Clears all user permission cache entries.

User permission cache entries are also automatically updated when the user starts a new session.

Parameters

Parameter	Type	Description
action	string	When set to refresh, refreshes all user permission cache entries. Required.
clear	boolean	When set to true, clears the entire user permission cache. Optional. Used with the action parameter.

18.7 PUT admin/{user}

Sets the password, public key, or role, or refreshes the user permission cache entries for the specified user.

The action, password, publickey, or role parameter must be specified.

Parameters

Parameter	Type	Description
action	string	When set to refresh, refreshes the user permission cache entries for the specified user. Cache entries are also automatically updated when the user starts a new session. Optional.
clear	boolean	When set to true, clears the user permission cache for the specified user. Optional. Used with the action parameter.
old_password	string	Used with the password parameter to change a local user's password. Set the parameter to the old password. Required if the password parameter is set.
password	string	Used with the old_password parameter to change the password for the specified local user. By default, the new password must be at least 1 character and cannot exceed 100 characters in length. Optional.
publickey	string	Changes the public key for SSH access for the specified user. Only system administrators can change public keys on behalf of other users. If no users are provided as arguments, a request to change the public key will be for the administrator issuing the request and a request to display set public keys will show all users with a public key configured. Optional.
role	string	Changes the local user's access level to the array. Valid values are readonly, ops_admin, storage_admin, and array_admin. Users with the Read-Only (readonly) role can perform operations that convey the state of the array. Read Only users cannot alter the state of the array. Users with the Ops Admin (ops_admin) role can perform the same operations as Read Only users plus enable and disable remote assistance sessions. Ops Admin users cannot alter the state of the array. Users with the Storage Admin (storage_admin) role can perform the same operations as Read Only users plus storage related operations, such as administering volumes, hosts, and host groups. Storage Admin users cannot perform operations that deal with global and system configurations. Users with the Array Admin (array_admin) role can perform the same operations as Storage Admin users plus array-wide changes dealing with global and system configurations. In other words, Array Admin users can perform all operations. Required.

18.8 DELETE admin/{user}

Deletes the specified local user.

Parameters

Parameter	Type	Description
None	n/a	n/a

18.9 DELETE admin/{user}/apitoken

Deletes API token for the specified user.

Parameters

Parameter	Type	Description
None	n/a	n/a

18.10 GET directoryservice

Lists current base configuration information for the directory service.

Parameters

Parameter	Type	Description
certificate	boolean	If set to true, returns information about the currently configured CA certificate data. Optional.

Example 1: List the directory service configuration

Request:

```
GET https://pure01.example.com/api/1.19/directoryservice
```

Response:

```
{
  "base_dn": "DC=ad1,DC=example,DC=com",
  "bind_password": "****",
  "bind_user": "readonlyuser",
  "check_peer": false,
  "enabled": true,
  "uri": [
    "ldaps://ad1.example.com"
  ]
}
```

Example 2: List the current configured CA certificate

Request:

```
GET https://pure01.example.com/api/1.19/directoryservice?certificate=true
```

Response:

```
{
  "certificate": "-----BEGIN CERTIFICATE-----\nMIIIE6jCCBF0gAwIBAgIDEIGKMA0GCSqGSIb3DQEBBQUAME4xCzAJBgNVBAYTA1VT\nMRAwDgYDVQQKEwdFcXVpZmF4MS\n}"
```

18.11 PUT directoryservice

Modifies and tests the directory service configuration.

At least one parameter must be specified.

Parameters

Parameter	Type	Description
action	string	When set to test, tests the current directory service configuration; verifies that the URIs can be resolved and that Purity can bind and query the tree using the bind user credentials. The call also verifies that it can find all the configured groups to ensure the Common Names and group base are correctly configured. Optional.
auto_fetch	boolean	When used with certificate, set the value to true to download and confirm the server certificate. Optional.
base_dn	string	Sets the base of the Distinguished Name (DN) of the directory service groups. The base should consist of only Domain Components (DCs). The base_dn will populate with a default value when a URI is entered by parsing domain components from the URI. The base DN should specify DC= for each domain component and multiple DCs should be separated by commas. Optional.
bind_password	string	Sets the password of the bind_user user name account. Optional.
bind_user	string	Sets the user name that can be used to bind to and query the directory. For Active Directory, enter the user name - often referred to as sAMAccountName or User Logon Name - of the account that is used to perform directory lookups. For OpenLDAP, enter the full DN of the user. Optional.
certificate	string	Certificate string in PEM format, including the "-----BEGIN CERTIFICATE-----" and "-----END CERTIFICATE-----" lines. Optional.
check_peer	boolean	Enables (true) or disables (false) server authenticity enforcement with the configured CA certificate. Optional.
enabled	boolean	Enables (true) or disables (false) directory service support. Optional.
trust	boolean	When used with certificate, set the value to true to skip certificate chain trust verification. Optional.
uri	list	A list of up to 30 URIs of the directory servers. Each URI must include the scheme ldap:// or ldaps:// (for LDAP over SSL), a hostname, and a domain name or IP address. For example, ldap://ad.company.com configures the directory service with the hostname "ad" in the domain "company.com" while specifying the unencrypted LDAP protocol. If specifying a domain name, it should be resolvable by the configured DNS servers. If specifying an IP address, for IPv4, specify the IP address in the form ddd.ddd.ddd.ddd, where ddd is a number ranging from 0 to 255 representing a group of 8 bits. For IPv6, specify the IP address in the form [xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx:xxxx], where xxxx is a hexadecimal number representing a group of 16 bits. Enclose the entire address in square brackets ([]). Consecutive fields of zeros can be shortened by replacing the zeros with a double colon (::). If the scheme of the URIs is ldaps://, SSL is enabled. SSL is either enabled or disabled globally, so the scheme of all supplied URIs must be the same. They must also all have the same domain. If base DN is not configured and a URI is provided, the base DN will automatically default to the domain components of the URIs. Optionally specify a port. If a port number is specified, append it to the end of the address. Default ports are 389 for ldap, and 636 for ldaps. Non-standard ports can be specified in the URI if they are in use. Optional.

Example 1: Disable the directory service

Request:

```
PUT https://pure01.example.com/api/1.19/directoryservice
{
  "enabled": false
}
```

Response:

```
{
  "base_dn": "DC=ad1,DC=example,DC=com",
  "bind_password": "****",
  "bind_user": "readonlyuser",
  "check_peer": false,
  "enabled": false,
  "uri": [
    "ldaps://ad1.example.com"
  ]
}
```

Example 2: Enable the directory service

Request:

```
PUT https://pure01.example.com/api/1.19/directoryservice
{
  "enabled": true
}
```

Response:

```
{
  "base_dn": "DC=ad1,DC=example,DC=com",
  "bind_password": "****",
  "bind_user": "readonlyuser",
  "check_peer": false,
  "enabled": true,
  "uri": [
    "ldaps://ad1.example.com"
  ]
}
```

18.12 GET directoryservice/role

Lists role names and their current role-to-group configurations for the directory service.

Parameters

Parameter	Type	Description
names	list	Displays the role-to-group configuration for the specified role. Valid values are readonly, ops_admin, storage_admin, and array_admin. Enter multiple role names in comma-separated format. Optional.

18.13 PUT directoryservice/role

Modifies the directory service role-to-group configuration of a role on the array.

At least one parameter must be specified in addition to the required names parameter.

Parameters

Parameter	Type	Description
group	string	Sets the Common Name (CN) of a directory service group mapping to a role. The name should be just the Common Name of the group without the CN= specifier. Common Names should not exceed 64 characters in length. Optional.
group_base	string	Specifies where the configured group is located in the directory tree. This field consists of Organizational Units (OUs) that combine with the base DN attribute and the configured group CNs to complete the full Distinguished Name of the group. The group base should specify OU= for each OU and multiple OUs should be separated by commas. The order of OUs is important and should get larger in scope from left to right. Each OU should not exceed 64 characters in length. Optional.
names	list	Configures the LDAP group mappings for the specified role name. Valid roles are readonly, ops_admin, storage_admin, and array_admin. Enter multiple role names in comma-separated format. Required.

Confidential and Proprietary. Subject to NDA and End User Agreement. | [End User Agreement](#) | [Support](#) | [Documentation Feedback](#)

© 2020 Pure Storage, Inc. All rights reserved. Pure Storage, Pure1, and the Pure Storage logo are trademarks or registered trademarks of Pure Storage, Inc. in the U.S. and other countries. Other company, product, or service names may be trademarks or service marks of their respective owners. The Pure Storage products described in this documentation are distributed under a license agreement restricting the use, copying, distribution, and decompilation/reverse engineering of the products. The Pure Storage products described in this documentation may only be used in accordance with the terms of the license agreement. No part of this documentation may be reproduced in any form by any means without prior written authorization from Pure Storage, Inc. and its licensors, if any. Pure Storage may make improvements and/or changes in the Pure Storage products and/or the programs described in this documentation at any time without notice. THIS DOCUMENTATION IS PROVIDED "AS IS" AND ALL EXPRESS OR IMPLIED CONDITIONS, REPRESENTATIONS

AND WARRANTIES, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR NONINFRINGEMENT, ARE DISCLAIMED, EXCEPT TO THE EXTENT THAT SUCH DISCLAIMERS ARE HELD TO BE LEGALLY INVALID. PURE STORAGE SHALL NOT BE LIABLE FOR INCIDENTAL OR CONSEQUENTIAL DAMAGES IN CONNECTION WITH THE FURNISHING, PERFORMANCE, OR USE OF THIS DOCUMENTATION. THE INFORMATION CONTAINED IN THIS DOCUMENTATION IS SUBJECT TO CHANGE WITHOUT NOTICE.