



Manage NFS services

ONTAP 9.7 REST API reference

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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-0050568bcbc9"
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-0050568bcbc9"
```

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 | _links | |
| num_records | integer | Number of NFS Server Records |
| records | array[nfs_service] | |

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 | href | |
| self | href | |

_links

| Name | Type | Description |
|------|----------------------|-------------|
| self | href | |

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 |
|------------------------|------------------------|--|
| _links | _links | |
| 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 | iops | The rate of I/O operations observed at the storage object. |

| Name | Type | Description |
|------------|----------------------------|---|
| latency | latency | 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 | 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. |
| 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 | v40_features | |
| v41_enabled | boolean | Specifies whether NFSv4.1 protocol is enabled. |
| v41_features | v41_features | |
| 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 | 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. |

| 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 | _links | |
| enabled | boolean | Specifies if the NFS service is administratively enabled. |
| metric | metric | Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol. |
| protocol | protocol | |
| 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 | statistics | Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol. |
| svm | svm | |
| transport | transport | |
| 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[error_arguments] | 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 |
|-----------------------------|---------|-------|----------|---|
| <code>return_records</code> | boolean | query | False | The default is false. If set to true, the records are returned. |

Request Body

| Name | Type | Description |
|-----------------------|--------------------------|---|
| <code>_links</code> | _links | |
| <code>enabled</code> | boolean | Specifies if the NFS service is administratively enabled. |
| <code>metric</code> | metric | Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol. |
| <code>protocol</code> | protocol | |
| <code>state</code> | 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 | statistics | Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol. |
| svm | svm | |
| transport | transport | |
| 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 | _links | |
| num_records | integer | Number of NFS Server Records |
| records | array[nfs_service] | |

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 | href | |

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 | _links | |
| 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 | iops | The rate of I/O operations observed at the storage object. |
| latency | latency | 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 | v40_features | |
| v41_enabled | boolean | Specifies whether NFSv4.1 protocol is enabled. |
| v41_features | v41_features | |
| 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 | 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. |

| 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 | _links | |
| enabled | boolean | Specifies if the NFS service is administratively enabled. |
| metric | metric | Historical performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol. |
| protocol | protocol | |
| 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 | statistics | Realtime performance numbers, such as IOPS latency and throughput, for SVM-NFS protocol. |
| svm | svm | |
| transport | transport | |
| vstorage_enabled | boolean | Specifies whether VMware vstorage feature is enabled. |

_links

| Name | Type | Description |
|------|----------------------|-------------|
| next | href | |
| self | href | |

nfs_service

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

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

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 | _links | |
| 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 | iops | The rate of I/O operations observed at the storage object. |
| latency | latency | 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 | v40_features | |
| v41_enabled | boolean | Specifies whether NFSv4.1 protocol is enabled. |
| v41_features | v41_features | |
| 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 | 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. |

| 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. |

error_arguments

| Name | Type | Description |
|---------|--------|------------------|
| code | string | Argument code |
| message | string | Message argument |

error

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

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 | _links | |
| 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 | iops | The rate of I/O operations observed at the storage object. |
| latency | latency | 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 | v40_features | |
| v41_enabled | boolean | Specifies whether NFSv4.1 protocol is enabled. |
| v41_features | v41_features | |
| 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 | 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. |

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

| 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[error_arguments] | 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"> • Default value: 1 |
| 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 | _links | |
| num_records | integer | Number of records |
| records | array[records] | |

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 | 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 | href | |
| self | href | |

_links

| Name | Type | Description |
|------|----------------------|-------------|
| self | href | |

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 |
|------------------------|------------------------|--|
| _links | _links | |
| 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 | iops | The rate of I/O operations observed at the storage object. |

| Name | Type | Description |
|------------|----------------------------|---|
| latency | latency | 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 | throughput | 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 | v3 | 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[error_arguments] | Message arguments |
| code | string | Error code |
| message | string | Error message |
| target | string | The target parameter that caused the error. |

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