



## **Manage clusters**

### **ONTAP 9.6 REST API reference**

NetApp  
April 02, 2024

# Table of Contents

- Manage clusters ..... 1
  - Cluster endpoint overview ..... 1
  - Overview ..... 1
  - Retrieve the cluster configuration ..... 15
  - Update the cluster configuration ..... 37
  - Create a cluster ..... 62

# Manage clusters

## Cluster endpoint overview

### Overview

This API is used to create a cluster, update cluster-wide configurations, and retrieve the current configuration details.

### Creating a cluster

You can create a new cluster by issuing a POST request to /cluster. Parameters are provided in the body of the POST request to configure cluster-wide settings and add nodes during the cluster setup.

### Fields used for creating a cluster

The fields used for the cluster APIs fall into the following categories:

#### Required cluster-wide configuration

The following fields are always required for any POST /cluster request:

- name
- password

#### Optional cluster-wide configuration

The following fields are used to setup additional cluster-wide configuration:

- location
- contact
- dns\_domains
- name\_servers
- ntp\_servers
- license
- configuration\_backup
- management\_interface
- nodes

#### Nodes field

The nodes field specifies the nodes to join to the cluster. All nodes must be at the same version to use this API. If no nodes are specified, the cluster is configured with one node added. The node added is the node to which the REST request is issued. If one node is specified, the "node.cluster\_interface.ip.address" field must not be used. If multiple nodes are specified, the node to which the REST request is issued must be provided in addition to the remote nodes, and the "node.cluster\_interface.ip.address" field is required for each node to identify them. All other node fields are optional in all cases. If a field is provided for one node, it must be provided for all nodes.

## Node networking fields

The cluster management interface and each node management interface use the cluster management interface netmask and gateway. For advanced configurations where the cluster and node management interfaces are on different subnets, the `/network/ip/interface` APIs must be used to configure network interfaces after setup is complete. The management interfaces are used to communicate with the name servers and NTP servers. The address family of the name servers and NTP servers must match the management interfaces address family.

## Single node cluster field

When the "single\_node\_cluster" field is set to true, the cluster is created in single node cluster mode. A node field for this node can be provided for node-specific configuration and the "node.cluster\_interface.ip.address" field must not be used. Storage failover is configured to non-HA mode, and ports used for cluster ports are moved to the default IPspace. This might cause the node to reboot during setup. While a node reboots, the RESTful interface might not be available. See 'Connection failures during cluster create' for more information.

## Performance monitoring

Performance of the cluster can be monitored by the `metric.*` and `statistics.*` fields. These show the performance of the cluster in terms of IOPS, latency and throughput. The `metric.*` fields denote an average whereas `statistics.*` fields denote a real-time monotonically increasing value aggregated across all nodes.

## Monitoring cluster create status

### Errors before the job starts

Configuration in the POST `/cluster` request is validated before the cluster create job starts. If an invalid configuration is found, an HTTP error code in the 4xx range is returned. No cluster create job is started.

### Polling on the job

After a successful POST `/cluster` has been issued, an HTTP error code of 202 is returned along with a job UUID and link in the body of the response. The cluster create job continues asynchronously and can be monitored with the job UUID using the `/cluster/jobs` API. The "message" field in the response of GET `/cluster/jobs/{uuid}` shows the current step in the job and the "state" field shows the overall state of the job.

### Errors during the job

If a failure occurs during the cluster create job, the job body provides details of the error along with error code fields. See the error table in the 'Responses' of the POST `/cluster` documentation for common error codes and descriptions.

### Re-running POST `/cluster`

The POST `/cluster` command can be re-run if errors occur. When re-running the request, the same body and query parameters must be used. The value of any field in the original body or query can be changed, but the fields that were provided cannot be changed. For example, an initial request might have a body section as follows:

```
body =
{
  "name": "clusCreateRerun",
  "password": "openSesame",
  "nodes": [
    {
      "cluster_interface": {
        "ip": {
          "address": "1.1.1.1"
        }
      }
    },
    {
      "cluster_interface": {
        "ip": {
          "address": "2.2.2.2"
        }
      }
    }
  ]
}
```

---

A re-run request updates the body details to:

---

```
body =
{
  "name": "clusCreateRerun",
  "password": "openSesame",
  "nodes": [
    {
      "cluster_interface": {
        "ip": {
          "address": "3.3.3.3"
        }
      }
    },
    {
      "cluster_interface": {
        "ip": {
          "address": "4.4.4.4"
        }
      }
    }
  ]
}
```

A re-run request with the following body details is invalid:

```
body =
{
  "name": "clusCreateRerun",
  "password": "openSesame",
  "nodes": [
    {
      "cluster_interface": {
        "ip": {
          "address": "3.3.3.3"
        }
      }
    }
  ]
}
```

Also, note that the password might already be configured. If a password is already configured and a new password is provided, this request overwrites the existing password. If a password is already configured either by another interface or by a previous POST to /cluster, any future REST requests must be authenticated with that password. If POST to /cluster with the default return\_timeout of 0 returns an error, then the password was not changed.

### Connection failures during cluster create

There are two cases where a request to poll the job status might fail during the cluster create job. In these cases, programmatic use of the RESTful interface should be resilient to these connection failures.

1. When the "single\_node\_cluster" flag is set to true, the node might reboot. During this time, the RESTful interface might refuse connections, return errors on GET, or connection timeouts might occur. Any programmatic use of the RESTful interface during reboots must consider these effects while polling a cluster create job.
2. The "mgmt\_auto" LIF is removed during the cluster create job. A POST /cluster request might be issued on the "mgmt\_auto" LIF. However, requests to poll the job status might fail during cluster create when the "mgmt\_auto" LIF is removed. The "mgmt\_auto" LIF is only removed if a cluster management interface is provided as an argument to POST /cluster, and only after the cluster management interface is created. Programmatic use of the POST /cluster API on the "mgmt\_auto" LIF should be configured to dynamically switch to polling the job on the cluster management LIF.

### Modifying cluster configurations

The following fields can be used to modify a cluster-wide configuration:

- name
- location
- contact
- dns\_domains
- name\_servers

### Examples

#### A minimal configuration of a 2-node setup

---

```
# Body
body =
{
"name": "clusCreateExample1",
"password": "openSesame",
"nodes": [
  {
    "cluster_interface": {
      "ip": {
        "address": "1.1.1.1"
      }
    }
  },
  {
    "cluster_interface": {
      "ip": {
        "address": "2.2.2.2"
      }
    }
  }
]
}

# Request
curl -X POST "https://<mgmt-ip>/api/cluster" -d body
```

---

## A single node setup with additional node configuration

---



```
# Body
body =
{
"name": "clusCreateExample2",
"password": "openSesame",
"nodes": [
{
"name": "singleNode",
"location": "Sunnyvale"
}
]
}

# Request
curl -X POST "https://<mgmt-ip>/api/cluster?single_node_cluster=true" -d
body
```

---

## Modifying a cluster-wide configuration

```
# Body
body =
{
"contact": "it@company.com"
}

# Request
curl -X PATCH "https://<mgmt-ip>/api/cluster" -d body
```

---

## A detailed example of a cluster "create" operation

The following is an example of how a cluster can be created using the cluster APIs. This example shows the creation of a two node cluster and uses information from the nodes themselves combined with user supplied information to configure the cluster.

### 1) Preparing for setup

Before the REST APIs can be issued to create the cluster, the cluster must be wired up and powered on. The network connections between the nodes for the cluster network, as well as the connections to the management network, must be completed. Once the nodes are powered up, the nodes automatically configure interfaces on the platform's default cluster ports to allow the nodes to discover each other during setup and expansion workflows. You must configure a management interface on one node or use the `mgmt_auto` LIF, which is

assigned an IP address using DHCP, to start using the REST APIs. By making a console connection to a node, the cluster setup wizard guides you through the configuration of the initial node management interface to which the REST calls can be sent. Once this step is completed, exit the wizard by typing "exit". You can then issue REST API requests.

1. Wire and power up the nodes.
  2. Make a console connection to one node to access the cluster setup wizard.
  3. Enter node management interface information to enable REST API requests to be sent to the node.
-

```
Welcome to the cluster setup wizard.
You can enter the following commands at any time:
"help" or "?" - if you want to have a question clarified,
"back" - if you want to change previously answered questions, and
"exit" or "quit" - if you want to quit the cluster setup wizard.
Any changes you made before quitting will be saved.
You can return to cluster setup at any time by typing "cluster setup".
To accept a default or omit a question, do not enter a value.
This system will send event messages and periodic reports to NetApp
Technical
Support. To disable this feature, enter
autosupport modify -support disable
within 24 hours.
Enabling AutoSupport can significantly speed problem determination and
resolution should a problem occur on your system.
For further information on AutoSupport, see:
http://support.netapp.com/autosupport/
Type yes to confirm and continue {yes}: yes
Enter the node management interface port [e0c]:
Enter the node management interface IP address: 10.224.82.249
Enter the node management interface netmask: 255.255.192.0
Enter the node management interface default gateway: 10.224.64.1
A node management interface on port e0c with IP address 10.224.82.249
has been created.
Use your web browser to complete cluster setup by accessing
https://10.224.82.249
Otherwise, press Enter to complete cluster setup using the command
line
interface: exit
Exiting the cluster setup wizard. Any changes you made have been
saved.
The cluster administrator's account (username "admin") password is set
to the system default.
Warning: You have exited the cluster setup wizard before completing
all
of the tasks. The cluster is not configured. You can complete cluster
setup by typing
"cluster setup" in the command line interface.
```

## 2) Discovering the nodes

Issuing a GET `/api/cluster/nodes` request when the nodes are not in a cluster, the API returns a list of nodes that were discovered on the cluster network. Information returned include the node's serial number, model, software version, UUID, and cluster interface address. The number of nodes returned should be the same as

the number of nodes expected to be in the cluster. If too many nodes are discovered, remove those nodes that should not be part of the cluster. If not enough nodes are discovered, ensure all the nodes are powered up, that the connections to the cluster network are complete, and retry the command.

```
# The API:
/api/cluster/nodes

# The call:
curl -X GET "https://<mgmt-ip>/api/cluster/nodes?fields=*" -H "accept:
application/hal+json"

# The response:
{
  "records": [
    {
      "uuid": "60277d87-19e4-11e9-ba25-005056bb6eee",
      "name": "Computer.local",
      "serial_number": "4136233-26-3",
      "model": "FAS9000",
      "version": {
        "full": "NetApp Release 9.6.0: Wed Jan 16 18:20:57 UTC 2019",
        "generation": 9,
        "major": 6,
        "minor": 0
      },
      "membership": "available",
      "cluster_interfaces": [
        {
          "ip": {
            "address": "169.254.245.113"
          }
        }
      ],
      "_links": {
        "self": {
          "href": "/api/cluster/nodes/60277d87-19e4-11e9-ba25-005056bb6eee"
        }
      }
    },
    {
      "uuid": "8071ba1b-19e3-11e9-b003-005056bb096a",
      "name": "Computer-6.local",
      "serial_number": "4136233-26-2",
      "model": "FAS9000",
      "version": {
```

```

    "full": "NetApp Release 9.6.0: Wed Jan 16 18:20:57 UTC 2019",
    "generation": 9,
    "major": 6,
    "minor": 0
  },
  "membership": "available",
  "cluster_interfaces": [
    {
      "ip": {
        "address": "169.254.217.95"
      }
    }
  ],
  "_links": {
    "self": {
      "href": "/api/cluster/nodes/8071ba1b-19e3-11e9-b003-005056bb096a"
    }
  }
},
"num_records": 2,
"_links": {
  "self": {
    "href": "/api/cluster/nodes?fields=*"
  }
}
}

```

### 3) Creating the cluster

Once the node information is available, including each node's cluster interface address, the information for creating the cluster can be assembled. You must provide the cluster name and the password for the admin account. The rest of the information is optional and can be configured later using other APIs. Each node to be included in the cluster must have the cluster interface address provided so that it can be connected to while adding it to the cluster. In addition to the cluster interface address, the optional node name, location, and management interface information can be supplied. If node names are not provided, nodes are named based on the cluster name. The nodes' management interface netmask and gateway values are omitted and must be the same as the cluster management interface's netmask and gateway.

```
# The API:
/api/cluster

# The call:
curl -X POST "https://<mgmt-ip>/api/cluster" -H "accept:
application/hal+json" -H "accept: application/hal+json" -d
'{"name":"cluster1","location":"datacenter1","contact":"me","dns_domains":
["example.com"],"name_servers":["10.224.223.130","10.224.223.131","10.224.
223.132"],"ntp_servers":["time.nist.gov"],"management_interface":{"ip":{"a
ddress":"10.224.82.25","netmask":"255.255.192.0","gateway":"10.224.64.1"}}
,"password":"mypassword","license":{"keys":["AMEPOS0IKLKGEEEEEDGNDEKSJDE"]}
,"nodes":[{"cluster_interface":{"ip":{"address":"169.254.245.113"}}, {"name"
:"node1","management_interface":{"ip":{"address":"10.224.82.29"}}, {"clust
er_interface":{"ip":{"address":"169.254.217.95"}}, {"name":"node2","manageme
nt_interface":{"ip":{"address":"10.224.82.31"}}}]}'

# The response:
{
  "job": {
    "uuid": "b5bc07e2-19e9-11e9-a751-005056bbd95f",
    "_links": {
      "self": {
        "href": "/api/cluster/jobs/b5bc07e2-19e9-11e9-a751-005056bbd95f"
      }
    }
  }
}
```

---

#### 4) Monitoring the progress of cluster creation

To monitor the progress of the cluster create operation, the job link returned should be polled until the state value is no longer "running" or "queued".

---

```
# The API:
/api/cluster/jobs/b5bc07e2-19e9-11e9-a751-005056bbd95f

# The call:
curl -X GET "https://<mgmt-ip>/api/cluster/jobs/b5bc07e2-1e9-11e9-a751-005056bbd95f" -H "accept: application/hal+json"

# The response:
{
  "uuid": "b5bc07e2-19e9-11e9-a751-005056bbd95f",
  "description": "POST /api/cluster",
  "state": "success",
  "message": "success",
  "code": 0,
  "_links": {
    "self": {
      "href": "/api/cluster/jobs/b5bc07e2-19e9-11e9-a751-005056bbd95f"
    }
  }
}
```

## 5) Verifying the cluster information

Once the cluster is created, the information applied can be verified using a number of APIs. Most of the information provided can be retrieved using the `/api/cluster` and `/api/cluster/nodes` APIs. In addition, the network interface and route information can be viewed using the `/api/network` APIs. The following example details how to retrieve the cluster information:

```
# The API:
/api/cluster

# The call:
curl -X GET "https://<mgmt-ip>/api/cluster" -H "accept: application/hal+json"

# The response:
{
  "name": "cluster1",
  "uuid": "93d05f83-7d80-482d-b59c-a6661d272a47",
  "location": "datacenter1",
  "contact": "me",
  "version": {
```

```
"full": "NetApp Release 9.6.0: Wed Jan 16 18:20:57 UTC 2019",
"generation": 9,
"major": 6,
"minor": 0
},
"dns_domains": [
  "example.com"
],
"name_servers": [
  "10.224.223.130",
  "10.224.223.131",
  "10.224.223.132"
],
"ntp_servers": [
  "time.nist.gov"
],
"management_interfaces": [
  {
    "uuid": "c661725a-19e9-11e9-a751-005056bbd95f",
    "name": "cluster_mgmt",
    "ip": {
      "address": "10.224.82.25"
    }
    "_links": {
      "self": {
        "href": "/api/network/ip/interfaces/c661725a-19e9-11e9-a751-005056bbd95f"
      }
    }
  }
],
"metric": {
  "timestamp": "2019-04-09T06:33:30Z",
  "duration": "PT15S",
  "status": "ok",
  "latency": {
    "other": 0,
    "total": 525,
    "read": 525,
    "write": 0
  },
  "iops": {
    "read": 200,
    "write": 0,
    "other": 0,
    "total": 200
  }
}
```



```
  },
  "throughput": {
    "read": 820838,
    "write": 0,
    "other": 0,
    "total": 820838
  }
},
"statistics": {
  "timestamp": "2019-04-09T06:33:50Z",
  "status": "ok",
  "latency_raw": {
    "other": 38928,
    "total": 3331918704,
    "read": 3331879776,
    "write": 0
  },
  "iops_raw": {
    "read": 6188132,
    "write": 0,
    "other": 5,
    "total": 6188137
  },
  "throughput_raw": {
    "read": 25346587876,
    "write": 0,
    "other": 0,
    "total": 25346587876
  }
},
"_links": {
  "self": {
    "href": "/api/cluster"
  }
}
}
```

## Retrieve the cluster configuration

GET /cluster

Retrieves the cluster configuration.

## Learn more

- [DOC /cluster](#)

## Parameters

Name	Type	In	Required	Description
fields	array[string]	query	False	Specify the fields to return.

## Response

Status: 200, Ok

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
<a href="#">configuration_backup</a>	<a href="#">configuration_backup</a>	
contact	string	
dns_domains	array[string]	<p>A list of DNS domains. Domain names have the following requirements:</p> <ul style="list-style-type: none"><li>• The name must contain only the following characters: A through Z, a through z, 0 through 9, ".", "-" or "_".</li><li>• The first character of each label, delimited by ".", must be one of the following characters: A through Z or a through z or 0 through 9.</li><li>• The last character of each label, delimited by ".", must be one of the following characters: A through Z, a through z, or 0 through 9.</li><li>• The top level domain must contain only the following characters: A through Z, a through z.</li><li>• The system reserves the following names: "all", "local", and "localhost".</li></ul>

Name	Type	Description
license	<a href="#">license</a>	License keys or NLF contents.
location	string	
management_interface	<a href="#">management_interface</a>	The management interface of the cluster. The netmask and gateway for this interface are used for the node management interfaces provided in the node configuration.
management_interfaces	array[ <a href="#">management_interfaces</a> ]	
metric	<a href="#">metric</a>	Performance numbers, such as IOPS latency and throughput.
name	string	
name_servers	array[string]	The list of IP addresses of the DNS servers. Addresses can be either IPv4 or IPv6 addresses.
nodes	array[ <a href="#">nodes</a> ]	
ntp_servers	array[string]	Host name, IPv4 address, or IPv6 address for the external NTP time servers.
password	string	Initial admin password used to create the cluster.
statistics	<a href="#">statistics</a>	These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster.
uuid	string	
version	<a href="#">version</a>	This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

## Example response

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "configuration_backup": {
    "password": "yourpassword",
    "url": "http://10.224.65.198/backups",
    "username": "me"
  },
  "contact": "<a href="
mailto:support@company.com">support@company.com</a>",
  "dns_domains": [
    "example.com",
    "example2.example3.com"
  ],
  "license": {
    "keys": {
    }
  },
  "location": "building 1",
  "management_interface": {
    "ip": {
      "address": "10.10.10.7",
      "gateway": "10.1.1.1",
      "netmask": "24"
    }
  },
  "management_interfaces": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "ip": {
      "address": "10.10.10.7"
    },
    "name": "lif1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "metric": {
    "_links": {
      "self": {
```

```

    "href": "/api/resourcelink"
  }
},
"duration": "PT15S",
"iops": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"latency": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"status": "ok",
"throughput": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"timestamp": "2017-01-25 11:20:13 UTC"
},
"name": "cluster1",
"name_servers": [
  "10.224.65.20",
  "2001:db08:a0b:12f0::1"
],
"nodes": {
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "cluster_interface": {
    "ip": {
      "address": "10.10.10.7"
    }
  },
  "cluster_interfaces": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "ip": {
      "address": "10.10.10.7"
    }
  }
}

```

```

    },
    "name": "lif1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "controller": {
    "flash_cache": {
      "capacity": 102400000000,
      "firmware_version": "NA05",
      "hardware_revision": "A1",
      "model": "X1970A",
      "part_number": "119-00207",
      "serial_number": "A22P5061550000187",
      "slot": "6-1",
      "state": "ok"
    },
    "frus": {
      "id": 0,
      "state": "ok",
      "type": "fan"
    },
    "over_temperature": "over"
  },
  "date": "2017-01-25 11:20:13 +0400",
  "ha": {
    "partners": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "node1",
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    }
  },
  "location": "rack 2 row 5",
  "management_interface": {
    "ip": {
      "address": "10.10.10.7"
    }
  },
  "management_interfaces": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    }
  },

```

```
"ip": {
  "address": "10.10.10.7"
},
"name": "lif1",
"uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"membership": "available",
"model": "FAS3070",
"name": "node-01",
"serial_number": "4048820-60-9",
"service_processor": {
  "firmware_version": "string",
  "ipv4_interface": {
    "address": "10.10.10.7",
    "gateway": "10.1.1.1",
    "netmask": "24"
  },
  "ipv6_interface": {
    "address": "10.10.10.7",
    "gateway": "10.1.1.1",
    "netmask": "24"
  },
  "link_status": "up",
  "mac_address": "string",
  "state": "online"
},
"uptime": 300536,
"uuid": "4ea7a442-86d1-11e0-ae1c-123478563412",
"version": {
  "full": "NetApp Release 9.4.0: Sun Nov 05 18:20:57 UTC 2017",
  "generation": 9,
  "major": 4,
  "minor": 0
}
},
"ntp_servers": [
  "time.nist.gov",
  "10.98.19.20",
  "2610:20:6F15:15::27"
],
"password": "mypassword",
"statistics": {
  "iops_raw": {
    "read": 200,
    "total": 1000,
    "write": 100
  }
}
```

```
    },
    "latency_raw": {
      "read": 200,
      "total": 1000,
      "write": 100
    },
    "status": "ok",
    "throughput_raw": {
      "read": 200,
      "total": 1000,
      "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
  },
  "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412",
  "version": {
    "full": "NetApp Release 9.4.0: Sun Nov 05 18:20:57 UTC 2017",
    "generation": 9,
    "major": 4,
    "minor": 0
  }
}
```

## Error

Status: Default, Error

Name	Type	Description
error	<a href="#">error</a>	



## Example error

```
{
  "error": {
    "arguments": {
      "code": "string",
      "message": "string"
    },
    "code": "4",
    "message": "entry doesn't exist",
    "target": "uuid"
  }
}
```

## Definitions

## See Definitions

href

Name	Type	Description
href	string	

\_links

Name	Type	Description
self	<a href="#">href</a>	

configuration\_backup

Name	Type	Description
password	string	
url	string	An external backup location for the cluster configuration. This is mostly required for single node clusters where node and cluster configuration backups cannot be copied to other nodes in the cluster.
username	string	

license

License keys or NLF contents.

Name	Type	Description
keys	array[string]	

ip

Object to setup an interface along with its default router.

Name	Type	Description
address	string	IPv4 or IPv6 address
gateway	string	The IPv4 or IPv6 address of the default router.

Name	Type	Description
netmask	string	Input as netmask length (16) or IPv4 mask (255.255.0.0). For IPv6, you must set the netmask length. The default value is 64. Output is always netmask length.

#### management\_interface

The management interface of the cluster. The netmask and gateway for this interface are used for the node management interfaces provided in the node configuration.

Name	Type	Description
ip	<a href="#">ip</a>	Object to setup an interface along with its default router.

#### ip

IP information

Name	Type	Description
address	string	IPv4 or IPv6 address

#### management\_interfaces

A network interface. Either UUID or name may be supplied on input.

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
ip	<a href="#">ip</a>	IP information
name	string	The name of the interface.
uuid	string	The UUID that uniquely identifies the interface.

#### iops

The rate of I/O operations observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### latency

The round trip latency in microseconds observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### throughput

The rate of throughput bytes per second observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.

Name	Type	Description
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

metric

Performance numbers, such as IOPS latency and throughput.

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
duration	string	The duration over which this sample is calculated. The time durations are represented in the ISO-8601 standard format. Samples can be calculated over the following durations:
iops	<a href="#">iops</a>	The rate of I/O operations observed at the storage object.
latency	<a href="#">latency</a>	The round trip latency in microseconds observed at the storage object.

Name	Type	Description
status	string	Any errors associated with the sample. For example, if the aggregation of data over multiple nodes fails then any of the partial errors might be returned, "ok" on success, or "error" on any internal uncategorized failure. Whenever a sample collection is missed but done at a later time, it is back filled to the previous 15 second timestamp and tagged with "backfilled_data". "Inconsistent_delta_time" is encountered when the time between two collections is not the same for all nodes. Therefore, the aggregated value might be over or under inflated. "Negative_delta" is returned when an expected monotonically increasing value has decreased in value. "Inconsistent_old_data" is returned when one or more nodes does not have the latest data.
throughput	<a href="#">throughput</a>	The rate of throughput bytes per second observed at the storage object.
timestamp	string	The timestamp of the performance data.

#### node\_setup\_ip

The IP configuration for cluster setup.

Name	Type	Description
address	string	IPv4 or IPv6 address

#### cluster\_interface

The cluster network IP address of the node to be added.

Name	Type	Description
ip	<a href="#">node_setup_ip</a>	The IP configuration for cluster setup.

## cluster\_interfaces

### Network interface

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
ip	<a href="#">ip</a>	IP information
name	string	The name of the interface.
uuid	string	The UUID that uniquely identifies the interface.

### flash\_cache

Name	Type	Description
capacity	integer	Size in bytes
firmware_version	string	
hardware_revision	string	
model	string	
part_number	string	
serial_number	string	
slot	string	
state	string	

### frus

Name	Type	Description
id	integer	
state	string	
type	string	

### controller

#### Controller information

Name	Type	Description
flash_cache	array[ <a href="#">flash_cache</a> ]	A list of Flash-Cache devices. Only returned when requested by name.

Name	Type	Description
frus	array[frus]	A list of frus in the node. Only returned when requested by name.
over_temperature	string	Specifies whether the hardware is currently operating outside of its recommended temperature range. The hardware shuts down if the temperature exceeds critical thresholds.

#### partners

Name	Type	Description
_links	<a href="#">_links</a>	
name	string	
uuid	string	

#### ha

Name	Type	Description
auto_giveback	boolean	Specifies whether giveback is automatically initiated when the node that owns the storage is ready.
enabled	boolean	Specifies whether or not storage failover is enabled.
partners	array[ <a href="#">partners</a> ]	The nodes in this node's High Availability (HA) group.

#### management\_interface

The management interface of the node to be added. The netmask is set based on the management interface of the cluster or the management interfaces of other nodes.

Name	Type	Description
ip	<a href="#">node_setup_ip</a>	The IP configuration for cluster setup.

#### management\_interfaces

Network interface



Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
ip	<a href="#">ip</a>	IP information
name	string	The name of the interface.
uuid	string	The UUID that uniquely identifies the interface.

#### ipv4\_interface

Object to setup an interface along with its default router.

Name	Type	Description
address	string	IPv4 or IPv6 address
gateway	string	The IPv4 or IPv6 address of the default router.
netmask	string	Input as netmask length (16) or IPv4 mask (255.255.0.0). For IPv6, you must set the netmask length. The default value is 64. Output is always netmask length.

#### ipv6\_interface

Object to setup an interface along with its default router.

Name	Type	Description
address	string	IPv4 or IPv6 address
gateway	string	The IPv4 or IPv6 address of the default router.
netmask	string	Input as netmask length (16) or IPv4 mask (255.255.0.0). For IPv6, you must set the netmask length. The default value is 64. Output is always netmask length.

#### service\_processor

Name	Type	Description
dhcp_enabled	boolean	Set to true to use DHCP to configure an IPv4 interface.
firmware_version	string	The version of firmware installed.
ipv4_interface	<a href="#">ipv4_interface</a>	Object to setup an interface along with its default router.
ipv6_interface	<a href="#">ipv6_interface</a>	Object to setup an interface along with its default router.
link_status	string	
mac_address	string	
state	string	

#### version

This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

Name	Type	Description
full	string	The full cluster version string.
generation	integer	The generation portion of the version.
major	integer	The major portion of the version.
minor	integer	The minor portion of the version.

#### nodes

Complete node information

Name	Type	Description
_links	<a href="#">_links</a>	
cluster_interface	<a href="#">cluster_interface</a>	The cluster network IP address of the node to be added.
cluster_interfaces	array[ <a href="#">cluster_interfaces</a> ]	
controller	<a href="#">controller</a>	Controller information

Name	Type	Description
date	string	Specifies the ISO-8601 format date and time on the node.
ha	<a href="#">ha</a>	
location	string	
management_interface	<a href="#">management_interface</a>	The management interface of the node to be added. The netmask is set based on the management interface of the cluster or the management interfaces of other nodes.
management_interfaces	array[ <a href="#">management_interfaces</a> ]	
membership	string	<p>Possible values:</p> <ul style="list-style-type: none"> <li>• <i>available</i> - If a node is available, this means it is detected on the internal cluster network and can be added to the cluster. Nodes that have a membership of "available" are not returned when a GET request is called when the cluster exists. A query on the "membership" property for <i>available</i> must be provided to scan for nodes on the cluster network. Nodes that have a membership of "available" are returned automatically before a cluster is created.</li> <li>• <i>joining</i> - Joining nodes are in the process of being added to the cluster. The node may be progressing through the steps to become a member or might have failed. The job to add the node or create the cluster provides details on the current progress of the node.</li> <li>• <i>member</i> - Nodes that are members have successfully joined the cluster.</li> </ul>
model	string	
name	string	

Name	Type	Description
serial_number	string	
service_processor	<a href="#">service_processor</a>	
uptime	integer	The total time, in seconds, that the node has been up.
uuid	string	
version	<a href="#">version</a>	This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

#### iops\_raw

The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### latency\_raw

The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### throughput\_raw

Throughput bytes observed at the storage object. This should be used along with delta time to calculate the rate of throughput bytes per unit of time.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### statistics

These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster.

Name	Type	Description
iops_raw	<a href="#">iops_raw</a>	The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time.
latency_raw	<a href="#">latency_raw</a>	The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation.
status	string	Any errors associated with the sample. For example, if the aggregation of data over multiple nodes fails then any of the partial errors might be returned, "ok" on success, or "error" on any internal uncategorized failure. Whenever a sample collection is missed but done at a later time, it is back filled to the previous 15 second timestamp and tagged with "backfilled_data". "Inconsistent_delta_time" is encountered when the time between two collections is not the same for all nodes. Therefore, the aggregated value might be over or under inflated. "Negative_delta" is returned when an expected monotonically increasing value has decreased in value. "Inconsistent_old_data" is returned when one or more nodes does not have the latest data.
throughput_raw	<a href="#">throughput_raw</a>	Throughput bytes observed at the storage object. This should be used along with delta time to calculate the rate of throughput bytes per unit of time.
timestamp	string	The timestamp of the performance data.

error\_arguments

Name	Type	Description
code	string	Argument code
message	string	Message argument

error

Name	Type	Description
arguments	array[ <a href="#">error_arguments</a> ]	Message arguments
code	string	Error code
message	string	Error message
target	string	The target parameter that caused the error.

## Update the cluster configuration

PATCH `/cluster`

Updates the cluster configuration once the cluster has been created.

### Learn more

- [DOC /cluster](#)

### Request Body

Name	Type	Description
<code>_links</code>	<a href="#">_links</a>	
<code>configuration_backup</code>	<a href="#">configuration_backup</a>	
<code>contact</code>	string	

Name	Type	Description
dns_domains	array[string]	<p>A list of DNS domains. Domain names have the following requirements:</p> <ul style="list-style-type: none"> <li>• The name must contain only the following characters: A through Z, a through z, 0 through 9, ".", "-" or "_".</li> <li>• The first character of each label, delimited by ".", must be one of the following characters: A through Z or a through z or 0 through 9.</li> <li>• The last character of each label, delimited by ".", must be one of the following characters: A through Z, a through z, or 0 through 9.</li> <li>• The top level domain must contain only the following characters: A through Z, a through z.</li> <li>• The system reserves the following names: "all", "local", and "localhost".</li> </ul>
license	<a href="#">license</a>	License keys or NLF contents.
location	string	
management_interface	<a href="#">management_interface</a>	The management interface of the cluster. The netmask and gateway for this interface are used for the node management interfaces provided in the node configuration.
management_interfaces	array[ <a href="#">management_interfaces</a> ]	
metric	<a href="#">metric</a>	Performance numbers, such as IOPS latency and throughput.
name	string	
name_servers	array[string]	The list of IP addresses of the DNS servers. Addresses can be either IPv4 or IPv6 addresses.
nodes	array[ <a href="#">nodes</a> ]	



Name	Type	Description
ntp_servers	array[string]	Host name, IPv4 address, or IPv6 address for the external NTP time servers.
password	string	Initial admin password used to create the cluster.
statistics	<a href="#">statistics</a>	These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster.
uuid	string	
version	<a href="#">version</a>	This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

## Example request

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "configuration_backup": {
    "password": "yourpassword",
    "url": "http://10.224.65.198/backups",
    "username": "me"
  },
  "contact": "<a href="
mailto:support@company.com">support@company.com</a>",
  "dns_domains": [
    "example.com",
    "example2.example3.com"
  ],
  "license": {
    "keys": {
    }
  },
  "location": "building 1",
  "management_interface": {
    "ip": {
      "address": "10.10.10.7",
      "gateway": "10.1.1.1",
      "netmask": "24"
    }
  },
  "management_interfaces": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "ip": {
      "address": "10.10.10.7"
    },
    "name": "lif1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "metric": {
    "_links": {
      "self": {
```

```
    "href": "/api/resourcelink"
  }
},
"duration": "PT15S",
"iops": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"latency": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"status": "ok",
"throughput": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"timestamp": "2017-01-25 11:20:13 UTC"
},
"name": "cluster1",
"name_servers": [
  "10.224.65.20",
  "2001:db08:a0b:12f0::1"
],
"nodes": {
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "cluster_interface": {
    "ip": {
      "address": "10.10.10.7"
    }
  },
  "cluster_interfaces": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "ip": {
      "address": "10.10.10.7"
    }
  }
}
```

```

    },
    "name": "lif1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "controller": {
    "flash_cache": {
      "capacity": 102400000000,
      "firmware_version": "NA05",
      "hardware_revision": "A1",
      "model": "X1970A",
      "part_number": "119-00207",
      "serial_number": "A22P5061550000187",
      "slot": "6-1",
      "state": "ok"
    },
    "frus": {
      "id": 0,
      "state": "ok",
      "type": "fan"
    },
    "over_temperature": "over"
  },
  "date": "2017-01-25 11:20:13 +0400",
  "ha": {
    "partners": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "node1",
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    }
  },
  "location": "rack 2 row 5",
  "management_interface": {
    "ip": {
      "address": "10.10.10.7"
    }
  },
  "management_interfaces": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    }
  },

```

```
"ip": {
  "address": "10.10.10.7"
},
"name": "lif1",
"uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"membership": "available",
"model": "FAS3070",
"name": "node-01",
"serial_number": "4048820-60-9",
"service_processor": {
  "firmware_version": "string",
  "ipv4_interface": {
    "address": "10.10.10.7",
    "gateway": "10.1.1.1",
    "netmask": "24"
  },
  "ipv6_interface": {
    "address": "10.10.10.7",
    "gateway": "10.1.1.1",
    "netmask": "24"
  },
  "link_status": "up",
  "mac_address": "string",
  "state": "online"
},
"uptime": 300536,
"uuid": "4ea7a442-86d1-11e0-ae1c-123478563412",
"version": {
  "full": "NetApp Release 9.4.0: Sun Nov 05 18:20:57 UTC 2017",
  "generation": 9,
  "major": 4,
  "minor": 0
}
},
"ntp_servers": [
  "time.nist.gov",
  "10.98.19.20",
  "2610:20:6F15:15::27"
],
"password": "mypassword",
"statistics": {
  "iops_raw": {
    "read": 200,
    "total": 1000,
    "write": 100
  }
}
```

```
},
"latency_raw": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"status": "ok",
"throughput_raw": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"timestamp": "2017-01-25 11:20:13 UTC"
},
"uuid": "1cd8a442-86d1-11e0-ae1c-123478563412",
"version": {
  "full": "NetApp Release 9.4.0: Sun Nov 05 18:20:57 UTC 2017",
  "generation": 9,
  "major": 4,
  "minor": 0
}
}
```

## Response

Status: 202, Accepted

Name	Type	Description
job	<a href="#">job_link</a>	

## Example response

```
{
  "job": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "uuid": "string"
  }
}
```

## Error

Status: Default

### ONTAP Error Response Codes

Error Code	Description
8847362	Too many name servers provided.
8847361	Too many DNS domains provided.
9240587	A name must be provided.
131727388	Hostnames for NTP servers cannot be used without DNS configured.
2097165	An NTP server could not be reached.

Name	Type	Description
error	error	

## Example error

```
{
  "error": {
    "arguments": {
      "code": "string",
      "message": "string"
    },
    "code": "4",
    "message": "entry doesn't exist",
    "target": "uuid"
  }
}
```

## Definitions



## See Definitions

href

Name	Type	Description
href	string	

\_links

Name	Type	Description
self	<a href="#">href</a>	

configuration\_backup

Name	Type	Description
password	string	
url	string	An external backup location for the cluster configuration. This is mostly required for single node clusters where node and cluster configuration backups cannot be copied to other nodes in the cluster.
username	string	

license

License keys or NLF contents.

Name	Type	Description
keys	array[string]	

ip

Object to setup an interface along with its default router.

Name	Type	Description
address	string	IPv4 or IPv6 address
gateway	string	The IPv4 or IPv6 address of the default router.

Name	Type	Description
netmask	string	Input as netmask length (16) or IPv4 mask (255.255.0.0). For IPv6, you must set the netmask length. The default value is 64. Output is always netmask length.

#### management\_interface

The management interface of the cluster. The netmask and gateway for this interface are used for the node management interfaces provided in the node configuration.

Name	Type	Description
ip	<a href="#">ip</a>	Object to setup an interface along with its default router.

#### ip

##### IP information

Name	Type	Description
address	string	IPv4 or IPv6 address

#### management\_interfaces

A network interface. Either UUID or name may be supplied on input.

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
<a href="#">ip</a>	<a href="#">ip</a>	IP information
name	string	The name of the interface.
uuid	string	The UUID that uniquely identifies the interface.

#### iops

The rate of I/O operations observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### latency

The round trip latency in microseconds observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### throughput

The rate of throughput bytes per second observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.

Name	Type	Description
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

metric

Performance numbers, such as IOPS latency and throughput.

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
duration	string	The duration over which this sample is calculated. The time durations are represented in the ISO-8601 standard format. Samples can be calculated over the following durations:
iops	<a href="#">iops</a>	The rate of I/O operations observed at the storage object.
latency	<a href="#">latency</a>	The round trip latency in microseconds observed at the storage object.

Name	Type	Description
status	string	Any errors associated with the sample. For example, if the aggregation of data over multiple nodes fails then any of the partial errors might be returned, "ok" on success, or "error" on any internal uncategorized failure. Whenever a sample collection is missed but done at a later time, it is back filled to the previous 15 second timestamp and tagged with "backfilled_data". "Inconsistent_delta_time" is encountered when the time between two collections is not the same for all nodes. Therefore, the aggregated value might be over or under inflated. "Negative_delta" is returned when an expected monotonically increasing value has decreased in value. "Inconsistent_old_data" is returned when one or more nodes does not have the latest data.
throughput	<a href="#">throughput</a>	The rate of throughput bytes per second observed at the storage object.
timestamp	string	The timestamp of the performance data.

#### node\_setup\_ip

The IP configuration for cluster setup.

Name	Type	Description
address	string	IPv4 or IPv6 address

#### cluster\_interface

The cluster network IP address of the node to be added.

Name	Type	Description
ip	<a href="#">node_setup_ip</a>	The IP configuration for cluster setup.

## cluster\_interfaces

### Network interface

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
ip	<a href="#">ip</a>	IP information
name	string	The name of the interface.
uuid	string	The UUID that uniquely identifies the interface.

### flash\_cache

Name	Type	Description
capacity	integer	Size in bytes
firmware_version	string	
hardware_revision	string	
model	string	
part_number	string	
serial_number	string	
slot	string	
state	string	

### frus

Name	Type	Description
id	integer	
state	string	
type	string	

### controller

#### Controller information

Name	Type	Description
flash_cache	array[ <a href="#">flash_cache</a> ]	A list of Flash-Cache devices. Only returned when requested by name.

Name	Type	Description
frus	array[frus]	A list of frus in the node. Only returned when requested by name.
over_temperature	string	Specifies whether the hardware is currently operating outside of its recommended temperature range. The hardware shuts down if the temperature exceeds critical thresholds.

#### partners

Name	Type	Description
_links	<a href="#">_links</a>	
name	string	
uuid	string	

#### ha

Name	Type	Description
auto_giveback	boolean	Specifies whether giveback is automatically initiated when the node that owns the storage is ready.
enabled	boolean	Specifies whether or not storage failover is enabled.
partners	array[ <a href="#">partners</a> ]	The nodes in this node's High Availability (HA) group.

#### management\_interface

The management interface of the node to be added. The netmask is set based on the management interface of the cluster or the management interfaces of other nodes.

Name	Type	Description
ip	<a href="#">node_setup_ip</a>	The IP configuration for cluster setup.

#### management\_interfaces

#### Network interface

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
ip	<a href="#">ip</a>	IP information
name	string	The name of the interface.
uuid	string	The UUID that uniquely identifies the interface.

#### ipv4\_interface

Object to setup an interface along with its default router.

Name	Type	Description
address	string	IPv4 or IPv6 address
gateway	string	The IPv4 or IPv6 address of the default router.
netmask	string	Input as netmask length (16) or IPv4 mask (255.255.0.0). For IPv6, you must set the netmask length. The default value is 64. Output is always netmask length.

#### ipv6\_interface

Object to setup an interface along with its default router.

Name	Type	Description
address	string	IPv4 or IPv6 address
gateway	string	The IPv4 or IPv6 address of the default router.
netmask	string	Input as netmask length (16) or IPv4 mask (255.255.0.0). For IPv6, you must set the netmask length. The default value is 64. Output is always netmask length.

#### service\_processor



Name	Type	Description
dhcp_enabled	boolean	Set to true to use DHCP to configure an IPv4 interface.
firmware_version	string	The version of firmware installed.
ipv4_interface	<a href="#">ipv4_interface</a>	Object to setup an interface along with its default router.
ipv6_interface	<a href="#">ipv6_interface</a>	Object to setup an interface along with its default router.
link_status	string	
mac_address	string	
state	string	

#### version

This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

Name	Type	Description
full	string	The full cluster version string.
generation	integer	The generation portion of the version.
major	integer	The major portion of the version.
minor	integer	The minor portion of the version.

#### nodes

Complete node information

Name	Type	Description
_links	<a href="#">_links</a>	
cluster_interface	<a href="#">cluster_interface</a>	The cluster network IP address of the node to be added.
cluster_interfaces	array[ <a href="#">cluster_interfaces</a> ]	
controller	<a href="#">controller</a>	Controller information

Name	Type	Description
date	string	Specifies the ISO-8601 format date and time on the node.
ha	<a href="#">ha</a>	
location	string	
management_interface	<a href="#">management_interface</a>	The management interface of the node to be added. The netmask is set based on the management interface of the cluster or the management interfaces of other nodes.
management_interfaces	array[ <a href="#">management_interfaces</a> ]	
membership	string	<p>Possible values:</p> <ul style="list-style-type: none"> <li>• <i>available</i> - If a node is available, this means it is detected on the internal cluster network and can be added to the cluster. Nodes that have a membership of "available" are not returned when a GET request is called when the cluster exists. A query on the "membership" property for <i>available</i> must be provided to scan for nodes on the cluster network. Nodes that have a membership of "available" are returned automatically before a cluster is created.</li> <li>• <i>joining</i> - Joining nodes are in the process of being added to the cluster. The node may be progressing through the steps to become a member or might have failed. The job to add the node or create the cluster provides details on the current progress of the node.</li> <li>• <i>member</i> - Nodes that are members have successfully joined the cluster.</li> </ul>
model	string	
name	string	

Name	Type	Description
serial_number	string	
service_processor	<a href="#">service_processor</a>	
uptime	integer	The total time, in seconds, that the node has been up.
uuid	string	
version	<a href="#">version</a>	This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

#### iops\_raw

The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### latency\_raw

The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### throughput\_raw

Throughput bytes observed at the storage object. This should be used along with delta time to calculate the rate of throughput bytes per unit of time.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### statistics

These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster.

Name	Type	Description
iops_raw	iops_raw	The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time.
latency_raw	latency_raw	The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation.
status	string	Any errors associated with the sample. For example, if the aggregation of data over multiple nodes fails then any of the partial errors might be returned, "ok" on success, or "error" on any internal uncategorized failure. Whenever a sample collection is missed but done at a later time, it is back filled to the previous 15 second timestamp and tagged with "backfilled_data". "Inconsistent_delta_time" is encountered when the time between two collections is not the same for all nodes. Therefore, the aggregated value might be over or under inflated. "Negative_delta" is returned when an expected monotonically increasing value has decreased in value. "Inconsistent_old_data" is returned when one or more nodes does not have the latest data.
throughput_raw	throughput_raw	Throughput bytes observed at the storage object. This should be used along with delta time to calculate the rate of throughput bytes per unit of time.
timestamp	string	The timestamp of the performance data.

cluster

## Complete cluster information

Name	Type	Description
_links	<a href="#">_links</a>	
configuration_backup	<a href="#">configuration_backup</a>	
contact	string	
dns_domains	array[string]	<p>A list of DNS domains. Domain names have the following requirements:</p> <ul style="list-style-type: none"> <li>• The name must contain only the following characters: A through Z, a through z, 0 through 9, ".", "-", or "_".</li> <li>• The first character of each label, delimited by ".", must be one of the following characters: A through Z or a through z or 0 through 9.</li> <li>• The last character of each label, delimited by ".", must be one of the following characters: A through Z, a through z, or 0 through 9.</li> <li>• The top level domain must contain only the following characters: A through Z, a through z.</li> <li>• The system reserves the following names: "all", "local", and "localhost".</li> </ul>
license	<a href="#">license</a>	License keys or NLF contents.
location	string	
management_interface	<a href="#">management_interface</a>	The management interface of the cluster. The netmask and gateway for this interface are used for the node management interfaces provided in the node configuration.
management_interfaces	array[ <a href="#">management_interfaces</a> ]	
metric	<a href="#">metric</a>	Performance numbers, such as IOPS latency and throughput.
name	string	

Name	Type	Description
name_servers	array[string]	The list of IP addresses of the DNS servers. Addresses can be either IPv4 or IPv6 addresses.
nodes	array[nodes]	
ntp_servers	array[string]	Host name, IPv4 address, or IPv6 address for the external NTP time servers.
password	string	Initial admin password used to create the cluster.
statistics	<a href="#">statistics</a>	These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster.
uuid	string	
version	<a href="#">version</a>	This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

#### job\_link

Name	Type	Description
_links	<a href="#">_links</a>	
uuid	string	The UUID of the asynchronous job that is triggered by a POST, PATCH, or DELETE operation.

#### error\_arguments

Name	Type	Description
code	string	Argument code
message	string	Message argument

#### error

Name	Type	Description
arguments	array[ <a href="#">error_arguments</a> ]	Message arguments
code	string	Error code
message	string	Error message
target	string	The target parameter that caused the error.

## Create a cluster

POST /cluster

Sets up a cluster.

### Required properties

- name
- password

### Recommended optional properties

- location
- contact
- dns\_domains
- name\_servers
- ntp\_servers
- license
- configuration\_backup
- management\_interface
- nodes

### Learn more

- [DOC /cluster](#)

### Parameters



Name	Type	In	Required	Description
single_node_cluster	boolean	query	False	Configures a single node cluster. All cluster ports are reassigned to the default network. The storage failover settings are configured to non-HA. The node reboots during this operation.

## Request Body

Name	Type	Description
_links	<a href="#">_links</a>	
configuration_backup	<a href="#">configuration_backup</a>	
contact	string	
dns_domains	array[string]	<p>A list of DNS domains. Domain names have the following requirements:</p> <ul style="list-style-type: none"> <li>• The name must contain only the following characters: A through Z, a through z, 0 through 9, ".", "-" or "_".</li> <li>• The first character of each label, delimited by ".", must be one of the following characters: A through Z or a through z or 0 through 9.</li> <li>• The last character of each label, delimited by ".", must be one of the following characters: A through Z, a through z, or 0 through 9.</li> <li>• The top level domain must contain only the following characters: A through Z, a through z.</li> <li>• The system reserves the following names: "all", "local", and "localhost".</li> </ul>
license	<a href="#">license</a>	License keys or NLF contents.

Name	Type	Description
location	string	
management_interface	<a href="#">management_interface</a>	The management interface of the cluster. The netmask and gateway for this interface are used for the node management interfaces provided in the node configuration.
management_interfaces	array[ <a href="#">management_interfaces</a> ]	
metric	<a href="#">metric</a>	Performance numbers, such as IOPS latency and throughput.
name	string	
name_servers	array[string]	The list of IP addresses of the DNS servers. Addresses can be either IPv4 or IPv6 addresses.
nodes	array[ <a href="#">nodes</a> ]	
ntp_servers	array[string]	Host name, IPv4 address, or IPv6 address for the external NTP time servers.
password	string	Initial admin password used to create the cluster.
statistics	<a href="#">statistics</a>	These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster.
uuid	string	
version	<a href="#">version</a>	This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

## Example request

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "configuration_backup": {
    "password": "yourpassword",
    "url": "http://10.224.65.198/backups",
    "username": "me"
  },
  "contact": "<a href="
mailto:support@company.com">support@company.com</a>",
  "dns_domains": [
    "example.com",
    "example2.example3.com"
  ],
  "license": {
    "keys": {
    }
  },
  "location": "building 1",
  "management_interface": {
    "ip": {
      "address": "10.10.10.7",
      "gateway": "10.1.1.1",
      "netmask": "24"
    }
  },
  "management_interfaces": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "ip": {
      "address": "10.10.10.7"
    },
    "name": "lif1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "metric": {
    "_links": {
      "self": {
```

```

    "href": "/api/resourcelink"
  }
},
"duration": "PT15S",
"iops": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"latency": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"status": "ok",
"throughput": {
  "read": 200,
  "total": 1000,
  "write": 100
},
"timestamp": "2017-01-25 11:20:13 UTC"
},
"name": "cluster1",
"name_servers": [
  "10.224.65.20",
  "2001:db08:a0b:12f0::1"
],
"nodes": {
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "cluster_interface": {
    "ip": {
      "address": "10.10.10.7"
    }
  },
  "cluster_interfaces": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "ip": {
      "address": "10.10.10.7"
    }
  }
}

```

```

    },
    "name": "lif1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "controller": {
    "flash_cache": {
      "capacity": 102400000000,
      "firmware_version": "NA05",
      "hardware_revision": "A1",
      "model": "X1970A",
      "part_number": "119-00207",
      "serial_number": "A22P5061550000187",
      "slot": "6-1",
      "state": "ok"
    },
    "frus": {
      "id": 0,
      "state": "ok",
      "type": "fan"
    },
    "over_temperature": "over"
  },
  "date": "2017-01-25 11:20:13 +0400",
  "ha": {
    "partners": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "node1",
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    }
  },
  "location": "rack 2 row 5",
  "management_interface": {
    "ip": {
      "address": "10.10.10.7"
    }
  },
  "management_interfaces": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    }
  },

```

```
"ip": {
  "address": "10.10.10.7"
},
"name": "lif1",
"uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"membership": "available",
"model": "FAS3070",
"name": "node-01",
"serial_number": "4048820-60-9",
"service_processor": {
  "firmware_version": "string",
  "ipv4_interface": {
    "address": "10.10.10.7",
    "gateway": "10.1.1.1",
    "netmask": "24"
  },
  "ipv6_interface": {
    "address": "10.10.10.7",
    "gateway": "10.1.1.1",
    "netmask": "24"
  },
  "link_status": "up",
  "mac_address": "string",
  "state": "online"
},
"uptime": 300536,
"uuid": "4ea7a442-86d1-11e0-ae1c-123478563412",
"version": {
  "full": "NetApp Release 9.4.0: Sun Nov 05 18:20:57 UTC 2017",
  "generation": 9,
  "major": 4,
  "minor": 0
}
},
"ntp_servers": [
  "time.nist.gov",
  "10.98.19.20",
  "2610:20:6F15:15::27"
],
"password": "mypassword",
"statistics": {
  "iops_raw": {
    "read": 200,
    "total": 1000,
    "write": 100
  }
}
```

```
  },
  "latency_raw": {
    "read": 200,
    "total": 1000,
    "write": 100
  },
  "status": "ok",
  "throughput_raw": {
    "read": 200,
    "total": 1000,
    "write": 100
  },
  "timestamp": "2017-01-25 11:20:13 UTC"
},
"uuid": "1cd8a442-86d1-11e0-ae1c-123478563412",
"version": {
  "full": "NetApp Release 9.4.0: Sun Nov 05 18:20:57 UTC 2017",
  "generation": 9,
  "major": 4,
  "minor": 0
}
}
```

## Response

Status: 202, Accepted

Name	Type	Description
job	<a href="#">job_link</a>	

## Example response

```
{
  "job": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "uuid": "string"
  }
}
```

## Error

Status: Default

### ONTAP Error Response Codes

Error Code	Description
131727360	A node could not be added to the cluster. This is a generic code, see response message for details.
8978433	An invalid license key was provided.
8847362	Too many name servers provided.
8847361	Too many DNS domains provided.
9240587	A name must be provided.
39387137	The URL provided is invalid.
131727389	URL and username are required for configuration backup.
262245	The value provided is invalid.
1179817	The IP address, netmask, and gateway must all be provided for cluster management interface.
1179813	Fields set for one node must be set for all nodes.
1179818	The IP address and gateway must be of the same family.
1179821	An IP address and netmask conflicts with an existing entry.
131727388	Hostnames for NTP servers cannot be used without DNS configured.



Error Code	Description
2097165	An NTP server could not be reached.
1179825	All management and cluster config IP addresses must belong to the same address family.
8847394	An invalid DNS domain was provided.
9240594	An invalid name was provided.
1179824	An invalid gateway was provided.

Name	Type	Description
error	error	

### Example error

```
{
  "error": {
    "arguments": {
      "code": "string",
      "message": "string"
    },
    "code": "4",
    "message": "entry doesn't exist",
    "target": "uuid"
  }
}
```

### Definitions

## See Definitions

href

Name	Type	Description
href	string	

\_links

Name	Type	Description
self	<a href="#">href</a>	

configuration\_backup

Name	Type	Description
password	string	
url	string	An external backup location for the cluster configuration. This is mostly required for single node clusters where node and cluster configuration backups cannot be copied to other nodes in the cluster.
username	string	

license

License keys or NLF contents.

Name	Type	Description
keys	array[string]	

ip

Object to setup an interface along with its default router.

Name	Type	Description
address	string	IPv4 or IPv6 address
gateway	string	The IPv4 or IPv6 address of the default router.

Name	Type	Description
netmask	string	Input as netmask length (16) or IPv4 mask (255.255.0.0). For IPv6, you must set the netmask length. The default value is 64. Output is always netmask length.

#### management\_interface

The management interface of the cluster. The netmask and gateway for this interface are used for the node management interfaces provided in the node configuration.

Name	Type	Description
ip	<a href="#">ip</a>	Object to setup an interface along with its default router.

#### ip

##### IP information

Name	Type	Description
address	string	IPv4 or IPv6 address

#### management\_interfaces

A network interface. Either UUID or name may be supplied on input.

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
ip	<a href="#">ip</a>	IP information
name	string	The name of the interface.
uuid	string	The UUID that uniquely identifies the interface.

#### iops

The rate of I/O operations observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### latency

The round trip latency in microseconds observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### throughput

The rate of throughput bytes per second observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.

Name	Type	Description
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

metric

Performance numbers, such as IOPS latency and throughput.

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
duration	string	The duration over which this sample is calculated. The time durations are represented in the ISO-8601 standard format. Samples can be calculated over the following durations:
iops	<a href="#">iops</a>	The rate of I/O operations observed at the storage object.
latency	<a href="#">latency</a>	The round trip latency in microseconds observed at the storage object.

Name	Type	Description
status	string	Any errors associated with the sample. For example, if the aggregation of data over multiple nodes fails then any of the partial errors might be returned, "ok" on success, or "error" on any internal uncategorized failure. Whenever a sample collection is missed but done at a later time, it is back filled to the previous 15 second timestamp and tagged with "backfilled_data". "Inconsistent_delta_time" is encountered when the time between two collections is not the same for all nodes. Therefore, the aggregated value might be over or under inflated. "Negative_delta" is returned when an expected monotonically increasing value has decreased in value. "Inconsistent_old_data" is returned when one or more nodes does not have the latest data.
throughput	<a href="#">throughput</a>	The rate of throughput bytes per second observed at the storage object.
timestamp	string	The timestamp of the performance data.

#### node\_setup\_ip

The IP configuration for cluster setup.

Name	Type	Description
address	string	IPv4 or IPv6 address

#### cluster\_interface

The cluster network IP address of the node to be added.

Name	Type	Description
ip	<a href="#">node_setup_ip</a>	The IP configuration for cluster setup.

## cluster\_interfaces

### Network interface

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
ip	<a href="#">ip</a>	IP information
name	string	The name of the interface.
uuid	string	The UUID that uniquely identifies the interface.

### flash\_cache

Name	Type	Description
capacity	integer	Size in bytes
firmware_version	string	
hardware_revision	string	
model	string	
part_number	string	
serial_number	string	
slot	string	
state	string	

### frus

Name	Type	Description
id	integer	
state	string	
type	string	

### controller

#### Controller information

Name	Type	Description
flash_cache	array[ <a href="#">flash_cache</a> ]	A list of Flash-Cache devices. Only returned when requested by name.

Name	Type	Description
frus	array[frus]	A list of frus in the node. Only returned when requested by name.
over_temperature	string	Specifies whether the hardware is currently operating outside of its recommended temperature range. The hardware shuts down if the temperature exceeds critical thresholds.

#### partners

Name	Type	Description
_links	<a href="#">_links</a>	
name	string	
uuid	string	

#### ha

Name	Type	Description
auto_giveback	boolean	Specifies whether giveback is automatically initiated when the node that owns the storage is ready.
enabled	boolean	Specifies whether or not storage failover is enabled.
partners	array[ <a href="#">partners</a> ]	The nodes in this node's High Availability (HA) group.

#### management\_interface

The management interface of the node to be added. The netmask is set based on the management interface of the cluster or the management interfaces of other nodes.

Name	Type	Description
ip	<a href="#">node_setup_ip</a>	The IP configuration for cluster setup.

#### management\_interfaces

Network interface



Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
ip	<a href="#">ip</a>	IP information
name	string	The name of the interface.
uuid	string	The UUID that uniquely identifies the interface.

#### ipv4\_interface

Object to setup an interface along with its default router.

Name	Type	Description
address	string	IPv4 or IPv6 address
gateway	string	The IPv4 or IPv6 address of the default router.
netmask	string	Input as netmask length (16) or IPv4 mask (255.255.0.0). For IPv6, you must set the netmask length. The default value is 64. Output is always netmask length.

#### ipv6\_interface

Object to setup an interface along with its default router.

Name	Type	Description
address	string	IPv4 or IPv6 address
gateway	string	The IPv4 or IPv6 address of the default router.
netmask	string	Input as netmask length (16) or IPv4 mask (255.255.0.0). For IPv6, you must set the netmask length. The default value is 64. Output is always netmask length.

#### service\_processor

Name	Type	Description
dhcp_enabled	boolean	Set to true to use DHCP to configure an IPv4 interface.
firmware_version	string	The version of firmware installed.
ipv4_interface	<a href="#">ipv4_interface</a>	Object to setup an interface along with its default router.
ipv6_interface	<a href="#">ipv6_interface</a>	Object to setup an interface along with its default router.
link_status	string	
mac_address	string	
state	string	

#### version

This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

Name	Type	Description
full	string	The full cluster version string.
generation	integer	The generation portion of the version.
major	integer	The major portion of the version.
minor	integer	The minor portion of the version.

#### nodes

Complete node information

Name	Type	Description
_links	<a href="#">_links</a>	
cluster_interface	<a href="#">cluster_interface</a>	The cluster network IP address of the node to be added.
cluster_interfaces	array[ <a href="#">cluster_interfaces</a> ]	
controller	<a href="#">controller</a>	Controller information

Name	Type	Description
date	string	Specifies the ISO-8601 format date and time on the node.
ha	ha	
location	string	
management_interface	management_interface	The management interface of the node to be added. The netmask is set based on the management interface of the cluster or the management interfaces of other nodes.
management_interfaces	array[management_interfaces]	
membership	string	<p>Possible values:</p> <ul style="list-style-type: none"> <li>• <i>available</i> - If a node is available, this means it is detected on the internal cluster network and can be added to the cluster. Nodes that have a membership of "available" are not returned when a GET request is called when the cluster exists. A query on the "membership" property for <i>available</i> must be provided to scan for nodes on the cluster network. Nodes that have a membership of "available" are returned automatically before a cluster is created.</li> <li>• <i>joining</i> - Joining nodes are in the process of being added to the cluster. The node may be progressing through the steps to become a member or might have failed. The job to add the node or create the cluster provides details on the current progress of the node.</li> <li>• <i>member</i> - Nodes that are members have successfully joined the cluster.</li> </ul>
model	string	
name	string	

Name	Type	Description
serial_number	string	
service_processor	<a href="#">service_processor</a>	
uptime	integer	The total time, in seconds, that the node has been up.
uuid	string	
version	<a href="#">version</a>	This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

#### iops\_raw

The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### latency\_raw

The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### throughput\_raw

Throughput bytes observed at the storage object. This should be used along with delta time to calculate the rate of throughput bytes per unit of time.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Performance metric for write I/O operations.

#### statistics

These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster.

Name	Type	Description
iops_raw	<a href="#">iops_raw</a>	The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time.
latency_raw	<a href="#">latency_raw</a>	The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation.
status	string	Any errors associated with the sample. For example, if the aggregation of data over multiple nodes fails then any of the partial errors might be returned, "ok" on success, or "error" on any internal uncategorized failure. Whenever a sample collection is missed but done at a later time, it is back filled to the previous 15 second timestamp and tagged with "backfilled_data". "Inconsistent_delta_time" is encountered when the time between two collections is not the same for all nodes. Therefore, the aggregated value might be over or under inflated. "Negative_delta" is returned when an expected monotonically increasing value has decreased in value. "Inconsistent_old_data" is returned when one or more nodes does not have the latest data.
throughput_raw	<a href="#">throughput_raw</a>	Throughput bytes observed at the storage object. This should be used along with delta time to calculate the rate of throughput bytes per unit of time.
timestamp	string	The timestamp of the performance data.

cluster

Complete cluster information

Name	Type	Description
_links	<a href="#">_links</a>	
configuration_backup	<a href="#">configuration_backup</a>	
contact	string	
dns_domains	array[string]	<p>A list of DNS domains. Domain names have the following requirements:</p> <ul style="list-style-type: none"> <li>• The name must contain only the following characters: A through Z, a through z, 0 through 9, ".", "-", or "_".</li> <li>• The first character of each label, delimited by ".", must be one of the following characters: A through Z or a through z or 0 through 9.</li> <li>• The last character of each label, delimited by ".", must be one of the following characters: A through Z, a through z, or 0 through 9.</li> <li>• The top level domain must contain only the following characters: A through Z, a through z.</li> <li>• The system reserves the following names: "all", "local", and "localhost".</li> </ul>
license	<a href="#">license</a>	License keys or NLF contents.
location	string	
management_interface	<a href="#">management_interface</a>	The management interface of the cluster. The netmask and gateway for this interface are used for the node management interfaces provided in the node configuration.
management_interfaces	array[ <a href="#">management_interfaces</a> ]	
metric	<a href="#">metric</a>	Performance numbers, such as IOPS latency and throughput.
name	string	

Name	Type	Description
name_servers	array[string]	The list of IP addresses of the DNS servers. Addresses can be either IPv4 or IPv6 addresses.
nodes	array[nodes]	
ntp_servers	array[string]	Host name, IPv4 address, or IPv6 address for the external NTP time servers.
password	string	Initial admin password used to create the cluster.
statistics	<a href="#">statistics</a>	These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster.
uuid	string	
version	<a href="#">version</a>	This returns the cluster version information. When the cluster has more than one node, the cluster version is equivalent to the lowest of generation, major, and minor versions on all nodes.

#### job\_link

Name	Type	Description
_links	<a href="#">_links</a>	
uuid	string	The UUID of the asynchronous job that is triggered by a POST, PATCH, or DELETE operation.

#### error\_arguments

Name	Type	Description
code	string	Argument code
message	string	Message argument

#### error



<b>Name</b>	<b>Type</b>	<b>Description</b>
arguments	array[ <a href="#">error_arguments</a> ]	Message arguments
code	string	Error code
message	string	Error message
target	string	The target parameter that caused the error.

## Copyright information

Copyright © 2024 NetApp, Inc. All Rights Reserved. Printed in the U.S. No part of this document covered by copyright may be reproduced in any form or by any means—graphic, electronic, or mechanical, including photocopying, recording, taping, or storage in an electronic retrieval system—without prior written permission of the copyright owner.

Software derived from copyrighted NetApp material is subject to the following license and disclaimer:

THIS SOFTWARE IS PROVIDED BY NETAPP "AS IS" AND WITHOUT ANY EXPRESS OR IMPLIED WARRANTIES, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED. IN NO EVENT SHALL NETAPP BE LIABLE FOR ANY DIRECT, INDIRECT, INCIDENTAL, SPECIAL, EXEMPLARY, OR CONSEQUENTIAL DAMAGES (INCLUDING, BUT NOT LIMITED TO, PROCUREMENT OF SUBSTITUTE GOODS OR SERVICES; LOSS OF USE, DATA, OR PROFITS; OR BUSINESS INTERRUPTION) HOWEVER CAUSED AND ON ANY THEORY OF LIABILITY, WHETHER IN CONTRACT, STRICT LIABILITY, OR TORT (INCLUDING NEGLIGENCE OR OTHERWISE) ARISING IN ANY WAY OUT OF THE USE OF THIS SOFTWARE, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGE.

NetApp reserves the right to change any products described herein at any time, and without notice. NetApp assumes no responsibility or liability arising from the use of products described herein, except as expressly agreed to in writing by NetApp. The use or purchase of this product does not convey a license under any patent rights, trademark rights, or any other intellectual property rights of NetApp.

The product described in this manual may be protected by one or more U.S. patents, foreign patents, or pending applications.

LIMITED RIGHTS LEGEND: Use, duplication, or disclosure by the government is subject to restrictions as set forth in subparagraph (b)(3) of the Rights in Technical Data -Noncommercial Items at DFARS 252.227-7013 (FEB 2014) and FAR 52.227-19 (DEC 2007).

Data contained herein pertains to a commercial product and/or commercial service (as defined in FAR 2.101) and is proprietary to NetApp, Inc. All NetApp technical data and computer software provided under this Agreement is commercial in nature and developed solely at private expense. The U.S. Government has a non-exclusive, non-transferrable, nonsublicensable, worldwide, limited irrevocable license to use the Data only in connection with and in support of the U.S. Government contract under which the Data was delivered. Except as provided herein, the Data may not be used, disclosed, reproduced, modified, performed, or displayed without the prior written approval of NetApp, Inc. United States Government license rights for the Department of Defense are limited to those rights identified in DFARS clause 252.227-7015(b) (FEB 2014).

## Trademark information

NETAPP, the NETAPP logo, and the marks listed at <http://www.netapp.com/TM> are trademarks of NetApp, Inc. Other company and product names may be trademarks of their respective owners.