



## **Manage NFS services**

### **ONTAP 9.7 REST API reference**

NetApp  
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# Manage NFS services

## Protocols NFS services endpoint overview

### Retrieving an NFS configuration

```
# The API:
GET /api/protocols/nfs/services

# The call:
curl -X GET "https://<mgmt-ip>/api/protocols/nfs/services"
```

### Creating an NFS configuration for an SVM

```
# The API:
POST /api/protocols/nfs/services

# The call:
curl -d "@test_nfs_post.txt" -X POST "https://<mgmt-ip>/api/protocols/nfs/services"
test_nfs_post.txt (body):
{
  "svm": {
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "protocol": {
    "v4_id_domain": "nfs-nsr-w01.rtp.netapp.com"
  },
  "vstorage_enabled": "true"
}
```

### Updating an NFS configuration for an SVM

```
# The API:
PATCH /api/protocols/nfs/services/{svm.uuid}

# The call:
curl -d "@test_nfs_patch.txt" -X PATCH "https://<mgmt-
ip>/api/protocols/nfs/services/4a415601-548c-11e8-a21d-0050568bcb9"
test_nfs_patch.txt (body) :
{
  "protocol": {
    "v4_id_domain": "nfs-nsr-w01.rtp.netapp.com"
  },
  "vstorage_enabled": "false"
}
```

## Deleting an NFS configuration for an SVM

```
# The API:
DELETE /api/protocols/nfs/services/{svm.uuid}

# The call:
curl -X DELETE "https://<mgmt-ip>/api/protocols/nfs/services/4a415601-
548c-11e8-a21d-0050568bcb9"
```

## Performance monitoring

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

## Retrieve NFS configuration for SVMs

GET /protocols/nfs/services

Retrieves the NFS configuration of SVMs.

### Expensive properties

There is an added cost to retrieving values for these properties. They are not included by default in GET results and must be explicitly requested using the `fields` query parameter. See [DOC Requesting specific fields](#) to learn more.

- `statistics.*`
- `metric.*`

## Related ONTAP commands

- `vserver nfs show`
- `vserver nfs status`

## Learn more

- [DOC /protocols/nfs/services](#)

## Parameters

Name	Type	In	Required	Description
svm.uuid	string	query	False	Filter by svm.uuid
svm.name	string	query	False	Filter by svm.name
enabled	boolean	query	False	Filter by enabled
statistics.v3.status	string	query	False	Filter by statistics.v3.status
statistics.v3.latency_raw.other	integer	query	False	Filter by statistics.v3.latency_raw.other
statistics.v3.latency_raw.write	integer	query	False	Filter by statistics.v3.latency_raw.write
statistics.v3.latency_raw.read	integer	query	False	Filter by statistics.v3.latency_raw.read
statistics.v3.latency_raw.total	integer	query	False	Filter by statistics.v3.latency_raw.total
statistics.v3.timestamp	string	query	False	Filter by statistics.v3.timestamp
statistics.v3.throughput_raw.read	integer	query	False	Filter by statistics.v3.throughput_raw.read

Name	Type	In	Required	Description
statistics.v3.throughput_raw.write	integer	query	False	Filter by statistics.v3.throughput_raw.write
statistics.v3.throughput_raw.total	integer	query	False	Filter by statistics.v3.throughput_raw.total
statistics.v3.iops_raw.other	integer	query	False	Filter by statistics.v3.iops_raw.other
statistics.v3.iops_raw.write	integer	query	False	Filter by statistics.v3.iops_raw.write
statistics.v3.iops_raw.read	integer	query	False	Filter by statistics.v3.iops_raw.read
statistics.v3.iops_raw.total	integer	query	False	Filter by statistics.v3.iops_raw.total
metric.v3.duration	string	query	False	Filter by metric.v3.duration
metric.v3.latency.other	integer	query	False	Filter by metric.v3.latency.other
metric.v3.latency.write	integer	query	False	Filter by metric.v3.latency.write
metric.v3.latency.read	integer	query	False	Filter by metric.v3.latency.read
metric.v3.latency.total	integer	query	False	Filter by metric.v3.latency.total
metric.v3.throughput.read	integer	query	False	Filter by metric.v3.throughput.read

Name	Type	In	Required	Description
metric.v3.throughput.write	integer	query	False	Filter by metric.v3.throughput.write
metric.v3.throughput.total	integer	query	False	Filter by metric.v3.throughput.total
metric.v3.timestamp	string	query	False	Filter by metric.v3.timestamp
metric.v3.iops.other	integer	query	False	Filter by metric.v3.iops.other
metric.v3.iops.write	integer	query	False	Filter by metric.v3.iops.write
metric.v3.iops.read	integer	query	False	Filter by metric.v3.iops.read
metric.v3.iops.total	integer	query	False	Filter by metric.v3.iops.total
metric.v3.status	string	query	False	Filter by metric.v3.status
state	string	query	False	Filter by state
transport.tcp_enabled	boolean	query	False	Filter by transport.tcp_enabled
transport.udp_enabled	boolean	query	False	Filter by transport.udp_enabled
vstorage_enabled	boolean	query	False	Filter by vstorage_enabled
protocol.v40_enabled	boolean	query	False	Filter by protocol.v40_enabled
protocol.v40_features.acl_enabled	boolean	query	False	Filter by protocol.v40_features.acl_enabled

Name	Type	In	Required	Description
protocol.v40_features.read_delegation_enabled	boolean	query	False	Filter by protocol.v40_features.read_delegation_enabled
protocol.v40_features.write_delegation_enabled	boolean	query	False	Filter by protocol.v40_features.write_delegation_enabled
protocol.v41_enabled	boolean	query	False	Filter by protocol.v41_enabled
protocol.v4_id_domain	string	query	False	Filter by protocol.v4_id_domain
protocol.v41_features.pnfs_enabled	boolean	query	False	Filter by protocol.v41_features.pnfs_enabled
protocol.v41_features.read_delegation_enabled	boolean	query	False	Filter by protocol.v41_features.read_delegation_enabled
protocol.v41_features.write_delegation_enabled	boolean	query	False	Filter by protocol.v41_features.write_delegation_enabled
protocol.v41_features.acl_enabled	boolean	query	False	Filter by protocol.v41_features.acl_enabled
protocol.v3_enabled	boolean	query	False	Filter by protocol.v3_enabled
fields	array[string]	query	False	Specify the fields to return.
max_records	integer	query	False	Limit the number of records returned.



Name	Type	In	Required	Description
return_timeout	integer	query	False	The number of seconds to allow the call to execute before returning. When iterating over a collection, the default is 15 seconds. ONTAP returns earlier if either max records or the end of the collection is reached.
return_records	boolean	query	False	The default is true for GET calls. When set to false, only the number of records is returned.
order_by	array[string]	query	False	Order results by specified fields and optional [asc

## Response

Status: 200, Ok

Name	Type	Description
_links	<a href="#">_links</a>	
num_records	integer	Number of NFS Server Records
records	array[ <a href="#">nfs_service</a> ]	

## Example response

```
{
  "_links": {
    "next": {
      "href": "/api/resourcelink"
    },
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "records": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "metric": {
      "v3": {
        "_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"
      }
    },
    "state": "online",
    "statistics": {
```

```

    "v3": {
      "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"
    },
    "svm": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "svm1",
      "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
    }
  }
}

```

## Error

Status: Default, Error

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
next	<a href="#">href</a>	
self	<a href="#">href</a>	

\_links

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

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
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.

### v3

The NFSv3 operations

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.

Name	Type	Description
latency	<a href="#">latency</a>	The round trip latency in microseconds observed at the storage object.
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 do 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.

metric

Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.

Name	Type	Description
v3	<a href="#">v3</a>	The NFSv3 operations

v40\_features

Name	Type	Description
acl_enabled	boolean	Specifies whether NFSv4.0 ACLs is enabled.
read_delegation_enabled	boolean	Specifies whether NFSv4.0 Read Delegation is enabled.
write_delegation_enabled	boolean	Specifies whether NFSv4.0 Write Delegation is enabled.

#### v41\_features

Name	Type	Description
acl_enabled	boolean	Specifies whether NFSv4.1 ACLs is enabled.
pnfs_enabled	boolean	Specifies whether NFSv4.1 Parallel NFS is enabled.
read_delegation_enabled	boolean	Specifies whether NFSv4.1 Read Delegation is enabled.
write_delegation_enabled	boolean	Specifies whether NFSv4.1 Write Delegation is enabled.

#### protocol

Name	Type	Description
v3_enabled	boolean	Specifies whether NFSv3 protocol is enabled.
v40_enabled	boolean	Specifies whether NFSv4.0 protocol is enabled.
v40_features	<a href="#">v40_features</a>	
v41_enabled	boolean	Specifies whether NFSv4.1 protocol is enabled.
v41_features	<a href="#">v41_features</a>	
v4_id_domain	string	Specifies the domain portion of the string form of user and group names as defined by the NFSv4 protocol.



### 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
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.

v3

The NFSv3 operations

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.

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 do 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.

#### statistics

Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.

Name	Type	Description
v3	v3	The NFSv3 operations

#### svm

Name	Type	Description
_links	_links	

Name	Type	Description
name	string	The name of the SVM.
uuid	string	The unique identifier of the SVM.

#### transport

Name	Type	Description
tcp_enabled	boolean	Specifies whether TCP transports are enabled on the server.
udp_enabled	boolean	Specifies whether UDP transports are enabled on the server.

#### nfs\_service

Name	Type	Description
_links	<a href="#">_links</a>	
enabled	boolean	Specifies if the NFS service is administratively enabled.
metric	<a href="#">metric</a>	Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
protocol	<a href="#">protocol</a>	
state	string	Specifies the state of the NFS service on the SVM. The following values are supported: * online - NFS server is ready to accept client requests. * offline - NFS server is not ready to accept client requests.
statistics	<a href="#">statistics</a>	Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
svm	<a href="#">svm</a>	
transport	<a href="#">transport</a>	
vstorage_enabled	boolean	Specifies whether VMware vstorage feature is enabled.

#### 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 an NFS configuration for an SVM

POST /protocols/nfs/services

Creates an NFS configuration for an SVM.

### Required properties

- `svm.uuid` or `svm.name` - Existing SVM for which to create the NFS configuration.

### Default property values

If not specified in POST, the following default property values are assigned:

- `enabled` - *true*
- `state` - *online*
- `transport.udp_enabled` - *true*
- `transport.tcp_enabled` - *true*
- `protocol.v3_enabled` - *true*
- `protocol.v4_id_domain` - *defaultv4iddomain.com*
- `protocol.v4_enabled` - *false*
- `protocol.v41_enabled` - *false*
- `protocol.v40_features.acl_enabled` - *false*

- `protocol.v40_features.read_delegation_enabled` - *false*
- `protocol.v40_features.write_delegation_enabled` - *false*
- `protocol.v41_features.acl_enabled` - *false*
- `protocol.v41_features.read_delegation_enabled` - *false*
- `protocol.v41_features.write_delegation_enabled` - *false*
- `protocol.v41_features.pnfs_enabled` - *false*
- `vstorage_enabled` - *false*

## Related ONTAP commands

- `vserver nfs create`

## Learn more

- [DOC /protocols/nfs/services](#)

## Parameters

Name	Type	In	Required	Description
return_records	boolean	query	False	The default is false. If set to true, the records are returned.

## Request Body

Name	Type	Description
<a href="#">_links</a>	<a href="#">_links</a>	
enabled	boolean	Specifies if the NFS service is administratively enabled.
metric	<a href="#">metric</a>	Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
protocol	<a href="#">protocol</a>	
state	string	Specifies the state of the NFS service on the SVM. The following values are supported: * online - NFS server is ready to accept client requests. * offline - NFS server is not ready to accept client requests.

Name	Type	Description
statistics	<a href="#">statistics</a>	Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
svm	<a href="#">svm</a>	
transport	<a href="#">transport</a>	
vstorage_enabled	boolean	Specifies whether VMware vstorage feature is enabled.

## Example request

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "metric": {
    "v3": {
      "_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"
    }
  },
  "state": "online",
  "statistics": {
    "v3": {
      "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"
    }
  },
  "svm": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "name": "svm1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
  }
}

```

## Response

Status: 201, Created

Name	Type	Description
_links	<a href="#">_links</a>	
num_records	integer	Number of NFS Server Records
records	array[ <a href="#">nfs_service</a> ]	

## Example response

```
{
  "_links": {
    "next": {
      "href": "/api/resourcelink"
    },
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "records": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "metric": {
      "v3": {
        "_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"
      }
    },
    "state": "online",
    "statistics": {
```

```

    "v3": {
      "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"
    },
    "svm": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "svm1",
      "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
    }
  }
}

```

## Error

Status: Default

### ONTAP Error Response Codes

Error Code	Description
3276916	Vserver is not running
3276994	Kerberos must be disabled on all LIFs on Vserver before adding or removing AES encryption. Disable Kerberos on the LIF and try again

Error Code	Description
3277038	Cannot enable \"showmount\" feature because it requires an effective cluster version of Data ONTAP 8.3.0 or later
3277049	Cannot enable \"showmount\" feature on ID-Discard Vserver. Ensure that the Vserver is initialized and retry the command
3277052	NFSv4.x access to transitioned volumes in this Vserver could trigger conversion of non-Unicode directories to Unicode, which might impact data-serving performance. Before enabling NFSv4.x for this Vserver, refer to the Data and Configuration Transition Guide
3277069	Cannot disable TCP because the SnapDiff RPC server is in the \"on\" state
3277089	Attempting to create an NFS server using 64-bits for NFSv3 FSIDs and File IDs on Vserver. Older client software might not work with 64-bit identifiers
3277099	Domain name contains invalid characters or it is too short. Allowed characters are: alphabetical characters (A-Za-z), numeric characters (0-9), minus sign (-), and the period (.). The first character must be alphabetical or numeric, last character must not be a minus sign or a period. Minimum supported length: 2 characters, maximum of 256 characters

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>	

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.

Name	Type	Description
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
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.

## v3

The NFSv3 operations

Name	Type	Description
_links	<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 do not have the latest data.
throughput	throughput	The rate of throughput bytes per second observed at the storage object.
timestamp	string	The timestamp of the performance data.

#### metric

Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.

Name	Type	Description
v3	v3	The NFSv3 operations

#### v40\_features

Name	Type	Description
acl_enabled	boolean	Specifies whether NFSv4.0 ACLs is enabled.
read_delegation_enabled	boolean	Specifies whether NFSv4.0 Read Delegation is enabled.



Name	Type	Description
write_delegation_enabled	boolean	Specifies whether NFSv4.0 Write Delegation is enabled.

#### v41\_features

Name	Type	Description
acl_enabled	boolean	Specifies whether NFSv4.1 ACLs is enabled.
pnfs_enabled	boolean	Specifies whether NFSv4.1 Parallel NFS is enabled.
read_delegation_enabled	boolean	Specifies whether NFSv4.1 Read Delegation is enabled.
write_delegation_enabled	boolean	Specifies whether NFSv4.1 Write Delegation is enabled.

#### protocol

Name	Type	Description
v3_enabled	boolean	Specifies whether NFSv3 protocol is enabled.
v40_enabled	boolean	Specifies whether NFSv4.0 protocol is enabled.
v40_features	<a href="#">v40_features</a>	
v41_enabled	boolean	Specifies whether NFSv4.1 protocol is enabled.
v41_features	<a href="#">v41_features</a>	
v4_id_domain	string	Specifies the domain portion of the string form of user and group names as defined by the NFSv4 protocol.

#### 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
read	integer	Performance metric for read I/O operations.

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

v3

The NFSv3 operations

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.

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 do 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.

#### statistics

Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.

Name	Type	Description
v3	v3	The NFSv3 operations

#### svm

Name	Type	Description
_links	_links	

Name	Type	Description
name	string	The name of the SVM.
uuid	string	The unique identifier of the SVM.

#### transport

Name	Type	Description
tcp_enabled	boolean	Specifies whether TCP transports are enabled on the server.
udp_enabled	boolean	Specifies whether UDP transports are enabled on the server.

#### nfs\_service

Name	Type	Description
_links	<a href="#">_links</a>	
enabled	boolean	Specifies if the NFS service is administratively enabled.
metric	<a href="#">metric</a>	Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
protocol	<a href="#">protocol</a>	
state	string	Specifies the state of the NFS service on the SVM. The following values are supported: * online - NFS server is ready to accept client requests. * offline - NFS server is not ready to accept client requests.
statistics	<a href="#">statistics</a>	Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
svm	<a href="#">svm</a>	
transport	<a href="#">transport</a>	
vstorage_enabled	boolean	Specifies whether VMware vstorage feature is enabled.

## \_links

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

## nfs\_service

Name	Type	Description
_links	<a href="#">_links</a>	
enabled	boolean	Specifies if the NFS service is administratively enabled.
metric	<a href="#">metric</a>	Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
protocol	<a href="#">protocol</a>	
state	string	Specifies the state of the NFS service on the SVM. The following values are supported: <ul style="list-style-type: none"><li>• online - NFS server is ready to accept client requests.</li><li>• offline - NFS server is not ready to accept client requests.</li></ul>
statistics	<a href="#">statistics</a>	Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
svm	<a href="#">svm</a>	
transport	<a href="#">transport</a>	
vstorage_enabled	boolean	Specifies whether VMware vstorage feature is enabled.

## error\_arguments

Name	Type	Description
code	string	Argument code

Name	Type	Description
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.

## Delete NFS configuration for an SVM

```
DELETE /protocols/nfs/services/{svm.uuid}
```

Deletes the NFS configuration of an SVM.

### Related ONTAP commands

- `vserver nfs delete`

### Learn more

- [DOC /protocols/nfs/services](#)

### Parameters

Name	Type	In	Required	Description
svm.uuid	string	path	True	

### Response

```
Status: 200, Ok
```

### Error

```
Status: Default
```

## ONTAP Error Response Codes

Error Code	Description
3276916	Vserver is not running
3277008	NFS Kerberos must be disabled on all LIFs of Vserver before deleting the NFS configuration. When all LIFs are disabled, try the operation
3277009	NFS Kerberos realms associated with the Vserver are deleted
3277111	Internal error. Failed to remove NFS-specific security trace filter for Vserver
3277112	Internal error. Failed to modify the protocols field of a security trace filter for Vserver

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

### 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.

## Retrieve NFS configuration for an SVM

GET /protocols/nfs/services/{svm.uuid}

Retrieves the NFS configuration of an SVM.

### Related ONTAP commands

- `vserver nfs show`
- `vserver nfs status`

### Learn more

- [DOC /protocols/nfs/services](#)

### Parameters

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

## Response

Status: 200, Ok

Name	Type	Description
_links	<a href="#">_links</a>	
enabled	boolean	Specifies if the NFS service is administratively enabled.
metric	<a href="#">metric</a>	Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
protocol	<a href="#">protocol</a>	
state	string	Specifies the state of the NFS service on the SVM. The following values are supported: <ul style="list-style-type: none"><li>• online - NFS server is ready to accept client requests.</li><li>• offline - NFS server is not ready to accept client requests.</li></ul>
statistics	<a href="#">statistics</a>	Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
svm	<a href="#">svm</a>	
transport	<a href="#">transport</a>	
vstorage_enabled	boolean	Specifies whether VMware vstorage feature is enabled.

## Example response

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "metric": {
    "v3": {
      "_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"
    }
  },
  "state": "online",
  "statistics": {
    "v3": {
      "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"
    }
  },
  "svm": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "name": "svm1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
  }
}

```

## Error

Status: Default, Error

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>	

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.

Name	Type	Description
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
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.

## v3

The NFSv3 operations

Name	Type	Description
_links	<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 do not have the latest data.
throughput	throughput	The rate of throughput bytes per second observed at the storage object.
timestamp	string	The timestamp of the performance data.

#### metric

Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.

Name	Type	Description
v3	v3	The NFSv3 operations

#### v40\_features

Name	Type	Description
acl_enabled	boolean	Specifies whether NFSv4.0 ACLs is enabled.
read_delegation_enabled	boolean	Specifies whether NFSv4.0 Read Delegation is enabled.



Name	Type	Description
write_delegation_enabled	boolean	Specifies whether NFSv4.0 Write Delegation is enabled.

#### v41\_features

Name	Type	Description
acl_enabled	boolean	Specifies whether NFSv4.1 ACLs is enabled.
pnfs_enabled	boolean	Specifies whether NFSv4.1 Parallel NFS is enabled.
read_delegation_enabled	boolean	Specifies whether NFSv4.1 Read Delegation is enabled.
write_delegation_enabled	boolean	Specifies whether NFSv4.1 Write Delegation is enabled.

#### protocol

Name	Type	Description
v3_enabled	boolean	Specifies whether NFSv3 protocol is enabled.
v40_enabled	boolean	Specifies whether NFSv4.0 protocol is enabled.
v40_features	<a href="#">v40_features</a>	
v41_enabled	boolean	Specifies whether NFSv4.1 protocol is enabled.
v41_features	<a href="#">v41_features</a>	
v4_id_domain	string	Specifies the domain portion of the string form of user and group names as defined by the NFSv4 protocol.

#### 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
read	integer	Performance metric for read I/O operations.

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

v3

The NFSv3 operations

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.

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 do 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.

#### statistics

Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.

Name	Type	Description
v3	<a href="#">v3</a>	The NFSv3 operations

#### svm

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

Name	Type	Description
name	string	The name of the SVM.
uuid	string	The unique identifier of the SVM.

#### transport

Name	Type	Description
tcp_enabled	boolean	Specifies whether TCP transports are enabled on the server.
udp_enabled	boolean	Specifies whether UDP transports are enabled on the server.

#### 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 NFS configuration for an SVM

```
PATCH /protocols/nfs/services/{svm.uuid}
```

Updates the NFS configuration of an SVM.

### Related ONTAP commands

- `vserver nfs modify`

- `vserver nfs on`
- `vserver nfs off`
- `vserver nfs start`
- `vserver nfs stop`

## Learn more

- [DOC /protocols/nfs/services](#)

## Parameters

Name	Type	In	Required	Description
svm.uuid	string	path	True	

## Request Body

Name	Type	Description
_links	<a href="#">_links</a>	
enabled	boolean	Specifies if the NFS service is administratively enabled.
metric	<a href="#">metric</a>	Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
protocol	<a href="#">protocol</a>	
state	string	Specifies the state of the NFS service on the SVM. The following values are supported: <ul style="list-style-type: none"> <li>• online - NFS server is ready to accept client requests.</li> <li>• offline - NFS server is not ready to accept client requests.</li> </ul>
statistics	<a href="#">statistics</a>	Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
svm	<a href="#">svm</a>	
transport	<a href="#">transport</a>	
vstorage_enabled	boolean	Specifies whether VMware vstorage feature is enabled.

## Example request

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "metric": {
    "v3": {
      "_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"
    }
  },
  "state": "online",
  "statistics": {
    "v3": {
      "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"
}
},
"svm": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "svm1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
}
}

```

## Response

Status: 200, Ok

## Error

Status: Default

### ONTAP Error Response Codes

Error Code	Description
3276916	Vserver is not running
3277069	Cannot disable TCP because the SnapDiff RPC server is in the \"on\" state
3277087	Attempting to reduce the number of bits used for NFSv3 FSIDs and File IDs from 64 to 32 on Vserver. This could result in collisions between different File IDs and is not recommended



Error Code	Description
3277088	Attempting to increase the number of bits used for NFSv3 FSIDs and File IDs from 32 to 64 on Vserver. This could result in older client software no longer working with the volumes owned by Vserver
3277090	Attempting to disallow multiple FSIDs per mount point on Vserver. Since this Vserver currently uses 32-bit NFSv3 FSIDs and File IDs, this could result in collisions between different File IDs and is not recommended
3277099	Domain name contains invalid characters or its too short. Allowed characters are: alphabetical characters (A-Za-z), numeric characters (0-9), minus sign (-), and the period (.). The first character must be alphabetical or numeric, last character must not be a minus sign or a period. Minimum supported length: 2 characters, maximum of 256 characters

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>	

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.

Name	Type	Description
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
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.

### v3

The NFSv3 operations

Name	Type	Description
_links	<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 do not have the latest data.
throughput	throughput	The rate of throughput bytes per second observed at the storage object.
timestamp	string	The timestamp of the performance data.

#### metric

Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.

Name	Type	Description
v3	v3	The NFSv3 operations

#### v40\_features

Name	Type	Description
acl_enabled	boolean	Specifies whether NFSv4.0 ACLs is enabled.
read_delegation_enabled	boolean	Specifies whether NFSv4.0 Read Delegation is enabled.

Name	Type	Description
write_delegation_enabled	boolean	Specifies whether NFSv4.0 Write Delegation is enabled.

#### v41\_features

Name	Type	Description
acl_enabled	boolean	Specifies whether NFSv4.1 ACLs is enabled.
pnfs_enabled	boolean	Specifies whether NFSv4.1 Parallel NFS is enabled.
read_delegation_enabled	boolean	Specifies whether NFSv4.1 Read Delegation is enabled.
write_delegation_enabled	boolean	Specifies whether NFSv4.1 Write Delegation is enabled.

#### protocol

Name	Type	Description
v3_enabled	boolean	Specifies whether NFSv3 protocol is enabled.
v40_enabled	boolean	Specifies whether NFSv4.0 protocol is enabled.
v40_features	<a href="#">v40_features</a>	
v41_enabled	boolean	Specifies whether NFSv4.1 protocol is enabled.
v41_features	<a href="#">v41_features</a>	
v4_id_domain	string	Specifies the domain portion of the string form of user and group names as defined by the NFSv4 protocol.

#### 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
read	integer	Performance metric for read I/O operations.

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

v3

The NFSv3 operations

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.

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 do 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.

#### statistics

Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.

Name	Type	Description
v3	v3	The NFSv3 operations

#### svm

Name	Type	Description
_links	_links	



Name	Type	Description
name	string	The name of the SVM.
uuid	string	The unique identifier of the SVM.

#### transport

Name	Type	Description
tcp_enabled	boolean	Specifies whether TCP transports are enabled on the server.
udp_enabled	boolean	Specifies whether UDP transports are enabled on the server.

#### nfs\_service

Name	Type	Description
_links	<a href="#">_links</a>	
enabled	boolean	Specifies if the NFS service is administratively enabled.
metric	<a href="#">metric</a>	Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
protocol	<a href="#">protocol</a>	
state	string	Specifies the state of the NFS service on the SVM. The following values are supported: <ul style="list-style-type: none"> <li>• online - NFS server is ready to accept client requests.</li> <li>• offline - NFS server is not ready to accept client requests.</li> </ul>
statistics	<a href="#">statistics</a>	Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.
svm	<a href="#">svm</a>	
transport	<a href="#">transport</a>	

Name	Type	Description
vstorage_enabled	boolean	Specifies whether VMware vstorage feature is enabled.

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.

## Retrieve NFS protocol historical performance metrics

GET /protocols/nfs/services/{svm.uuid}/metrics

Retrieves historical performance metrics for the NFS protocol of an SVM.

### Parameters

Name	Type	In	Required	Description
timestamp	string	query	False	Filter by timestamp
v3.iops.other	integer	query	False	Filter by v3.iops.other
v3.iops.write	integer	query	False	Filter by v3.iops.write
v3.iops.read	integer	query	False	Filter by v3.iops.read

Name	Type	In	Required	Description
v3.iops.total	integer	query	False	Filter by v3.iops.total
v3.status	string	query	False	Filter by v3.status
v3.latency.other	integer	query	False	Filter by v3.latency.other
v3.latency.write	integer	query	False	Filter by v3.latency.write
v3.latency.read	integer	query	False	Filter by v3.latency.read
v3.latency.total	integer	query	False	Filter by v3.latency.total
v3.duration	string	query	False	Filter by v3.duration
v3.throughput.read	integer	query	False	Filter by v3.throughput.read
v3.throughput.write	integer	query	False	Filter by v3.throughput.write
v3.throughput.total	integer	query	False	Filter by v3.throughput.total
return_timeout	integer	query	False	<p>The number of seconds to allow the call to execute before returning. When iterating over a collection, the default is 15 seconds. ONTAP returns earlier if either max records or the end of the collection is reached.</p> <ul style="list-style-type: none"> <li>• Default value: 1</li> </ul>
fields	array[string]	query	False	Specify the fields to return.

Name	Type	In	Required	Description
max_records	integer	query	False	Limit the number of records returned.
order_by	array[string]	query	False	Order results by specified fields and optional [asc
desc] direction. Default direction is 'asc' for ascending.	return_records	boolean	query	False
The default is true for GET calls. When set to false, only the number of records is returned.  • Default value: 1	svm.uuid	string	path	True
Unique identifier of the SVM.	interval	string	query	False

## Response

Status: 200, Ok

Name	Type	Description
_links	<a href="#">_links</a>	
num_records	integer	Number of records
records	array[ <a href="#">records</a> ]	

## Example response

```
{
  "_links": {
    "next": {
      "href": "/api/resourcelink"
    },
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "records": {
    "v3": {
      "_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"
    }
  }
}
```

## 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
next	<a href="#">href</a>	
self	<a href="#">href</a>	

\_links

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

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
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.

### v3

The NFSv3 operations

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.



Name	Type	Description
latency	<a href="#">latency</a>	The round trip latency in microseconds observed at the storage object.
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 do 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.

#### records

Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol.

Name	Type	Description
v3	<a href="#">v3</a>	The NFSv3 operations

#### error\_arguments

Name	Type	Description
code	string	Argument code

Name	Type	Description
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.

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