



SAN

REST API reference

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SAN

SAN overview

Overview

The storage area network (SAN) endpoints and objects enable you to configure, provision, and manage SAN-related objects.

Fibre Channel

Logins

Fibre Channel logins represent connections, formed by Fibre Channel initiators, that have successfully logged in to ONTAP. This represents the Fibre Channel login on which higher-level protocols, such as Fibre Channel Protocol (FCP) and Non-Volatile Memory Express over Fibre Channel (NVMe over FC), rely.

The Fibre Channel logins REST API provides information about active Fibre Channel logins.

WWPN Aliases

A WWPN (world wide port name) is a unique 64-bit identifier for a Fibre Channel initiator. It is displayed as a 16-character hexadecimal value. SAN administrators may find it easier to identify Fibre Channel initiators using an alias, especially in larger SANs.

The WWPN alias REST API allows you to create, delete and discover aliases for WWPNs.

Services

A Fibre Channel Protocol (FCP) service defines the properties of the Fibre Channel Protocol target for an SVM. There can be at most one FCP service for a given SVM. An SVM's FCP service must be created before FCP initiators can login to the SVM.

The Fibre Channel Protocol (FCP) service REST API allows you to create, update, delete, and discover Fibre Channel Services for SVMs. Fibre Channel interfaces are the logical endpoints for Fibre Channel network connections to an SVM.

iSCSI

Credentials

An iSCSI credentials object defines the authentication credentials to be used between an iSCSI initiator and ONTAP. It identifies an authentication type, user names, and the passwords that must be used to authenticate a specific initiator.

The iSCSI credentials REST API allows you to create, update, delete, and discover iSCSI credential objects.

Services

An iSCSI service defines the properties of the iSCSI target for an SVM. There can be at most one iSCSI service for an SVM. An SVM's iSCSI service must be created before iSCSI initiators can login to the SVM.

The iSCSI service REST API allows you to create, update, delete, and discover iSCSI services for SVMs.

Sessions

An iSCSI session consists of one or more TCP connections that link an iSCSI initiator with an iSCSI target. TCP connections can be added and removed from an iSCSI session by the iSCSI initiator. Across all TCP connections within an iSCSI session, an initiator sees one and the same target. After the connection is established, iSCSI control, data, and status messages are communicated over the session.

The iSCSI sessions REST API provides information about iSCSI initiators that have successfully logged in to ONTAP.

Learn More

- *IP Interfaces* found in the *networking* section. IP interfaces are the logical endpoints for iSCSI network connections to an SVM.

Initiator Groups

An initiator group (igroup) is a collection of Fibre Channel WWPNs (world wide port names), iSCSI IQNs (qualified names), iSCSI EUIs (extended unique identifiers), or any combination of these, that identify host initiators.

Initiator groups are used to control which hosts can access specific LUNs. To grant access to a LUN from one or more hosts, a network administrator creates an initiator group containing the hosts' initiator names, and then creates a LUN map that associates the initiator group with the LUN.

The initiator group REST API allows you to create, update, delete, and discover initiator groups. It also enables you to add and remove initiators that can access the target and associated LUNs.

LUN Maps

A LUN map is an association between a LUN and an initiator group. When a LUN is mapped to an initiator group, the group's initiators are granted access to the LUN. The relationship between an initiator group and a LUN is many initiator groups to many LUNs.

The LUN map REST API allows you to create, delete, and discover LUN maps.

LUNs

A LUN is the logical representation of storage in a storage area network (SAN).

The LUN REST API allows you to create, update, delete, and discover LUNs.

Retrieve FC port information

Network FC logins endpoint overview

Overview

Fibre Channel (FC) logins represent connections formed by FC initiators that have successfully logged in to ONTAP. This represents the FC login on which higher-level protocols such as Fibre Channel Protocol and NVMe over FC (NVMe/FC) rely.

The Fibre Channel logins REST API provides information about active FC logins.

Examples

Retrieving all FC logins

```
# The API:  
GET /api/network/fc/logins  
  
# The call:  
curl -X GET "https://<mgmt-ip>/api/network/fc/logins" -H "accept:  
application/hal+json"  
  
# The response:  
{  
  "records": [  
    {  
      "svm": {  
        "uuid": "056403da-83a7-4b13-bc78-6a93e8ea3596",  
        "name": "svm1",  
        "_links": {  
          "self": {  
            "href": "/api/svm/svms/056403da-83a7-4b13-bc78-6a93e8ea3596"  
          }  
        }  
      },  
      "interface": {  
        "uuid": "01056403-1383-bc4b-786a-93e8ea35969d",  
        "name": "lif1",  
        "_links": {  
          "self": {  
            "href": "/api/network/fc/interfaces/01056403-1383-bc4b-786a-  
93e8ea35969d"  
          }  
        }  
      },  
      "initiator": {
```

```

        "wwpn": "8b:21:2f:07:00:00:00:00"
    },
    "_links": {
        "self": {
            "href": "/api/network/fc/logins/01056403-1383-bc4b-786a-
93e8ea35969d/8b%3A21%3A2f%3A07%3A00%3A00%3A00%3A00"
        }
    }
},
{
    "svm": {
        "uuid": "056403da-83a7-4b13-bc78-6a93e8ea3596",
        "name": "svm1",
        "_links": {
            "self": {
                "href": "/api/svm/svms/056403da-83a7-4b13-bc78-6a93e8ea3596"
            }
        }
    },
    "interface": {
        "uuid": "02056403-1383-bc4b-786a-93e8ea35969d",
        "name": "lif2",
        "_links": {
            "self": {
                "href": "/api/network/fc/interfaces/02056403-1383-bc4b-786a-
93e8ea35969d"
            }
        }
    },
    "initiator": {
        "wwpn": "8c:21:2f:07:00:00:00:00"
    },
    "_links": {
        "self": {
            "href": "/api/network/fc/logins/02056403-1383-bc4b-786a-
93e8ea35969d/8c%3A21%3A2f%3A07%3A00%3A00%3A00%3A00"
        }
    }
},
{
    "svm": {
        "uuid": "156403da-83a7-4b13-bc78-6a93e8ea3596",
        "name": "svm2",
        "_links": {
            "self": {
                "href": "/api/svm/svms/156403da-83a7-4b13-bc78-6a93e8ea3596"
            }
        }
    }
}

```

```

        }
    }
},
"interface": {
    "uuid": "03056403-1383-bc4b-786a-93e8ea35969d",
    "name": "lif3",
    "_links": {
        "self": {
            "href": "/api/network/fc/interfaces/00056403-1383-bc4b-786a-93e8ea35969d"
        }
    }
},
"initiator": {
    "wwpn": "8a:21:2f:07:00:00:00:00"
},
"_links": {
    "self": {
        "href": "/api/network/fc/logins/00056403-1383-bc4b-786a-93e8ea35969d/8a%3A21%3A2f%3A07%3A00%3A00%3A00%3A00"
    }
}
}
],
"num_records": 3,
"_links": {
    "self": {
        "href": "/api/network/fc/logins"
    }
}
}
}

```

Retrieving all FC logins with data protocol *fcp* in SVM *svm1*

The `svm.name` and `protocol` query parameters are used to perform the query.

```

# The API:
GET /api/network/fc/logins

# The call:
curl -X GET "https://<mgmt-
ip>/api/network/fc/logins?svm.name=svm1&protocol=fcp" -H "accept:
application/hal+json"

```

```

# The response:
{
"records": [
{
  "svm": {
    "uuid": "056403da-83a7-4b13-bc78-6a93e8ea3596",
    "name": "svm1",
    "_links": {
      "self": {
        "href": "/api/svm/svms/056403da-83a7-4b13-bc78-6a93e8ea3596"
      }
    }
  },
  "interface": {
    "uuid": "01056403-1383-bc4b-786a-93e8ea35969d",
    "name": "lif2",
    "_links": {
      "self": {
        "href": "/api/network/fc/interfaces/01056403-1383-bc4b-786a-93e8ea35969d"
      }
    }
  },
  "initiator": {
    "wwpn": "8b:21:2f:07:00:00:00:00"
  },
  "protocol": "fcp",
  "_links": {
    "self": {
      "href": "/api/network/fc/logins/01056403-1383-bc4b-786a-93e8ea35969d/8b%3A21%3A2f%3A07%3A00%3A00%3A00%3A00"
    }
  }
},
{
  "svm": {
    "uuid": "056403da-83a7-4b13-bc78-6a93e8ea3596",
    "name": "svm1",
    "_links": {
      "self": {
        "href": "/api/svm/svms/056403da-83a7-4b13-bc78-6a93e8ea3596"
      }
    }
  },
  "interface": {
    "uuid": "02056403-1383-bc4b-786a-93e8ea35969d",
    "name": "lif2"
  }
}
]
}

```

```

    "name": "lif3",
    "_links": {
        "self": {
            "href": "/api/network/fc/interfaces/02056403-1383-bc4b-786a-
93e8ea35969d"
        }
    },
    "initiator": {
        "wwpn": "8c:21:2f:07:00:00:00:00"
    },
    "protocol": "fcp",
    "_links": {
        "self": {
            "href": "/api/network/fc/logins/02056403-1383-bc4b-786a-
93e8ea35969d/8c%3A21%3A2f%3A07%3A00%3A00%3A00%3A00"
        }
    }
},
"num_records": 2,
"_links": {
    "self": {
        "href": "/api/network/fc/logins?svm.name=svm1&protocol=fcp"
    }
}
}

```

Retrieving all FC logins for initiators belonging to *igroup1* and returning all of their properties

The `igroups.name` query parameter is used to perform the query. The `fields` query parameter is used to return all of the properties.

```

# The API:
GET /api/network/fc/logins

# The call:
curl -X GET "https://<mgmt-
ip>/api/network/fc/logins?igroups.name=igroup1&fields=*" -H "accept:
application/hal+json"

# The response:
{
"records": [

```

```
{
  "svm": {
    "uuid": "056403da-83a7-4b13-bc78-6a93e8ea3596",
    "name": "svm1",
    "_links": {
      "self": {
        "href": "/api/svm/svms/056403da-83a7-4b13-bc78-6a93e8ea3596"
      }
    }
  },
  "interface": {
    "uuid": "01056403-1383-bc4b-786a-93e8ea35969d",
    "name": "lif2",
    "wwpn": "8b:21:2f:07:00:00:00:00",
    "_links": {
      "self": {
        "href": "/api/network/fc/interfaces/01056403-1383-bc4b-786a-93e8ea35969d"
      }
    }
  },
  "initiator": {
    "wwpn": "8b:21:2f:07:00:00:00:00",
    "wwnn": "95:21:2f:07:00:00:00:00"
  },
  "igroups": [
    {
      "uuid": "243bbb8a-46e9-4b2d-a508-a62dc93df9d1",
      "name": "igroup1",
      "_links": {
        "self": {
          "href": "/api/protocols/san/igroups/243bbb8a-46e9-4b2d-a508-a62dc93df9d1"
        }
      }
    }
  ],
  "port_address": "8aa53",
  "protocol": "fcp",
  "_links": {
    "self": {
      "href": "/api/network/fc/logins/01056403-1383-bc4b-786a-93e8ea35969d/8b%3A21%3A2f%3A07%3A00%3A00%3A00%3A00"
    }
  }
}
```

```
],
  "num_records": 1,
  "_links": {
    "self": {
      "href": "/api/network/fc/logins?igroups.name=igroup1&fields=*"
    }
  }
}
```

Retrieve FC logins

GET /network/fc/logins

Retrieves FC logins.

Related ONTAP commands

- vserver fcp initiator show

Learn more

- SAN: [DOC /network/fc/logins](#)
- NVMe: [DOC /network/fc/logins](#)

Parameters

| Name | Type | In | Required | Description |
|-------------------|--------|-------|----------|-----------------------------|
| interface.wwpn | string | query | False | Filter by interface.wwpn |
| interface.name | string | query | False | Filter by interface.name |
| interface.uuid | string | query | False | Filter by interface.uuid |
| protocol | string | query | False | Filter by protocol |
| igroups.uuid | string | query | False | Filter by igroups.uuid |
| igroups.name | string | query | False | Filter by igroups.name |
| initiator.aliases | string | query | False | Filter by initiator.aliases |

| Name | Type | In | Required | Description |
|------------------------|---------------|-------|----------|--|
| initiator.wwpn | string | query | False | Filter by initiator.wwpn |
| initiator.wwnn | string | query | False | Filter by initiator.wwnn |
| initiator.port_address | string | query | False | Filter by initiator.port_addresses |
| svm.uuid | string | query | False | Filter by svm.uuid |
| svm.name | string | query | False | Filter by svm.name |
| fields | array[string] | query | False | Specify the fields to return. |
| max_records | integer | query | False | Limit the number of records returned. |
| return_records | boolean | query | False | The default is true for GET calls. When set to false, only the number of records is returned. |
| 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. |
| 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 records. |
| records | array[fc_login] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "next": {  
          "href": "/api/resourcelink"  
        },  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "igroups": [  
        {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          },  
          "name": "igroup1",  
          "uuid": "4ea7a442-86d1-11e0-aelc-123478563412"  
        }  
      ],  
      "initiator": {  
        "aliases": [  
          "alias1"  
        ],  
        "port_address": "5060A",  
        "wwnn": "2f:a0:00:a0:98:0b:56:13",  
        "wwpn": "2f:a0:00:a0:98:0b:56:13"  
      },  
      "interface": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "name": "interface1",  
        "port": "5060A",  
        "wwnn": "2f:a0:00:a0:98:0b:56:13",  
        "wwpn": "2f:a0:00:a0:98:0b:56:13"  
      }  
    }  
  ]  
}
```

```

        "name": "lif1",
        "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412",
        "wwpn": "20:00:00:50:56:b4:13:a8"
    },
    "protocol": "string",
    "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 | |

igroups

| Name | Type | Description |
|--------|------------------------|---|
| _links | _links | |
| name | string | The name of the initiator group. |
| uuid | string | The unique identifier of the initiator group. |

initiator

Information about the logged in FC initiator.

| Name | Type | Description |
|---------|---------------|--|
| aliases | array[string] | The logged in initiator world wide port name (WWPN) aliases. |

| Name | Type | Description |
|--------------|--------|---|
| port_address | string | <p>The port address of the initiator's FC port.</p> <p>Each port in an FC switched fabric has its own unique port address for routing purposes. The port address is assigned by a switch in the fabric when that port logs in to the fabric. This property refers to the address given by a switch to the initiator port.</p> <p>This is useful for obtaining statistics and diagnostic information from FC switches.</p> <p>This is a hexadecimal encoded numeric value.</p> |
| wwnn | string | The logged in initiator world wide node name (WWNN). |
| wwpn | string | The logged in initiator WWPN. |

interface

An FC interface.

| Name | Type | Description |
|--------|------------------------|--|
| _links | _links | |
| name | string | The name of the FC interface. |
| uuid | string | The unique identifier of the FC interface. |
| wwpn | string | The WWPN of the FC interface. |

svm

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

fc_login

A Fibre Channel (FC) login represents a connection formed by an FC initiator that has successfully logged in to ONTAP. This represents the FC login on which higher-level protocols such as Fibre Channel Protocol and NVMe over Fibre Channel (NVMe/FC) rely.

| Name | Type | Description |
|-----------|----------------------------------|--|
| _links | _links | |
| igroups | array[igroups] | The initiator groups in which the initiator is a member. |
| initiator | initiator | Information about the logged in FC initiator. |
| interface | interface | An FC interface. |
| protocol | string | The data protocol used to perform the login. |
| svm | svm | |

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 an FC login

GET /network/fc/logins/{interface.uuid}/{initiator.wwpn}

Retrieves an FC login.

Related ONTAP commands

- vserver fcp initiator show

Learn more

- SAN: [DOC /network/fc/logins](#)
- NVMe: [DOC /network/fc/logins](#)

Parameters

| Name | Type | In | Required | Description |
|----------------|---------------|-------|----------|--|
| interface.uuid | string | path | True | The unique identifier of the FC interface through which the initiator logged in. |
| initiator.wwpn | string | path | True | The world wide port name (WWPN) of the initiator. |
| fields | array[string] | query | False | Specify the fields to return. |

Response

```
Status: 200, Ok
```

| Name | Type | Description |
|-----------|--------------------------------|--|
| _links | _links | |
| igroups | array[igroups] | The initiator groups in which the initiator is a member. |
| initiator | initiator | Information about the logged in FC initiator. |
| interface | interface | An FC interface. |
| protocol | string | The data protocol used to perform the login. |
| svm | svm | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "igroups": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "name": "igroup1",  
      "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
    }  
  ],  
  "initiator": {  
    "aliases": [  
      "alias1"  
    ],  
    "port_address": "5060A",  
    "wwnn": "2f:a0:00:a0:98:0b:56:13",  
    "wwpn": "2f:a0:00:a0:98:0b:56:13"  
  },  
  "interface": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "name": "lif1",  
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412",  
    "wwpn": "20:00:00:50:56:b4:13:a8"  
  },  
  "protocol": "string",  
  "svm": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    }  
  }  
}
```

```

        },
        "name": "svm1",
        "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
    }
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|---|
| 4 | The Fibre Channel login specified does not exist. |
| 5373983 | An invalid WWPN was supplied. |
| 5374881 | The Fibre Channel interface specified does not exist. |

| 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 | |

igroups

| Name | Type | Description |
|--------|------------------------|---|
| _links | _links | |
| name | string | The name of the initiator group. |
| uuid | string | The unique identifier of the initiator group. |

initiator

Information about the logged in FC initiator.

| Name | Type | Description |
|---------|---------------|--|
| aliases | array[string] | The logged in initiator world wide port name (WWPN) aliases. |

| Name | Type | Description |
|--------------|--------|---|
| port_address | string | <p>The port address of the initiator's FC port.</p> <p>Each port in an FC switched fabric has its own unique port address for routing purposes. The port address is assigned by a switch in the fabric when that port logs in to the fabric. This property refers to the address given by a switch to the initiator port.</p> <p>This is useful for obtaining statistics and diagnostic information from FC switches.</p> <p>This is a hexadecimal encoded numeric value.</p> |
| wwnn | string | The logged in initiator world wide node name (WWNN). |
| wwpn | string | The logged in initiator WWPN. |

interface

An FC interface.

| Name | Type | Description |
|--------|------------------------|--|
| _links | _links | |
| name | string | The name of the FC interface. |
| uuid | string | The unique identifier of the FC interface. |
| wwpn | string | The WWPN of the FC interface. |

svm

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

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. |

Manage FC WWPN aliases

Network FC wwpn-aliases endpoint overview

Overview

A worldwide port name (WWPN) is a unique 64-bit identifier for a Fibre Channel (FC) initiator. It is displayed as a 16-character hexadecimal value. SAN administrators might find it easier to identify FC initiators using an alias, especially in larger SANs.

The WWPN alias REST API allows you to create, delete, and discover aliases for WWPNs.

Multiple aliases can be created for a WWPN, but you cannot use the same alias for multiple WWPNs.

An alias can consist of up to 32 characters. Valid characters are:

- A through Z
- a through z
- numbers 0 through 9
- hyphen ("")
- underscore ("_")
- left and right braces ("{", "}")
- period (".")

Examples

Creating a WWPN alias

```
# The API:  
POST /api/network/fc/wwpn-aliases  
  
# The call:  
curl -X POST "https://<mgmt-ip>/api/network/fc/wwpn-aliases" -H "accept: application/json" -d '{ "svm": { "name": "svml" }, "wwpn": "50:0a:09:82:b4:30:25:05", "alias": "alias3" }'
```

Retrieving all properties of all WWPN aliases

The `fields` query parameter is used to request that all properties be returned.

```
# The API:  
GET /api/network/fc/wwpn-aliases  
  
# The call:  
curl -X GET "https://<mgmt-ip>/api/network/fc/wwpn-aliases?fields=*" -H "accept: application/hal+json"  
  
# The response:  
{  
  "records": [  
    {  
      "svm": {  
        "uuid": "68589d3d-7efa-11e8-9eed-005056b43025",  
        "name": "svml",  
        "_links": {  
          "self": {  
            "href": "/api/svm/svms/68589d3d-7efa-11e8-9eed-005056b43025"  
          }  
        }  
      },  
      "alias": "alias1",  
      "wwpn": "20:00:00:50:56:b4:30:25",  
      "_links": {  
        "self": {  
          "href": "/api/network/fc/wwpn-aliases/68589d3d-7efa-11e8-9eed-005056b43025/alias1"  
        }  
      }  
    }  
  ]  
}
```

```

"svm": {
    "uuid": "68589d3d-7efa-11e8-9eed-005056b43025",
    "name": "svm1",
    "_links": {
        "self": {
            "href": "/api/svm/svms/68589d3d-7efa-11e8-9eed-005056b43025"
        }
    },
    "alias": "alias2",
    "wwpn": "50:0a:09:82:b4:30:25:00",
    "_links": {
        "self": {
            "href": "/api/network/fc/wwpn-aliases/68589d3d-7efa-11e8-9eed-005056b43025/alias2"
        }
    }
},
"num_records": 2,
"_links": {
    "self": {
        "href": "/api/network/fc/wwpn-aliases"
    }
}
}

```

Retrieving all WWPN aliases named "alias1"

The `alias` query parameter is used to specify a query for the value "alias1".

```

# The API:
GET /api/network/fc/wwpn-aliases

# The call:
curl -X GET "https://<mgmt-ip>/api/network/fc/wwpn-aliases?alias=alias1"
-H "accept: application/hal+json"

# The response:
{
  "records": [
    {
      "svm": {
        "uuid": "68589d3d-7efa-11e8-9eed-005056b43025",
        "name": "svm1",
        "_links": {
          "self": {
            "href": "/api/svm/svms/68589d3d-7efa-11e8-9eed-005056b43025"
          }
        }
      },
      "alias": "alias1",
      "wwpn": "20:00:00:50:56:b4:30:25",
      "_links": {
        "self": {
          "href": "/api/network/fc/wwpn-aliases/68589d3d-7efa-11e8-9eed-005056b43025/alias1"
        }
      }
    }
  ],
  "num_records": 1,
  "_links": {
    "self": {
      "href": "/api/network/fc/wwpn-aliases?alias=alias1"
    }
  }
}

```

Retrieving a specific WWPN alias

The alias to be returned is identified by the UUID of its SVM and the alias name.

```

# The API:
GET /api/network/fc/wwpn-aliases/{svm.uuid}/{alias}

# The call:
curl -X GET "https://<mgmt-ip>/api/network/fc/wwpn-aliases/68589d3d-7efa-11e8-9eed-005056b43025/alias2" -H "accept: application/hal+json"

# The response:
{
  "records": [
    {
      "svm": {
        "uuid": "68589d3d-7efa-11e8-9eed-005056b43025",
        "name": "svm1",
        "_links": {
          "self": {
            "href": "/api/svm/svms/68589d3d-7efa-11e8-9eed-005056b43025"
          }
        }
      },
      "alias": "alias2",
      "wwpn": "50:0a:09:82:b4:30:25:00",
      "_links": {
        "self": {
          "href": "/api/network/fc/wwpn-aliases/68589d3d-7efa-11e8-9eed-005056b43025/alias1"
        }
      }
    }
  ],
  "num_records": 1,
  "_links": {
    "self": {
      "href": "/api/network/fc/wwpn-aliases?alias=alias1"
    }
  }
}

```

Deleting a WWPN alias

The alias to delete is identified by the UUID of its SVM and the alias name.

```

# The API:
DELETE /api/network/fc/wwpn-aliases/{svm.uuid}/{alias}

# The call:
curl -X DELETE "https://<mgmt-ip>/api/network/fc/wwpn-aliases/68589d3d-7efa-11e8-9eed-005056b43025/alias2" -H "accept: application/hal+json"

```

Retrieve FC WWPN aliases

GET /network/fc/wwpn-aliases

Retrieves FC WWPN aliases.

Related ONTAP commands

- vserver fcp wwpn-alias show

Learn more

- [DOC /network/fc/wwpn-aliases](#)

Parameters

| Name | Type | In | Required | Description |
|----------------|---------------|-------|----------|---|
| wwpn | string | query | False | Filter by wwpn |
| svm.uuid | string | query | False | Filter by svm.uuid |
| svm.name | string | query | False | Filter by svm.name |
| alias | string | query | False | Filter by alias |
| fields | array[string] | query | False | Specify the fields to return. |
| max_records | integer | query | False | Limit the number of records returned. |
| return_records | boolean | query | False | The default is true for GET calls. When set to false, only the number of records is 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. |
| 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 records. |
| records | array[wwpn_alias] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "alias": "host1",  
      "svm": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "name": "svml1",  
        "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"  
      },  
      "wwpn": "2f:a0:00:a0:98:0b:56:13"  
    }  
  ]  
}
```

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 | |

svm

SVM, applies only to SVM-scoped objects.

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

wwpn_alias

A Fibre Channel (FC) world wide port name (WWPN) alias. A WWPN is a unique 64-bit identifier for an FC initiator. It is displayed as a 16-character hexadecimal value. SAN administrators may find it easier to identify FC initiators using an alias, especially in larger SANs.

| Name | Type | Description |
|--------|--------|--|
| _links | _links | |
| alias | string | The FC WWPN alias. Required in POST. |
| svm | svm | SVM, applies only to SVM-scoped objects. |
| wwpn | string | The FC initiator WWPN. Required in POST. |

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 FC WWPN alias

POST /network/fc/wwpn-aliases

Creates an FC WWPN alias.

Required properties

- `svm.uuid` or `svm.name` - Existing SVM in which to create the FC alias.
- `alias` - Name of the FC alias.
- `wwpn` - FC WWPN for which to create the alias.

Related ONTAP commands

- `vserver fcp wwpn-alias set`

Learn more

- [DOC /network/fc/wwpn-aliases](#)

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 |
|--------|--------|--|
| _links | _links | |
| alias | string | The FC WWPN alias. Required in POST. |
| svm | svm | SVM, applies only to SVM-scoped objects. |
| wwpn | string | The FC initiator WWPN. Required in POST. |

Example request

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "alias": "host1",
  "svm": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "name": "svml1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
  },
  "wwpn": "2f:a0:00:a0:98:0b:56:13"
}
```

Response

Status: 201, Created

| Name | Type | Description |
|-------------|-------------------|--------------------|
| _links | _links | |
| num_records | integer | Number of records. |
| records | array[wwpn_alias] | |

Example response

```
{
  "_links": {
    "next": {
      "href": "/api/resourcelink"
    },
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "records": [
    {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "alias": "host1",
      "svm": {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        },
        "name": "svml1",
        "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
      },
      "wwpn": "2f:a0:00:a0:98:0b:56:13"
    }
  ]
}
```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 1254317 | The alias already exists. |
| 1260882 | The supplied SVM does not exist. |
| 2621462 | The supplied SVM does not exist. |
| 2621706 | Both the SVM UUID and SVM name were supplied, but do not refer to the same SVM. |
| 2621707 | No SVM was specified. Either <code>svm.name</code> or <code>svm.uuid</code> must be supplied. |
| 5373982 | An invalid WWPN was supplied. The valid WWN format is XX:XX:XX:XX:XX:XX, where X is a hexadecimal digit. Example: "01:02:03:04:0a:0b:0c:0d". |

| 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 | |

svm

SVM, applies only to SVM-scoped objects.

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

wwpn_alias

A Fibre Channel (FC) world wide port name (WWPN) alias. A WWPN is a unique 64-bit identifier for an FC initiator. It is displayed as a 16-character hexadecimal value. SAN administrators may find it easier to identify FC initiators using an alias, especially in larger SANs.

| Name | Type | Description |
|--------|--------|--|
| _links | _links | |
| alias | string | The FC WWPN alias. Required in POST. |
| svm | svm | SVM, applies only to SVM-scoped objects. |
| wwpn | string | The FC initiator WWPN. Required in POST. |

_links

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

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. |

Delete an FC WWPN alias

`DELETE /network/fc/wwpn-aliases/{svm.uuid}/{alias}`

Deletes an FC WWPN alias.

Related ONTAP commands

- `vserver fcp wwpn-alias remove`

Learn more

- [DOC /network/fc/wwpn-aliases](#)

Parameters

| Name | Type | In | Required | Description |
|----------|--------|------|----------|-------------|
| svm.uuid | string | path | True | |
| alias | string | path | True | |

Response

Status: 200, Ok

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 1260882 | An SVM with the specified UUID does not exist. |
| 5374046 | The alias could not be found. |

| 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 an FC WWPN alias

GET /network/fc/wwpn-aliases/{svm.uuid}/{alias}

Retrieves an FC WWPN alias.

Related ONTAP commands

- `vserver fcp wwpn-alias show`

Learn more

- [DOC /network/fc/wwpn-aliases](#)

Parameters

| Name | Type | In | Required | Description |
|----------|--------|------|----------|---|
| svm.uuid | string | path | True | The unique identifier of the SVM in which the alias is found. |
| alias | string | path | True | The name of FC WWPN alias. |

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

Response

Status: 200, Ok

| Name | Type | Description |
|--------|------------------------|--|
| _links | _links | |
| alias | string | The FC WWPN alias. Required in POST. |
| svm | svm | SVM, applies only to SVM-scoped objects. |
| wwpn | string | The FC initiator WWPN. Required in POST. |

Example response

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "alias": "host1",
  "svm": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "name": "svml1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
  },
  "wwpn": "2f:a0:00:a0:98:0b:56:13"
}
```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|----------------------------------|
| 1260882 | The supplied SVM does not exist. |

| 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 | |

svm

SVM, applies only to SVM-scoped objects.

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

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. |

Manage FC services for SVMs

Protocols SAN fcp services endpoint overview

Overview

A Fibre Channel Protocol (FC Protocol) service defines the properties of the FC Protocol target for an SVM. There can be at most one FC Protocol service for an SVM. An SVM FC Protocol service must be created before FC Protocol initiators can log in to the SVM.

The FC Protocol service REST API allows you to create, update, delete, and discover FC services for SVMs.

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.

Examples

Creating an FC Protocol service for an SVM

The simplest way to create an FC Protocol service is to specify only the SVM, either by name or UUID. By default, the new FC Protocol service is enabled.

In this example, the `return_records` query parameter is used to retrieve the new FC Protocol service object in the REST response.

```

# The API:
POST /api/protocols/san/fcp/services

# The call:
curl -X POST 'https://<mgmt-
ip>/api/protocols/san/fcp/services?return_records=true' -H 'accept:
application/hal+json' -d '{ "svm": { "name": "svm1" } }'

# The response:
{
  "num_records": 1,
  "records": [
    {
      "svm": {
        "uuid": "5c659d90-c01a-11e8-88ed-005056bbb24b",
        "name": "svm1",
        "_links": {
          "self": {
            "href": "/api/svm/svms/5c659d90-c01a-11e8-88ed-005056bbb24b"
          }
        },
        "enabled": true,
        "target": {
          "name": "20:00:00:50:56:bb:b2:4b"
        },
        "_links": {
          "self": {
            "href": "/api/protocols/san/fcp/services/5c659d90-c01a-11e8-88ed-
005056bbb24b"
          }
        }
      }
    ]
  }
}

```

Retrieving FC Protocol services for all SVMs in the cluster

```

# The API:
GET /api/protocols/san/fcp/services

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/fcp/services' -H 'accept:

```

```

application/hal+json'

# The response:
{
"records": [
  {
    "svm": {
      "uuid": "5c659d90-c01a-11e8-88ed-005056bbb24b",
      "name": "svm1",
      "_links": {
        "self": {
          "href": "/api/svm/svms/5c659d90-c01a-11e8-88ed-005056bbb24b"
        }
      },
      "_links": {
        "self": {
          "href": "/api/protocols/san/fcp/services/5c659d90-c01a-11e8-88ed-005056bbb24b"
        }
      }
    },
    {
      "svm": {
        "uuid": "6011f874-c01a-11e8-88ed-005056bbb24b",
        "name": "svm2",
        "_links": {
          "self": {
            "href": "/api/svm/svms/6011f874-c01a-11e8-88ed-005056bbb24b"
          }
        },
        "_links": {
          "self": {
            "href": "/api/protocols/san/fcp/services/6011f874-c01a-11e8-88ed-005056bbb24b"
          }
        }
      }
    }
  ],
  "num_records": 2,
  "_links": {
    "self": {
      "href": "/api/protocols/san/fcp/services"
    }
  }
}

```

```
}
```

Retrieving details for a specific FC Protocol service

The FC Protocol service is identified by the UUID of its SVM.

```
# The API:  
GET /api/protocols/san/fcp/services/{svm.uuid}  
  
# The call:  
curl -X GET 'https://<mgmt-ip>/api/protocols/san/fcp/services/5c659d90-  
c01a-11e8-88ed-005056bbb24b' -H 'accept: application/hal+json'  
  
# The response:  
{  
  "svm": {  
    "uuid": "5c659d90-c01a-11e8-88ed-005056bbb24b",  
    "name": "svm1",  
    "_links": {  
      "self": {  
        "href": "/api/svm/svms/5c659d90-c01a-11e8-88ed-005056bbb24b"  
      }  
    },  
    "enabled": true,  
    "target": {  
      "name": "20:00:00:50:56:bb:b2:4b"  
    },  
    "_links": {  
      "self": {  
        "href": "/api/protocols/san/fcp/services/5c659d90-c01a-11e8-88ed-  
005056bbb24b"  
      }  
    }  
  }  
}
```

Disabling an FC Protocol service

Disabling an FC Protocol service shuts down all active FC Protocol logins for the SVM and prevents new FC Protocol logins.

The FC Protocol service to update is identified by the UUID of its SVM.

```

# The API:
PATCH /api/protocols/san/fcp/services/{svm.uuid}

# The call:
curl -X PATCH 'https://<mgmt-ip>/api/protocols/san/fcp/services/5c659d90-
c01a-11e8-88ed-005056bbb24b' -H 'accept: application/hal+json' -d '{
"enabled": "false" }'
```

You can retrieve the FC Protocol service to confirm the change.

In this example, the `fields` query parameter is used to limit the response to the `enabled` property and FC Protocol service identifiers.

```

# The API:
GET /api/protocols/san/fcp/services/{svm.uuid}

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/fcp/services/5c659d90-
c01a-11e8-88ed-005056bbb24b?fields=enabled' -H 'accept:
application/hal+json'

# The response:
{
  "svm": {
    "uuid": "5c659d90-c01a-11e8-88ed-005056bbb24b",
    "name": "svm1",
    "_links": {
      "self": {
        "href": "/api/svm/svms/5c659d90-c01a-11e8-88ed-005056bbb24b"
      }
    }
  },
  "enabled": false,
  "_links": {
    "self": {
      "href": "/api/protocols/san/fcp/services/5c659d90-c01a-11e8-88ed-
005056bbb24b"
    }
  }
}
```

Deleting an FC Protocol service

The FC Protocol service must be disabled before it can be deleted.

The FC Protocol service to delete is identified by the UUID of its SVM.

```
# The API:  
DELETE /api/protocols/san/fcp/services/{svm.uuid}  
  
# The call:  
curl -X DELETE 'https://<mgmt-ip>/api/protocols/san/fcp/services/5c659d90-  
c01a-11e8-88ed-005056bbb24b' -H 'accept: application/hal+json'
```

Retrieve FC protocol services

GET /protocols/san/fcp/services

Retrieves FC Protocol services.

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 fcp show`

Learn more

- [DOC /protocols/san/fcp/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 |
| target.name | string | query | False | Filter by target.name |
| enabled | boolean | query | False | Filter by enabled |

| Name | Type | In | Required | Description |
|---------------------------------|---------|-------|----------|---|
| statistics.status | string | query | False | Filter by statistics.status |
| statistics.latency_rw.other | integer | query | False | Filter by statistics.latency_rw.other |
| statistics.latency_rw.write | integer | query | False | Filter by statistics.latency_rw.write |
| statistics.latency_rw.read | integer | query | False | Filter by statistics.latency_rw.read |
| statistics.latency_rw.total | integer | query | False | Filter by statistics.latency_rw.total |
| statistics.timestamp | string | query | False | Filter by statistics.timestamp |
| statistics.throughput_raw.read | integer | query | False | Filter by statistics.throughput_raw.read |
| statistics.throughput_raw.write | integer | query | False | Filter by statistics.throughput_raw.write |
| statistics.throughput_raw.total | integer | query | False | Filter by statistics.throughput_raw.total |
| statistics.iops_raw.other | integer | query | False | Filter by statistics.iops_raw.other |
| statistics.iops_raw.write | integer | query | False | Filter by statistics.iops_raw.write |
| statistics.iops_raw.read | integer | query | False | Filter by statistics.iops_raw.read |

| Name | Type | In | Required | Description |
|---------------------------|---------|-------|----------|-------------------------------------|
| statistics.iops_raw.total | integer | query | False | Filter by statistics.iops_raw.total |
| metric.duration | string | query | False | Filter by metric.duration |
| metric.latency.other | integer | query | False | Filter by metric.latency.other |
| metric.latency.write | integer | query | False | Filter by metric.latency.write |
| metric.latency.read | integer | query | False | Filter by metric.latency.read |
| metric.latency.total | integer | query | False | Filter by metric.latency.total |
| metric.throughput.read | integer | query | False | Filter by metric.throughput.read |
| metric.throughput.write | integer | query | False | Filter by metric.throughput.write |
| metric.throughput.total | integer | query | False | Filter by metric.throughput.total |
| metric.timestamp | string | query | False | Filter by metric.timestamp |
| metric.iops.other | integer | query | False | Filter by metric.iops.other |
| metric.iops.write | integer | query | False | Filter by metric.iops.write |
| metric.iops.read | integer | query | False | Filter by metric.iops.read |
| metric.iops.total | integer | query | False | Filter by metric.iops.total |

| Name | Type | In | Required | Description |
|----------------|---------------|-------|----------|--|
| metric.status | string | query | False | Filter by metric.status |
| fields | array[string] | query | False | Specify the fields to return. |
| max_records | integer | query | False | Limit the number of records returned. |
| return_records | boolean | query | False | The default is true for GET calls. When set to false, only the number of records is returned. |
| 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. |
| 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 records. |
| records | array[fcp_service] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "metric": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "duration": "PT15S",  
        "iops": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "latency": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "status": "ok",  
        "throughput": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "timestamp": "2017-01-25 11:20:13 UTC"  
      },  
      "statistics": {  
        "iops_raw": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        }  
      }  
    }  
  ]  
}
```

```

        "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"
},
"target": {
    "name": "20:00:00:50:56:bb:b2:4b"
}
}
]
}

```

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. |

metric

| 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. |

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. |

| 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. |

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. |

statistics

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

svm

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

target

| Name | Type | Description |
|------|--------|---|
| name | string | <p>The target name of the FC Protocol service. This is generated for the SVM during POST.</p> <p>The FC Protocol target name is a world wide node name (WWNN).</p> <p>If required, the target name can be modified using the ONTAP command line.</p> <ul style="list-style-type: none">• example: 20:00:00:50:56:bb:b2:4b• maxLength: 128• minLength: 1• readOnly: 1 |

fcp_service

A Fibre Channel (FC) Protocol service defines the properties of the FC Protocol target for an SVM. There can be at most one FC Protocol service for an SVM. An SVM's FC Protocol service must be created before FC Protocol initiators can login to the SVM.

A FC Protocol service is identified by the UUID of its SVM.

| Name | Type | Description |
|--------|------------------------|-------------|
| _links | _links | |

| Name | Type | Description |
|------------|------------|---|
| enabled | boolean | The administrative state of the FC Protocol service. The FC Protocol service can be disabled to block all FC Protocol connectivity to the SVM. This is optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST. |
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

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 FC protocol service

POST /protocols/san/fcp/services

Creates an FC Protocol service.

Required properties

- `svm.uuid` or `svm.name` - Existing SVM in which to create the FC Protocol service.

Related ONTAP commands

- `vserver fcp create`

Learn more

- [DOC /protocols/san/fcp/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 |
|------------|----------------------------|---|
| _links | _links | |
| enabled | boolean | The administrative state of the FC Protocol service. The FC Protocol service can be disabled to block all FC Protocol connectivity to the SVM. This is optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST. |
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "metric": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "duration": "PT15S",  
    "iops": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "timestamp": "2017-01-25 11:20:13 UTC"  
  },  
  "statistics": {  
    "iops_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    }  
  }  
}
```

```

    "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"
},
"target": {
  "name": "20:00:00:50:56:bb:b2:4b"
}
}
}

```

Response

Status: 201, Created

| Name | Type | Description |
|-------------|--------------------------------------|--------------------|
| _links | _links | |
| num_records | integer | Number of records. |
| records | array[fcp_service] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "metric": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "duration": "PT15S",  
        "iops": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "latency": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "status": "ok",  
        "throughput": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "timestamp": "2017-01-25 11:20:13 UTC"  
      },  
      "statistics": {  
        "iops_raw": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        }  
      }  
    }  
  ]  
}
```

```

        "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"
},
"target": {
    "name": "20:00:00:50:56:bb:b2:4b"
}
}
]
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 1115127 | The cluster lacks a valid FCP license. |
| 2621462 | The supplied SVM does not exist. |
| 2621507 | The Fibre Channel Protocol is not allowed for the specified SVM. |

| Error Code | Description |
|------------|---|
| 2621706 | The specified <code>svm.uuid</code> and <code>svm.name</code> do not refer to the same SVM. |
| 2621707 | No SVM was specified. Either <code>svm.name</code> or <code>svm.uuid</code> must be supplied. |
| 5374082 | The Fibre Channel Protocol service already exists for the SVM. |
| 5374092 | The Fibre Channel Protocol is not supported on the cluster hardware configuration; there are no Fibre Channel adapters. |
| 5374893 | The SVM is stopped. The SVM must be running to create a Fibre Channel Protocol service. |

| 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. |

metric

| 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. |

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. |

| Name | Type | Description |
|-------|---------|---|
| 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. |

statistics

| Name | Type | Description |
|----------------|--------------------------------|--|
| iops_raw | iops_raw | The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time. |
| latency_raw | latency_raw | The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation. |
| status | string | <p>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".</p> <p>"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.</p> <p>"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.</p> |
| 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. |

svm

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

target

| Name | Type | Description |
|------|--------|--|
| name | string | <p>The target name of the FC Protocol service. This is generated for the SVM during POST.</p> <p>The FC Protocol target name is a world wide node name (WWNN).</p> <p>If required, the target name can be modified using the ONTAP command line.</p> <ul style="list-style-type: none"> • example: 20:00:00:50:56:bb:b2:4b • maxLength: 128 • minLength: 1 • readOnly: 1 |

fcp_service

A Fibre Channel (FC) Protocol service defines the properties of the FC Protocol target for an SVM. There can be at most one FC Protocol service for an SVM. An SVM's FC Protocol service must be created before FC Protocol initiators can login to the SVM.

A FC Protocol service is identified by the UUID of its SVM.

| Name | Type | Description |
|---------|------------------------|--|
| _links | _links | |
| enabled | boolean | <p>The administrative state of the FC Protocol service. The FC Protocol service can be disabled to block all FC Protocol connectivity to the SVM.</p> <p>This is optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST.</p> |

| Name | Type | Description |
|------------|------------|-------------|
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

_links

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

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. |

Delete an FC protocol service

DELETE /protocols/san/fcp/services/{svm.uuid}

Deletes an FC Protocol service. An FC Protocol service must be disabled before it can be deleted.

Related ONTAP commands

- vserver fcp delete

Learn more

- [DOC /protocols/san/fcp/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 |
|------------|---|
| 2621462 | An SVM with the specified UUID does not exist. |
| 5373960 | The Fibre Channel Protocol service cannot be removed while it is enabled. |
| 5374083 | There is no Fibre Channel Protocol service for the specified SVM. |

| 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 an FC protocol service

GET /protocols/san/fcp/services/{svm.uuid}

Retrieves an FC Protocol service.

Related ONTAP commands

- `vserver fcp show`

Learn more

- [DOC /protocols/san/fcp/services](#)

Parameters

| Name | Type | In | Required | Description |
|----------|---------------|-------|----------|---|
| svm.uuid | string | path | True | The unique identifier of the SVM for which to retrieve the FC Protocol service. |
| fields | array[string] | query | False | Specify the fields to return. |

Response

Status: 200, Ok

| Name | Type | Description |
|------------|----------------------------|---|
| _links | _links | |
| enabled | boolean | The administrative state of the FC Protocol service. The FC Protocol service can be disabled to block all FC Protocol connectivity to the SVM. This is optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST. |
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

Example response

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "metric": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "duration": "PT15S",  
    "iops": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "timestamp": "2017-01-25 11:20:13 UTC"  
  },  
  "statistics": {  
    "iops_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    }  
  }  
}
```

```

    "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"
},
"target": {
  "name": "20:00:00:50:56:bb:b2:4b"
}
}
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|---|
| 2621462 | An SVM with the specified UUID does not exist. |
| 5374083 | There is no Fibre Channel Protocol service for the specified SVM. |

| 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. |

metric

| 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. |

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. |

| Name | Type | Description |
|-------|---------|---|
| 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. |

statistics

| Name | Type | Description |
|----------------|--------------------------------|--|
| iops_raw | iops_raw | The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time. |
| latency_raw | latency_raw | The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation. |
| status | string | <p>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".</p> <p>"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.</p> <p>"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.</p> |
| 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. |

svm

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

target

| Name | Type | Description |
|------|--------|--|
| name | string | <p>The target name of the FC Protocol service. This is generated for the SVM during POST.</p> <p>The FC Protocol target name is a world wide node name (WWNN).</p> <p>If required, the target name can be modified using the ONTAP command line.</p> <ul style="list-style-type: none"> • example: 20:00:00:50:56:bb:b2:4b • maxLength: 128 • minLength: 1 • readOnly: 1 |

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 |

| Name | Type | Description |
|--------|--------|---|
| target | string | The target parameter that caused the error. |

Update an FC protocol service

PATCH /protocols/san/fcp/services/{svm.uuid}

Updates an FC Protocol service.

Related ONTAP commands

- vserver fcp modify
- vserver fcp start
- vserver fcp stop

Learn more

- [DOC /protocols/san/fcp/services](#)

Parameters

| Name | Type | In | Required | Description |
|----------|--------|------|----------|--|
| svm.uuid | string | path | True | The unique identifier of the SVM whose FC Protocol service is to be updated. |

Request Body

| Name | Type | Description |
|------------|----------------------------|---|
| _links | _links | |
| enabled | boolean | The administrative state of the FC Protocol service. The FC Protocol service can be disabled to block all FC Protocol connectivity to the SVM. This is optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST. |
| metric | metric | |
| statistics | statistics | |

| Name | Type | Description |
|--------|--------|-------------|
| svm | svm | |
| target | target | |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "metric": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "duration": "PT15S",  
    "iops": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "timestamp": "2017-01-25 11:20:13 UTC"  
  },  
  "statistics": {  
    "iops_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    }  
  }  
}
```

```

    "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"
},
"target": {
  "name": "20:00:00:50:56:bb:b2:4b"
}
}
}

```

Response

Status: 200, Ok

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|---|
| 2621462 | An SVM with the specified UUID does not exist. |
| 5374083 | There is no Fibre Channel Protocol service for the specified SVM. |

| 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. |

metric

| 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. |

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. |

| Name | Type | Description |
|-------|---------|---|
| 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. |

statistics

| Name | Type | Description |
|----------------|--------------------------------|--|
| iops_raw | iops_raw | The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time. |
| latency_raw | latency_raw | The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation. |
| status | string | <p>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".</p> <p>"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.</p> <p>"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.</p> |
| 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. |

svm

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

target

| Name | Type | Description |
|------|--------|--|
| name | string | <p>The target name of the FC Protocol service. This is generated for the SVM during POST.</p> <p>The FC Protocol target name is a world wide node name (WWNN).</p> <p>If required, the target name can be modified using the ONTAP command line.</p> <ul style="list-style-type: none"> • example: 20:00:00:50:56:bb:b2:4b • maxLength: 128 • minLength: 1 • readOnly: 1 |

fcp_service

A Fibre Channel (FC) Protocol service defines the properties of the FC Protocol target for an SVM. There can be at most one FC Protocol service for an SVM. An SVM's FC Protocol service must be created before FC Protocol initiators can login to the SVM.

A FC Protocol service is identified by the UUID of its SVM.

| Name | Type | Description |
|---------|------------------------|--|
| _links | _links | |
| enabled | boolean | <p>The administrative state of the FC Protocol service. The FC Protocol service can be disabled to block all FC Protocol connectivity to the SVM.</p> <p>This is optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST.</p> |

| Name | Type | Description |
|------------|------------|-------------|
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

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 historical performance metrics for the FC protocol service of an SVM

GET /protocols/san/fcp/services/{svm.uuid}/metrics

Retrieves historical performance metrics for the FC Protocol service of an SVM.

Parameters

| Name | Type | In | Required | Description |
|------------|---------|-------|----------|----------------------|
| status | string | query | False | Filter by status |
| timestamp | string | query | False | Filter by timestamp |
| iops.other | integer | query | False | Filter by iops.other |
| iops.write | integer | query | False | Filter by iops.write |

| Name | Type | In | Required | Description |
|------------------|---------------|-------|----------|--|
| iops.read | integer | query | False | Filter by iops.read |
| iops.total | integer | query | False | Filter by iops.total |
| throughput.other | integer | query | False | Filter by throughput.other |
| throughput.write | integer | query | False | Filter by throughput.write |
| throughput.read | integer | query | False | Filter by throughput.read |
| throughput.total | integer | query | False | Filter by throughput.total |
| duration | string | query | False | Filter by duration |
| latency.other | integer | query | False | Filter by latency.other |
| latency.write | integer | query | False | Filter by latency.write |
| latency.read | integer | query | False | Filter by latency.read |
| latency.total | integer | query | False | Filter by latency.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 |
| The 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": [  
    {  
      "_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 |
|-------|---------|--|
| 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. |

records

Performance numbers, such as IOPS latency and throughput.

| Name | Type | Description |
|--------|------------------------|-------------|
| _links | _links | |

| Name | Type | Description |
|------------|------------|---|
| 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. |
| status | string | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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. |

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. |

Manage SAN igroups

Protocols SAN igroups endpoint overview

Overview

An initiator group (igroup) is a collection of Fibre Channel (FC) world wide port names (WWPNs), and/or iSCSI Qualified Names (IQNs), and/or iSCSI EUIs (Extended Unique Identifiers) that identify host initiators.

Initiator groups are used to control which hosts can access specific LUNs. To grant access to a LUN from one or more hosts, create an initiator group containing the host initiator names, then create a LUN map that associates the initiator group with the LUN.

The initiator group REST API allows you to create, update, delete, and discover initiator groups, and add and remove initiators that can access the target and associated LUNs. An initiator can appear in multiple initiator groups. An initiator group can be mapped to multiple LUNs. A specific initiator can be mapped to a specific LUN only once.

All initiators in an initiator group must be from the same operating system. The initiator group's operating system is specified when the initiator group is created.

When an initiator group is created, the `protocol` property is used to restrict member initiators to Fibre Channel (`fcp`), iSCSI (`iscsi`), or both (`mixed`).

Zero or more initiators can be supplied when the initiator group is created. After creation, initiators can be added or removed from the initiator group using the

`/protocols/san/igroups/{igroup.uuid}/initiators` endpoint. See [DELETE /protocols/san/igroups/{igroup.uuid}/initiators/{name}](#) for more details.

An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an

iSCSI IQN is *iqn.yyyy-mm.reverse_domain_name:any*. The iSCSI EUI format consists of the *eui.* prefix followed by 16 hexadecimal characters.

Examples

Creating an initiator group with no initiators

The example initiator group is for Linux iSCSI initiators only. Note that the `return_records` query parameter is used to obtain the newly created initiator group in the response.

```
# The API:  
POST /api/protocols/san/igroups  
  
# The call:  
curl -X POST 'https://<mgmt-  
ip>/api/protocols/san/igroups?return_records=true' -H 'accept:  
application/hal+json' -d '{ "svm": { "name": "svml" }, "name": "igroup1",  
"os_type": "linux", "protocol": "iscsi" }'  
  
# The response:  
{  
  "num_records": 1,  
  "records": [  
    {  
      "svm": {  
        "uuid": "02b0dfff-aa28-11e8-a653-005056bb7072",  
        "name": "svml",  
        "_links": {  
          "self": {  
            "href": "/api/svm/svms/02b0dfff-aa28-11e8-a653-005056bb7072"  
          }  
        }  
      },  
      "uuid": "8f249e7d-ab9f-11e8-b8a3-005056bb7072",  
      "name": "igroup1",  
      "protocol": "iscsi",  
      "os_type": "linux",  
      "_links": {  
        "self": {  
          "href": "/api/protocols/san/igroups/8f249e7d-ab9f-11e8-b8a3-  
005056bb7072"  
        }  
      }  
    }  
  ]  
}
```

Creating an initiator group with initiators

The example initiator group is for Windows. FC Protocol and iSCSI initiators are allowed. Note that the `return_records` query parameter is used to obtain the newly created initiator group in the response.

```
# The API:  
POST /api/protocols/san/igroups  
  
# The call:  
curl -X POST 'https://<mgmt-  
ip>/api/protocols/san/igroups?return_records=true' -H 'accept:  
application/hal+json' -d '{ "svm": { "name": "svm1" }, "name": "igroup2",  
"os_type": "windows", "protocol": "mixed", "initiators": [ { "name":  
"20:01:00:50:56:bb:70:72" }, { "name": "iqn.1991-05.com.ms:host1" } ] }'  
  
# The response:  
{  
  "num_records": 1,  
  "records": [  
    {  
      "svm": {  
        "uuid": "02b0dfff-aa28-11e8-a653-005056bb7072",  
        "name": "svm1",  
        "_links": {  
          "self": {  
            "href": "/api/svm/svms/02b0dfff-aa28-11e8-a653-005056bb7072"  
          }  
        }  
      },  
      "uuid": "abf9c39d-ab9f-11e8-b8a3-005056bb7072",  
      "name": "igroup2",  
      "protocol": "mixed",  
      "os_type": "windows",  
      "initiators": [  
        {  
          "name": "20:01:00:50:56:bb:70:72",  
          "_links": {  
            "self": {  
              "href": "/api/protocols/san/igroups/abf9c39d-ab9f-11e8-b8a3-  
005056bb7072/initiators/20:01:00:50:56:bb:70:72"  
            }  
          }  
      },  
      {  
        "name": "iqn.1991-05.com.ms:host1",  
        "_links": {  
          "self": {  
            "href": "/api/protocols/san/igroups/abf9c39d-ab9f-11e8-b8a3-  
005056bb7072/initiators/iqn.1991-05.com.ms:host1"  
          }  
        }  
      }  
    ]  
  ]  
}
```

```

        "href": "/api/protocols/san/igroups/abf9c39d-ab9f-11e8-b8a3-
005056bb7072/initiators/iqn.1991-05.com.ms:host1"
    }
}
]
{
  "_links": {
    "self": {
      "href": "/api/protocols/san/igroups/abf9c39d-ab9f-11e8-b8a3-
005056bb7072"
    }
  }
}
]
}

```

Retrieving all initiator groups

```

# The API:
GET /api/protocols/san/igroups

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/igroups' -H 'accept:
application/hal+json'

# The response:
{
  "records": [
    {
      "svm": {
        "uuid": "02b0dfff-aa28-11e8-a653-005056bb7072",
        "name": "svm1",
        "_links": {
          "self": {
            "href": "/api/svm/svms/02b0dfff-aa28-11e8-a653-005056bb7072"
          }
        }
      },
      "uuid": "8f249e7d-ab9f-11e8-b8a3-005056bb7072",
      "name": "igroup1",
      "_links": {
        "self": {
          "href": "/api/protocols/san/igroups/8f249e7d-ab9f-11e8-b8a3-
005056bb7072"
        }
      }
    }
  ]
}

```

```

        }
    },
},
{
    "svm": {
        "uuid": "02b0dfff-aa28-11e8-a653-005056bb7072",
        "name": "svm1",
        "_links": {
            "self": {
                "href": "/api/svm/svms/02b0dfff-aa28-11e8-a653-005056bb7072"
            }
        }
    },
    "uuid": "abf9c39d-ab9f-11e8-b8a3-005056bb7072",
    "name": "igroup2",
    "_links": {
        "self": {
            "href": "/api/protocols/san/igroups/abf9c39d-ab9f-11e8-b8a3-005056bb7072"
        }
    }
},
"num_records": 2,
"_links": {
    "self": {
        "href": "/api/protocols/san/igroups"
    }
}
}

```

Retrieving all properties of all initiator groups

The `fields` query parameter is used to request all initiator group properties.

```

# The API:
GET /api/protocols/san/igroups

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/igroups?fields=' -H
'accept: application/hal+json'

# The response:
{

```

```

"records": [
  {
    "svm": {
      "uuid": "02b0dfff-aa28-11e8-a653-005056bb7072",
      "name": "svm1",
      "_links": {
        "self": {
          "href": "/api/svm/svms/02b0dfff-aa28-11e8-a653-005056bb7072"
        }
      }
    },
    "uuid": "8f249e7d-ab9f-11e8-b8a3-005056bb7072",
    "name": "igroup1",
    "protocol": "iscsi",
    "os_type": "linux",
    "_links": {
      "self": {
        "href": "/api/protocols/san/igroups/8f249e7d-ab9f-11e8-b8a3-005056bb7072"
      }
    }
  },
  {
    "svm": {
      "uuid": "02b0dfff-aa28-11e8-a653-005056bb7072",
      "name": "svm1",
      "_links": {
        "self": {
          "href": "/api/svm/svms/02b0dfff-aa28-11e8-a653-005056bb7072"
        }
      }
    },
    "uuid": "abf9c39d-ab9f-11e8-b8a3-005056bb7072",
    "name": "igroup2",
    "protocol": "mixed",
    "os_type": "windows",
    "initiators": [
      {
        "name": "20:01:00:50:56:bb:70:72",
        "_links": {
          "self": {
            "href": "/api/protocols/san/igroups/abf9c39d-ab9f-11e8-b8a3-005056bb7072/initiators/20:01:00:50:56:bb:70:72"
          }
        }
      },
      {
        "name": "20:01:00:50:56:bb:70:73",
        "_links": {
          "self": {
            "href": "/api/protocols/san/igroups/abf9c39d-ab9f-11e8-b8a3-005056bb7072/initiators/20:01:00:50:56:bb:70:73"
          }
        }
      }
    ]
  }
]

```

```
{  
    "name": "iqn.1991-05.com.ms:host1",  
    "_links": {  
        "self": {  
            "href": "/api/protocols/san/igroups/abf9c39d-ab9f-11e8-b8a3-  
005056bb7072/initiators/iqn.1991-05.com.ms:host1"  
        }  
    }  
},  
    "_links": {  
        "self": {  
            "href": "/api/protocols/san/igroups/abf9c39d-ab9f-11e8-b8a3-  
005056bb7072"  
        }  
    }  
},  
],  
"num_records": 2,  
"_links": {  
    "self": {  
        "href": "/api/protocols/san/igroups?fields=*"  
    }  
}  
}
```

Retrieving all initiator groups for Linux

The `os_type` query parameter is used to perform the query.

```

# The API:
GET /api/protocols/san/igroups

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/igroups?os_type=linux' -H
'accept: application/hal+json'

# The response:
{
  "records": [
    {
      "svm": {
        "uuid": "02b0dfff-aa28-11e8-a653-005056bb7072",
        "name": "svm1",
        "_links": {
          "self": {
            "href": "/api/svm/svms/02b0dfff-aa28-11e8-a653-005056bb7072"
          }
        }
      },
      "uuid": "8f249e7d-ab9f-11e8-b8a3-005056bb7072",
      "name": "igroup1",
      "os_type": "linux",
      "_links": {
        "self": {
          "href": "/api/protocols/san/igroups/8f249e7d-ab9f-11e8-b8a3-005056bb7072"
        }
      }
    }
  ],
  "num_records": 1,
  "_links": {
    "self": {
      "href": "/api/protocols/san/igroups?os_type=linux"
    }
  }
}

```

Retrieving a specific initiator group

```

# The API:
GET /api/protocols/san/igroups/{uuid}

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/igroups/8f249e7d-ab9f-11e8-b8a3-005056bb7072' -H 'accept: application/hal+json'

# The response:
{
  "svm": {
    "uuid": "02b0dfff-aa28-11e8-a653-005056bb7072",
    "name": "svm1",
    "_links": {
      "self": {
        "href": "/api/svm/svms/02b0dfff-aa28-11e8-a653-005056bb7072"
      }
    }
  },
  "uuid": "8f249e7d-ab9f-11e8-b8a3-005056bb7072",
  "name": "igroup1",
  "protocol": "iscsi",
  "os_type": "linux",
  "_links": {
    "self": {
      "href": "/api/protocols/san/igroups/8f249e7d-ab9f-11e8-b8a3-005056bb7072"
    }
  }
}

```

Retrieving LUNs mapped to a specific initiator group

The `fields` parameter is used to specify the desired properties.

```

# The API:
GET /api/protocols/san/igroups

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/igroups/8f249e7d-ab9f-11e8-b8a3-005056bb7072?fields=lun_maps' -H 'accept: application/hal+json'

# The response:
{

```

```

"svm": {
  "uuid": "02b0dfff-aa28-11e8-a653-005056bb7072",
  "name": "svm1",
  "_links": {
    "self": {
      "href": "/api/svm/svms/02b0dfff-aa28-11e8-a653-005056bb7072"
    }
  }
},
"uuid": "8f249e7d-ab9f-11e8-b8a3-005056bb7072",
"name": "igroup1",
"lun_maps": [
  {
    "logical_unit_number": 0,
    "lun": {
      "name": "/vol/vol1/lun1",
      "uuid": "4b33ba57-c4e0-4dbb-bc47-214800d18a71",
      "node": {
        "name": "node1",
        "uuid": "f17182af-223f-4d51-8197-2cb2146d5c4c",
        "_links": {
          "self": {
            "href": "/api/cluster/nodes/f17182af-223f-4d51-8197-2cb2146d5c4c"
          }
        }
      },
      "_links": {
        "self": {
          "href": "/api/storage/luns/4b33ba57-c4e0-4dbb-bc47-214800d18a71"
        }
      }
    }
  }
]
"_links": {
  "self": {
    "href": "/api/protocols/san/igroups/8f249e7d-ab9f-11e8-b8a3-005056bb7072"
  }
}
}

```

Renaming an initiator group

Note that renaming an initiator group must be done in a PATCH request separate from any other modifications.

```
# The API:  
PATCH /api/protocols/san/igroups/{uuid}  
  
# The call:  
curl -X PATCH 'https://<mgmt-ip>/api/protocols/san/igroups/8f249e7d-ab9f-  
11e8-b8a3-005056bb7072' -H 'accept: application/hal+json' -d '{ "name":  
"igroup1_newName" }'
```

Changing the operating system type of an initiator group

```
# The API:  
PATCH /api/protocols/san/igroups/{uuid}  
  
# The call:  
curl -X PATCH 'https://<mgmt-ip>/api/protocols/san/igroups/8f249e7d-ab9f-  
11e8-b8a3-005056bb7072' -H 'accept: application/hal+json' -d '{ "os_type":  
"aix" }'
```

Adding an initiator to an initiator group

```
# The API:  
POST /api/protocols/san/igroups/{igroup.uuid}/initiators  
  
# The call:  
curl -X POST 'https://<mgmt-ip>/api/protocols/san/igroups/8f249e7d-ab9f-  
11e8-b8a3-005056bb7072/initiators' -H 'accept: application/hal+json' -d '{  
"name": "iqn.1991-05.com.ms:host2" }'
```

Adding multiple initiators to an initiator group

Note the use of the `records` property to add multiple initiators to the initiator group in a single API call.

```
# The API:  
POST /api/protocols/san/igroups/{igroup.uuid}/initiators  
  
# The call:  
curl -X POST 'https://<mgmt-ip>/api/protocols/san/igroups/8f249e7d-ab9f-  
11e8-b8a3-005056bb7072/initiators' -H 'accept: application/hal+json' -d '{  
"records": [ { "name": "iqn.1991-05.com.ms:host3" }, { "name": "iqn.1991-  
05.com.ms:host4" } ] }'
```

Removing an initiator from an initiator group

```
# The API:  
DELETE /api/protocols/san/igroups/{igroup.uuid}/initiators/iqn.1991-  
05.com.ms:host3  
  
# The call:  
curl -X DELETE 'https://<mgmt-ip>/api/protocols/san/igroups/8f249e7d-ab9f-  
11e8-b8a3-005056bb7072/initiators/iqn.1991-05.com.ms:host3' -H 'accept:  
application/hal+json'
```

Removing an initiator from a mapped initiator group

Normally, removing an initiator from an initiator group that is mapped to a LUN is not allowed. The removal can be forced using the `allow_delete_while_mapped` query parameter.

```
# The API:  
DELETE /api/protocols/san/igroups/{igroup.uuid}/initiators/iqn.1991-  
05.com.ms:host4  
  
# The call:  
curl -X DELETE 'https://<mgmt-ip>/api/protocols/san/igroups/8f249e7d-ab9f-  
11e8-b8a3-005056bb7072/initiators/iqn.1991-  
05.com.ms:host4?allow_delete_while_mapped=true' -H 'accept:  
application/hal+json'
```

Deleting an initiator group

```
# The API:  
DELETE /api/protocols/san/igroups/{uuid}  
  
# The call:  
curl -X DELETE 'https://<mgmt-ip>/api/protocols/san/igroups/abf9c39d-ab9f-  
11e8-b8a3-005056bb7072' -H 'accept: application/hal+json'
```

Deleting a mapped initiator group

Normally, deleting an initiator group that is mapped to a LUN is not allowed. The deletion can be forced using the `allow_delete_while_mapped` query parameter.

```
# The API:  
DELETE /api/protocols/san/igroups/{uuid}  
  
# The call:  
curl -X DELETE 'https://<mgmt-ip>/api/protocols/san/igroups/abf9c39d-ab9f-  
11e8-b8a3-005056bb7072?allow_delete_while_mapped=true' -H 'accept:  
application/hal+json'
```

Retrieve initiator groups

GET /protocols/san/igroups

Retrieves initiator groups.

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.

- `lun_maps.*`

Related ONTAP commands

- `lun igrup show`
- `lun mapping show`

Learn more

- [DOC /protocols/san/igroups](#)

Parameters

| Name | Type | In | Required | Description |
|------------------------------|---------------|-------|----------|--|
| delete_on_unmap | boolean | query | False | Filter by delete_on_unmap |
| initiators.name | string | query | False | Filter by initiators.name |
| initiators.igroup.uuid | string | query | False | Filter by initiators.igroup.uuid |
| protocol | string | query | False | Filter by protocol |
| name | string | query | False | Filter by name |
| uuid | string | query | False | Filter by uuid |
| lun_maps.logical_unit_number | integer | query | False | Filter by lun_maps.logical_unit_number |
| lun_maps.lun.node.uuid | string | query | False | Filter by lun_maps.lun.node.uuid |
| lun_maps.lun.node.name | string | query | False | Filter by lun_maps.lun.node.name |
| lun_maps.lun.uuid | string | query | False | Filter by lun_maps.lun.uuid |
| lun_maps.lun.name | string | query | False | Filter by lun_maps.lun.name |
| svm.uuid | string | query | False | Filter by svm.uuid |
| svm.name | string | query | False | Filter by svm.name |
| os_type | string | query | False | Filter by os_type |
| 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_records | boolean | query | False | The default is true for GET calls. When set to false, only the number of records is returned. |
| 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. |
| 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 records. |
| records | array[igroup] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "initiators": [  
        {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          },  
          "igroup": {  
            "_links": {  
              "self": {  
                "href": "/api/resourcelink"  
              }  
            },  
            "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
          },  
          "name": "iqn.1998-01.com.corp.iscsi:name1"  
        }  
      ],  
      "lun_maps": [  
        {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          },  
          "logical_unit_number": 0,  
          "lun": {  
            "_links": {  
              "self": {  
                "href": "/api/resourcelink"  
              }  
            }  
          }  
        }  
      ]  
    }  
  ]  
}
```

```

        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "lun1",
    "node": {
        "_links": {
            "self": {
                "href": "/api/resourcelink"
            }
        },
        "name": "node1",
        "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    },
    "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
}
}
],
"name": "igroup1",
"os_type": "string",
"protocol": "string",
"svm": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "svm1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
},
"uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
}
]
}

```

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 | |

igroup

The initiator group in which the initiator is found.

Note that this does not mean that the initiator cannot also be found in other initiator groups.

| Name | Type | Description |
|--------|--------|---|
| _links | _links | |
| uuid | string | The unique identifier of the initiator group. |

igroup_initiator_no_records

| Name | Type | Description |
|--------|--------|--|
| _links | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |

| Name | Type | Description |
|------|--------|---|
| name | string | <p>The FC WWPN, iSCSI IQN, or iSCSI EUI that identifies the host initiator. Valid in POST only and not allowed when the <code>records</code> property is used.</p> <p>An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an iSCSI IQN is <code>iqn.yyyy-mm.reverse_domain_name:any</code>. The iSCSI EUI format consists of the <code>eui</code>. prefix followed by 16 hexadecimal characters.</p> |

node

| Name | Type | Description |
|---------------------|------------------------|-------------|
| <code>_links</code> | _links | |
| name | string | |
| uuid | string | |

lun

The LUN to which the initiator group is mapped.

| Name | Type | Description |
|---------------------|------------------------|-----------------------------------|
| <code>_links</code> | _links | |
| name | string | The name of the LUN. |
| node | node | |
| uuid | string | The unique identifier of the LUN. |

lun_maps

A LUN map with which the initiator group is associated.

| Name | Type | Description |
|---------------------|------------------------|--|
| <code>_links</code> | _links | |
| logical_unit_number | integer | The logical unit number assigned to the LUN for initiators in the initiator group. |

| Name | Type | Description |
|------|---------------------|---|
| lun | lun | The LUN to which the initiator group is mapped. |

svm

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

igroup

An initiator group (igroup) is a collection of Fibre Channel (FC) world wide port names (WWPN), and/or iSCSI Qualified Names (IQNs), and/or iSCSI EUIs (Extended Unique Identifiers) that identify host initiators.

Initiator groups are used to control which hosts can access specific LUNs. To grant access to a LUN from one or more hosts, create an initiator group containing the hosts' initiator names, then create a LUN map that associates the initiator group with the LUN.

An initiator can appear in multiple initiator groups. An initiator group can be mapped to multiple LUNs. A specific initiator can be mapped to a specific LUN only once.

All initiators in an initiator group must be from the same operating system. The initiator group's operating system is specified when the initiator group is created.

When an initiator group is created, the `protocol` property is used to restrict member initiators to Fibre Channel (`fcp`), iSCSI (`iscsi`), or both (`mixed`).

Zero or more initiators can be supplied when the initiator group is created. After creation, initiators can be added or removed from the initiator group using the [/protocols/san/igroups/{igroup.uuid}/initiators](#) endpoint. See [DELETE /protocols/san/igroups/{igroup.uuid}/initiators/{name}](#) for more details.

| Name | Type | Description |
|-----------------|------------------------|---|
| _links | _links | |
| delete_on_unmap | boolean | An option that causes the initiator group to be deleted when the last LUN map associated with it is deleted. Optional in PATCH only; not available in POST. This property defaults to <code>false</code> when the initiator group is created. |

| Name | Type | Description |
|------------|--|--|
| initiators | array[igroup_initiator_no_records] | <p>The initiators that are members of the group. Optional in POST.</p> <p>Zero or more initiators can be supplied when the initiator group is created. After creation, initiators can be added or removed from the initiator group using the /protocols/san/igroups/{igroup.uuid}/initiators endpoint. See DELETE /protocols/san/igroups/{igroup.uuid}/initiators/{name} for more details.</p> |
| lun_maps | array[lun_maps] | <p>All LUN maps with which the initiator is associated.</p> <p>There is an added cost to retrieving property values for <code>lun_maps</code>. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| name | string | <p>The name of the initiator group. Required in POST; optional in PATCH.</p> <p>Note that renaming an initiator group must be done in a PATCH request separate from any other modifications.</p> |
| os_type | string | The host operating system of the initiator group. All initiators in the group should be hosts of the same operating system. Required in POST; optional in PATCH. |

| Name | Type | Description |
|----------|---------------------|---|
| protocol | string | <p>The protocols supported by the initiator group. This restricts the type of initiators that can be added to the initiator group. Optional in POST; if not supplied, this defaults to <i>mixed</i>.</p> <p>The protocol of an initiator group cannot be changed after creation of the group.</p> |
| svm | svm | |
| uuid | string | The unique identifier of the initiator group. |

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 initiator group

POST /protocols/san/igroups

Creates an initiator group.

Required properties

- `svm.uuid` or `svm.name` - Existing SVM in which to create the initiator group.

- `name` - Name of the initiator group.
- `os_type` - Operating system of the initiator group's initiators.

Recommended optional properties

- `initiators.name` - Name(s) of initiator group's initiators. This property can be used to create the initiator group and populate it with initiators in a single request.

Default property values

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

- `protocol` - *mixed* - Data protocol of the initiator group's initiators.

Learn more

- [DOC /protocols/san/igroups](#)

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>initiators</code> | array[igroup_initiator_no_records] | <p>The initiators that are members of the group. Optional in POST.</p> <p>Zero or more initiators can be supplied when the initiator group is created. After creation, initiators can be added or removed from the initiator group using the /protocols/san/igroups/{igroup.uuid}/initiators endpoint. See DELETE /protocols/san/igroups/{igroup.uuid}/initiators/{name} for more details.</p> |

| Name | Type | Description |
|----------|-----------------|---|
| lun_maps | array[lun_maps] | <p>All LUN maps with which the initiator is associated.</p> <p>There is an added cost to retrieving property values for <code>lun_maps</code>. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| name | string | <p>The name of the initiator group. Required in POST; optional in PATCH.</p> <p>Note that renaming an initiator group must be done in a PATCH request separate from any other modifications.</p> |
| os_type | string | The host operating system of the initiator group. All initiators in the group should be hosts of the same operating system. Required in POST; optional in PATCH. |
| protocol | string | <p>The protocols supported by the initiator group. This restricts the type of initiators that can be added to the initiator group. Optional in POST; if not supplied, this defaults to <code>mixed</code>.</p> <p>The protocol of an initiator group cannot be changed after creation of the group.</p> |
| svm | svm | |
| uuid | string | The unique identifier of the initiator group. |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "delete_on_unmap": null,  
  "initiators": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "igroup": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
      },  
      "name": "iqn.1998-01.com.corp.iscsi:name1"  
    }  
  ],  
  "lun_maps": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "logical_unit_number": 0,  
      "lun": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "name": "lun1",  
        "node": {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          }  
        }  
      }  
    }  
  ]  
}
```

```

        }
    },
    "name": "node1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
}
],
"name": "igroup1",
"os_type": "string",
"protocol": "string",
"svm": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "svml1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
},
"uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
}
}

```

Response

Status: 201, Created

| Name | Type | Description |
|-------------|---------------|--------------------|
| _links | _links | |
| num_records | integer | Number of records. |
| records | array[igroup] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "delete_on_unmap": null,  
      "initiators": [  
        {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          },  
          "igroup": {  
            "_links": {  
              "self": {  
                "href": "/api/resourcelink"  
              }  
            },  
            "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
          },  
          "name": "iqn.1998-01.com.corp.iscsi:name1"  
        }  
      ],  
      "lun_maps": [  
        {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          },  
          "logical_unit_number": 0,  
          "lun": {  
            "logical_unit_number": 0,  
            "lun": 0,  
            "target": {  
              "name": "iqn.1998-01.com.corp.iscsi:target1"  
            }  
          }  
        }  
      ]  
    }  
  ]  
}
```

```

    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "name": "lun1",
    "node": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "node1",
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    },
    "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
  }
}
],
{
  "name": "igroup1",
  "os_type": "string",
  "protocol": "string",
  "svm": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "name": "svm1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
  },
  "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
}
]
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|---|
| 2621462 | The supplied SVM does not exist. |
| 2621706 | The specified <code>svm.uuid</code> and <code>svm.name</code> do not refer to the same SVM. |
| 2621707 | No SVM was specified. Either <code>svm.name</code> or <code>svm.uuid</code> must be supplied. |
| 5373958 | An invalid initiator group name was supplied. |
| 5373966 | An initiator group cannot be created in an SVM that is configured for NVMe. |
| 5373969 | A supplied initiator name looks like an iSCSI IQN initiator, but the portions after the prefix are missing. |
| 5373971 | A supplied initiator name looks like an iSCSI IQN initiator, but the date portion is invalid. |
| 5373972 | A supplied initiator name looks like an iSCSI IQN initiator, but the naming authority portion is invalid. |
| 5373977 | A supplied initiator name looks like an iSCSI EUI initiator, but the length is invalid. |
| 5373978 | A supplied initiator name looks like an iSCSI EUI initiator, but the format is invalid. |
| 5373992 | A supplied initiator name was too long to be valid. |
| 5373993 | A supplied initiator name did not match any valid format. |
| 5374023 | An initiator group with the same name already exists. |
| 5374038 | An invalid Fibre Channel WWPN was supplied. |
| 5374039 | An invalid iSCSI initiator name was supplied. |
| 5374732 | An initiator is already in another initiator group with a conflicting operating system type. |

| 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 | |

igroup

The initiator group in which the initiator is found.

Note that this does not mean that the initiator cannot also be found in other initiator groups.

| Name | Type | Description |
|--------|--------|---|
| _links | _links | |
| uuid | string | The unique identifier of the initiator group. |

igroup_initiator_no_records

| Name | Type | Description |
|--------|--------|--|
| _links | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |

| Name | Type | Description |
|------|--------|---|
| name | string | <p>The FC WWPN, iSCSI IQN, or iSCSI EUI that identifies the host initiator. Valid in POST only and not allowed when the <code>records</code> property is used.</p> <p>An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an iSCSI IQN is <code>iqn.yyyy-mm.reverse_domain_name:any</code>. The iSCSI EUI format consists of the <code>eui</code>. prefix followed by 16 hexadecimal characters.</p> |

node

| Name | Type | Description |
|---------------------|------------------------|-------------|
| <code>_links</code> | _links | |
| name | string | |
| uuid | string | |

lun

The LUN to which the initiator group is mapped.

| Name | Type | Description |
|---------------------|------------------------|-----------------------------------|
| <code>_links</code> | _links | |
| name | string | The name of the LUN. |
| node | node | |
| uuid | string | The unique identifier of the LUN. |

lun_maps

A LUN map with which the initiator group is associated.

| Name | Type | Description |
|---------------------|------------------------|--|
| <code>_links</code> | _links | |
| logical_unit_number | integer | The logical unit number assigned to the LUN for initiators in the initiator group. |

| Name | Type | Description |
|------|---------------------|---|
| lun | lun | The LUN to which the initiator group is mapped. |

svm

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

igroup

An initiator group (igroup) is a collection of Fibre Channel (FC) world wide port names (WWPN), and/or iSCSI Qualified Names (IQNs), and/or iSCSI EUIs (Extended Unique Identifiers) that identify host initiators.

Initiator groups are used to control which hosts can access specific LUNs. To grant access to a LUN from one or more hosts, create an initiator group containing the hosts' initiator names, then create a LUN map that associates the initiator group with the LUN.

An initiator can appear in multiple initiator groups. An initiator group can be mapped to multiple LUNs. A specific initiator can be mapped to a specific LUN only once.

All initiators in an initiator group must be from the same operating system. The initiator group's operating system is specified when the initiator group is created.

When an initiator group is created, the `protocol` property is used to restrict member initiators to Fibre Channel (`fcp`), iSCSI (`iscsi`), or both (`mixed`).

Zero or more initiators can be supplied when the initiator group is created. After creation, initiators can be added or removed from the initiator group using the `/protocols/san/igroups/{igroup.uuid}/initiators` endpoint. See [DELETE /protocols/san/igroups/{igroup.uuid}/initiators/{name}](#) for more details.

| Name | Type | Description |
|--------|------------------------|-------------|
| _links | _links | |

| Name | Type | Description |
|------------|--|--|
| initiators | array[igroup_initiator_no_records] | <p>The initiators that are members of the group. Optional in POST.</p> <p>Zero or more initiators can be supplied when the initiator group is created. After creation, initiators can be added or removed from the initiator group using the /protocols/san/igroups/{igroup.uuid}/initiators endpoint. See DELETE /protocols/san/igroups/{igroup.uuid}/initiators/{name} for more details.</p> |
| lun_maps | array[lun_maps] | <p>All LUN maps with which the initiator is associated.</p> <p>There is an added cost to retrieving property values for <code>lun_maps</code>. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| name | string | <p>The name of the initiator group. Required in POST; optional in PATCH.</p> <p>Note that renaming an initiator group must be done in a PATCH request separate from any other modifications.</p> |
| os_type | string | The host operating system of the initiator group. All initiators in the group should be hosts of the same operating system. Required in POST; optional in PATCH. |

| Name | Type | Description |
|----------|---------------------|---|
| protocol | string | <p>The protocols supported by the initiator group. This restricts the type of initiators that can be added to the initiator group. Optional in POST; if not supplied, this defaults to <i>mixed</i>.</p> <p>The protocol of an initiator group cannot be changed after creation of the group.</p> |
| svm | svm | |
| uuid | string | The unique identifier of the initiator group. |

_links

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

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 initiators of an initiator group

GET /protocols/san/igroups/{igroup.uuid}/initiators

Retrieves initiators of an initiator group.

Related ONTAP commands

- lun igrp show

Learn more

- [DOC /protocols/san/igroups](#)

Parameters

| Name | Type | In | Required | Description |
|----------------|---------------|-------|----------|--|
| igroup.uuid | string | path | True | The unique identifier of the initiator group. |
| fields | array[string] | query | False | Specify the fields to return. |
| max_records | integer | query | False | Limit the number of records returned. |
| return_records | boolean | query | False | The default is true for GET calls. When set to false, only the number of records is returned. |
| 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. |
| 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 records. |
| records | array[igroup_initiator] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "igroup": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
      },  
      "name": "iqn.1998-01.com.corp.iscsi:namel"  
    }  
  ]  
}
```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 5374852 | The initiator group specified in the URI does not exist. |

| 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 | |

igroup

The initiator group in which the initiator is found.

Note that this does not mean that the initiator cannot also be found in other initiator groups.

| Name | Type | Description |
|--------|--------|---|
| _links | _links | |
| uuid | string | The unique identifier of the initiator group. |

records

| Name | Type | Description |
|--------|--------|--|
| _links | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |

| Name | Type | Description |
|------|--------|---|
| name | string | <p>The FC WWPN, iSCSI IQN, or iSCSI EUI that identifies the host initiator. Valid in POST only and not allowed when the <code>records</code> property is used.</p> <p>An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an iSCSI IQN is <i>iqn.yyyy-mm.reverse_domain_name:any</i>. The iSCSI EUI format consists of the <i>eui</i>. prefix followed by 16 hexadecimal characters.</p> |

igroup_initiator

| Name | Type | Description |
|---------------------|------------------------|---|
| <code>_links</code> | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |
| name | string | <p>The FC WWPN, iSCSI IQN, or iSCSI EUI that identifies the host initiator. Valid in POST only and not allowed when the <code>records</code> property is used.</p> <p>An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an iSCSI IQN is <i>iqn.yyyy-mm.reverse_domain_name:any</i>. The iSCSI EUI format consists of the <i>eui</i>. prefix followed by 16 hexadecimal characters.</p> |

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. |

Add initiators to an initiator group

POST /protocols/san/igroups/{igroup.uuid}/initiators

Adds one or more initiators to an initiator group.

Required properties

- name or records.name - Initiator name(s) to add to the initiator group.

Related ONTAP commands

- lun igrup add

Learn more

- [DOC /protocols/san/igroups](#)

Parameters

| Name | Type | In | Required | Description |
|----------------|---------|-------|----------|---|
| return_records | boolean | query | False | The default is false. If set to true, the records are returned. |
| igroup.uuid | string | path | True | The unique identifier of the initiator group. |

Request Body

| Name | Type | Description |
|---------|----------------|---|
| _links | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |
| name | string | <p>The FC WWPN, iSCSI IQN, or iSCSI EUI that identifies the host initiator. Valid in POST only and not allowed when the <code>records</code> property is used.</p> <p>An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an iSCSI IQN is <i>iqn.yyyy-mm.reverse_domain_name:any</i>. The iSCSI EUI format consists of the <i>eui</i>. prefix followed by 16 hexadecimal characters.</p> |
| records | array[records] | An array of initiators specified to add multiple initiators to an initiator group in a single API call. Valid in POST only and not allowed when the <code>name</code> property is used. |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "igroup": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
  },  
  "name": "iqn.1998-01.com.corp.iscsi:name1",  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "igroup": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
      },  
      "name": "iqn.1998-01.com.corp.iscsi:name1"  
    }  
  ]  
}
```

Response

Status: 201, Created

| Name | Type | Description |
|-------------|---|--------------------|
| _links | _links | |
| num_records | integer | Number of records. |
| records | array[igroup_initiator] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "igroup": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
      },  
      "name": "iqn.1998-01.com.corp.iscsi:name1",  
      "records": [  
        {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          },  
          "igroup": {  
            "_links": {  
              "self": {  
                "href": "/api/resourcelink"  
              }  
            },  
            "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
          },  
          "name": "iqn.1998-01.com.corp.iscsi:name1"  
        }  
      ]  
    }  
  ]  
}
```

```
    ]  
}
```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|---|
| 1254193 | Adding an initiator would cause the initiator to be mapped to the same LUN more than once. |
| 1254324 | Adding an initiator would cause the initiator to have the same logical unit identifier for multiple LUN maps. |
| 5373969 | A supplied initiator name looks like an iSCSI IQN initiator, but the portions after the prefix are missing. |
| 5373971 | A supplied initiator name looks like an iSCSI IQN initiator, but the date portion is invalid. |
| 5373972 | A supplied initiator name looks like an iSCSI IQN initiator, but the naming authority portion is invalid. |
| 5373977 | A supplied initiator name looks like an iSCSI EUI initiator, but the length is invalid. |
| 5373978 | A supplied initiator name looks like an iSCSI EUI initiator, but the format is invalid. |
| 5373992 | A supplied initiator name was too long to be valid. |
| 5373993 | A supplied initiator name did not match any valid format. |
| 5374033 | Initiators must be supplied. |
| 5374035 | A supplied initiator is already in the initiator group. |
| 5374038 | An invalid Fibre Channel WWPN was supplied. |
| 5374039 | An invalid iSCSI initiator name was supplied. |
| 5374734 | An initiator is already in another initiator group with a conflicting operating system type. |
| 5374852 | The initiator group specified in the URI does not exist. |
| 5374853 | You can add initiators to an initiator group using the <code>records</code> property, or the <code>name</code> property, but you cannot use both in the same request. |
| 5374854 | Only <code>records</code> property elements should be populated with the <code>name</code> property values. |

| 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 | |

igroup

The initiator group in which the initiator is found.

Note that this does not mean that the initiator cannot also be found in other initiator groups.

| Name | Type | Description |
|--------|--------|---|
| _links | _links | |
| uuid | string | The unique identifier of the initiator group. |

records

| Name | Type | Description |
|--------|--------|--|
| _links | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |

| Name | Type | Description |
|------|--------|---|
| name | string | <p>The FC WWPN, iSCSI IQN, or iSCSI EUI that identifies the host initiator. Valid in POST only and not allowed when the <code>records</code> property is used.</p> <p>An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an iSCSI IQN is <i>iqn.yyyy-mm.reverse_domain_name:any</i>. The iSCSI EUI format consists of the <i>eui</i>. prefix followed by 16 hexadecimal characters.</p> |

igroup_initiator

| Name | Type | Description |
|---------------------|------------------------|---|
| <code>_links</code> | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |
| name | string | <p>The FC WWPN, iSCSI IQN, or iSCSI EUI that identifies the host initiator. Valid in POST only and not allowed when the <code>records</code> property is used.</p> <p>An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an iSCSI IQN is <i>iqn.yyyy-mm.reverse_domain_name:any</i>. The iSCSI EUI format consists of the <i>eui</i>. prefix followed by 16 hexadecimal characters.</p> |

| Name | Type | Description |
|---------|----------------|--|
| records | array[records] | An array of initiators specified to add multiple initiators to an initiator group in a single API call. Valid in POST only and not allowed when the name property is used. |

_links

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

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. |

Delete an initiator from an initiator group

`DELETE /protocols/san/igroups/{igroup.uuid}/initiators/{name}`

Deletes an initiator from an initiator group.

Related ONTAP commands

- `lun igroup remove`

Learn more

- [DOC /protocols/san/igroups](#)

Parameters

| Name | Type | In | Required | Description |
|---------------------------|---------|-------|----------|---|
| igroup.uuid | string | path | True | The unique identifier of the initiator group. |
| name | string | path | True | The initiator name. |
| allow_delete_while_mapped | boolean | query | False | <p>Allows deletion of an initiator from of a mapped initiator group.</p> <p>Deleting an initiator from a mapped initiator group makes the LUNs to which the initiator group is mapped no longer available to the initiator. This might cause a disruption in the availability of data.</p> <p>This parameter should be used with caution.</p> <ul style="list-style-type: none">• Default value: |

Response

```
Status: 200, Ok
```

Error

```
Status: Default
```

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 1254213 | The initiator group is mapped to one or more LUNs and <code>allow_delete_while_mapped</code> has not been specified. |
| 5374034 | The initiator is not a member of the group. |
| 5374852 | The initiator group specified in the URI does not exist. |

| 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 an initiator

GET /protocols/san/igroups/{igroup.uuid}/initiators/{name}

Retrieves an initiator of an initiator group.

Related ONTAP commands

- lun igrup show

Learn more

- [DOC /protocols/san/igroups](#)

Parameters

| Name | Type | In | Required | Description |
|-------------|---------------|-------|----------|---|
| igroup.uuid | string | path | True | The unique identifier of the initiator group. |
| name | string | path | True | Initiator name |
| fields | array[string] | query | False | Specify the fields to return. |

Response

Status: 200, Ok

| Name | Type | Description |
|--------|------------------------|---|
| _links | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |
| name | string | <p>The FC WWPN, iSCSI IQN, or iSCSI EUI that identifies the host initiator. Valid in POST only and not allowed when the <code>records</code> property is used.</p> <p>An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an iSCSI IQN is <code>iqn.yyyy-mm.reverse_domain_name:any</code>. The iSCSI EUI format consists of the <code>eui.</code> prefix followed by 16 hexadecimal characters.</p> |

Example response

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "igroup": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
  },  
  "name": "iqn.1998-01.com.corp.iscsi:namel"  
}
```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 4 | The initiator is not a member of the initiator group. |
| 5374852 | The initiator group specified in the URI does not exist. |

| 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 | |

igroup

The initiator group in which the initiator is found.

Note that this does not mean that the initiator cannot also be found in other initiator groups.

| Name | Type | Description |
|--------|--------|---|
| _links | _links | |
| uuid | string | The unique identifier of the initiator group. |

records

| Name | Type | Description |
|--------|--------|--|
| _links | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |

| Name | Type | Description |
|------|--------|---|
| name | string | <p>The FC WWPN, iSCSI IQN, or iSCSI EUI that identifies the host initiator. Valid in POST only and not allowed when the <code>records</code> property is used.</p> <p>An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an iSCSI IQN is <i>iqn.yyyy-mm.reverse_domain_name:any</i>. The iSCSI EUI format consists of the <i>eui</i>. prefix followed by 16 hexadecimal characters.</p> |

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. |

Delete an initiator group

DELETE /protocols/san/igroups/{uuid}

Deletes an initiator group.

Related ONTAP commands

- lun igrup delete

Learn more

- [DOC /protocols/san/igroups](#)

Parameters

| Name | Type | In | Required | Description |
|---------------------------|---------|-------|----------|---|
| uuid | string | path | True | The unique identifier of the initiator group. |
| allow_delete_while_mapped | boolean | query | False | <p>Allows deletion of a mapped initiator group.</p> <p>Deleting a mapped initiator group makes the LUNs to which the initiator group is mapped no longer available. This might cause a disruption in the availability of data.</p> <p>This parameter should be used with caution.</p> <ul style="list-style-type: none">• Default value: |

Response

```
Status: 200, Ok
```

Error

```
Status: Default
```

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 1254213 | The initiator group is mapped to one or more LUNs and <code>allow_delete_while_mapped</code> has not been specified. |
| 5374852 | The initiator group does not exist. |

| 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 an initiator group

GET /protocols/san/igroups/{uuid}

Retrieves an initiator group.

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.

- `lun_maps.*`

Related ONTAP commands

- `lun igrup show`
- `lun mapping show`

Learn more

- [DOC /protocols/san/igroups](#)

Parameters

| Name | Type | In | Required | Description |
|--------|---------------|-------|----------|---|
| uuid | string | path | True | The unique identifier of the initiator group. |
| fields | array[string] | query | False | Specify the fields to return. |

Response

Status: 200, Ok

| Name | Type | Description |
|------------------------------|------------------------|---|
| <code>_links</code> | _links | |
| <code>delete_on_unmap</code> | boolean | An option that causes the initiator group to be deleted when the last LUN map associated with it is deleted. Optional in PATCH only; not available in POST. This property defaults to <code>false</code> when the initiator group is created. |

| Name | Type | Description |
|------------|--|---|
| initiators | array[igroup_initiator_no_records] | <p>The initiators that are members of the group. Optional in POST.</p> <p>Zero or more initiators can be supplied when the initiator group is created. After creation, initiators can be added or removed from the initiator group using the <code>/protocols/san/igroups/{group.uuid}/initiators</code> endpoint. See DELETE /protocols/san/igroups/{group.uuid}/initiators/{name} for more details.</p> |
| lun_maps | array[lun_maps] | <p>All LUN maps with which the initiator is associated.</p> <p>There is an added cost to retrieving property values for <code>lun_maps</code>. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| name | string | <p>The name of the initiator group. Required in POST; optional in PATCH.</p> <p>Note that renaming an initiator group must be done in a PATCH request separate from any other modifications.</p> |
| os_type | string | The host operating system of the initiator group. All initiators in the group should be hosts of the same operating system. Required in POST; optional in PATCH. |

| Name | Type | Description |
|----------|---------------------|---|
| protocol | string | <p>The protocols supported by the initiator group. This restricts the type of initiators that can be added to the initiator group. Optional in POST; if not supplied, this defaults to <i>mixed</i>.</p> <p>The protocol of an initiator group cannot be changed after creation of the group.</p> |
| svm | svm | |
| uuid | string | The unique identifier of the initiator group. |

Example response

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "initiators": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "igroup": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
      },  
      "name": "iqn.1998-01.com.corp.iscsi:name1"  
    }  
  ],  
  "lun_maps": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "logical_unit_number": 0,  
      "lun": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "name": "lun1",  
        "node": {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          }  
        }  
      }  
    }  
  ]  
}
```

```

        },
        "name": "node1",
        "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    },
    "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
}
],
{
    "name": "igroup1",
    "os_type": "string",
    "protocol": "string",
    "svm": {
        "_links": {
            "self": {
                "href": "/api/resourcelink"
            }
        },
        "name": "svml",
        "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
    },
    "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
}
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|-------------------------------------|
| 5374852 | The initiator group does not exist. |

| 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 | |

igroup

The initiator group in which the initiator is found.

Note that this does not mean that the initiator cannot also be found in other initiator groups.

| Name | Type | Description |
|--------|--------|---|
| _links | _links | |
| uuid | string | The unique identifier of the initiator group. |

igroup_initiator_no_records

| Name | Type | Description |
|--------|--------|--|
| _links | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |

| Name | Type | Description |
|------|--------|---|
| name | string | <p>The FC WWPN, iSCSI IQN, or iSCSI EUI that identifies the host initiator. Valid in POST only and not allowed when the <code>records</code> property is used.</p> <p>An FC WWPN consist of 16 hexadecimal digits grouped as 8 pairs separated by colons. The format for an iSCSI IQN is <code>iqn.yyyy-mm.reverse_domain_name:any</code>. The iSCSI EUI format consists of the <code>eui</code>. prefix followed by 16 hexadecimal characters.</p> |

node

| Name | Type | Description |
|---------------------|------------------------|-------------|
| <code>_links</code> | _links | |
| name | string | |
| uuid | string | |

lun

The LUN to which the initiator group is mapped.

| Name | Type | Description |
|---------------------|------------------------|-----------------------------------|
| <code>_links</code> | _links | |
| name | string | The name of the LUN. |
| node | node | |
| uuid | string | The unique identifier of the LUN. |

lun_maps

A LUN map with which the initiator group is associated.

| Name | Type | Description |
|---------------------|------------------------|--|
| <code>_links</code> | _links | |
| logical_unit_number | integer | The logical unit number assigned to the LUN for initiators in the initiator group. |

| Name | Type | Description |
|------|---------------------|---|
| lun | lun | The LUN to which the initiator group is mapped. |

svm

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

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 an initiator group

PATCH /protocols/san/igroups/{uuid}

Updates an initiator group.

Related ONTAP commands

- `lun igrup modify`
- `lun igrup rename`

Learn more

- [DOC /protocols/san/igroups](#)

Parameters

| Name | Type | In | Required | Description |
|------|--------|------|----------|---|
| uuid | string | path | True | The unique identifier of the initiator group. |

Request Body

| Name | Type | Description |
|-----------------|-----------------------------------|---|
| _links | _links | |
| delete_on_unmap | boolean | An option that causes the initiator group to be deleted when the last LUN map associated with it is deleted. Optional in PATCH only; not available in POST. This property defaults to <i>false</i> when the initiator group is created. |
| lun_maps | array[lun_maps] | All LUN maps with which the initiator is associated. There is an added cost to retrieving property values for <code>lun_maps</code> . They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more. |
| name | string | The name of the initiator group. Required in POST; optional in PATCH. Note that renaming an initiator group must be done in a PATCH request separate from any other modifications. |
| os_type | string | The host operating system of the initiator group. All initiators in the group should be hosts of the same operating system. Required in POST; optional in PATCH. |

| Name | Type | Description |
|------|---------------------|---|
| svm | svm | |
| uuid | string | The unique identifier of the initiator group. |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "lun_maps": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "logical_unit_number": 0,  
      "lun": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "name": "lun1",  
        "node": {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          },  
          "name": "node1",  
          "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"  
        },  
        "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
      },  
    }  
  ],  
  "name": "igroup1",  
  "os_type": "string",  
  "svm": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "name": "svm1",  
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
```

```
  } ,  
  "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"  
}
```

Response

Status: 200, Ok

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 5373958 | An invalid initiator group name was supplied for a rename operation. |
| 5374023 | A rename operation failed because an initiator group with the same name already exists. |
| 5374733 | An initiator is already in another initiator group with a conflicting operating system type. |
| 5374852 | The initiator group does not exist. |
| 5374868 | The initiator group was partially modified before an error was encountered while renaming the initiator group. |

| 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 | |

igroup

The initiator group in which the initiator is found.

Note that this does not mean that the initiator cannot also be found in other initiator groups.

| Name | Type | Description |
|--------|--------|---|
| _links | _links | |
| uuid | string | The unique identifier of the initiator group. |

igroup_initiator_no_records

| Name | Type | Description |
|--------|--------|--|
| _links | _links | |
| igroup | igroup | <p>The initiator group in which the initiator is found.</p> <p>Note that this does not mean that the initiator cannot also be found in other initiator groups.</p> |

node

| Name | Type | Description |
|--------|--------|-------------|
| _links | _links | |
| name | string | |
| uuid | string | |

lun

The LUN to which the initiator group is mapped.

| Name | Type | Description |
|--------|------------------------|-----------------------------------|
| _links | _links | |
| name | string | The name of the LUN. |
| node | node | |
| uuid | string | The unique identifier of the LUN. |

lun_maps

A LUN map with which the initiator group is associated.

| Name | Type | Description |
|---------------------|------------------------|--|
| _links | _links | |
| logical_unit_number | integer | The logical unit number assigned to the LUN for initiators in the initiator group. |
| lun | lun | The LUN to which the initiator group is mapped. |

svm

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

igroup

An initiator group (igroup) is a collection of Fibre Channel (FC) world wide port names (WWPN), and/or iSCSI Qualified Names (IQNs), and/or iSCSI EUIs (Extended Unique Identifiers) that identify host initiators.

Initiator groups are used to control which hosts can access specific LUNs. To grant access to a LUN from one or more hosts, create an initiator group containing the hosts' initiator names, then create a LUN map that associates the initiator group with the LUN.

An initiator can appear in multiple initiator groups. An initiator group can be mapped to multiple LUNs. A specific initiator can be mapped to a specific LUN only once.

All initiators in an initiator group must be from the same operating system. The initiator group's operating system is specified when the initiator group is created.

When an initiator group is created, the `protocol` property is used to restrict member initiators to Fibre Channel (`fcp`), iSCSI (`iscsi`), or both (`mixed`).

Zero or more initiators can be supplied when the initiator group is created. After creation, initiators can be added or removed from the initiator group using the `/protocols/san/igroups/{igroup.uuid}/initiators` endpoint. See [DELETE /protocols/san/igroups/{igroup.uuid}/initiators/{name}](#) for more details.

| Name | Type | Description |
|------------------------------|---------------------------------|---|
| <code>_links</code> | _links | |
| <code>delete_on_unmap</code> | boolean | An option that causes the initiator group to be deleted when the last LUN map associated with it is deleted. Optional in PATCH only; not available in POST. This property defaults to <code>false</code> when the initiator group is created. |
| <code>lun_maps</code> | array[lun_maps] | <p>All LUN maps with which the initiator is associated.</p> <p>There is an added cost to retrieving property values for <code>lun_maps</code>. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| <code>name</code> | string | <p>The name of the initiator group. Required in POST; optional in PATCH.</p> <p>Note that renaming an initiator group must be done in a PATCH request separate from any other modifications.</p> |
| <code>os_type</code> | string | The host operating system of the initiator group. All initiators in the group should be hosts of the same operating system. Required in POST; optional in PATCH. |
| <code>svm</code> | svm | |
| <code>uuid</code> | string | The unique identifier of the initiator group. |

`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. |

Manage iSCSI credentials

Protocols SAN iSCSI credentials endpoint overview

Overview

An iSCSI credentials object defines authentication credentials to be used between an initiator and ONTAP. It identifies an authentication type, user names, and passwords that must be used to authenticate a specific initiator.

The iSCSI credentials REST API allows you to create, update, delete, and discover iSCSI credentials.

How iSCSI authentication works

An iSCSI credentials object defines the authentication credentials to be used between an initiator and ONTAP. While establishing an iSCSI connection, the initiator sends a login request to ONTAP to begin an iSCSI session. ONTAP then either permits or denies the login request, or determines that a login is not required.

For an initiator, you can specify an authentication type, user names and passwords, and a whitelist of optional network addresses from which the initiator is allowed to connect.

iSCSI authentication methods

- Challenge-Handshake Authentication Protocol (CHAP) - The initiator logs in using a CHAP user name and password. There are two types of CHAP user names and passwords:
 - Inbound - ONTAP authenticates the initiator. Inbound settings are required if you are using CHAP authentication.
 - Outbound - These are optional credentials to enable the initiator to authenticate ONTAP. You can use credentials only if inbound credentials are also being used.

- **deny** - The initiator is denied access to ONTAP.
- **none** - ONTAP does not require authentication for the initiator. The CHAP inbound/outbound password can be any valid string or an even number of valid hexadecimal digits preceded by '0X' or '0x'.

Initiator address list

The initiator address list is a way to specify valid IP addresses from which the initiator is allowed to connect. If the list is specified and the source address of an iSCSI connection is not in the list, the connection is rejected. Initiator addresses can be specified in either IPv4 or IPv6 format and in one of two forms:

- Range

```
{
  "start": "192.168.0.0",
  "end": "192.168.0.255"
}
```

- Mask

```
{
  "address": "192.168.0.0",
  "netmask": "24"
}
```

Initiator "default"

The default iSCSI authentication definition is created when the iSCSI service is created. An iSCSI credentials object with *default* as the initiator name identifies the default authentication for an SVM. The default credentials are used for any initiator that does not have specific iSCSI credentials. The default iSCSI authentication method is *none*, but can be changed to *deny* or *CHAP*. The default credentials object does not support an initiator address list.

Examples

Creating iSCSI credentials requiring no authentication

```
# The API:
POST /api/protocols/san/iscsi/credentials

# The call:
curl -X POST 'https://<mgmt-ip>/api/protocols/san/iscsi/credentials' -H
'accept: application/hal+json' -d '{ "svm": { "name": "svm1" },
"initiator": "iqn.1992-08.com.netapp:initiator1", "authentication_type": "none" }'
```

Creating iSCSI credentials using CHAP inbound authentication

```
# The API:  
POST /api/protocols/san/iscsi/credentials  
  
# The call:  
curl -X POST 'https://<mgmt-ip>/api/protocols/san/iscsi/credentials' -H  
'accept: application/hal+json' -d '{ "svm": { "name": "svm1" },  
"initiator": "iqn.1992-08.com.netapp:initiator2", "authentication_type":  
"CHAP", "chap": { "inbound": { "user": "user1", "password": "password1" } } }'
```

Retrieving all properties of all iSCSI credentials

The `fields` query parameter is used to request all iSCSI credentials properties.

Passwords are not included in the GET output.

```
# The API:  
GET /api/protocols/san/iscsi/credentials  
  
# The call:  
curl -X GET 'https://<mgmt-  
ip>/api/protocols/san/iscsi/credentials?fields=' -H 'accept:  
application/hal+json'  
  
# The response:  
{  
  "records": [  
    {  
      "svm": {  
        "uuid": "19d04b8e-94d7-11e8-8370-005056b48fd2",  
        "name": "svm1",  
        "_links": {  
          "self": {  
            "href": "/api/svm/svms/19d04b8e-94d7-11e8-8370-005056b48fd2"  
          }  
        }  
      },  
      "initiator": "default",  
      "authentication_type": "none",  
      "_links": {  
        "self": {  
          "href": "/api/protocols/san/iscsi/credentials/19d04b8e-94d7-11e8-
```

```

8370-005056b48fd2/default"
    }
}
},
{
"svm": {
    "uuid": "19d04b8e-94d7-11e8-8370-005056b48fd2",
    "name": "svm1",
    "_links": {
        "self": {
            "href": "/api/svm/svms/19d04b8e-94d7-11e8-8370-005056b48fd2"
        }
    }
},
"initiator": "iqn.1992-08.com.netapp:initiator1",
"authentication_type": "none",
"_links": {
    "self": {
        "href": "/api/protocols/san/iscsi/credentials/19d04b8e-94d7-11e8-
8370-005056b48fd2/iqn.1992-08.com.netapp:initiator1"
    }
}
},
{
"svm": {
    "uuid": "19d04b8e-94d7-11e8-8370-005056b48fd2",
    "name": "svm1",
    "_links": {
        "self": {
            "href": "/api/svm/svms/19d04b8e-94d7-11e8-8370-005056b48fd2"
        }
    }
},
"initiator": "iqn.1992-08.com.netapp:initiator2",
"authentication_type": "chap",
"chap": {
    "inbound": {
        "user": "user1"
    }
},
"_links": {
    "self": {
        "href": "/api/protocols/san/iscsi/credentials/19d04b8e-94d7-11e8-
8370-005056b48fd2/iqn.1992-08.com.netapp:initiator2"
    }
}
}

```

```

} ,
{
  "svm": {
    "uuid": "25f617cf-94d7-11e8-8370-005056b48fd2",
    "name": "svm2",
    "_links": {
      "self": {
        "href": "/api/svm/svms/25f617cf-94d7-11e8-8370-005056b48fd2"
      }
    }
  },
  "initiator": "default",
  "authentication_type": "none",
  "_links": {
    "self": {
      "href": "/api/protocols/san/iscsi/credentials/25f617cf-94d7-11e8-8370-005056b48fd2/default"
    }
  }
},
{
  "svm": {
    "uuid": "25f617cf-94d7-11e8-8370-005056b48fd2",
    "name": "svm2",
    "_links": {
      "self": {
        "href": "/api/svm/svms/25f617cf-94d7-11e8-8370-005056b48fd2"
      }
    }
  },
  "initiator": "iqn.1992-08.com.netapp:initiator2",
  "authentication_type": "none",
  "_links": {
    "self": {
      "href": "/api/protocols/san/iscsi/credentials/25f617cf-94d7-11e8-8370-005056b48fd2/iqn.1992-08.com.netapp:initiator2"
    }
  }
},
{
  "svm": {
    "uuid": "25f617cf-94d7-11e8-8370-005056b48fd2",
    "name": "svm2",
    "_links": {
      "self": {
        "href": "/api/svm/svms/25f617cf-94d7-11e8-8370-005056b48fd2"
      }
    }
  }
}

```

```
        }
    }
},
"initiator": "iqn.1992-08.com.netapp:initiator3",
"authentication_type": "deny",
"_links": {
    "self": {
        "href": "/api/protocols/san/iscsi/credentials/25f617cf-94d7-11e8-
8370-005056b48fd2/iqn.1992-08.com.netapp:initiator3"
    }
}
}
],
"num_records": 6,
"_links": {
    "self": {
        "href": "/api/protocols/san/iscsi/credentials?fields=*"
    }
}
}
```

Retrieving specific iSCSI credentials

```

# The API:
GET /api/protocols/san/iscsi/credentials/{svm.uuid}/{initiator}

# The call:
curl -X GET 'https://<mgmt-
ip>/api/protocols/san/iscsi/credentials/25f617cf-94d7-11e8-8370-
005056b48fd2/iqn.1992-08.com.netapp:initiator2' -H 'accept:
application/hal+json'

# The response:
{
  "svm": {
    "uuid": "25f617cf-94d7-11e8-8370-005056b48fd2",
    "name": "svm2",
    "_links": {
      "self": {
        "href": "/api/svm/svms/25f617cf-94d7-11e8-8370-005056b48fd2"
      }
    }
  },
  "initiator": "iqn.1992-08.com.netapp:initiator2",
  "authentication_type": "chap",
  "chap": {
    "inbound": {
      "user": "user1"
    }
  },
  "_links": {
    "self": {
      "href": "/api/protocols/san/iscsi/credentials/25f617cf-94d7-11e8-8370-
005056b48fd2/iqn.1992-08.com.netapp:initiator2"
    }
  }
}

```

Updating the authentication type of iSCSI credentials

```

# The API:
PATCH /api/protocols/san/iscsi/credentials/{svm.uuid}/{initiator}

# The call:
curl -X PATCH 'https://<mgmt-
ip>/api/protocols/san/iscsi/credentials/25f617cf-94d7-11e8-8370-
005056b48fd2/iqn.1992-08.com.netapp:initiator2' -H 'accept:
application/hal+json' -d '{ "authentication_type": "chap", "chap": {
"inbound": { "user": "user1", "password": "password1" } } }'
```

Updating the initiator address list of iSCSI credentials

```

# The API:
PATCH /api/protocols/san/iscsi/credentials/{svm.uuid}/{initiator}

# The call:
curl -X PATCH 'https://<mgmt-
ip>/api/protocols/san/iscsi/credentials/25f617cf-94d7-11e8-8370-
005056b48fd2/iqn.1992-08.com.netapp:initiator2' -H 'accept:
application/hal+json' -d '{ "initiator_address": { "ranges": [ { "start": "192.168.0.0", "end": "192.168.255.255" } ] } }'
```

Deleting iSCSI credentials

```

# The API:
DELETE /api/protocols/san/iscsi/credentials/{svm.uuid}/{initiator}

# The call:
curl -X DELETE 'https://<mgmt-
ip>/api/protocols/san/iscsi/credentials/25f617cf-94d7-11e8-8370-
005056b48fd2/iqn.1992-08.com.netapp:initiator2' -H 'accept:
application/hal+json'
```

Retrieve iSCSI credentials

GET /protocols/san/iscsi/credentials

Retrieves iSCSI credentials.

Related ONTAP commands

- `vserver iscsi security show`

Learn more

- [DOC /protocols/san/iscsi/credentials](#)

Parameters

| Name | Type | In | Required | Description |
|---------------------------------|--------|-------|----------|---|
| svm.uuid | string | query | False | Filter by svm.uuid |
| svm.name | string | query | False | Filter by svm.name |
| initiator_address.masks.netmask | string | query | False | Filter by initiator_address.masks.netmask |
| initiator_address.masks.address | string | query | False | Filter by initiator_address.masks.address |
| initiator_address.masks.family | string | query | False | Filter by initiator_address.masks.family |
| initiator_address.ranges.end | string | query | False | Filter by initiator_address.ranges.end |
| initiator_address.ranges.start | string | query | False | Filter by initiator_address.ranges.start |
| initiator_address.ranges.family | string | query | False | Filter by initiator_address.ranges.family |
| authentication_type | string | query | False | Filter by authentication_type |
| initiator | string | query | False | Filter by initiator |
| chap.outbound.user | string | query | False | Filter by chap.outbound.user |

| Name | Type | In | Required | Description |
|-------------------|---------------|-------|----------|--|
| chap.inbound.user | string | query | False | Filter by chap.inbound.user |
| fields | array[string] | query | False | Specify the fields to return. |
| max_records | integer | query | False | Limit the number of records returned. |
| return_records | boolean | query | False | The default is true for GET calls. When set to false, only the number of records is returned. |
| 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. |
| 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 records. |
| records | array[iscsi_credentials] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "authentication_type": "string",  
      "chap": {  
        "inbound": {  
          "user": "string"  
        },  
        "outbound": {  
          "user": "string"  
        }  
      },  
      "initiator": "iqn.1998-01.com.corp.iscsi:name1",  
      "initiator_address": {  
        "masks": [  
          {  
            "address": "10.10.10.7",  
            "family": "string",  
            "netmask": "24"  
          }  
        ],  
        "ranges": [  
          {  
            "end": "10.10.10.7",  
            "family": "string",  
            "start": "10.10.10.7"  
          }  
        ]  
      },  
      "svm": {  
        "_links": {  
          "self": {  
            "href": "/api/svm/  
          }  
        }  
      }  
    }  
  ]  
}
```

```

        "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 | |

inbound

Inbound CHAP credentials.

| Name | Type | Description |
|------|--------|---|
| user | string | The inbound CHAP user name. Optional in POST and PATCH. |

outbound

Output CHAP credentials.

| Name | Type | Description |
|------|--------|--|
| user | string | The outbound CHAP user name. Optional in POST and PATCH. |

chap

Challenge-Handshake Authentication Protocol (CHAP) credentials.

| Name | Type | Description |
|----------|----------|---------------------------|
| inbound | inbound | Inbound CHAP credentials. |
| outbound | outbound | Output CHAP credentials. |

ip_info

IP information

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

ip_address_range

IP address range

| Name | Type | Description |
|--------|--------|----------------------|
| end | string | IPv4 or IPv6 address |
| family | string | IPv4 or IPv6 |
| start | string | IPv4 or IPv6 address |

initiator_address

Initiator address ranges.

| Name | Type | Description |
|--------|-------------------------|-------------|
| masks | array[ip_info] | |
| ranges | array[ip_address_range] | |

svm

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

iscsi_credentials

| Name | Type | Description |
|--------|------------------------|-------------|
| _links | _links | |

| Name | Type | Description |
|---------------------|-------------------|--|
| authentication_type | string | The iSCSI authentication type. Required in POST and optional in PATCH. |
| chap | chap | Challenge-Handshake Authentication Protocol (CHAP) credentials. |
| initiator | string | The iSCSI initiator to which the credentials apply. Required in POST. |
| initiator_address | initiator_address | Initiator address ranges. |
| svm | svm | |

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 iSCSI credentials

POST /protocols/san/iscsi/credentials

Creates iSCSI credentials.

Required properties

- `svm.uuid` or `svm.name` - Existing SVM in which to create the iSCSI credentials.

- `initiator` - Initiator for which the iSCSI credentials are to be created.
- `authentication_type` - Type of authentication to use for the credentials.

Recommended optional properties

- `chap.inbound.user` - In-bound CHAP authentication user name.
- `chap.inbound.password` - In-bound CHAP authentication password.
- `chap.outbound.user` - Out-bound CHAP authentication user name.
- `chap.outbound.password` - Out-bound CHAP authentication password.

Related ONTAP commands

- `vserver iscsi security create`

Learn more

- [DOC /protocols/san/iscsi/credentials](#)

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>authentication_type</code> | string | The iSCSI authentication type. Required in POST and optional in PATCH. |
| <code>chap</code> | chap | Challenge-Handshake Authentication Protocol (CHAP) credentials. |
| <code>initiator</code> | string | The iSCSI initiator to which the credentials apply. Required in POST. |
| <code>initiator_address</code> | initiator_address | Initiator address ranges. |
| <code>svm</code> | svm | |

Example request

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "authentication_type": "string",
  "chap": {
    "inbound": {
      "password": "string",
      "user": "string"
    },
    "outbound": {
      "password": "string",
      "user": "string"
    }
  },
  "initiator": "iqn.1998-01.com.corp.iscsi:namel",
  "initiator_address": {
    "masks": [
      {
        "address": "10.10.10.7",
        "family": "string",
        "netmask": "24"
      }
    ],
    "ranges": [
      {
        "end": "10.10.10.7",
        "family": "string",
        "start": "10.10.10.7"
      }
    ]
  },
  "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 records. |
| records | array[iscsi_credentials] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "authentication_type": "string",  
      "chap": {  
        "inbound": {  
          "password": "string",  
          "user": "string"  
        },  
        "outbound": {  
          "password": "string",  
          "user": "string"  
        }  
      },  
      "initiator": "iqn.1998-01.com.corp.iscsi:name1",  
      "initiator_address": {  
        "masks": [  
          {  
            "address": "10.10.10.7",  
            "family": "string",  
            "netmask": "24"  
          }  
        ],  
        "ranges": [  
          {  
            "end": "10.10.10.7",  
            "family": "string",  
            "start": "10.10.10.7"  
          }  
        ]  
      }  
    }  
  ]  
},
```

```

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

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|---|
| 2621462 | An SVM with the specified UUID does not exist. |
| 2621706 | Both the SVM UUID and SVM name were supplied, but they do not refer to the same SVM. |
| 2621707 | No SVM was specified. Either <code>svm.name</code> or <code>svm.uuid</code> must be supplied. |
| 5373969 | A non-empty qualifier is required after the prefix. An example of a valid IQN is <code>iqn.1995-08.com.example:string</code> . |
| 5373970 | The IQN prefix is invalid. The correct IQN prefix is <code>iqn</code> . An example of a valid IQN is <code>iqn.1995-08.com.example:string</code> . |
| 5373971 | The date field is invalid. A valid date field is <code>yyyy-mm</code> . An example of a valid IQN is <code>iqn.1995-08.com.example:string</code> . |
| 5373972 | The naming authority and string fields can contain only the characters <code>a-z</code> , <code>0-9</code> , <code>,</code> , <code>:</code> , and <code>-</code> . |
| 5373977 | The EUI-64 identifier field must be exactly 16 hexadecimal digits. |
| 5373978 | The EUI formatted initiator name supplied is invalid. A valid EUI format is <code>eui.XXXXXXXXXXXXXXXXXX</code> , where X is a hexadecimal digit. |

| Error Code | Description |
|------------|--|
| 5373997 | The initiator name supplied is invalid. The valid initiator name formats are <i>iqn.1995-08.com.example:string</i> or <i>eui.0123456789abcdef</i> . |
| 5374078 | The iSCSI service does not exist. |
| 5374142 | An iSCSI security credential already exists for the specified initiator. |
| 5374145 | The iSCSI security password must contain an even number of valid hex digits. |
| 5374147 | The CHAP inbound and outbound passwords must be different. |
| 5374149 | The inbound user and password properties are required for CHAP authentication. |
| 5374150 | Outbound CHAP authentication requires an outbound password. |
| 5374855 | The value for property <code>initiator_address.ranges.start</code> is greater than the value for property <code>initiator_address.ranges.end</code> . |
| 5374856 | The value for property <code>initiator_address.ranges.start</code> does not belong to the same IP address family as the value for property <code>initiator_address.ranges.end</code> . |
| 5374900 | Setting the CHAP authentication properties are not supported with authentication types <i>none</i> or <i>deny</i> . |

| 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 | |

inbound

Inbound CHAP credentials.

| Name | Type | Description |
|----------|--------|--|
| password | string | The inbound CHAP password. Write-only; optional in POST and PATCH. |
| user | string | The inbound CHAP user name. Optional in POST and PATCH. |

outbound

Output CHAP credentials.

| Name | Type | Description |
|----------|--------|---|
| password | string | The outbound CHAP password. Write-only; optional in POST and PATCH. |
| user | string | The outbound CHAP user name. Optional in POST and PATCH. |

chap

Challenge-Handshake Authentication Protocol (CHAP) credentials.

| Name | Type | Description |
|----------|----------|---------------------------|
| inbound | inbound | Inbound CHAP credentials. |
| outbound | outbound | Output CHAP credentials. |

ip_info

IP information

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

ip_address_range

IP address range

| Name | Type | Description |
|--------|--------|----------------------|
| end | string | IPv4 or IPv6 address |
| family | string | IPv4 or IPv6 |
| start | string | IPv4 or IPv6 address |

initiator_address

Initiator address ranges.

| Name | Type | Description |
|--------|---|-------------|
| masks | array[ip_info] | |
| ranges | array[ip_address_range] | |

svm

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

iscsi_credentials

| Name | Type | Description |
|--------|------------------------|-------------|
| _links | _links | |

| Name | Type | Description |
|---------------------|-------------------|--|
| authentication_type | string | The iSCSI authentication type. Required in POST and optional in PATCH. |
| chap | chap | Challenge-Handshake Authentication Protocol (CHAP) credentials. |
| initiator | string | The iSCSI initiator to which the credentials apply. Required in POST. |
| initiator_address | initiator_address | Initiator address ranges. |
| svm | svm | |

_links

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

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. |

Delete iSCSI credentials

`DELETE /protocols/san/iscsi/credentials/{svm.uuid}/{initiator}`

Deletes specified iSCSI credentials.

Related ONTAP commands

- `vserver iscsi security delete`

Learn more

- [DOC /protocols/san/iscsi/credentials](#)

Parameters

| Name | Type | In | Required | Description |
|-----------|--------|------|----------|-------------|
| svm.uuid | string | path | True | |
| initiator | string | path | True | |

Response

Status: 200, Ok

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|---|
| 2621462 | An SVM with the specified UUID does not exist. |
| 2621706 | Both the SVM UUID and SVM name were supplied, but they do not refer to the same SVM. |
| 2621707 | No SVM was specified. Either <code>svm.name</code> or <code>svm.uuid</code> must be supplied. |
| 5374148 | The default security credential cannot be deleted for an SVM. |
| 5374895 | The iSCSI security credential does not exist on the specified SVM. |

| 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 specific iSCSI credentials

GET /protocols/san/iscsi/credentials/{svm.uuid}/{initiator}

Retrieves specified iSCSI credentials.

Related ONTAP commands

- `vserver iscsi security show`

Learn more

- [DOC /protocols/san/iscsi/credentials](#)

Parameters

| Name | Type | In | Required | Description |
|-----------|---------------|-------|----------|--|
| svm.uuid | string | path | True | The unique identifier of an SVM. |
| initiator | string | path | True | The iSCSI initiator of the credentials object. |
| fields | array[string] | query | False | Specify the fields to return. |

Response

Status: 200, Ok

| Name | Type | Description |
|---------------------|-----------------------------------|--|
| _links | _links | |
| authentication_type | string | The iSCSI authentication type. Required in POST and optional in PATCH. |
| chap | chap | Challenge-Handshake Authentication Protocol (CHAP) credentials. |
| initiator | string | The iSCSI initiator to which the credentials apply. Required in POST. |
| initiator_address | initiator_address | Initiator address ranges. |
| svm | svm | |

Example response

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "authentication_type": "string",  
  "chap": {  
    "inbound": {  
      "user": "string"  
    },  
    "outbound": {  
      "user": "string"  
    }  
  },  
  "initiator": "iqn.1998-01.com.corp.iscsi:name1",  
  "initiator_address": {  
    "masks": [  
      {  
        "address": "10.10.10.7",  
        "family": "string",  
        "netmask": "24"  
      }  
    ],  
    "ranges": [  
      {  
        "end": "10.10.10.7",  
        "family": "string",  
        "start": "10.10.10.7"  
      }  
    ]  
  },  
  "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 | |

inbound

Inbound CHAP credentials.

| Name | Type | Description |
|------|--------|---|
| user | string | The inbound CHAP user name. Optional in POST and PATCH. |

outbound

Output CHAP credentials.

| Name | Type | Description |
|------|--------|--|
| user | string | The outbound CHAP user name. Optional in POST and PATCH. |

chap

Challenge-Handshake Authentication Protocol (CHAP) credentials.

| Name | Type | Description |
|----------|----------|---------------------------|
| inbound | inbound | Inbound CHAP credentials. |
| outbound | outbound | Output CHAP credentials. |

ip_info

IP information

| Name | Type | Description |
|---------|--------|----------------------|
| address | string | IPv4 or IPv6 address |

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

ip_address_range

IP address range

| Name | Type | Description |
|--------|--------|----------------------|
| end | string | IPv4 or IPv6 address |
| family | string | IPv4 or IPv6 |
| start | string | IPv4 or IPv6 address |

initiator_address

Initiator address ranges.

| Name | Type | Description |
|--------|-------------------------|-------------|
| masks | array[ip_info] | |
| ranges | array[ip_address_range] | |

svm

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

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 iSCSI credentials

PATCH /protocols/san/iscsi/credentials/{svm.uuid}/{initiator}

Updates specified iSCSI credentials.

Related ONTAP commands

- vserver iscsi security add-initiator-address-ranges
- vserver iscsi security default
- vserver iscsi security modify
- vserver iscsi security remove-initiator-address-ranges

Learn more

- [DOC /protocols/san/iscsi/credentials](#)

Parameters

| Name | Type | In | Required | Description |
|-----------|--------|------|----------|--|
| svm.uuid | string | path | True | The unique identifier of an SVM. |
| initiator | string | path | True | The iSCSI initiator of the credentials object. |

| Name | Type | In | Required | Description |
|----------------------------|---------|-------|----------|--|
| add_initiator_addresses | boolean | query | False | <p>If <i>true</i>, the initiator addresses in the body merge into the existing addresses in the iSCSI security object rather than replace the existing addresses.</p> <ul style="list-style-type: none"> • Default value: |
| remove_initiator_addresses | boolean | query | False | <p>If <i>true</i>, the initiator addresses in the body are removed from the existing addresses in the iSCSI security object rather than replace the existing addresses.</p> <ul style="list-style-type: none"> • Default value: |

Request Body

| Name | Type | Description |
|---------------------|-----------------------------------|--|
| _links | _links | |
| authentication_type | string | The iSCSI authentication type. Required in POST and optional in PATCH. |
| chap | chap | Challenge-Handshake Authentication Protocol (CHAP) credentials. |
| initiator_address | initiator_address | Initiator address ranges. |
| svm | svm | |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "authentication_type": "string",  
  "chap": {  
    "inbound": {  
      "password": "string",  
      "user": "string"  
    },  
    "outbound": {  
      "password": "string",  
      "user": "string"  
    }  
  },  
  "initiator_address": {  
    "masks": [  
      {  
        "address": "10.10.10.7",  
        "family": "string",  
        "netmask": "24"  
      }  
    ],  
    "ranges": [  
      {  
        "end": "10.10.10.7",  
        "family": "string",  
        "start": "10.10.10.7"  
      }  
    ]  
  },  
  "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 |
|------------|--|
| 2621462 | An SVM with the specified UUID does not exist. |
| 2621706 | Both the SVM UUID and SVM name were supplied, but they do not refer to the same SVM. |
| 2621707 | No SVM was specified. Either <code>svm.name</code> or <code>svm.uuid</code> must be supplied. |
| 5374145 | The iSCSI security password must contain an even number of valid hex digits. |
| 5374147 | The CHAP inbound and outbound passwords must be different. |
| 5374149 | The inbound user and password properties are required for CHAP authentication. |
| 5374150 | Outbound CHAP authentication requires an outbound password. |
| 5374155 | The functionality is not supported for the default security credential. |
| 5374855 | The value for property <code>initiator_address.ranges.start</code> is greater than the value for property <code>initiator_address.ranges.end</code> . |
| 5374856 | The value for property <code>initiator_address.ranges.start</code> does not belong to the same IP address family as the value for property <code>initiator_address.ranges.end</code> . |
| 5374895 | The iSCSI security credential does not exist on the specified SVM. |
| 5374900 | Setting the CHAP authentication properties are not supported with authentication types <code>none</code> or <code>deny</code> . |

| 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 | |

inbound

Inbound CHAP credentials.

| Name | Type | Description |
|----------|--------|--|
| password | string | The inbound CHAP password. Write-only; optional in POST and PATCH. |
| user | string | The inbound CHAP user name. Optional in POST and PATCH. |

outbound

Output CHAP credentials.

| Name | Type | Description |
|----------|--------|---|
| password | string | The outbound CHAP password. Write-only; optional in POST and PATCH. |
| user | string | The outbound CHAP user name. Optional in POST and PATCH. |

chap

Challenge-Handshake Authentication Protocol (CHAP) credentials.

| Name | Type | Description |
|----------|----------|---------------------------|
| inbound | inbound | Inbound CHAP credentials. |
| outbound | outbound | Output CHAP credentials. |

ip_info

IP information

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

ip_address_range

IP address range

| Name | Type | Description |
|--------|--------|----------------------|
| end | string | IPv4 or IPv6 address |
| family | string | IPv4 or IPv6 |
| start | string | IPv4 or IPv6 address |

initiator_address

Initiator address ranges.

| Name | Type | Description |
|--------|---|-------------|
| masks | array[ip_info] | |
| ranges | array[ip_address_range] | |

svm

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

iscsi_credentials

| Name | Type | Description |
|--------|------------------------|-------------|
| _links | _links | |

| Name | Type | Description |
|---------------------|-------------------|--|
| authentication_type | string | The iSCSI authentication type. Required in POST and optional in PATCH. |
| chap | chap | Challenge-Handshake Authentication Protocol (CHAP) credentials. |
| initiator_address | initiator_address | Initiator address ranges. |
| svm | svm | |

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. |

Manage iSCSI services

Protocols SAN iSCSI services endpoint overview

Overview

An iSCSI service defines the properties of the iSCSI target for an SVM. There can be at most one iSCSI service for an SVM. An SVM's iSCSI service must be created before iSCSI initiators can log in to the SVM.

The iSCSI service REST API allows you to create, update, delete, and discover iSCSI services for SVMs.

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.

Examples

Creating an iSCSI service for an SVM

The simplest way to create an iSCSI service is to specify only the SVM, either by name or UUID. By default, the new iSCSI service is enabled and uses the SVM name as its target alias.

In this example, the `return_records` query parameter is used to retrieve the new iSCSI service object in the REST response.

```

# The API:
POST /api/protocols/san/iscsi/services

# The call:
curl -X POST 'https://<mgmt-
ip>/api/protocols/san/iscsi/services?return_records=true' -H 'accept:
application/hal+json' -d '{ "svm": { "name": "svm1" } }'

# The response:
{
  "num_records": 1,
  "records": [
    {
      "svm": {
        "uuid": "19d04b8e-94d7-11e8-8370-005056b48fd2",
        "name": "svm1",
        "_links": {
          "self": {
            "href": "/api/svm/svms/19d04b8e-94d7-11e8-8370-005056b48fd2"
          }
        },
        "enabled": true,
        "target": {
          "name": "iqn.1992-
08.com.netapp:sn.19d04b8e94d711e88370005056b48fd2:vs.4",
          "alias": "svm1"
        },
        "_links": {
          "self": {
            "href": "/api/protocols/san/iscsi/services/19d04b8e-94d7-11e8-
8370-005056b48fd2"
          }
        }
      }
    ]
  }
}

```

Retrieving the iSCSI services for all SVMs in the cluster

```

# The API:
GET /api/protocols/san/iscsi/services

```

```

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/iscsi/services' -H
'accept: application/hal+json'

# The response:
{
  "records": [
    {
      "svm": {
        "uuid": "19d04b8e-94d7-11e8-8370-005056b48fd2",
        "name": "svm1",
        "_links": {
          "self": {
            "href": "/api/svm/svms/19d04b8e-94d7-11e8-8370-005056b48fd2"
          }
        },
        "_links": {
          "self": {
            "href": "/api/protocols/san/iscsi/services/19d04b8e-94d7-11e8-8370-005056b48fd2"
          }
        }
      }
    },
    {
      "svm": {
        "uuid": "25f617cf-94d7-11e8-8370-005056b48fd2",
        "name": "svm2",
        "_links": {
          "self": {
            "href": "/api/svm/svms/25f617cf-94d7-11e8-8370-005056b48fd2"
          }
        },
        "_links": {
          "self": {
            "href": "/api/protocols/san/iscsi/services/25f617cf-94d7-11e8-8370-005056b48fd2"
          }
        }
      }
    }
  ],
  "num_records": 2,
  "_links": {
    "self": {
      "href": "/api/protocols/san/iscsi/services"
    }
  }
}

```

```
    }
}
}
```

Retrieving details for a specific iSCSI service

The iSCSI service is identified by the UUID of its SVM.

```
# The API:
GET /api/protocols/san/iscsi/services/{svm.uuid}

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/iscsi/services/19d04b8e-94d7-11e8-8370-005056b48fd2' -H 'accept: application/hal+json'

# The response:
{
  "svm": {
    "uuid": "19d04b8e-94d7-11e8-8370-005056b48fd2",
    "name": "svm1",
    "_links": {
      "self": {
        "href": "/api/svm/svms/19d04b8e-94d7-11e8-8370-005056b48fd2"
      }
    },
    "enabled": true,
    "target": {
      "name": "iqn.1992-08.com.netapp:sn.19d04b8e94d711e88370005056b48fd2:vs.4",
      "alias": "svm1"
    },
    "_links": {
      "self": {
        "href": "/api/protocols/san/iscsi/services/19d04b8e-94d7-11e8-8370-005056b48fd2"
      }
    }
}
```

Disabling an iSCSI service

Disabling an iSCSI service shuts down all active iSCSI sessions for the SVM and prevents the creation of new iSCSI sessions.

The iSCSI service to update is identified by the UUID of its SVM.

```
# The API:  
PATCH /api/protocols/san/iscsi/services/{svm.uuid}  
  
# The call:  
curl -X PATCH 'https://<mgmt-  
ip>/api/protocols/san/iscsi/services/19d04b8e-94d7-11e8-8370-005056b48fd2'  
-H 'accept: application/hal+json' -d '{ "enabled": "false" }'
```

You can retrieve the iSCSI service to confirm the change.

In this example, the `fields` query parameter is used to limit the response to the `enabled` property and iSCSI service identifiers.

```

# The API:
GET /api/protocols/san/iscsi/services/{svm.uuid}

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/iscsi/services/19d04b8e-94d7-11e8-8370-005056b48fd2?fields=enabled' -H 'accept: application/hal+json'

# The response:
{
  "svm": {
    "uuid": "19d04b8e-94d7-11e8-8370-005056b48fd2",
    "name": "svml1",
    "_links": {
      "self": {
        "href": "/api/svm/svms/19d04b8e-94d7-11e8-8370-005056b48fd2"
      }
    },
    "enabled": false,
    "_links": {
      "self": {
        "href": "/api/protocols/san/iscsi/services/19d04b8e-94d7-11e8-8370-005056b48fd2"
      }
    }
  }
}

```

Deleting an iSCSI service

The iSCSI service must be disabled before it can be deleted.

The iSCSI service to be deleted is identified by the UUID of its SVM.

```

# The API:
DELETE /api/protocols/san/iscsi/services/{svm.uuid}

# The call:
curl -X DELETE 'https://<mgmt-ip>/api/protocols/san/iscsi/services/19d04b8e-94d7-11e8-8370-005056b48fd2' -H 'accept: application/hal+json'

```

Retrieve iSCSI services

GET /protocols/san/iscsi/services

Retrieves iSCSI services.

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 iscsi show`

Learn more

- [DOC /protocols/san/iscsi/services](#)

Parameters

| Name | Type | In | Required | Description |
|--|---------|-------|----------|--|
| <code>statistics.status</code> | string | query | False | Filter by <code>statistics.status</code> |
| <code>statistics.latency_ra.w.other</code> | integer | query | False | Filter by <code>statistics.latency_ra.w.other</code> |
| <code>statistics.latency_ra.w.write</code> | integer | query | False | Filter by <code>statistics.latency_ra.w.write</code> |
| <code>statistics.latency_ra.w.read</code> | integer | query | False | Filter by <code>statistics.latency_ra.w.read</code> |
| <code>statistics.latency_ra.w.total</code> | integer | query | False | Filter by <code>statistics.latency_ra.w.total</code> |
| <code>statistics.timestamp</code> | string | query | False | Filter by <code>statistics.timestamp</code> |

| Name | Type | In | Required | Description |
|---------------------------------|---------|-------|----------|---|
| statistics.throughput_raw.read | integer | query | False | Filter by statistics.throughput_raw.read |
| statistics.throughput_raw.write | integer | query | False | Filter by statistics.throughput_raw.write |
| statistics.throughput_raw.total | integer | query | False | Filter by statistics.throughput_raw.total |
| statistics.iops_raw.other | integer | query | False | Filter by statistics.iops_raw.other |
| statistics.iops_raw.write | integer | query | False | Filter by statistics.iops_raw.write |
| statistics.iops_raw.read | integer | query | False | Filter by statistics.iops_raw.read |
| statistics.iops_raw.total | integer | query | False | Filter by statistics.iops_raw.total |
| enabled | boolean | query | False | Filter by enabled |
| metric.duration | string | query | False | Filter by metric.duration |
| metric.latency.other | integer | query | False | Filter by metric.latency.other |
| metric.latency.write | integer | query | False | Filter by metric.latency.write |
| metric.latency.read | integer | query | False | Filter by metric.latency.read |
| metric.latency.total | integer | query | False | Filter by metric.latency.total |

| Name | Type | In | Required | Description |
|------------------------|---------------|-------|----------|---------------------------------------|
| metric.readthroughput | integer | query | False | Filter by metric.readthroughput |
| metric.writethroughput | integer | query | False | Filter by metric.writethroughput |
| metric.totalthroughput | integer | query | False | Filter by metric.totalthroughput |
| metric.timestamp | string | query | False | Filter by metric.timestamp |
| metric.otheriops | integer | query | False | Filter by metric.otheriops |
| metric.writeiops | integer | query | False | Filter by metric.writeiops |
| metric.readiops | integer | query | False | Filter by metric.readiops |
| metric.totaliops | integer | query | False | Filter by metric.totaliops |
| metric.status | string | query | False | Filter by metric.status |
| target.name | string | query | False | Filter by target.name |
| target.alias | string | query | False | Filter by target.alias |
| svm.uuid | string | query | False | Filter by svm.uuid |
| svm.name | string | query | False | Filter by svm.name |
| 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_records | boolean | query | False | The default is true for GET calls. When set to false, only the number of records is returned. |
| 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. |
| 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 records. |
| records | array[iscsi_service] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "metric": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "duration": "PT15S",  
        "iops": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "latency": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "status": "ok",  
        "throughput": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "timestamp": "2017-01-25 11:20:13 UTC"  
      },  
      "statistics": {  
        "iops_raw": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        }  
      }  
    }  
  ]  
}
```

```

        "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"
},
"target": {
    "alias": "svm1",
    "name": "iqn.1992-
08.com.netapp:sn.574caf71890911e8a6b7005056b4ea79:vs.2"
}
}
]
}

```

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. |

metric

| 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. |

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. |

| 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. |

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. |

statistics

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

svm

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

target

| Name | Type | Description |
|-------|--------|---|
| alias | string | <p>The iSCSI target alias of the iSCSI service.</p> <p>The target alias can contain one (1) to 128 characters and feature any printable character except space (" "). A PATCH request with an empty alias ("") clears the alias.</p> <p>Optional in POST and PATCH. In POST, this defaults to the name of the SVM.</p> |
| name | string | <p>The iSCSI target name of the iSCSI service. This is generated for the SVM during POST.</p> <p>If required, the target name can be modified using the ONTAP command line.</p> <ul style="list-style-type: none"> example: iqn.1992-08.com.netapp:sn.574caf71890911e8a6b7005056b4ea79:vs.2 maxLength: 128 minLength: 1 readOnly: 1 |

iscsi_service

An iSCSI service defines the properties of the iSCSI target for an SVM. There can be at most one iSCSI service for an SVM. An SVM's iSCSI service must be created before iSCSI initiators can log in to the SVM.

An iSCSI service is identified by the UUID of its SVM.

| Name | Type | Description |
|------------|----------------------------|---|
| _links | _links | |
| enabled | boolean | The administrative state of the iSCSI service. The iSCSI service can be disabled to block all iSCSI connectivity to the SVM. Optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST. |
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

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 iSCSI service

POST /protocols/san/iscsi/services

Creates an iSCSI service.

Required properties

- `svm.uuid` or `svm.name` - Existing SVM in which to create the iSCSI service.

Related ONTAP commands

- `vserver iscsi create`

Learn more

- [DOC /protocols/san/iscsi/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 |
|------------|----------------------------|---|
| _links | _links | |
| enabled | boolean | The administrative state of the iSCSI service. The iSCSI service can be disabled to block all iSCSI connectivity to the SVM. Optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST. |
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "metric": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "duration": "PT15S",  
    "iops": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "timestamp": "2017-01-25 11:20:13 UTC"  
  },  
  "statistics": {  
    "iops_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    }  
  }  
}
```

```

    "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"
},
"target": {
  "alias": "svm1",
  "name": "iqn.1992-
08.com.netapp:sn.574caf71890911e8a6b7005056b4ea79:vs.2"
}
}

```

Response

Status: 201, Created

| Name | Type | Description |
|-------------|----------------------|--------------------|
| _links | _links | |
| num_records | integer | Number of records. |
| records | array[iscsi_service] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "metric": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "duration": "PT15S",  
        "iops": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "latency": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "status": "ok",  
        "throughput": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        },  
        "timestamp": "2017-01-25 11:20:13 UTC"  
      },  
      "statistics": {  
        "iops_raw": {  
          "read": 200,  
          "total": 1000,  
          "write": 100  
        }  
      }  
    }  
  ]  
}
```

```

        "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"
},
"target": {
    "alias": "svm1",
    "name": "iqn.1992-
08.com.netapp:sn.574caf71890911e8a6b7005056b4ea79:vs.2"
}
}
]
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 1115127 | The cluster lacks a valid iSCSI license. |
| 2621462 | The supplied SVM does not exist. |

| Error Code | Description |
|------------|---|
| 2621507 | The iSCSI protocol is not allowed for the specified SVM. |
| 2621706 | The specified <code>svm.uuid</code> and <code>svm.name</code> do not refer to the same SVM. |
| 2621707 | No SVM was specified. Either <code>svm.name</code> or <code>svm.uuid</code> must be supplied. |
| 5373966 | An iSCSI service cannot be created in an SVM that is configured for NVMe. |
| 5374077 | An iSCSI service already exists for the specified SVM. |
| 5374893 | The SVM is stopped. The SVM must be running to create an iSCSI service. |

| 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. |

metric

| 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. |

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. |

| Name | Type | Description |
|-------|---------|---|
| 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. |

statistics

| Name | Type | Description |
|----------------|--------------------------------|--|
| iops_raw | iops_raw | The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time. |
| latency_raw | latency_raw | The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation. |
| status | string | <p>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".</p> <p>"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.</p> <p>"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.</p> |
| 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. |

svm

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

target

| Name | Type | Description |
|-------|--------|---|
| alias | string | <p>The iSCSI target alias of the iSCSI service.</p> <p>The target alias can contain one (1) to 128 characters and feature any printable character except space (" "). A PATCH request with an empty alias ("") clears the alias.</p> <p>Optional in POST and PATCH. In POST, this defaults to the name of the SVM.</p> |
| name | string | <p>The iSCSI target name of the iSCSI service. This is generated for the SVM during POST.</p> <p>If required, the target name can be modified using the ONTAP command line.</p> <ul style="list-style-type: none"> example: iqn.1992-08.com.netapp:sn.574caf71890911e8a6b7005056b4ea79:vs.2 maxLength: 128 minLength: 1 readOnly: 1 |

iscsi_service

An iSCSI service defines the properties of the iSCSI target for an SVM. There can be at most one iSCSI service for an SVM. An SVM's iSCSI service must be created before iSCSI initiators can log in to the SVM.

An iSCSI service is identified by the UUID of its SVM.

| Name | Type | Description |
|------------|----------------------------|---|
| _links | _links | |
| enabled | boolean | The administrative state of the iSCSI service. The iSCSI service can be disabled to block all iSCSI connectivity to the SVM. Optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST. |
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

_links

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

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. |

Delete an iSCSI service

```
DELETE /protocols/san/iscsi/services/{svm.uuid}
```

Deletes an iSCSI service. An iSCSI service must be disabled before it can be deleted.

Related ONTAP commands

- `vserver iscsi delete`

Learn more

- [DOC /protocols/san/iscsi/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 |
|------------|--|
| 2621462 | An SVM with the specified UUID does not exist. |
| 5373960 | The iSCSI service is enabled. The iSCSI service must be disabled before it can be deleted. |
| 5374078 | The SVM does not have an iSCSI service. |

| 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 an iSCSI service

GET /protocols/san/iscsi/services/{svm.uuid}

Retrieves an iSCSI service.

Related ONTAP commands

- `vserver iscsi show`

Learn more

- [DOC /protocols/san/iscsi/services](#)

Parameters

| Name | Type | In | Required | Description |
|----------|---------------|-------|----------|---|
| svm.uuid | string | path | True | The unique identifier of the SVM for which to retrieve the iSCSI service. |
| fields | array[string] | query | False | Specify the fields to return. |

Response

Status: 200, Ok

| Name | Type | Description |
|------------|----------------------------|---|
| _links | _links | |
| enabled | boolean | The administrative state of the iSCSI service. The iSCSI service can be disabled to block all iSCSI connectivity to the SVM. Optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST. |
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

Example response

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "metric": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "duration": "PT15S",  
    "iops": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "timestamp": "2017-01-25 11:20:13 UTC"  
  },  
  "statistics": {  
    "iops_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    }  
}
```

```

    "read": 200,
    "total": 1000,
    "write": 100
  },
  "timestamp": "2017-01-25 11:20:13 UTC"
},
"svm": {
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "name": "svml1",
  "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
},
"target": {
  "alias": "svml1",
  "name": "iqn.1992-
08.com.netapp:sn.574caf71890911e8a6b7005056b4ea79:vs.2"
}
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 2621462 | An SVM with the specified UUID does not exist. |
| 5374078 | The SVM does not have an iSCSI service. |

| 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. |

metric

| 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. |

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. |

| Name | Type | Description |
|-------|---------|---|
| 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. |

statistics

| Name | Type | Description |
|----------------|--------------------------------|--|
| iops_raw | iops_raw | The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time. |
| latency_raw | latency_raw | The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation. |
| status | string | <p>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".</p> <p>"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.</p> <p>"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.</p> |
| 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. |

svm

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

target

| Name | Type | Description |
|-------|--------|---|
| alias | string | <p>The iSCSI target alias of the iSCSI service.</p> <p>The target alias can contain one (1) to 128 characters and feature any printable character except space (" "). A PATCH request with an empty alias ("") clears the alias.</p> <p>Optional in POST and PATCH. In POST, this defaults to the name of the SVM.</p> |
| name | string | <p>The iSCSI target name of the iSCSI service. This is generated for the SVM during POST.</p> <p>If required, the target name can be modified using the ONTAP command line.</p> <ul style="list-style-type: none"> example: iqn.1992-08.com.netapp:sn.574caf71890911e8a6b7005056b4ea79:vs.2 maxLength: 128 minLength: 1 readOnly: 1 |

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 an iSCSI service

PATCH /protocols/san/iscsi/services/{svm.uuid}

Updates an iSCSI service.

Related ONTAP commands

- vserver iscsi modify
- vserver iscsi start
- vserver iscsi stop

Learn more

- [DOC /protocols/san/iscsi/services](#)

Parameters

| Name | Type | In | Required | Description |
|----------|--------|------|----------|---|
| svm.uuid | string | path | True | The unique identifier of the SVM for which to update the iSCSI service. |

Request Body

| Name | Type | Description |
|--------|------------------------|-------------|
| _links | _links | |

| Name | Type | Description |
|------------|----------------------------|---|
| enabled | boolean | The administrative state of the iSCSI service. The iSCSI service can be disabled to block all iSCSI connectivity to the SVM. Optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST. |
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "metric": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "duration": "PT15S",  
    "iops": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "timestamp": "2017-01-25 11:20:13 UTC"  
  },  
  "statistics": {  
    "iops_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "latency_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    },  
    "status": "ok",  
    "throughput_raw": {  
      "read": 200,  
      "total": 1000,  
      "write": 100  
    }  
  }  
}
```

```

    "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"
},
"target": {
  "alias": "svm1",
  "name": "iqn.1992-
08.com.netapp:sn.574caf71890911e8a6b7005056b4ea79:vs.2"
}
}

```

Response

Status: 200, Ok

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 2621462 | An SVM with the specified UUID does not exist. |
| 5374078 | The SVM does not have an iSCSI service. |

| 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. |

metric

| 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. |

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. |

| Name | Type | Description |
|-------|---------|---|
| 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. |

statistics

| Name | Type | Description |
|----------------|--------------------------------|--|
| iops_raw | iops_raw | The number of I/O operations observed at the storage object. This should be used along with delta time to calculate the rate of I/O operations per unit of time. |
| latency_raw | latency_raw | The raw latency in microseconds observed at the storage object. This should be divided by the raw IOPS value to calculate the average latency per I/O operation. |
| status | string | <p>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".</p> <p>"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.</p> <p>"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.</p> |
| 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. |

svm

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

target

| Name | Type | Description |
|-------|--------|---|
| alias | string | <p>The iSCSI target alias of the iSCSI service.</p> <p>The target alias can contain one (1) to 128 characters and feature any printable character except space (" "). A PATCH request with an empty alias ("") clears the alias.</p> <p>Optional in POST and PATCH. In POST, this defaults to the name of the SVM.</p> |
| name | string | <p>The iSCSI target name of the iSCSI service. This is generated for the SVM during POST.</p> <p>If required, the target name can be modified using the ONTAP command line.</p> <ul style="list-style-type: none"> example: iqn.1992-08.com.netapp:sn.574caf71890911e8a6b7005056b4ea79:vs.2 maxLength: 128 minLength: 1 readOnly: 1 |

iscsi_service

An iSCSI service defines the properties of the iSCSI target for an SVM. There can be at most one iSCSI service for an SVM. An SVM's iSCSI service must be created before iSCSI initiators can log in to the SVM.

An iSCSI service is identified by the UUID of its SVM.

| Name | Type | Description |
|------------|----------------------------|---|
| _links | _links | |
| enabled | boolean | The administrative state of the iSCSI service. The iSCSI service can be disabled to block all iSCSI connectivity to the SVM. Optional in POST and PATCH. The default setting is <i>true</i> (enabled) in POST. |
| metric | metric | |
| statistics | statistics | |
| svm | svm | |
| target | target | |

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 historical performance metrics for the iSCSI protocol of an SVM

GET /protocols/san/iscsi/services/{svm.uuid}/metrics

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

Parameters

| Name | Type | In | Required | Description |
|------------------|---------|-------|----------|----------------------------|
| timestamp | string | query | False | Filter by timestamp |
| iops.other | integer | query | False | Filter by iops.other |
| iops.write | integer | query | False | Filter by iops.write |
| iops.read | integer | query | False | Filter by iops.read |
| iops.total | integer | query | False | Filter by iops.total |
| status | string | query | False | Filter by status |
| duration | string | query | False | Filter by duration |
| latency.other | integer | query | False | Filter by latency.other |
| latency.write | integer | query | False | Filter by latency.write |
| latency.read | integer | query | False | Filter by latency.read |
| latency.total | integer | query | False | Filter by latency.total |
| throughput.other | integer | query | False | Filter by throughput.other |
| throughput.write | integer | query | False | Filter by throughput.write |
| throughput.read | integer | query | False | Filter by throughput.read |
| throughput.total | integer | query | False | Filter by throughput.total |

| Name | Type | In | Required | Description |
|---|----------------|---------|----------|--|
| 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. |
| 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 |
| The unique identifier of the SVM. | interval | string | query | False |

Response

```
Status: 200, Ok
```

| Name | Type | Description |
|--------|--------|-------------|
| _links | _links | |

| Name | Type | Description |
|-------------|----------------|-------------------|
| num_records | integer | Number of records |
| records | array[records] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_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 |
|-------|---------|--|
| 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. |

records

Performance numbers, such as IOPS latency and throughput.

| Name | Type | Description |
|--------|------------------------|-------------|
| _links | _links | |

| Name | Type | Description |
|------------|------------|---|
| 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. |
| status | string | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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. |

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. |

View iSCSI sessions

Protocols SAN iSCSI sessions endpoint overview

Overview

An iSCSI session is one or more TCP connections that link an iSCSI initiator with an iSCSI target. TCP connections can be added and removed from an iSCSI session by the iSCSI initiator. Across all TCP connections within an iSCSI session, an initiator sees one and the same target. After the connection is established, iSCSI control, data, and status messages are communicated over the session.

The iSCSI sessions REST API provides information about iSCSI initiators that have successfully logged in to ONTAP.

Examples

Retrieving all iSCSI sessions

```
# The API:
GET /api/protocols/san/iscsi/sessions

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

# The response:
{
  "records": [
```

```

{
  "svm": {
    "uuid": "a009a9e7-4081-b576-7575-ada21efcaf16",
    "name": "svm1",
    "_links": {
      "self": {
        "href": "/api/svm/svms/a009a9e7-4081-b576-7575-ada21efcaf16"
      }
    }
  },
  "target_portal_group": "iscsi_lif1",
  "tsih": 10,
  "_links": {
    "self": {
      "href": "/api/protocols/san/iscsi/sessions/a009a9e7-4081-b576-7575-ada21efcaf16/iscsi_lif1/10"
    }
  }
},
{
  "svm": {
    "uuid": "b009a9e7-4081-b576-7575-ada21efcaf16",
    "name": "svm2",
    "_links": {
      "self": {
        "href": "/api/svm/svms/b009a9e7-4081-b576-7575-ada21efcaf16"
      }
    }
  },
  "target_portal_group": "iscsi_lif2",
  "tsih": 11,
  "_links": {
    "self": {
      "href": "/api/protocols/san/iscsi/sessions/b009a9e7-4081-b576-7575-ada21efcaf16/iscsi_lif2/11"
    }
  }
},
"num_records": 2,
"_links": {
  "self": {
    "href": "/api/protocols/san/iscsi/sessions"
  }
}
}

```

Retrieving all of the iSCSI sessions under the target portal group *iscsi_lif1*

The `tpgroup` query parameter is used to perform the query.

```
# The API:  
GET /api/protocols/san/iscsi/sessions  
  
# The call:  
curl -X GET "https://<mgmt-  
ip>/api/protocols/san/iscsi/sessions?tpgroup=iscsi_lif1" -H "accept:  
application/hal+json"  
  
# The response:  
{  
  "records": [  
    {  
      "svm": {  
        "uuid": "a009a9e7-4081-b576-7575-ada21efcaf16",  
        "name": "svm1",  
        "_links": {  
          "self": {  
            "href": "/api/svm/svms/a009a9e7-4081-b576-7575-ada21efcaf16"  
          }  
        }  
      },  
      "target_portal_group": "iscsi_lif1",  
      "tsih": 10,  
      "_links": {  
        "self": {  
          "href": "/api/protocols/san/iscsi/sessions/a009a9e7-4081-b576-  
7575-ada21efcaf16/iscsi_lif1/10"  
        }  
      }  
    }  
  ],  
  "num_records": 1,  
  "_links": {  
    "self": {  
      "href": "/api/protocols/san/iscsi/sessions"  
    }  
  }  
}
```

Retrieving an iSCSI session

```
# The API:
GET
/api/protocols/san/iscsi/sessions/{svm.uuid}/{target_portal_group}/{tsih}

# The call:
curl -X GET "https://<mgmt-ip>/api/protocols/san/iscsi/sessions/a009a9e7-
4081-b576-7575-ada21efcaf16/iscsi_lif1/10" -H "accept:
application/hal+json"

# The response:
{
  "svm": {
    "uuid": "a009a9e7-4081-b576-7575-ada21efcaf16",
    "name": "svm1",
    "_links": {
      "self": {
        "href": "/api/svm/svms/a009a9e7-4081-b576-7575-ada21efcaf16"
      }
    }
  },
  "target_portal_group": "iscsi_lif1",
  "tsih": 10,
  "initiator": {
    "name": "iqn.1994-05.com.example:string"
  },
  "isid": "61:62:63:64:65:00",
  "target_portal_group_tag": 1027,
  "connections": [
    {
      "cid": 1,
      "authentication_type": "chap",
      "initiator_address": {
        "address": "10.224.123.85",
        "port": 43827
      },
      "interface": {
        "name": "iscsi_lif1",
        "uuid": "c15439b4-dbb4-11e8-90ac-005056bba882",
        "ip": {
          "address": "192.168.0.1",
          "port": 3260
        },
        "_links": {
          "self": {
            "href": "/api/protocols/san/iscsi/sessions/a009a9e7-4081-b576-7575-ada21efcaf16/iscsi_lif1/10"
          }
        }
      }
    }
  ]
}
```

```

        "href": "/api/network/ip/interfaces/c15439b4-dbb4-11e8-90ac-
005056bba882"
    }
}
}
],
"igroups": [
{
    "uuid": "af7838cd-f993-4faf-90b7-5524787ae1e8",
    "name": "igroup1",
    "_links": {
        "self": {
            "href": "/api/protocols/san/igroups/af7838cd-f993-4faf-90b7-
5524787ae1e8"
        }
    }
},
{
    "uuid": "bf7838cd-f993-4faf-90b7-5524787ae1e8",
    "name": "igroup2",
    "_links": {
        "self": {
            "href": "/api/protocols/san/igroups/bf7838cd-f993-4faf-90b7-
5524787ae1e8"
        }
    }
},
"_links": {
    "self": {
        "href": "/api/protocols/san/iscsi/sessions/a009a9e7-4081-b576-7575-
ada21efcaf16/iscsi_lif1/10"
    }
}
}

```

Retrieve iSCSI sessions

GET /protocols/san/iscsi/sessions

Retrieves iSCSI sessions.

Related ONTAP commands

- vserver iscsi connection show

- vserver iscsi session parameter show
- vserver iscsi session show

Learn more

- [DOC /protocols/san/iscsi/sessions](#)

Parameters

| Name | Type | In | Required | Description |
|---------------------------------------|---------|-------|----------|---|
| tsih | integer | query | False | Filter by tsih |
| initiator.alias | string | query | False | Filter by initiator.alias |
| initiator.name | string | query | False | Filter by initiator.name |
| isid | string | query | False | Filter by isid |
| igroups.uuid | string | query | False | Filter by igroups.uuid |
| igroups.name | string | query | False | Filter by igroups.name |
| svm.uuid | string | query | False | Filter by svm.uuid |
| svm.name | string | query | False | Filter by svm.name |
| target_portal_group_tag | integer | query | False | Filter by target_portal_group_tag |
| connections.authentication_type | string | query | False | Filter by connections.authentication_type |
| connections.initiator_address.port | integer | query | False | Filter by connections.initiator_address.port |
| connections.initiator_address.address | string | query | False | Filter by connections.initiator_address.address |

| Name | Type | In | Required | Description |
|----------------------------------|---------------|-------|----------|--|
| connections.cid | integer | query | False | Filter by connections.cid |
| connections.interface.name | string | query | False | Filter by connections.interface.name |
| connections.interface.uuid | string | query | False | Filter by connections.interface.uuid |
| connections.interface.ip.address | string | query | False | Filter by connections.interface.ip.address |
| connections.interface.ip.port | integer | query | False | Filter by connections.interface.ip.port |
| target_portal_group | string | query | False | Filter by target_portal_group |
| fields | array[string] | query | False | Specify the fields to return. |
| max_records | integer | query | False | Limit the number of records returned. |
| return_records | boolean | query | False | The default is true for GET calls. When set to false, only the number of records is returned. |
| 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. |

| Name | Type | In | Required | Description |
|----------|---------------|-------|----------|--|
| 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 records. |
| records | array[iscsi_session] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "connections": [  
        {  
          "_links": {  
            "next": {  
              "href": "/api/resourcelink"  
            },  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          },  
          "authentication_type": "string",  
          "cid": 0,  
          "initiator_address": {  
            "address": "10.10.10.7",  
            "port": 55432  
          },  
          "interface": {  
            "_links": {  
              "self": {  
                "href": "/api/resourcelink"  
              }  
            },  
            "ip": {  
              "address": "10.10.10.7",  
              "port": 3260  
            },  
            "name": "lifi1",  
            "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"  
          }  
        }  
      ]  
    }  
  ]  
}
```

```

        }
    }
],
"igroups": [
{
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "igroup1",
    "uuid": "4ea7a442-86d1-11e0-aelc-123478563412"
}
],
"initiator": {
    "alias": "initiator_alias1",
    "name": "iqn.1992-01.example.com:string"
},
"isid": "61:62:63:64:65:00",
"svm": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "svm1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
},
"target_portal_group": "tpgroup1",
"target_portal_group_tag": 0,
"tsih": 0
}
]
}

```

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 | |

initiator_address

The TCP socket information for the initiator end of the connection. This is useful for network packet debugging.

| Name | Type | Description |
|---------|---------|--|
| address | string | The TCP IPv4 or IPv6 address of the initiator end of the iSCSI connection. |
| port | integer | The TCP port number of the initiator end of the iSCSI connection. |

ip

The IP information. ONTAP only supports port 3260.

| Name | Type | Description |
|---------|---------|---|
| address | string | IPv4 or IPv6 address |
| port | integer | The TCP port number of the iSCSI access endpoint. |

interface

The network interface information for the target end of the connection.

| Name | Type | Description |
|--------|------------------------|--|
| _links | _links | |
| ip | ip | The IP information. ONTAP only supports port 3260. <ul style="list-style-type: none">• readOnly: 1 |
| name | string | The name of the interface. |
| uuid | string | The UUID that uniquely identifies the interface. |

iscsi_connection

An active iSCSI connection.

| Name | Type | Description |
|---------------------|-----------------------------------|--|
| _links | _links | |
| authentication_type | string | The iSCSI authentication type used to establish the connection. |
| cid | integer | The identifier of the connection within the session. |
| initiator_address | initiator_address | The TCP socket information for the initiator end of the connection. This is useful for network packet debugging. |
| interface | interface | The network interface information for the target end of the connection. |

igroups

| Name | Type | Description |
|--------|------------------------|---|
| _links | _links | |
| name | string | The name of the initiator group. |
| uuid | string | The unique identifier of the initiator group. |

initiator

The initiator that created the session.

| Name | Type | Description |
|-------|--------|--|
| alias | string | The initiator alias. |
| name | string | The world wide unique name of the initiator. |

svm

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

iscsi_session

An iSCSI session is one or more TCP connections that link an iSCSI initiator with an iSCSI target. TCP connections can be added and removed from an iSCSI session by the iSCSI initiator. Across all TCP connections within an iSCSI session, an initiator sees one and the same target. After the connection is established, iSCSI control, data, and status messages are communicated over the session.

| Name | Type | Description |
|-------------------------|---|--|
| _links | _links | |
| connections | array[iscsi_connection] | The iSCSI connections that make up the iSCSI session. |
| igroups | array[igroups] | The initiator groups in which the initiator is a member. |
| initiator | initiator | The initiator that created the session. |
| isid | string | The initiator portion of the session identifier specified by the initiator during login. |
| svm | svm | |
| target_portal_group | string | The target portal group to which the session belongs. |
| target_portal_group_tag | integer | The target portal group tag of the session. |

| Name | Type | Description |
|------|---------|---|
| tsih | integer | The target session identifier handle (TSIH) of the session. |

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 an iSCSI session

GET /protocols/san/iscsi/sessions/{svm.uuid}/{tpgroup}/{tsih}

Retrieves an iSCSI session.

Related ONTAP commands

- vserver iscsi connection show
- vserver iscsi session parameter show
- vserver iscsi session show

Learn more

- [DOC /protocols/san/iscsi/sessions](#)

Parameters

| Name | Type | In | Required | Description |
|----------|---------------|-------|----------|--|
| svm.uuid | string | path | True | The unique identifier of the SVM of the iSCSI session. |
| tpgroup | string | path | True | The target portal group of the iSCSI session. |
| tsih | integer | path | True | The target session identifying handle. |
| fields | array[string] | query | False | Specify the fields to return. |

Response

Status: 200, Ok

| Name | Type | Description |
|-------------------------|---|--|
| _links | _links | |
| connections | array[iscsi_connection] | The iSCSI connections that make up the iSCSI session. |
| igroups | array[igroups] | The initiator groups in which the initiator is a member. |
| initiator | initiator | The initiator that created the session. |
| isid | string | The initiator portion of the session identifier specified by the initiator during login. |
| svm | svm | |
| target_portal_group | string | The target portal group to which the session belongs. |
| target_portal_group_tag | integer | The target portal group tag of the session. |
| tsih | integer | The target session identifier handle (TSIH) of the session. |

Example response

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "connections": [  
    {  
      "_links": {  
        "next": {  
          "href": "/api/resourcelink"  
        },  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "authentication_type": "string",  
      "cid": 0,  
      "initiator_address": {  
        "address": "10.10.10.7",  
        "port": 55432  
      },  
      "interface": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "ip": {  
          "address": "10.10.10.7",  
          "port": 3260  
        },  
        "name": "lif1",  
        "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"  
      }  
    }  
  ],  
  "igroups": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
    }  
  ]  
}
```

```

        "name": "igroup1",
        "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
    }
],
"initiator": {
    "alias": "initiator_alias1",
    "name": "iqn.1992-01.example.com:string"
},
"isid": "61:62:63:64:65:00",
"svm": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "svml1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
},
"target_portal_group": "tpgroup1",
"target_portal_group_tag": 0,
"tsih": 0
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 2621462 | An SVM with the specified UUID does not exist. |

| 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 | |

_links

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

initiator_address

The TCP socket information for the initiator end of the connection. This is useful for network packet debugging.

| Name | Type | Description |
|---------|---------|--|
| address | string | The TCP IPv4 or IPv6 address of the initiator end of the iSCSI connection. |
| port | integer | The TCP port number of the initiator end of the iSCSI connection. |

ip

The IP information. ONTAP only supports port 3260.

| Name | Type | Description |
|---------|---------|---|
| address | string | IPv4 or IPv6 address |
| port | integer | The TCP port number of the iSCSI access endpoint. |

interface

The network interface information for the target end of the connection.

| Name | Type | Description |
|--------|------------------------|--|
| _links | _links | |
| ip | ip | The IP information. ONTAP only supports port 3260. <ul style="list-style-type: none">• readOnly: 1 |
| name | string | The name of the interface. |
| uuid | string | The UUID that uniquely identifies the interface. |

iscsi_connection

An active iSCSI connection.

| Name | Type | Description |
|---------------------|-----------------------------------|--|
| _links | _links | |
| authentication_type | string | The iSCSI authentication type used to establish the connection. |
| cid | integer | The identifier of the connection within the session. |
| initiator_address | initiator_address | The TCP socket information for the initiator end of the connection. This is useful for network packet debugging. |
| interface | interface | The network interface information for the target end of the connection. |

igroups

| Name | Type | Description |
|--------|------------------------|---|
| _links | _links | |
| name | string | The name of the initiator group. |
| uuid | string | The unique identifier of the initiator group. |

initiator

The initiator that created the session.

| Name | Type | Description |
|-------|--------|--|
| alias | string | The initiator alias. |
| name | string | The world wide unique name of the initiator. |

svm

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

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. |

Manage SAN LUN maps

Protocols SAN lun-maps endpoint overview

Overview

A LUN map is an association between a LUN and an initiator group. When a LUN is mapped to an initiator group, the initiator group's initiators are granted access to the LUN. The relationship between an initiator group and a LUN is many initiator groups to many LUNs.

The LUN map REST API allows you to create, delete, and discover LUN maps.

Examples

Creating a LUN map

```
# The API:  
POST /api/protocols/san/lun-maps  
  
# The call:  
curl -X POST 'https://<mgmt-ip>/api/protocols/san/lun-maps' -H 'accept: application/hal+json' -d '{ "svm": { "name": "svml" }, "igroup": { "name": "igroup1" }, "lun": { "name": "/vol/voll/lun1" } }'
```

Retrieving all of the LUN maps

```
# The API:  
GET /api/protocols/san/lun-maps  
  
# The call:  
curl -X GET 'https://<mgmt-ip>/api/protocols/san/lun-maps' -H 'accept: application/hal+json'  
  
# The response:  
{  
  "records": [  
    {  
      "svm": {  
        "uuid": "03157e81-24c5-11e9-9ec1-005056bba643",  
        "name": "svml",  
        "_links": {  
          "self": {  
            "href": "/api/svm/svms/03157e81-24c5-11e9-9ec1-005056bba643"  
          }  
        }  
      },  
      "lun": {  
        "uuid": "a60d9862-9bee-49a6-8162-20d2421bb1a6",  
        "name": "/vol/voll/lun1",  
        "_links": {  
          "self": {  
            "href": "/api/storage/luns/a60d9862-9bee-49a6-8162-20d2421bb1a6"  
          }  
        }  
      }  
    }  
  ]  
}
```

```

} ,
"igroup": {
  "uuid": "40d98b2c-24c5-11e9-9ec1-005056bba643",
  "name": "ig1",
  "_links": {
    "self": {
      "href": "/api/protocols/san/igroups/40d98b2c-24c5-11e9-9ec1-005056bba643"
    }
  }
},
"_links": {
  "self": {
    "href": "/api/protocols/san/lun-maps/a60d9862-9bee-49a6-8162-20d2421bb1a6/40d98b2c-24c5-11e9-9ec1-005056bba643"
  }
}
}
],
"num_records": 1,
"_links": {
  "self": {
    "href": "/api/protocols/san/lun-maps"
  }
}
}
}

```

Retrieving a specific LUN map

```

# The API:
GET /api/protocols/san/lun-maps/{lun.uuid}/{igroup.uuid}

# The call:
curl -X GET 'https://<mgmt-ip>/api/protocols/san/lun-maps/a60d9862-9bee-49a6-8162-20d2421bb1a6/40d98b2c-24c5-11e9-9ec1-005056bba643' -H 'accept: application/hal+json'

# The response:
{
  "svm": {
    "uuid": "03157e81-24c5-11e9-9ec1-005056bba643",
    "name": "svm1",
    "_links": {
      "self": {

```

```

        "href": "/api/svm/svms/03157e81-24c5-11e9-9ec1-005056bba643"
    }
}
},
"lun": {
    "uuid": "a60d9862-9bee-49a6-8162-20d2421bb1a6",
    "name": "/vol/vol1/lun1",
    "node": {
        "uuid": "7d8607ea-24c1-11e9-9ec1-005056bba643",
        "name": "node1",
        "_links": {
            "self": {
                "href": "/api/cluster/nodes/7d8607ea-24c1-11e9-9ec1-005056bba643"
            }
        }
    },
    "_links": {
        "self": {
            "href": "/api/storage/luns/a60d9862-9bee-49a6-8162-20d2421bb1a6"
        }
    }
},
"igroup": {
    "uuid": "40d98b2c-24c5-11e9-9ec1-005056bba643",
    "name": "ig1",
    "os_type": "linux",
    "protocol": "mixed",
    "_links": {
        "self": {
            "href": "/api/protocols/san/igroups/40d98b2c-24c5-11e9-9ec1-005056bba643"
        }
    }
},
"logical_unit_number": 0,
"_links": {
    "self": {
        "href": "/api/protocols/san/lun-maps/a60d9862-9bee-49a6-8162-20d2421bb1a6/40d98b2c-24c5-11e9-9ec1-005056bba643"
    }
}
}
}

```

Deleting a LUN map

```
# The API:  
DELETE /api/protocols/san/lun-maps/{lun.uuid}/{igroup.uuid}  
  
# The call:  
curl -X DELETE 'https://<mgmt-ip>/api/protocols/san/lun-maps/a60d9862-  
9bee-49a6-8162-20d2421bb1a6/40d98b2c-24c5-11e9-9ec1-005056bba643' -H  
'accept: application/hal+json'
```

Retrieve LUN maps

GET /protocols/san/lun-maps

Retrieves LUN maps.

Related ONTAP commands

- lun mapping show
- [DOC /protocols/san/lun-maps](#)

Learn more

- [DOC /protocols/san/lun-maps](#)

Parameters

| Name | Type | In | Required | Description |
|-------------------|--------|-------|----------|-----------------------------|
| svm.uuid | string | query | False | Filter by svm.uuid |
| svm.name | string | query | False | Filter by svm.name |
| igroup.name | string | query | False | Filter by igroup.name |
| igroup.os_type | string | query | False | Filter by igroup.os_type |
| igroup.initiators | string | query | False | Filter by igroup.initiators |
| igroup.protocol | string | query | False | Filter by igroup.protocol |
| igroup.uuid | string | query | False | Filter by igroup.uuid |

| Name | Type | In | Required | Description |
|---------------------|---------------|-------|----------|--|
| lun.node.name | string | query | False | Filter by lun.node.name |
| lun.node.uuid | string | query | False | Filter by lun.node.uuid |
| lun.uuid | string | query | False | Filter by lun.uuid |
| lun.name | string | query | False | Filter by lun.name |
| logical_unit_number | integer | query | False | Filter by logical_unit_number |
| fields | array[string] | query | False | Specify the fields to return. |
| max_records | integer | query | False | Limit the number of records returned. |
| return_records | boolean | query | False | The default is true for GET calls. When set to false, only the number of records is returned. |
| 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. |
| 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 records. |
| records | array[lun_map] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "igroup": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "initiators": [  
          "iqn.1998-01.com.corp.iscsi:name1"  
        ],  
        "name": "igroup1",  
        "os_type": "string",  
        "protocol": "string",  
        "uuid": "1ad8544d-8cd1-91e0-9e1c-723478563412"  
      },  
      "logical_unit_number": 1,  
      "lun": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "name": "/vol/volumel/qtree1/lun1",  
        "node": {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          }  
        }  
      }  
    }  
  ]  
}
```

```

        "name": "node1",
        "uuid": "1cf8aa42-8cd1-12e0-a11c-423468563412"
    },
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"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 | |

igroup

The initiator group to which the LUN is mapped. Required in POST by supplying either the igroup.uuid, igroup.name, or both.

| Name | Type | Description |
|------------|---------------|---|
| _links | _links | |
| initiators | array[string] | The initiators that are members of the initiator group. |
| name | string | The name of the initiator group. Valid in POST. |
| os_type | string | The host operating system of the initiator group. All initiators in the group should be hosts of the same operating system. |
| protocol | string | The protocols supported by the initiator group. This restricts the type of initiators that can be added to the initiator group. |
| uuid | string | The unique identifier of the initiator group. Valid in POST. |

node

The LUN node.

| Name | Type | Description |
|--------|------------------------|--|
| _links | _links | |
| name | string | The name the LUN's node. |
| uuid | string | The unique identifier of the LUN node. |

lun

The LUN to which the initiator group is mapped. Required in POST by supplying either the `lun.uuid`, `lun.name`, or both.

| Name | Type | Description |
|--------|------------------------|--|
| _links | _links | |
| name | string | The fully qualified path name of the LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and file name of the LUN. Valid in POST. |
| node | node | The LUN node. |
| uuid | string | The unique identifier of the LUN. Valid in POST. |

svm

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

lun_map

A LUN map is an association between a LUN and an initiator group. When a LUN is mapped to an initiator group, the initiator group's initiators are granted access to the LUN. The relationship between a LUN and an initiator group is many LUNs to many initiator groups.

| Name | Type | Description |
|--------|------------------------|-------------|
| _links | _links | |

| Name | Type | Description |
|---------------------|---------|--|
| igroup | igroup | The initiator group to which the LUN is mapped. Required in POST by supplying either the igroup.uuid, igroup.name, or both. |
| logical_unit_number | integer | <p>The logical unit number assigned to the LUN when mapped to the specified initiator group. The number is used to identify the LUN to initiators in the initiator group when communicating through Fibre Channel Protocol or iSCSI. Optional in POST; if no value is provided, ONTAP assigns the lowest available value.</p> <ul style="list-style-type: none"> • example: 1 • maxValue: 4095 • minValue: 0 • readCreate: 1 |
| lun | lun | The LUN to which the initiator group is mapped. Required in POST by supplying either the lun.uuid, lun.name, or both. |
| svm | svm | |

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 |

| Name | Type | Description |
|--------|--------|---|
| target | string | The target parameter that caused the error. |

Create a LUN map

POST /protocols/san/lun-maps

Creates a LUN map.

Required properties

- `svm.uuid` or `svm.name` - Existing SVM in which to create the LUN map.
- `igroup.uuid` or `igroup.name` - Existing initiator group to map to the specified LUN.
- `lun.uuid` or `lun.name` - Existing LUN to map to the specified initiator group.

Default property values

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

- `logical_unit_number` - If no value is provided, ONTAP assigns the lowest available value.

Related ONTAP commands

- `lun mapping create`

Learn more

- [DOC /protocols/san/lun-maps](#)

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 | |

| Name | Type | Description |
|---------------------|------------------------|---|
| igroup | igroup | The initiator group to which the LUN is mapped. Required in POST by supplying either the <code>igroup.uuid</code> , <code>igroup.name</code> , or both. |
| logical_unit_number | integer | The logical unit number assigned to the LUN when mapped to the specified initiator group. The number is used to identify the LUN to initiators in the initiator group when communicating through Fibre Channel Protocol or iSCSI. Optional in POST; if no value is provided, ONTAP assigns the lowest available value. <ul style="list-style-type: none"> • example: 1 • maxValue: 4095 • minValue: 0 • readCreate: 1 |
| lun | lun | The LUN to which the initiator group is mapped. Required in POST by supplying either the <code>lun.uuid</code> , <code>lun.name</code> , or both. |
| svm | svm | |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "igroup": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "initiators": [  
      "iqn.1998-01.com.corp.iscsi:name1"  
    ],  
    "name": "igroup1",  
    "os_type": "string",  
    "protocol": "string",  
    "uuid": "1ad8544d-8cd1-91e0-9e1c-723478563412"  
  },  
  "logical_unit_number": 1,  
  "lun": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "name": "/vol/volume1/qtree1/lun1",  
    "node": {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "name": "node1",  
      "uuid": "1cf8aa42-8cd1-12e0-a11c-423468563412"  
    },  
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"  
  },  
  "svm": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    }  
}
```

```
        } ,  
        "name": "svml",  
        "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"  
    }  
}
```

Response

Status: 201, Created

| Name | Type | Description |
|-------------|----------------------------------|--------------------|
| _links | _links | |
| num_records | integer | Number of records. |
| records | array[lun_map] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "igroup": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "initiators": [  
          "iqn.1998-01.com.corp.iscsi:name1"  
        ],  
        "name": "igroup1",  
        "os_type": "string",  
        "protocol": "string",  
        "uuid": "1ad8544d-8cd1-91e0-9e1c-723478563412"  
      },  
      "logical_unit_number": 1,  
      "lun": {  
        "_links": {  
          "self": {  
            "href": "/api/resourcelink"  
          }  
        },  
        "name": "/vol/volumel/qtree1/lun1",  
        "node": {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          }  
        }  
      }  
    }  
  ]  
}
```

```

        "name": "node1",
        "uuid": "1cf8aa42-8cd1-12e0-a11c-423468563412"
    },
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"svm": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "svm1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
}
}
]
}
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 1254207 | The LUN is already mapped to the same initiator group. |
| 2621462 | The specific SVM does not exist. |
| 2621706 | Both the SVM UUID and SVM name were supplied, but don't refer to the same SVM. |
| 2621707 | No SVM was specified. Either <code>svm.name</code> or <code>svm.uuid</code> must be supplied. |
| 5374053 | The LUN is the destination of an ongoing restore operation and is inaccessible for I/O and management. Wait for the restore to complete and try the command again. |
| 5374238 | The operation is not allowed on a LUN in a Snapshot copy. |
| 5374316 | A LUN move operation is in progress on the source LUN. |
| 5374329 | A LUN of class <code>vvol</code> cannot be mapped. |

| Error Code | Description |
|------------|--|
| 5374573 | A node has no interface configured with the iSCSI or Fibre Channel protocols for the specified SVM. |
| 5374574 | Multiple nodes have no interface configured with the iSCSI or Fibre Channel protocols for the specified SVM. |
| 5374581 | A node has no interface configured with the iSCSI protocol for the specified SVM. |
| 5374582 | Multiple nodes have no interface configured with the iSCSI protocol for the specified SVM. |
| 5374583 | A node has no interface configured with the Fibre Channel protocol for the specified SVM. |
| 5374584 | Multiple nodes have no interface configured with the Fibre Channel protocol for the specified SVM. |
| 5374901 | Either lun.uuid or lun.name must be provided to create a LUN map. |
| 5374902 | Either igrp.uuid or igrp.name must be provided to create a LUN map. |

| 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 | |

igroup

The initiator group to which the LUN is mapped. Required in POST by supplying either the igroup.uuid, igroup.name, or both.

| Name | Type | Description |
|------------|---------------|---|
| _links | _links | |
| initiators | array[string] | The initiators that are members of the initiator group. |
| name | string | The name of the initiator group. Valid in POST. |
| os_type | string | The host operating system of the initiator group. All initiators in the group should be hosts of the same operating system. |
| protocol | string | The protocols supported by the initiator group. This restricts the type of initiators that can be added to the initiator group. |
| uuid | string | The unique identifier of the initiator group. Valid in POST. |

node

The LUN node.

| Name | Type | Description |
|--------|--------|--------------------------|
| _links | _links | |
| name | string | The name the LUN's node. |

| Name | Type | Description |
|------|--------|--|
| uuid | string | The unique identifier of the LUN node. |

lun

The LUN to which the initiator group is mapped. Required in POST by supplying either the `lun.uuid`, `lun.name`, or both.

| Name | Type | Description |
|---------------------|------------------------|--|
| <code>_links</code> | _links | |
| name | string | The fully qualified path name of the LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and file name of the LUN. Valid in POST. |
| node | node | The LUN node. |
| uuid | string | The unique identifier of the LUN. Valid in POST. |

svm

| Name | Type | Description |
|---------------------|------------------------|-----------------------------------|
| <code>_links</code> | _links | |
| name | string | The name of the SVM. |
| uuid | string | The unique identifier of the SVM. |

lun_map

A LUN map is an association between a LUN and an initiator group. When a LUN is mapped to an initiator group, the initiator group's initiators are granted access to the LUN. The relationship between a LUN and an initiator group is many LUNs to many initiator groups.

| Name | Type | Description |
|---------------------|------------------------|---|
| <code>_links</code> | _links | |
| igroup | igroup | The initiator group to which the LUN is mapped. Required in POST by supplying either the <code>igroup.uuid</code> , <code>igroup.name</code> , or both. |

| Name | Type | Description |
|---------------------|---------|--|
| logical_unit_number | integer | <p>The logical unit number assigned to the LUN when mapped to the specified initiator group. The number is used to identify the LUN to initiators in the initiator group when communicating through Fibre Channel Protocol or iSCSI. Optional in POST; if no value is provided, ONTAP assigns the lowest available value.</p> <ul style="list-style-type: none"> • example: 1 • maxValue: 4095 • minValue: 0 • readCreate: 1 |
| lun | lun | The LUN to which the initiator group is mapped. Required in POST by supplying either the lun.uuid, lun.name, or both. |
| svm | svm | |

_links

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

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 |

| Name | Type | Description |
|---------|--------|---|
| message | string | Error message |
| target | string | The target parameter that caused the error. |

Delete a LUN map

DELETE /protocols/san/lun-maps/{lun.uuid}/{igroup.uuid}

Deletes a LUN map.

Related ONTAP commands

- lun mapping delete

Learn more

- [DOC /protocols/san/lun-maps](#)

Parameters

| Name | Type | In | Required | Description |
|-------------|--------|------|----------|-------------|
| lun.uuid | string | path | True | |
| igroup.uuid | string | path | True | |

Response

Status: 200, Ok

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|------------------------|
| 5374875 | The LUN was not found. |

| 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 a LUN map

GET /protocols/san/lun-maps/{lun.uuid}/{igroup.uuid}

Retrieves a LUN map.

Related ONTAP commands

- lun mapping show

Learn more

- [DOC /protocols/san/lun-maps](#)

Parameters

| Name | Type | In | Required | Description |
|-------------|---------------|-------|----------|--------------------------------------|
| lun.uuid | string | path | True | The unique identifier of the LUN. |
| igroup.uuid | string | path | True | The unique identifier of the igroup. |
| fields | array[string] | query | False | Specify the fields to return. |

Response

Status: 200, Ok

| Name | Type | Description |
|--------|------------------------|---|
| _links | _links | |
| igroup | igroup | The initiator group to which the LUN is mapped. Required in POST by supplying either the igroup.uuid, igroup.name, or both. |

| Name | Type | Description |
|---------------------|---------------------|--|
| logical_unit_number | integer | <p>The logical unit number assigned to the LUN when mapped to the specified initiator group. The number is used to identify the LUN to initiators in the initiator group when communicating through Fibre Channel Protocol or iSCSI. Optional in POST; if no value is provided, ONTAP assigns the lowest available value.</p> <ul style="list-style-type: none"> • example: 1 • maxValue: 4095 • minValue: 0 • readCreate: 1 |
| lun | lun | The LUN to which the initiator group is mapped. Required in POST by supplying either the lun.uuid, lun.name, or both. |
| svm | svm | |

Example response

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "igroup": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "initiators": [  
      "iqn.1998-01.com.corp.iscsi:name1"  
    ],  
    "name": "igroup1",  
    "os_type": "string",  
    "protocol": "string",  
    "uuid": "1ad8544d-8cd1-91e0-9e1c-723478563412"  
  },  
  "logical_unit_number": 1,  
  "lun": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    },  
    "name": "/vol/volume1/qtree1/lun1",  
    "node": {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "name": "node1",  
      "uuid": "1cf8aa42-8cd1-12e0-a11c-423468563412"  
    },  
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"  
  },  
  "svm": {  
    "_links": {  
      "self": {  
        "href": "/api/resourcelink"  
      }  
    }  
}
```

```

        },
        "name": "svml",
        "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
    }
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|------------------------------------|
| 5374852 | The initiator group was not found. |
| 5374875 | The LUN was not found. |

| 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 | |

igroup

The initiator group to which the LUN is mapped. Required in POST by supplying either the igroup.uuid, igroup.name, or both.

| Name | Type | Description |
|------------|---------------|---|
| _links | _links | |
| initiators | array[string] | The initiators that are members of the initiator group. |
| name | string | The name of the initiator group. Valid in POST. |
| os_type | string | The host operating system of the initiator group. All initiators in the group should be hosts of the same operating system. |
| protocol | string | The protocols supported by the initiator group. This restricts the type of initiators that can be added to the initiator group. |
| uuid | string | The unique identifier of the initiator group. Valid in POST. |

node

The LUN node.

| Name | Type | Description |
|--------|--------|--------------------------|
| _links | _links | |
| name | string | The name the LUN's node. |

| Name | Type | Description |
|------|--------|--|
| uuid | string | The unique identifier of the LUN node. |

lun

The LUN to which the initiator group is mapped. Required in POST by supplying either the `lun.uuid`, `lun.name`, or both.

| Name | Type | Description |
|---------------------|------------------------|--|
| <code>_links</code> | _links | |
| name | string | The fully qualified path name of the LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and file name of the LUN. Valid in POST. |
| node | node | The LUN node. |
| uuid | string | The unique identifier of the LUN. Valid in POST. |

svm

| Name | Type | Description |
|---------------------|------------------------|-----------------------------------|
| <code>_links</code> | _links | |
| name | string | The name of the SVM. |
| uuid | string | The unique identifier of the SVM. |

error_arguments

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

error

| Name | Type | Description |
|-----------|--|-------------------|
| arguments | array[error_arguments] | Message arguments |

| Name | Type | Description |
|---------|--------|---|
| code | string | Error code |
| message | string | Error message |
| target | string | The target parameter that caused the error. |

Manage LUNs

Storage luns endpoint overview

Overview

A LUN is the logical representation of storage in a storage area network (SAN).

The LUN REST API allows you to create, update, delete, and discover LUNs.

In ONTAP, a LUN is located within a volume. Optionally, it can be located within a qtree in a volume.

A LUN can be created to a specified size using thin or thick provisioning. A LUN can then be renamed, resized, cloned, and moved to a different volume. LUNs support the assignment of a quality of service (QoS) policy for performance management or a QoS policy can be assigned to the volume containing the LUN. See the LUN object model to learn more about each of the properties supported by the LUN REST API.

A LUN must be mapped to an initiator group to grant access to the initiator group's initiators (client hosts). Initiators can then access the LUN and perform I/O over a Fibre Channel (FC) fabric using the FC Protocol or a TCP/IP network using iSCSI.

Performance monitoring

Performance of a LUN can be monitored by observing the `metric.*` and `statistics.*` properties. These properties show the performance of a LUN 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.

Examples

Creating a LUN

This example creates a 300 gigabyte, thin-provisioned LUN in SVM `svm1`, volume `vol1`, configured for use by `linux` initiators. The `return_records` query parameter is used to retrieve properties of the newly created LUN in the POST response.

```
# The API:
POST /api/storage/luns

# The call:
```

```

curl -X POST 'https://<mgmt-ip>/api/storage/luns?return_records=true' -H
'accept: application/hal+json' -d '{ "svm": { "name": "svm1" }, "os_type": "linux", "space": { "size": "300G" }, "name" : "/vol/vol1/lun1" }'

# The response:
{
  "num_records": 1,
  "records": [
    {
      "uuid": "5a24ae5b-28af-47fb-b129-5adf6cfba0a6",
      "svm": {
        "uuid": "6bf967fd-2a1c-11e9-b682-005056bbc17d",
        "name": "svm1",
        "_links": {
          "self": {
            "href": "/api/svm/svms/6bf967fd-2a1c-11e9-b682-005056bbc17d"
          }
        },
        "name": "/vol/vol1/lun1",
        "location": {
          "logical_unit": "lun1",
          "volume": {
            "uuid": "71cd0dba-2a1c-11e9-b682-005056bbc17d",
            "name": "vol1",
            "_links": {
              "self": {
                "href": "/api/storage/volumes/71cd0dba-2a1c-11e9-b682-005056bbc17d"
              }
            }
          }
        }
      },
      "class": "regular",
      "enabled": true,
      "os_type": "linux",
      "serial_number": "wf0Iq+N4uck3",
      "space": {
        "size": 322163441664,
        "used": 0,
        "guarantee": {
          "requested": false,
          "reserved": false
        }
      },
      "status": {
        "state": "OK"
      }
    }
  ]
}

```

```

        "container_state": "online",
        "read_only": false,
        "state": "online"
    },
    "_links": {
        "self": {
            "href": "/api/storage/luns/5a24ae5b-28af-47fb-b129-5adf6cfba0a6"
        }
    }
}
]
}

```

Updating a LUN

This example sets the `comment` property of a LUN.

```

# The API:
PATCH /api/storage/luns/{uuid}

# The call:
curl -X PATCH 'https://<mgmt-ip>/api/storage/luns/5a24ae5b-28af-47fb-b129-
5adf6cfba0a6' -H 'accept: application/hal+json' -d '{ "comment": "Data for
the finance department." }'

```

Retrieving LUNs

This example retrieves summary information for all online LUNs in SVM `svm1`. The `svm.name` and `status.state` query parameters are used to find the desired LUNs.

```

# The API:
GET /api/storage/luns

# The call:
curl -X GET 'https://<mgmt-
ip>/api/storage/luns?svm.name=svm1&status.state=online' -H 'accept:
application/hal+json'

# The response:
{
"records": [
{

```

```

"uuid": "5a24ae5b-28af-47fb-b129-5adf6cfba0a6",
"svm": {
    "name": "svm1"
},
"name": "/vol/vol1/lun1",
"status": {
    "state": "online"
},
"_links": {
    "self": {
        "href": "/api/storage/luns/5a24ae5b-28af-47fb-b129-5adf6cfba0a6"
    }
}
},
{
"uuid": "c903a978-9bac-4ce9-8237-4a3ba8b13f08",
"svm": {
    "name": "svm1"
},
"name": "/vol/vol1/lun2",
"status": {
    "state": "online"
},
"_links": {
    "self": {
        "href": "/api/storage/luns/c903a978-9bac-4ce9-8237-4a3ba8b13f08"
    }
}
},
{
"uuid": "7faf0a9e-0a47-4876-8318-3638d5da16bf",
"svm": {
    "name": "svm1"
},
"name": "/vol/vol2/lun3",
"status": {
    "state": "online"
},
"_links": {
    "self": {
        "href": "/api/storage/luns/7faf0a9e-0a47-4876-8318-3638d5da16bf"
    }
}
}
],
"num_records": 3,

```

```
"_links": {
  "self": {
    "href": "/api/storage/luns?svm.name=svm1&status.state=online"
  }
}
```

Retrieving details for a specific LUN

In this example, the `fields` query parameter is used to request all fields, including advanced fields, that would not otherwise be returned by default for the LUN.

```
# The API:
GET /api/storage/luns/{uuid}

# The call:
curl -X GET 'https://<mgmt-ip>/api/storage/luns/5a24ae5b-28af-47fb-b129-5adf6cfba0a6?fields=**' -H 'accept: application/hal+json'

# The response:
{
  "uuid": "5a24ae5b-28af-47fb-b129-5adf6cfba0a6",
  "svm": {
    "uuid": "6bf967fd-2a1c-11e9-b682-005056bbc17d",
    "name": "svm1",
    "_links": {
      "self": {
        "href": "/api/svm/svms/6bf967fd-2a1c-11e9-b682-005056bbc17d"
      }
    }
  },
  "name": "/vol/vol1/lun1",
  "location": {
    "logical_unit": "lun1",
    "volume": {
      "uuid": "71cd0dba-2a1c-11e9-b682-005056bbc17d",
      "name": "vol1",
      "_links": {
        "self": {
          "href": "/api/storage/volumes/71cd0dba-2a1c-11e9-b682-005056bbc17d"
        }
      }
    }
  }
}
```

```
},
"auto_delete": false,
"class": "regular",
"comment": "Data for the finance department.",
"enabled": true,
"lun_maps": [
  {
    "logical_unit_number": 0,
    "igroup": {
      "uuid": "2b9d57e1-2a66-11e9-b682-005056bbc17d",
      "name": "ig1",
      "_links": {
        "self": {
          "href": "/api/protocols/san/igroups/2b9d57e1-2a66-11e9-b682-005056bbc17d"
        }
      }
    },
    "_links": {
      "self": {
        "href": "/api/protocols/san/lun-maps/5a24ae5b-28af-47fb-b129-5adf6cfba0a6/2b9d57e1-2a66-11e9-b682-005056bbc17d"
      }
    }
  }
],
"os_type": "linux",
"serial_number": "wf0Iq+N4uck3",
"space": {
  "size": 322163441664,
  "used": 0,
  "guarantee": {
    "requested": false,
    "reserved": false
  }
},
"metric": {
  "timestamp": "2019-04-09T05:50:15Z",
  "duration": "PT15S",
  "status": "ok",
  "latency": {
    "other": 0,
    "total": 0,
    "read": 0,
    "write": 0
  }
},
```

```
"iops": {
    "read": 0,
    "write": 0,
    "other": 0,
    "total": 0
},
"throughput": {
    "read": 0,
    "write": 0,
    "other": 0,
    "total": 0
}
},
"statistics": {
    "timestamp": "2019-04-09T05:50:42Z",
    "status": "ok",
    "latency_raw": {
        "other": 38298,
        "total": 38298,
        "read": 0,
        "write": 0
    },
    "iops_raw": {
        "read": 0,
        "write": 0,
        "other": 3,
        "total": 3
    },
    "throughput_raw": {
        "read": 0,
        "write": 0,
        "other": 0,
        "total": 0
    }
},
"status": {
    "container_state": "online",
    "mapped": true,
    "read_only": false,
    "state": "online"
},
"_links": {
    "self": {
        "href": "/api/storage/luns/5a24ae5b-28af-47fb-b129-5adf6cfba0a6?fields=**"
    }
}
```

```
    }  
}
```

Cloning LUNs

A clone of a LUN is an independent "copy" of the LUN that shares unchanged data blocks with the original. As blocks of the source and clone are modified, unique blocks are written for each. LUN clones can be created quickly and consume very little space initially. They can be created for the purpose of back-up, or to replicate data for multiple consumers.

Space reservations can be set for the LUN clone independent of the source LUN by setting the `space.guarantee.requested` property in a POST or PATCH request.

A LUN clone can also be set to auto-delete by setting the `auto_delete` property. If the LUN's volume is configured for automatic deletion, LUNs that have auto-delete enabled are deleted when a volume is nearly full to reclaim a target amount of free space in the volume.

Examples

Creating a new LUN clone

You create a new LUN clone as you create any LUN - a POST request to </storage/luns>. Set `clone.source.uuid` or `clone.source.name` to identify the source LUN from which the clone is created. The LUN clone and its source must reside in the same volume.

The source LUN can reside in a Snapshot copy, in which case the `clone.source.name` field must be used to identify it. Add `/.snapshot/<snapshot_name>` to the path after the volume name to identify the Snapshot copy. For example `/vol/vol1/.snapshot/snap1/lun1`.

By default, new LUN clones do not inherit the QoS policy of the source LUN; a QoS policy should be set for the clone by setting the `qos_policy` property.

```
# The API:  
POST /api/storage/luns  
  
# The call:  
curl -X POST 'https://<mgmt-ip>/api/storage/luns' -H 'accept: application/hal+json' -d '{ "svm": { "name": "svml" }, "name": "/vol/vol1/lun2clone1", "clone": { "source": { "name": "/vol/vol1/lun2" } }, "qos_policy": { "name": "qos1" } }'
```

Over-writing an existing LUN's data as a clone of another

You can overwrite an existing LUN as a clone of another, using a PATCH request to </storage/luns/{uuid}>. Set the `clone.source.uuid` or `clone.source.name` property to identify the source LUN from which the clone data is taken. The LUN clone and its source must reside in the same volume.

When used in a PATCH request, the patched LUN's data is overwritten as a clone of the source. The following

properties are preserved from the patched LUN unless otherwise specified as part of the PATCH: `class`, `auto_delete`, `lun_maps`, `serial_number`, `status.state`, and `uuid`.

Persistent reservations for the updated LUN are also preserved.

```
# The API:  
PATCH /api/storage/luns/{uuid}  
  
# The call:  
curl -X PATCH 'https://<mgmt-ip>/api/storage/luns/5a24ae5b-28af-47fb-b129-  
5adf6cfba0a6' -H 'accept: application/hal+json' -d '{ "clone": { "source":  
{ "name": "/vol/vol1/lun2" } } }'
```

Moving LUNs between volumes

You move a LUN between volumes by using a PATCH request to `/storage/luns/{uuid}`. Set the volume portion of the fully qualified LUN path name property, `path.volume.uuid`, or `path.volume.name` property to a different volume than the LUN's current volume. Moving a LUN between volumes is an asynchronous activity. A successful request returns a response of 200 synchronously, which indicates that the movement has been successfully queued. The LUN object can then be further polled with a GET request to `/storage/luns/{uuid}` to monitor the status of the movement.

The `movement` sub-object of the LUN object is populated while a LUN movement is in progress and for two minutes following completion of a movement.

Examples

Starting a LUN movement

```
# The API:  
PATCH /api/storage/luns/{uuid}  
  
# The call:  
curl -X PATCH 'https://<mgmt-ip>/api/storage/luns/7faf0a9e-0a47-4876-8318-  
3638d5da16bf' -H 'accept: application/hal+json' -d '{ "name":  
"/vol/vol1/lun3" } '
```

Checking on the status of the LUN movement

```

# The API:
GET /api/storage/luns/{uuid}

# The call:
curl -X GET 'https://<mgmt-ip>/api/storage/luns/7faf0a9e-0a47-4876-8318-
3638d5da16bf?fields=movement' -H 'accept: application/hal+json'

# The response:
{
  "uuid": "7faf0a9e-0a47-4876-8318-3638d5da16bf",
  "name": "/vol/vol1/lun3",
  "movement": {
    "paths": {
      "destination": "/vol/vol1/lun3",
      "source": "/vol/vol2/lun3"
    },
    "progress": {
      "elapsed": 1,
      "percent_complete": 0,
      "state": "preparing",
      "volume_snapshot_blocked": false
    }
  },
  "_links": {
    "self": {
      "href": "/api/storage/luns/7faf0a9e-0a47-4876-8318-3638d5da16bf"
    }
  }
}

```

Deleting a LUN

```

# The API:
DELETE /api/storage/luns/{uuid}

# The call:
curl -X DELETE 'https://<mgmt-ip>/api/storage/luns/c903a978-9bac-4ce9-
8237-4a3ba8b13f08' -H 'accept: application/hal+json'

```

Retrieve LUNs

GET /storage/luns

Retrieves LUNs.

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.

- `auto_delete`
- `lun_maps.*`
- `movement.*`
- `status.mapped`
- `statistics.*`
- `metrics.*`

Related ONTAP commands

- `lun mapping show`
- `lun move show`
- `lun show`
- `volume file clone show-autodelete`

Learn more

- [DOC /storage/luns](#)

Parameters

| Name | Type | In | Required | Description |
|------------------------------|--------|-------|----------|--|
| <code>qos_policy.uuid</code> | string | query | False | Filter by <code>qos_policy.uuid</code> |
| <code>qos_policy.name</code> | string | query | False | Filter by <code>qos_policy.name</code> |
| <code>svm.uuid</code> | string | query | False | Filter by <code>svm.uuid</code> |
| <code>svm.name</code> | string | query | False | Filter by <code>svm.name</code> |
| <code>os_type</code> | string | query | False | Filter by <code>os_type</code> |

| Name | Type | In | Required | Description |
|---|---------|-------|----------|---|
| enabled | boolean | query | False | Filter by enabled |
| movement.paths.destination | string | query | False | Filter by movement.paths.destination |
| movement.paths.source | string | query | False | Filter by movement.paths.source |
| movement.progress.failure.code | string | query | False | Filter by movement.progress.failure.code |
| movement.progress.failure.message | string | query | False | Filter by movement.progress.failure.message |
| movement.progress.volume_snapshot_blocked | boolean | query | False | Filter by movement.progress.volume_snapshot_blocked |
| movement.progress.percent_complete | integer | query | False | Filter by movement.progress.percent_complete |
| movement.progress.elapsed | integer | query | False | Filter by movement.progress.elapsed |
| movement.progress.state | string | query | False | Filter by movement.progress.state |
| movement.max_throughput | string | query | False | Filter by movement.max_throughput |
| uuid | string | query | False | Filter by uuid |
| auto_delete | boolean | query | False | Filter by auto_delete |
| name | string | query | False | Filter by name |

| Name | Type | In | Required | Description |
|---------------------------|---------|-------|----------|-------------------------------------|
| space.guarantee.requested | boolean | query | False | Filter by space.guarantee.requested |
| space.guarantee.reserved | boolean | query | False | Filter by space.guarantee.reserved |
| space.size | integer | query | False | Filter by space.size |
| space.used | integer | query | False | Filter by space.used |
| comment | string | query | False | Filter by comment |
| status.state | string | query | False | Filter by status.state |
| status.container_state | string | query | False | Filter by status.container_state |
| status.mapped | boolean | query | False | Filter by status.mapped |
| status.read_only | boolean | query | False | Filter by status.read_only |
| serial_number | string | query | False | Filter by serial_number |
| location.logical_unit | string | query | False | Filter by location.logical_unit |
| location.volume.uuid | string | query | False | Filter by location.volume.uuid |
| location.volume.name | string | query | False | Filter by location.volume.name |
| location.qtree.name | string | query | False | Filter by location.qtree.name |
| location.qtree.id | integer | query | False | Filter by location.qtree.id |

| Name | Type | In | Required | Description |
|------------------------------|---------|-------|----------|--|
| lun_maps.logical_unit_number | integer | query | False | Filter by lun_maps.logical_unit_number |
| lun_maps.igroup.name | string | query | False | Filter by lun_maps.igroup.name |
| lun_maps.igroup.uuid | string | query | False | Filter by lun_maps.igroup.uuid |
| class | string | query | False | Filter by class |
| metric.timestamp | string | query | False | Filter by metric.timestamp |
| metric.iops.other | integer | query | False | Filter by metric.iops.other |
| metric.iops.write | integer | query | False | Filter by metric.iops.write |
| metric.iops.read | integer | query | False | Filter by metric.iops.read |
| metric.iops.total | integer | query | False | Filter by metric.iops.total |
| metric.status | string | query | False | Filter by metric.status |
| metric.duration | string | query | False | Filter by metric.duration |
| metric.latency.other | integer | query | False | Filter by metric.latency.other |
| metric.latency.write | integer | query | False | Filter by metric.latency.write |
| metric.latency.read | integer | query | False | Filter by metric.latency.read |
| metric.latency.total | integer | query | False | Filter by metric.latency.total |

| Name | Type | In | Required | Description |
|---------------------------------|---------|-------|----------|---|
| metric.throughput.other | integer | query | False | Filter by metric.throughput.other |
| metric.throughput.write | integer | query | False | Filter by metric.throughput.write |
| metric.throughput.read | integer | query | False | Filter by metric.throughput.read |
| metric.throughput.total | integer | query | False | Filter by metric.throughput.total |
| statistics.iops_raw.other | integer | query | False | Filter by statistics.iops_raw.other |
| statistics.iops_raw.write | integer | query | False | Filter by statistics.iops_raw.write |
| statistics.iops_raw.read | integer | query | False | Filter by statistics.iops_raw.read |
| statistics.iops_raw.total | integer | query | False | Filter by statistics.iops_raw.total |
| statistics.timestamp | string | query | False | Filter by statistics.timestamp |
| statistics.throughput_raw.other | integer | query | False | Filter by statistics.throughput_raw.other |
| statistics.throughput_raw.write | integer | query | False | Filter by statistics.throughput_raw.write |
| statistics.throughput_raw.read | integer | query | False | Filter by statistics.throughput_raw.read |

| Name | Type | In | Required | Description |
|---------------------------------|---------------|-------|----------|---|
| statistics.throughput_raw.total | integer | query | False | Filter by statistics.throughput_raw.total |
| statistics.status | string | query | False | Filter by statistics.status |
| statistics.latency_raw.other | integer | query | False | Filter by statistics.latency_raw.other |
| statistics.latency_raw.write | integer | query | False | Filter by statistics.latency_raw.write |
| statistics.latency_raw.read | integer | query | False | Filter by statistics.latency_raw.read |
| statistics.latency_raw.total | integer | query | False | Filter by statistics.latency_raw.total |
| create_time | string | query | False | Filter by create_time |
| fields | array[string] | query | False | Specify the fields to return. |
| max_records | integer | query | False | Limit the number of records returned. |
| return_records | boolean | query | False | The default is true for GET calls. When set to false, only the number of records is 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. |
| 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 records. |
| records | array[lun] | |

Example response

```
{
  "_links": {
    "next": {
      "href": "/api/resourcelink"
    },
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "records": [
    {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "class": "string",
      "comment": "string",
      "create_time": "2018-06-04 19:00:00 UTC",
      "location": {
        "logical_unit": "lun1",
        "qtree": {
          "_links": {
            "self": {
              "href": "/api/resourcelink"
            }
          },
          "id": 1,
          "name": "qtree1"
        }
      },
      "volume": {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        },
        "name": "volume1",
        "uuid": "028baa66-41bd-11e9-81d5-00a0986138f7"
      }
    },
    "lun_maps": [
      {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        }
      }
    ]
  }
}
```

```

        "href": "/api/resourcelink"
    }
},
"igroup": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "igroup1",
    "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
},
"logical_unit_number": 0
}
],
"metric": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "duration": "PT15S",
    "iops": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "latency": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "status": "ok",
    "throughput": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
},
"movement": {
    "max_throughput": "string",
    "paths": {
        "destination": "/vol/vol1/lun1",
        "source": "/vol/vol2/lun2"
    }
},

```

```

"progress": {
    "elapsed": 0,
    "failure": {
        "code": "4",
        "message": "Destination volume is offline."
    },
    "percent_complete": 0,
    "state": "string"
}
},
"name": "/vol/volume1/qtree1/lun1",
"os_type": "string",
"qos_policy": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "qos1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"serial_number": "string",
"space": {
    "size": 1073741824,
    "used": 0
},
"statistics": {
    "iops_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "latency_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "status": "ok",
    "throughput_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
},
"status": {

```

```

        "container_state": "string",
        "state": "online"
    },
    "svm": {
        "_links": {
            "self": {
                "href": "/api/resourcelink"
            }
        },
        "name": "svm1",
        "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
    },
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
}
]
}

```

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 | |

source

The source LUN for a LUN clone operation. This can be specified using property `clone.source.uuid` or `clone.source.name`. If both properties are supplied, they must refer to the same LUN.

Valid in POST to create a new LUN as a clone of the source.

Valid in PATCH to overwrite an existing LUN's data as a clone of another.

clone

This sub-object is used in POST to create a new LUN as a clone of an existing LUN, or PATCH to overwrite an existing LUN as a clone of another. Setting a property in this sub-object indicates that a LUN clone is desired. Consider the following other properties when cloning a LUN: `auto_delete`, `qos_policy`, and `space.guarantee.requested`.

When used in a PATCH, the patched LUN's data is over-written as a clone of the source and the following properties are preserved from the patched LUN unless otherwise specified as part of the PATCH: `class`, `auto_delete`, `lun_maps`, `serial_number`, `status.state`, and `uuid`.

Persistent reservations for the patched LUN are also preserved.

qtree

The qtree in which the LUN is optionally located. Valid in POST and PATCH.

If properties `name` and `location.qtree.name` and/or `location.qtree.uuid` are specified in the same request, they must refer to the same qtree.

A PATCH that modifies the qtree of the LUN is considered a rename operation.

| Name | Type | Description |
|--------|------------------------|---|
| _links | _links | |
| id | integer | The identifier for the qtree, unique within the qtree's volume. |
| name | string | The name of the qtree. |

volume

The volume in which the LUN is located. Valid in POST and PATCH.

If properties `name` and `location.volume.name` and/or `location.volume.uuid` are specified in the same request, they must refer to the same volume.

A PATCH that modifies the volume of the LUN begins an asynchronous LUN movement operation.

| Name | Type | Description |
|--------|------------------------|---|
| _links | _links | |
| name | string | The name of the volume. |
| uuid | string | Unique identifier for the volume. This corresponds to the instance-uuid that is exposed in the CLI and ONTAPI. It does not change due to a volume move. <ul style="list-style-type: none"> example: 028baa66-41bd-11e9-81d5-00a0986138f7 |

location

The location of the LUN within the ONTAP cluster. Valid in POST and PATCH.

| Name | Type | Description |
|--------------|--------|---|
| logical_unit | string | The base name component of the LUN. Valid in POST and PATCH. <p>If properties <code>name</code> and <code>location.logical_unit</code> are specified in the same request, they must refer to the base name.</p> <p>A PATCH that modifies the base name of the LUN is considered a rename operation.</p> |

| Name | Type | Description |
|--------|------------------------|--|
| qtree | qtree | <p>The qtree in which the LUN is optionally located. Valid in POST and PATCH.</p> <p>If properties <code>name</code> and <code>location.qtree.name</code> and/or <code>location.qtree.uuid</code> are specified in the same request, they must refer to the same qtree.</p> <p>A PATCH that modifies the qtree of the LUN is considered a rename operation.</p> |
| volume | volume | <p>The volume in which the LUN is located. Valid in POST and PATCH.</p> <p>If properties <code>name</code> and <code>location.volume.name</code> and/or <code>location.volume.uuid</code> are specified in the same request, they must refer to the same volume.</p> <p>A PATCH that modifies the volume of the LUN begins an asynchronous LUN movement operation.</p> |

igroup

The initiator group to which the LUN is mapped.

| Name | Type | Description |
|---------------------|------------------------|---|
| <code>_links</code> | _links | |
| <code>name</code> | <code>string</code> | The name of the initiator group. |
| <code>uuid</code> | <code>string</code> | The unique identifier of the initiator group. |

lun_maps

A LUN map with which the LUN is associated.

| Name | Type | Description |
|---------------------|------------------------|--|
| _links | _links | |
| igroup | igroup | The initiator group to which the LUN is mapped. |
| logical_unit_number | integer | The logical unit number assigned to the LUN for initiators in the initiator group. |

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. |

| Name | Type | Description |
|-------|---------|--|
| write | integer | Performance metric for write I/O operations. |

throughput

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

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

metric

Performance numbers, such as IOPS latency and throughput.

| Name | Type | Description |
|----------|-------------------------|--|
| _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 | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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. |

paths

The fully qualified LUN path names involved in the LUN movement.

| Name | Type | Description |
|-------------|--------|---|
| destination | string | The fully qualified path of the LUN movement destination composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. |

| Name | Type | Description |
|--------|--------|--|
| source | string | The fully qualified path of the LUN movement source composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. |

failure

Error information provided if the asynchronous LUN movement operation fails.

| Name | Type | Description |
|---------|--------|--------------------|
| code | string | The error code. |
| message | string | The error message. |

progress

| Name | Type | Description |
|-------------------------|---------|---|
| elapsed | integer | The amount of time, in seconds, that has elapsed since the start of the LUN movement. |
| failure | failure | Error information provided if the asynchronous LUN movement operation fails. |
| percent_complete | integer | The percentage complete of the LUN movement. |
| state | string | The state of the LUN movement. Valid in PATCH when an LUN movement is active. Set to <i>paused</i> to pause a LUN movement. Set to <i>replicating</i> to resume a paused LUN movement. |
| volume_snapshot_blocked | boolean | This property reports if volume Snapshot copies are blocked by the LUN movement. This property can be polled to identify when volume Snapshot copies can be resumed after beginning a LUN movement. |

movement

This sub-object applies to LUN movement between volumes. A LUN can be moved to a new volume with a PATCH request that changes either the volume portion of property name, location.volume.uuid, or location.volume.name. If the volume is changed using more than one of these properties, the supplied properties used must refer to the same volume.

Moving a LUN between volumes is an asynchronous activity begun by a PATCH request. The data for the LUN is then asynchronously copied from the source volume to the destination volume. The time required to complete the move depends on the size of the LUN and the load on the cluster. The movement sub-object is populated while a LUN movement is in progress and for two (2) minutes following completion of a movement.

While the LUN is being moved, the status of the LUN movement operation can be obtained using a GET for the LUN that requests the movement properties. The LUN movement operation can be further modified using a PATCH on the properties on the movement sub-object.

There is added cost to retrieving property values for movement. They are not populated for either a collection GET or an instance GET unless explicitly requested using the `fields` query parameter. See [DOC Requesting specific fields](#) to learn more.

| Name | Type | Description |
|----------------|----------|--|
| max_throughput | string | <p>The maximum data throughput that should be utilized in support of the LUN movement. This property can be used to throttle a transfer and limit its impact on the performance of the source and destination nodes. The specified value will be rounded up to the nearest megabyte.</p> <p>If this property is not specified in a POST that begins a LUN movement, throttling is not applied to the data transfer.</p> <p>For more information, see Size properties in the <code>docs</code> section of the ONTAP REST API documentation.</p> <p>This property is valid only in a POST that begins a LUN movement or a PATCH when a LUN movement is already in process.</p> |
| paths | paths | The fully qualified LUN path names involved in the LUN movement. |
| progress | progress | |

qos_policy

The QoS policy for the LUN. Both traditional and adaptive QoS policies are supported. If both property `qos_policy.uuid` and `qos_policy.name` are specified in the same request, they must refer to the same QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set property `qos_policy.name` to an empty string ("") in a PATCH request. Valid in POST and PATCH.

Note that a QoS policy can be set on a LUN, or a LUN's volume, but not both.

| Name | Type | Description |
|---------------------|------------------------|--|
| <code>_links</code> | _links | |
| <code>name</code> | string | The name of the QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set this property to an empty string ("") in a PATCH request. Valid in POST and PATCH. |
| <code>uuid</code> | string | The unique identifier of the QoS policy. Valid in POST and PATCH. |

guarantee

Properties that request and report the space guarantee for the LUN.

| Name | Type | Description |
|------------------------|---------|--|
| <code>requested</code> | boolean | The requested space reservation policy for the LUN. If <code>true</code> , a space reservation is requested for the LUN; if <code>false</code> , the LUN is thin provisioned. Guaranteeing a space reservation request for a LUN requires that the volume in which the LUN resides is also space reserved and that the fractional reserve for the volume is 100%. Valid in POST and PATCH. |

| Name | Type | Description |
|----------|---------|---|
| reserved | boolean | <p>Reports if the LUN is space guaranteed.</p> <p>If <i>true</i>, a space guarantee is requested and the containing volume and aggregate support the request. If <i>false</i>, a space guarantee is not requested or a space guarantee is requested and either the containing volume or aggregate do not support the request.</p> |

space

The storage space related properties of the LUN.

| Name | Type | Description |
|-----------|-----------|---|
| guarantee | guarantee | Properties that request and report the space guarantee for the LUN. |
| size | integer | <p>The total provisioned size of the LUN. The LUN size can be increased but not be made smaller using the REST interface.</p> <p>For more information, see <i>Size properties</i> in the <i>docs</i> section of the ONTAP REST API documentation.</p> <ul style="list-style-type: none"> example: 1073741824 |

| Name | Type | Description |
|------|---------|--|
| used | integer | <p>The amount of space consumed by the main data stream of the LUN.</p> <p>This value is the total space consumed in the volume by the LUN, including filesystem overhead, but excluding prefix and suffix streams. Due to internal filesystem overhead and the many ways SAN filesystems and applications utilize blocks within a LUN, this value does not necessarily reflect actual consumption/availability from the perspective of the filesystem or application. Without specific knowledge of how the LUN blocks are utilized outside of ONTAP, this property should not be used as an indicator for an out-of-space condition.</p> <p>For more information, see <i>Size properties</i> in the <i>docs</i> section of the ONTAP REST API documentation.</p> <ul style="list-style-type: none"> • readOnly: 1 |

iops_raw

The number of I/O operations observed at the storage object. This can 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. |

| Name | Type | Description |
|-------|---------|--|
| write | integer | Performance metric for write I/O operations. |

latency_raw

The raw latency in microseconds observed at the storage object. This can 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 can be used along with delta time to calculate the rate of throughput bytes per unit of time.

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

statistics

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

| Name | Type | Description |
|----------------|--------------------------------|---|
| iops_raw | iops_raw | The number of I/O operations observed at the storage object. This can 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 can be divided by the raw IOPS value to calculate the average latency per I/O operation. |
| status | string | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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 can 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. |

status

Status information about the LUN.

| Name | Type | Description |
|-----------------|---------|--|
| container_state | string | The state of the volume and aggregate that contain the LUN. LUNs are only available when their containers are available. |
| mapped | boolean | Reports if the LUN is mapped to one or more initiator groups. There is an added cost to retrieving this property's value. It is not populated for either a collection GET or an instance GET unless it is explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more. |
| read_only | boolean | Reports if the LUN allows only read access. |
| state | string | The state of the LUN. Normal states for a LUN are <i>online</i> and <i>offline</i> . Other states indicate errors. |

svm

The SVM in which the LUN is located.

| Name | Type | Description |
|---------------------|------------------------|-----------------------------------|
| <code>_links</code> | _links | |
| name | string | The name of the SVM. |
| uuid | string | The unique identifier of the SVM. |

lun

A LUN is the logical representation of storage in a storage area network (SAN).

In ONTAP, a LUN is located within a volume. Optionally, it can be located within a qtree in a volume.

A LUN can be created to a specified size using thin or thick provisioning. A LUN can then be renamed, resized, cloned, and moved to a different volume. LUNs support the assignment of a quality of service

(QoS) policy for performance management or a QoS policy can be assigned to the volume containing the LUN. See the LUN object model to learn more about each of the properties supported by the LUN REST API.

A LUN must be mapped to an initiator group to grant access to the initiator group's initiators (client hosts). Initiators can then access the LUN and perform I/O over a Fibre Channel (FC) fabric using the Fibre Channel Protocol or a TCP/IP network using iSCSI.

| Name | Type | Description |
|-------------|------------------------|---|
| _links | _links | |
| auto_delete | boolean | <p>This property marks the LUN for auto deletion when the volume containing the LUN runs out of space. This is most commonly set on LUN clones.</p> <p>When set to <i>true</i>, the LUN becomes eligible for automatic deletion when the volume runs out of space. Auto deletion only occurs when the volume containing the LUN is also configured for auto deletion and free space in the volume decreases below a particular threshold.</p> <p>This property is optional in POST and PATCH. The default value for a new LUN is <i>false</i>.</p> <p>There is an added cost to retrieving this property's value. It is not populated for either a collection GET or an instance GET unless it is explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| class | string | The class of LUN. Only <i>regular</i> LUNs can be created using the REST API. |
| comment | string | A configurable comment available for use by the administrator. Valid in POST and PATCH. |
| create_time | string | The time the LUN was created. |

| Name | Type | Description |
|----------|-----------------|--|
| enabled | boolean | The enabled state of the LUN. LUNs can be disabled to prevent access to the LUN. Certain error conditions also cause the LUN to become disabled. If the LUN is disabled, you can consult the state property to determine if the LUN is administratively disabled (<i>offline</i>) or has become disabled as a result of an error. A LUN in an error condition can be brought online by setting the enabled property to <i>true</i> or brought administratively offline by setting the enabled property to <i>false</i> . Upon creation, a LUN is enabled by default. Valid in PATCH. |
| location | location | The location of the LUN within the ONTAP cluster. Valid in POST and PATCH. |
| lun_maps | array[lun_maps] | <p>The LUN maps with which the LUN is associated.</p> <p>There is an added cost to retrieving property values for lun_maps. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| metric | metric | Performance numbers, such as IOPS latency and throughput. |

| Name | Type | Description |
|----------|--------------------------|---|
| movement | movement | <p>This sub-object applies to LUN movement between volumes. A LUN can be moved to a new volume with a PATCH request that changes either the volume portion of property <code>name</code>, <code>location.volume.uuid</code>, or <code>location.volume.name</code>. If the volume is changed using more than one of these properties, the supplied properties used must refer to the same volume.</p> <p>Moving a LUN between volumes is an asynchronous activity begun by a PATCH request. The data for the LUN is then asynchronously copied from the source volume to the destination volume. The time required to complete the move depends on the size of the LUN and the load on the cluster. The <code>movement</code> sub-object is populated while a LUN movement is in progress and for two (2) minutes following completion of a movement.</p> <p>While the LUN is being moved, the status of the LUN movement operation can be obtained using a GET for the LUN that requests the <code>movement</code> properties. The LUN movement operation can be further modified using a PATCH on the properties on the <code>movement</code> sub-object.</p> <p>There is added cost to retrieving property values for <code>movement</code>. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |

| Name | Type | Description |
|------------|----------------------------|---|
| name | string | <p>The fully qualified path name of the LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. Valid in POST and PATCH.</p> <p>A PATCH that modifies the qtree and/or base name portion of the LUN path is considered a rename operation.</p> <p>A PATCH that modifies the volume portion of the LUN path begins an asynchronous LUN movement operation.</p> |
| os_type | string | <p>The operating system type of the LUN.</p> <p>Required in POST when creating a LUN that is not a clone of another. Disallowed in POST when creating a LUN clone.</p> |
| qos_policy | qos_policy | <p>The QoS policy for the LUN. Both traditional and adaptive QoS policies are supported. If both property <code>qos_policy.uuid</code> and <code>qos_policy.name</code> are specified in the same request, they must refer to the same QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set property <code>qos_policy.name</code> to an empty string ("") in a PATCH request. Valid in POST and PATCH.</p> <p>Note that a QoS policy can be set on a LUN, or a LUN's volume, but not both.</p> |

| Name | Type | Description |
|---------------|------------|---|
| serial_number | string | <p>The LUN serial number. The serial number is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> • maxLength: 12 • minLength: 12 • readOnly: 1 |
| space | space | The storage space related properties of the LUN. |
| statistics | statistics | These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster. |
| status | status | Status information about the LUN. |
| svm | svm | The SVM in which the LUN is located. |
| uuid | string | <p>The unique identifier of the LUN. The UUID is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> • example: 1cd8a442-86d1-11e0-ae1c-123478563412 • readOnly: 1 |

error_arguments

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

error

| Name | Type | Description |
|-----------|------------------------|-------------------|
| arguments | array[error_arguments] | Message arguments |

| Name | Type | Description |
|---------|--------|---|
| code | string | Error code |
| message | string | Error message |
| target | string | The target parameter that caused the error. |

Create a LUN

POST /storage/luns

Creates a LUN.

Required properties

- `svm.uuid` or `svm.name` - Existing SVM in which to create the LUN.
- `name`, `location.volume.name` or `location.volume.uuid` - Existing volume in which to create the LUN.
- `name` or `location.logical_unit` - Base name of the LUN.
- `os_type` - Operating system from which the LUN will be accessed. Required when creating a non-clone LUN and disallowed when creating a clone of an existing LUN. A clone's `os_type` is taken from the source LUN.
- `space.size` - Size of the LUN. Required when creating a non-clone LUN and disallowed when creating a clone of an existing LUN. A clone's size is taken from the source LUN.

Recommended optional properties

- `qos_policy.name` or `qos_policy.uuid` - Existing traditional or adaptive QoS policy to be applied to the LUN. All LUNs should be managed by a QoS policy at the volume or LUN level.

Default property values

If not specified in POST, the follow default property values are assigned.

- `auto_delete` - `false`

Related ONTAP commands

- `lun create`
- `volume file clone autodelete`
- `volume file clone create`

Learn more

- [DOC /storage/luns](#)

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 |
|-------------|------------------------|---|
| _links | _links | |
| auto_delete | boolean | <p>This property marks the LUN for auto deletion when the volume containing the LUN runs out of space. This is most commonly set on LUN clones.</p> <p>When set to <i>true</i>, the LUN becomes eligible for automatic deletion when the volume runs out of space. Auto deletion only occurs when the volume containing the LUN is also configured for auto deletion and free space in the volume decreases below a particular threshold.</p> <p>This property is optional in POST and PATCH. The default value for a new LUN is <i>false</i>.</p> <p>There is an added cost to retrieving this property's value. It is not populated for either a collection GET or an instance GET unless it is explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| class | string | The class of LUN. Only <i>regular</i> LUNs can be created using the REST API. |

| Name | Type | Description |
|-------------|-----------------|--|
| clone | clone | <p>This sub-object is used in POST to create a new LUN as a clone of an existing LUN, or PATCH to overwrite an existing LUN as a clone of another. Setting a property in this sub-object indicates that a LUN clone is desired. Consider the following other properties when cloning a LUN: <code>auto_delete</code>, <code>qos_policy</code>, and <code>space.guarantee.requested</code>.</p> <p>When used in a PATCH, the patched LUN's data is over-written as a clone of the source and the following properties are preserved from the patched LUN unless otherwise specified as part of the PATCH: <code>class</code>, <code>auto_delete</code>, <code>lun_maps</code>, <code>serial_number</code>, <code>status.state</code>, and <code>uuid</code>.</p> <p>Persistent reservations for the patched LUN are also preserved.</p> |
| comment | string | A configurable comment available for use by the administrator. Valid in POST and PATCH. |
| create_time | string | The time the LUN was created. |
| location | location | The location of the LUN within the ONTAP cluster. Valid in POST and PATCH. |
| lun_maps | array[lun_maps] | <p>The LUN maps with which the LUN is associated.</p> <p>There is an added cost to retrieving property values for <code>lun_maps</code>. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| metric | metric | Performance numbers, such as IOPS latency and throughput. |

| Name | Type | Description |
|----------|---------------------------------|--|
| movement | <p>movement</p> | <p>This sub-object applies to LUN movement between volumes. A LUN can be moved to a new volume with a PATCH request that changes either the volume portion of property name, location.volume.uuid, or location.volume.name. If the volume is changed using more than one of these properties, the supplied properties used must refer to the same volume.</p> <p>Moving a LUN between volumes is an asynchronous activity begun by a PATCH request. The data for the LUN is then asynchronously copied from the source volume to the destination volume. The time required to complete the move depends on the size of the LUN and the load on the cluster. The movement sub-object is populated while a LUN movement is in progress and for two (2) minutes following completion of a movement.</p> <p>While the LUN is being moved, the status of the LUN movement operation can be obtained using a GET for the LUN that requests the movement properties. The LUN movement operation can be further modified using a PATCH on the properties on the movement sub-object.</p> <p>There is added cost to retrieving property values for movement. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |

| Name | Type | Description |
|---------------|----------------------------|---|
| name | string | <p>The fully qualified path name of the LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. Valid in POST and PATCH.</p> <p>A PATCH that modifies the qtree and/or base name portion of the LUN path is considered a rename operation.</p> <p>A PATCH that modifies the volume portion of the LUN path begins an asynchronous LUN movement operation.</p> |
| os_type | string | <p>The operating system type of the LUN.</p> <p>Required in POST when creating a LUN that is not a clone of another. Disallowed in POST when creating a LUN clone.</p> |
| qos_policy | qos_policy | <p>The QoS policy for the LUN. Both traditional and adaptive QoS policies are supported. If both property <code>qos_policy.uuid</code> and <code>qos_policy.name</code> are specified in the same request, they must refer to the same QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set property <code>qos_policy.name</code> to an empty string ("") in a PATCH request. Valid in POST and PATCH.</p> <p>Note that a QoS policy can be set on a LUN, or a LUN's volume, but not both.</p> |
| serial_number | string | <p>The LUN serial number. The serial number is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> • <code>maxLength: 12</code> • <code>minLength: 12</code> • <code>readOnly: 1</code> |

| Name | Type | Description |
|------------|----------------------------|---|
| space | space | The storage space related properties of the LUN. |
| statistics | statistics | These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster. |
| status | status | Status information about the LUN. |
| svm | svm | The SVM in which the LUN is located. |
| uuid | string | <p>The unique identifier of the LUN. The UUID is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> • example: 1cd8a442-86d1-11e0-ae1c-123478563412 • readOnly: 1 |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "class": "string",  
  "clone": {  
    "source": {  
      "name": "/vol/volume1/lun1",  
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"  
    }  
  },  
  "comment": "string",  
  "create_time": "2018-06-04 19:00:00 UTC",  
  "enabled": null,  
  "location": {  
    "logical_unit": "lun1",  
    "qtree": {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "id": 1,  
      "name": "qt1"  
    },  
    "volume": {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "name": "volume1",  
      "uuid": "028baa66-41bd-11e9-81d5-00a0986138f7"  
    }  
  },  
  "lun_maps": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
    ],  
  ]}
```

```

"igroup": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "igroup1",
    "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
},
"logical_unit_number": 0
},
],
"metric": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "duration": "PT15S",
    "iops": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "latency": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "status": "ok",
    "throughput": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
},
"movement": {
    "max_throughput": "string",
    "paths": {
        "destination": "/vol/vol1/lun1",
        "source": "/vol/vol2/lun2"
    }
},
"name": "/vol/volume1/qtree1/lun1",
"os_type": "string",

```

```
"qos_policy": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "qos1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"serial_number": "string",
"space": {
    "size": 1073741824,
    "used": 0
},
"statistics": {
    "iops_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "latency_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "status": "ok",
    "throughput_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
},
"status": {
    "container_state": "string",
    "state": "online"
},
"svm": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "svml1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
},
```

```
  "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"  
}
```

Response

Status: 201, Created

| Name | Type | Description |
|-------------|------------------------------|--------------------|
| _links | _links | |
| num_records | integer | Number of records. |
| records | array[lun] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "class": "string",  
      "clone": {  
        "source": {  
          "name": "/vol/volumel/lun1",  
          "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"  
        }  
      },  
      "comment": "string",  
      "create_time": "2018-06-04 19:00:00 UTC",  
      "enabled": null,  
      "location": {  
        "logical_unit": "lun1",  
        "qtree": {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          },  
          "id": 1,  
          "name": "qt1"  
        },  
        "volume": {  
          "_links": {  
            "self": {  
              "href": "/api/resourcelink"  
            }  
          },  
          "name": "volumel",  
        }  
      }  
    }  
  ]  
}
```

```

        "uuid": "028baa66-41bd-11e9-81d5-00a0986138f7"
    }
},
"lun_maps": [
{
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "igroup": {
        "_links": {
            "self": {
                "href": "/api/resourcelink"
            }
        },
        "name": "igroup1",
        "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
    },
    "logical_unit_number": 0
}
],
"metric": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "duration": "PT15S",
    "iops": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "latency": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "status": "ok",
    "throughput": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
}

```

```

} ,
"movement": {
  "max_throughput": "string",
  "paths": {
    "destination": "/vol/voll/lun1",
    "source": "/vol/vol2/lun2"
  }
},
"name": "/vol/volume1/qtree1/lun1",
"os_type": "string",
"qos_policy": {
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "name": "qos1",
  "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"serial_number": "string",
"space": {
  "size": 1073741824,
  "used": 0
},
"statistics": {
  "iops_raw": {
    "read": 200,
    "total": 1000,
    "write": 100
  },
  "latency_raw": {
    "read": 200,
    "total": 1000,
    "write": 100
  },
  "status": "ok",
  "throughput_raw": {
    "read": 200,
    "total": 1000,
    "write": 100
  },
  "timestamp": "2017-01-25 11:20:13 UTC"
},
"status": {
  "container_state": "string",
  "state": "online"
}

```

```

        },
        "svm": {
            "_links": {
                "self": {
                    "href": "/api/resourcelink"
                }
            },
            "name": "svm1",
            "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
        },
        "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    }
}
]
}

```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 917927 | The specified volume was not found. |
| 918236 | The specified <code>location.volume.uuid</code> and <code>location.volume.name</code> do not refer to the same volume. |
| 2621462 | The specified SVM does not exist. |
| 2621706 | The specified <code>svm.uuid</code> and <code>svm.name</code> do not refer to the same SVM. |
| 2621707 | No SVM was specified. Either <code>svm.name</code> or <code>svm.uuid</code> must be supplied. |
| 5242927 | The specified qtree was not found. |
| 5242950 | The specified <code>location.qtree.id</code> and <code>location.qtree.name</code> do not refer to the same qtree. |
| 5374121 | A LUN name can only contain characters A-Z, a-z, 0-9, "-", ".", "_", "{" and "}". |
| 5374123 | A negative size was provided for the LUN. |
| 5374124 | The specified size is too small for the LUN. |
| 5374125 | The specified size is too large for the LUN. |

| Error Code | Description |
|------------|---|
| 5374129 | LUNs cannot be created on a load sharing mirror volume. |
| 5374130 | An invalid size value was provided. |
| 5374237 | LUNs cannot be created on an SVM root volume. |
| 5374238 | LUNs cannot be created in Snapshot copies. |
| 5374241 | A size value with invalid units was provided. |
| 5374242 | A LUN or NVMe namespace already exists at the specified path. |
| 5374352 | An invalid name was provided for the LUN. |
| 5374707 | Creating a LUN in the specific volume is not allowed because the volume is reserved for an application. |
| 5374858 | The volume specified by <code>name</code> is not the same as that specified by <code>location.volume</code> . |
| 5374859 | No volume was specified for the LUN. |
| 5374860 | The qtree specified by <code>name</code> is not the same as that specified by <code>location.qtree</code> . |
| 5374861 | The LUN base name specified by <code>name</code> is not the same as that specified by <code>location.logical_unit</code> . |
| 5374862 | No LUN path base name was provided for the LUN. |
| 5374863 | An error occurred after successfully creating the LUN. Some properties were not set. |
| 5374874 | The specified <code>clone.source.uuid</code> and <code>clone.source.name</code> do not refer to the same LUN. |
| 5374875 | The specified <code>clone.source</code> was not found. |
| 5374876 | The specified <code>clone.source</code> was not found. |
| 5374883 | The property cannot be specified when creating a LUN clone. The <code>target</code> property of the error object identifies the property. |
| 5374884 | The property is required except when creating a LUN clone. The <code>target</code> property of the error object identifies the property. |
| 5374886 | An error occurred after successfully creating the LUN preventing the retrieval of its properties. |
| 5374899 | The <code>clone.source.uuid</code> property is not supported when specifying a source LUN from a Snapshot copy. |
| 13565952 | The LUN clone request failed. |

| 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 | |

source

The source LUN for a LUN clone operation. This can be specified using property `clone.source.uuid` or `clone.source.name`. If both properties are supplied, they must refer to the same LUN.

Valid in POST to create a new LUN as a clone of the source.

Valid in PATCH to overwrite an existing LUN's data as a clone of another.

| Name | Type | Description |
|------|--------|---|
| name | string | The fully qualified path name of the clone source LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. Valid in POST and PATCH. |
| uuid | string | The unique identifier of the clone source LUN. Valid in POST and PATCH. |

clone

This sub-object is used in POST to create a new LUN as a clone of an existing LUN, or PATCH to overwrite an existing LUN as a clone of another. Setting a property in this sub-object indicates that a LUN clone is desired. Consider the following other properties when cloning a LUN: `auto_delete`, `qos_policy`, and `space.guarantee.requested`.

When used in a PATCH, the patched LUN's data is over-written as a clone of the source and the following properties are preserved from the patched LUN unless otherwise specified as part of the PATCH: `class`, `auto_delete`, `lun_maps`, `serial_number`, `status.state`, and `uuid`.

Persistent reservations for the patched LUN are also preserved.

| Name | Type | Description |
|--------|--------|---|
| source | source | <p>The source LUN for a LUN clone operation. This can be specified using property <code>clone.source.uuid</code> or <code>clone.source.name</code>. If both properties are supplied, they must refer to the same LUN.</p> <p>Valid in POST to create a new LUN as a clone of the source.</p> <p>Valid in PATCH to overwrite an existing LUN's data as a clone of another.</p> |

qtree

The qtree in which the LUN is optionally located. Valid in POST and PATCH.

If properties `name` and `location.qtree.name` and/or `location.qtree.uuid` are specified in the same request, they must refer to the same qtree.

A PATCH that modifies the qtree of the LUN is considered a rename operation.

| Name | Type | Description |
|---------------------|---------------------|---|
| <code>_links</code> | <code>_links</code> | |
| id | integer | The identifier for the qtree, unique within the qtree's volume. |
| name | string | The name of the qtree. |

volume

The volume in which the LUN is located. Valid in POST and PATCH.

If properties `name` and `location.volume.name` and/or `location.volume.uuid` are specified in the same request, they must refer to the same volume.

A PATCH that modifies the volume of the LUN begins an asynchronous LUN movement operation.

| Name | Type | Description |
|---------------------|---------------------|-------------------------|
| <code>_links</code> | <code>_links</code> | |
| name | string | The name of the volume. |

| Name | Type | Description |
|------|--------|--|
| uuid | string | <p>Unique identifier for the volume. This corresponds to the instance-uuid that is exposed in the CLI and ONTAPI. It does not change due to a volume move.</p> <ul style="list-style-type: none"> example: 028baa66-41bd-11e9-81d5-00a0986138f7 |

location

The location of the LUN within the ONTAP cluster. Valid in POST and PATCH.

| Name | Type | Description |
|--------------|--------|---|
| logical_unit | string | <p>The base name component of the LUN. Valid in POST and PATCH.</p> <p>If properties <code>name</code> and <code>location.logical_unit</code> are specified in the same request, they must refer to the base name.</p> <p>A PATCH that modifies the base name of the LUN is considered a rename operation.</p> |
| qtree | qtree | <p>The qtree in which the LUN is optionally located. Valid in POST and PATCH.</p> <p>If properties <code>name</code> and <code>location.qtree.name</code> and/or <code>location.qtree.uuid</code> are specified in the same request, they must refer to the same qtree.</p> <p>A PATCH that modifies the qtree of the LUN is considered a rename operation.</p> |

| Name | Type | Description |
|--------|--------|--|
| volume | volume | <p>The volume in which the LUN is located. Valid in POST and PATCH.</p> <p>If properties <code>name</code> and <code>location.volume.name</code> and/or <code>location.volume.uuid</code> are specified in the same request, they must refer to the same volume.</p> <p>A PATCH that modifies the volume of the LUN begins an asynchronous LUN movement operation.</p> |

igroup

The initiator group to which the LUN is mapped.

| Name | Type | Description |
|---------------------|------------------------|---|
| <code>_links</code> | _links | |
| <code>name</code> | string | The name of the initiator group. |
| <code>uuid</code> | string | The unique identifier of the initiator group. |

lun_maps

A LUN map with which the LUN is associated.

| Name | Type | Description |
|----------------------------------|------------------------|--|
| <code>_links</code> | _links | |
| <code>igroup</code> | igroup | The initiator group to which the LUN is mapped. |
| <code>logical_unit_number</code> | integer | The logical unit number assigned to the LUN for initiators in the initiator group. |

iops

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

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

latency

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

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

throughput

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

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

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

metric

Performance numbers, such as IOPS latency and throughput.

| Name | Type | Description |
|----------|-------------------------|--|
| _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 | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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. |

paths

The fully qualified LUN path names involved in the LUN movement.

| Name | Type | Description |
|-------------|--------|---|
| destination | string | The fully qualified path of the LUN movement destination composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. |

| Name | Type | Description |
|--------|--------|--|
| source | string | The fully qualified path of the LUN movement source composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. |

failure

Error information provided if the asynchronous LUN movement operation fails.

| Name | Type | Description |
|---------|--------|--------------------|
| code | string | The error code. |
| message | string | The error message. |

progress

| Name | Type | Description |
|-------------------------|-------------------------|---|
| elapsed | integer | The amount of time, in seconds, that has elapsed since the start of the LUN movement. |
| failure | failure | Error information provided if the asynchronous LUN movement operation fails. |
| percent_complete | integer | The percentage complete of the LUN movement. |
| volume_snapshot_blocked | boolean | This property reports if volume Snapshot copies are blocked by the LUN movement. This property can be polled to identify when volume Snapshot copies can be resumed after beginning a LUN movement. |

movement

This sub-object applies to LUN movement between volumes. A LUN can be moved to a new volume with a PATCH request that changes either the volume portion of property name, `location.volume.uuid`, or `location.volume.name`. If the volume is changed using more than one of these properties, the supplied properties used must refer to the same volume.

Moving a LUN between volumes is an asynchronous activity begun by a PATCH request. The data for the

LUN is then asynchronously copied from the source volume to the destination volume. The time required to complete the move depends on the size of the LUN and the load on the cluster. The movement sub-object is populated while a LUN movement is in progress and for two (2) minutes following completion of a movement.

While the LUN is being moved, the status of the LUN movement operation can be obtained using a GET for the LUN that requests the movement properties. The LUN movement operation can be further modified using a PATCH on the properties on the movement sub-object.

There is added cost to retrieving property values for movement. They are not populated for either a collection GET or an instance GET unless explicitly requested using the `fields` query parameter. See [DOC Requesting specific fields](#) to learn more.

| Name | Type | Description |
|----------------|--------|---|
| max_throughput | string | <p>The maximum data throughput that should be utilized in support of the LUN movement. This property can be used to throttle a transfer and limit its impact on the performance of the source and destination nodes. The specified value will be rounded up to the nearest megabyte.</p> <p>If this property is not specified in a POST that begins a LUN movement, throttling is not applied to the data transfer.</p> <p>For more information, see <code>Size properties</code> in the <code>docs</code> section of the ONTAP REST API documentation.</p> <p>This property is valid only in a POST that begins a LUN movement or a PATCH when a LUN movement is already in process.</p> |
| paths | paths | The fully qualified LUN path names involved in the LUN movement. |

qos_policy

The QoS policy for the LUN. Both traditional and adaptive QoS policies are supported. If both property `qos_policy.uuid` and `qos_policy.name` are specified in the same request, they must refer to the same QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set property `qos_policy.name` to an empty string ("") in a PATCH request. Valid in POST and PATCH.

Note that a QoS policy can be set on a LUN, or a LUN's volume, but not both.

| Name | Type | Description |
|--------|------------------------|--|
| _links | _links | |
| name | string | The name of the QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set this property to an empty string ("") in a PATCH request. Valid in POST and PATCH. |
| uuid | string | The unique identifier of the QoS policy. Valid in POST and PATCH. |

guarantee

Properties that request and report the space guarantee for the LUN.

| Name | Type | Description |
|-----------|---------|--|
| requested | boolean | The requested space reservation policy for the LUN. If <i>true</i> , a space reservation is requested for the LUN; if <i>false</i> , the LUN is thin provisioned. Guaranteeing a space reservation request for a LUN requires that the volume in which the LUN resides is also space reserved and that the fractional reserve for the volume is 100%. Valid in POST and PATCH. |
| reserved | boolean | Reports if the LUN is space guaranteed. If <i>true</i> , a space guarantee is requested and the containing volume and aggregate support the request. If <i>false</i> , a space guarantee is not requested or a space guarantee is requested and either the containing volume or aggregate do not support the request. |

space

The storage space related properties of the LUN.

| Name | Type | Description |
|-----------|-----------|--|
| guarantee | guarantee | Properties that request and report the space guarantee for the LUN. |
| size | integer | <p>The total provisioned size of the LUN. The LUN size can be increased but not be made smaller using the REST interface.</p> <p>For more information, see <i>Size properties</i> in the <i>docs</i> section of the ONTAP REST API documentation.</p> <ul style="list-style-type: none"> example: 1073741824 |
| used | integer | <p>The amount of space consumed by the main data stream of the LUN.</p> <p>This value is the total space consumed in the volume by the LUN, including filesystem overhead, but excluding prefix and suffix streams. Due to internal filesystem overhead and the many ways SAN filesystems and applications utilize blocks within a LUN, this value does not necessarily reflect actual consumption/availability from the perspective of the filesystem or application. Without specific knowledge of how the LUN blocks are utilized outside of ONTAP, this property should not be used as an indicator for an out-of-space condition.</p> <p>For more information, see <i>Size properties</i> in the <i>docs</i> section of the ONTAP REST API documentation.</p> <ul style="list-style-type: none"> readOnly: 1 |

iops_raw

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

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

statistics

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

| Name | Type | Description |
|-------------|-----------------------------|---|
| iops_raw | iops_raw | The number of I/O operations observed at the storage object. This can 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 can be divided by the raw IOPS value to calculate the average latency per I/O operation. |

| Name | Type | Description |
|----------------|--------------------------------|---|
| status | string | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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 can 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. |

status

Status information about the LUN.

| Name | Type | Description |
|-----------------|--------|--|
| container_state | string | The state of the volume and aggregate that contain the LUN. LUNs are only available when their containers are available. |

| Name | Type | Description |
|-----------|---------|--|
| mapped | boolean | Reports if the LUN is mapped to one or more initiator groups. There is an added cost to retrieving this property's value. It is not populated for either a collection GET or an instance GET unless it is explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more. |
| read_only | boolean | Reports if the LUN allows only read access. |
| state | string | The state of the LUN. Normal states for a LUN are <i>online</i> and <i>offline</i> . Other states indicate errors. |

svm

The SVM in which the LUN is located.

| Name | Type | Description |
|---------------------|------------------------|-----------------------------------|
| <code>_links</code> | _links | |
| name | string | The name of the SVM. |
| uuid | string | The unique identifier of the SVM. |

lun

A LUN is the logical representation of storage in a storage area network (SAN).

In ONTAP, a LUN is located within a volume. Optionally, it can be located within a qtree in a volume.

A LUN can be created to a specified size using thin or thick provisioning. A LUN can then be renamed, resized, cloned, and moved to a different volume. LUNs support the assignment of a quality of service (QoS) policy for performance management or a QoS policy can be assigned to the volume containing the LUN. See the LUN object model to learn more about each of the properties supported by the LUN REST API.

A LUN must be mapped to an initiator group to grant access to the initiator group's initiators (client hosts). Initiators can then access the LUN and perform I/O over a Fibre Channel (FC) fabric using the Fibre Channel Protocol or a TCP/IP network using iSCSI.

| Name | Type | Description |
|-------------|---------|---|
| _links | _links | |
| auto_delete | boolean | <p>This property marks the LUN for auto deletion when the volume containing the LUN runs out of space. This is most commonly set on LUN clones.</p> <p>When set to <i>true</i>, the LUN becomes eligible for automatic deletion when the volume runs out of space. Auto deletion only occurs when the volume containing the LUN is also configured for auto deletion and free space in the volume decreases below a particular threshold.</p> <p>This property is optional in POST and PATCH. The default value for a new LUN is <i>false</i>.</p> <p>There is an added cost to retrieving this property's value. It is not populated for either a collection GET or an instance GET unless it is explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| class | string | The class of LUN. Only <i>regular</i> LUNs can be created using the REST API. |

| Name | Type | Description |
|-------------|-----------------------------------|---|
| clone | clone | <p>This sub-object is used in POST to create a new LUN as a clone of an existing LUN, or PATCH to overwrite an existing LUN as a clone of another. Setting a property in this sub-object indicates that a LUN clone is desired. Consider the following other properties when cloning a LUN: <code>auto_delete</code>, <code>qos_policy</code>, and <code>space.guarantee.requested</code>.</p> <p>When used in a PATCH, the patched LUN's data is overwritten as a clone of the source and the following properties are preserved from the patched LUN unless otherwise specified as part of the PATCH: <code>class</code>, <code>auto_delete</code>, <code>lun_maps</code>, <code>serial_number</code>, <code>status.state</code>, and <code>uuid</code>.</p> <p>Persistent reservations for the patched LUN are also preserved.</p> |
| comment | string | A configurable comment available for use by the administrator. Valid in POST and PATCH. |
| create_time | string | The time the LUN was created. |
| location | location | The location of the LUN within the ONTAP cluster. Valid in POST and PATCH. |
| lun_maps | array[lun_maps] | <p>The LUN maps with which the LUN is associated.</p> <p>There is an added cost to retrieving property values for <code>lun_maps</code>. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |

| Name | Type | Description |
|----------|----------|--|
| metric | metric | Performance numbers, such as IOPS latency and throughput. |
| movement | movement | <p>This sub-object applies to LUN movement between volumes. A LUN can be moved to a new volume with a PATCH request that changes either the volume portion of property name, location.volume.uuid, or location.volume.name. If the volume is changed using more than one of these properties, the supplied properties used must refer to the same volume.</p> <p>Moving a LUN between volumes is an asynchronous activity begun by a PATCH request. The data for the LUN is then asynchronously copied from the source volume to the destination volume. The time required to complete the move depends on the size of the LUN and the load on the cluster. The movement sub-object is populated while a LUN movement is in progress and for two (2) minutes following completion of a movement.</p> <p>While the LUN is being moved, the status of the LUN movement operation can be obtained using a GET for the LUN that requests the movement properties. The LUN movement operation can be further modified using a PATCH on the properties on the movement sub-object.</p> <p>There is added cost to retrieving property values for movement. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |

| Name | Type | Description |
|------------|----------------------------|---|
| name | string | <p>The fully qualified path name of the LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. Valid in POST and PATCH.</p> <p>A PATCH that modifies the qtree and/or base name portion of the LUN path is considered a rename operation.</p> <p>A PATCH that modifies the volume portion of the LUN path begins an asynchronous LUN movement operation.</p> |
| os_type | string | <p>The operating system type of the LUN.</p> <p>Required in POST when creating a LUN that is not a clone of another. Disallowed in POST when creating a LUN clone.</p> |
| qos_policy | qos_policy | <p>The QoS policy for the LUN. Both traditional and adaptive QoS policies are supported. If both property <code>qos_policy.uuid</code> and <code>qos_policy.name</code> are specified in the same request, they must refer to the same QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set property <code>qos_policy.name</code> to an empty string ("") in a PATCH request. Valid in POST and PATCH.</p> <p>Note that a QoS policy can be set on a LUN, or a LUN's volume, but not both.</p> |

| Name | Type | Description |
|---------------|------------|---|
| serial_number | string | <p>The LUN serial number. The serial number is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> • maxLength: 12 • minLength: 12 • readOnly: 1 |
| space | space | The storage space related properties of the LUN. |
| statistics | statistics | These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster. |
| status | status | Status information about the LUN. |
| svm | svm | The SVM in which the LUN is located. |
| uuid | string | <p>The unique identifier of the LUN. The UUID is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> • example: 1cd8a442-86d1-11e0-ae1c-123478563412 • readOnly: 1 |

_links

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

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. |

Delete a LUN

`DELETE /storage/luns/{uuid}`

Deletes a LUN.

Related ONTAP commands

- `lun delete`

Learn more

- [DOC /storage/luns](#)

Parameters

| Name | Type | In | Required | Description |
|------|--------|------|----------|-----------------------------------|
| uuid | string | path | True | The unique identifier of the LUN. |

| Name | Type | In | Required | Description |
|---------------------------|---------|-------|----------|---|
| allow_delete_while_mapped | boolean | query | False | <p>Allows deletion of a mapped LUN. A mapped LUN might be in use. Deleting a mapped LUN also deletes the LUN map and makes the data no longer available. This might cause a disruption in the availability of data. This parameter should be used with caution.</p> <ul style="list-style-type: none"> • Default value: |

Response

Status: 200, Ok

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 1254197 | The LUN is mapped and cannot be deleted without specifying the <code>allow_delete_while_mapped</code> query parameter. |
| 5374705 | Deleting the LUN is not allowed because it is part of an application. |
| 5374865 | The LUN's aggregate is offline. The aggregate must be online to modify or remove the LUN. |
| 5374866 | The LUN's volume is offline. The volume must be online to modify or remove the LUN. |
| 5374875 | The specified LUN was not found. |
| 5374876 | The specified LUN was not found. |

| 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 LUN properties or data

GET /storage/luns/{uuid}

Retrieves a LUN.

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.

- `auto_delete`
- `lun_maps.*`
- `movement.*`
- `status.mapped`
- `statistics.*`
- `metrics.*`

Related ONTAP commands

- `lun mapping show`
- `lun move show`
- `lun show`
- `volume file clone show-autodelete`

Learn more

- [DOC /storage/luns](#)

Parameters

| Name | Type | In | Required | Description |
|---------------------|---------------|-------|----------|---|
| <code>uuid</code> | string | path | True | The unique identifier of the LUN to retrieve. |
| <code>fields</code> | array[string] | query | False | Specify the fields to return. |

Response

Status: 200, Ok

| Name | Type | Description |
|-------------|------------------------|---|
| _links | _links | |
| auto_delete | boolean | <p>This property marks the LUN for auto deletion when the volume containing the LUN runs out of space. This is most commonly set on LUN clones.</p> <p>When set to <i>true</i>, the LUN becomes eligible for automatic deletion when the volume runs out of space. Auto deletion only occurs when the volume containing the LUN is also configured for auto deletion and free space in the volume decreases below a particular threshold.</p> <p>This property is optional in POST and PATCH. The default value for a new LUN is <i>false</i>.</p> <p>There is an added cost to retrieving this property's value. It is not populated for either a collection GET or an instance GET unless it is explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| class | string | The class of LUN. Only <i>regular</i> LUNs can be created using the REST API. |
| comment | string | A configurable comment available for use by the administrator. Valid in POST and PATCH. |
| create_time | string | The time the LUN was created. |

| Name | Type | Description |
|----------|-----------------------------------|---|
| enabled | boolean | The enabled state of the LUN. LUNs can be disabled to prevent access to the LUN. Certain error conditions also cause the LUN to become disabled. If the LUN is disabled, you can consult the <code>state</code> property to determine if the LUN is administratively disabled (<code>offline</code>) or has become disabled as a result of an error. A LUN in an error condition can be brought online by setting the <code>enabled</code> property to <code>true</code> or brought administratively offline by setting the <code>enabled</code> property to <code>false</code> . Upon creation, a LUN is enabled by default. Valid in PATCH. |
| location | location | The location of the LUN within the ONTAP cluster. Valid in POST and PATCH. |
| lun_maps | array[lun_maps] | <p>The LUN maps with which the LUN is associated.</p> <p>There is an added cost to retrieving property values for <code>lun_maps</code>. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| metric | metric | Performance numbers, such as IOPS latency and throughput. |

| Name | Type | Description |
|----------|--------------------------|--|
| movement | movement | <p>This sub-object applies to LUN movement between volumes. A LUN can be moved to a new volume with a PATCH request that changes either the volume portion of property name, location.volume.uuid, or location.volume.name. If the volume is changed using more than one of these properties, the supplied properties used must refer to the same volume.</p> <p>Moving a LUN between volumes is an asynchronous activity begun by a PATCH request. The data for the LUN is then asynchronously copied from the source volume to the destination volume. The time required to complete the move depends on the size of the LUN and the load on the cluster. The movement sub-object is populated while a LUN movement is in progress and for two (2) minutes following completion of a movement.</p> <p>While the LUN is being moved, the status of the LUN movement operation can be obtained using a GET for the LUN that requests the movement properties. The LUN movement operation can be further modified using a PATCH on the properties on the movement sub-object.</p> <p>There is added cost to retrieving property values for movement. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |

| Name | Type | Description |
|---------------|----------------------------|---|
| name | string | <p>The fully qualified path name of the LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. Valid in POST and PATCH.</p> <p>A PATCH that modifies the qtree and/or base name portion of the LUN path is considered a rename operation.</p> <p>A PATCH that modifies the volume portion of the LUN path begins an asynchronous LUN movement operation.</p> |
| os_type | string | <p>The operating system type of the LUN.</p> <p>Required in POST when creating a LUN that is not a clone of another. Disallowed in POST when creating a LUN clone.</p> |
| qos_policy | qos_policy | <p>The QoS policy for the LUN. Both traditional and adaptive QoS policies are supported. If both property <code>qos_policy.uuid</code> and <code>qos_policy.name</code> are specified in the same request, they must refer to the same QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set property <code>qos_policy.name</code> to an empty string ("") in a PATCH request. Valid in POST and PATCH.</p> <p>Note that a QoS policy can be set on a LUN, or a LUN's volume, but not both.</p> |
| serial_number | string | <p>The LUN serial number. The serial number is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> • <code>maxLength: 12</code> • <code>minLength: 12</code> • <code>readOnly: 1</code> |

| Name | Type | Description |
|------------|------------|---|
| space | space | The storage space related properties of the LUN. |
| statistics | statistics | These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster. |
| status | status | Status information about the LUN. |
| svm | svm | The SVM in which the LUN is located. |
| uuid | string | <p>The unique identifier of the LUN. The UUID is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> example: 1cd8a442-86d1-11e0-ae1c-123478563412 readOnly: 1 |

Example response

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "class": "string",
  "comment": "string",
  "create_time": "2018-06-04 19:00:00 UTC",
  "location": {
    "logical_unit": "lun1",
    "qtree": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "id": 1,
      "name": "qtl1"
    },
    "volume": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "volume1",
      "uuid": "028baa66-41bd-11e9-81d5-00a0986138f7"
    }
  },
  "lun_maps": [
    {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "igroup": {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        },
        "name": "igroup1",
        "type": "string"
      }
    }
  ]
}
```

```
        "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
    },
    "logical_unit_number": 0
}
],
"metric": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "duration": "PT15S",
    "iops": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "latency": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "status": "ok",
    "throughput": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
},
"movement": {
    "max_throughput": "string",
    "paths": {
        "destination": "/vol/vol1/lun1",
        "source": "/vol/vol2/lun2"
    },
    "progress": {
        "elapsed": 0,
        "failure": {
            "code": "4",
            "message": "Destination volume is offline."
        },
        "percent_complete": 0,
        "state": "string"
    }
},
}
```

```
"name": "/vol/volume1/qtree1/lun1",
"os_type": "string",
"qos_policy": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "qos1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"serial_number": "string",
"space": {
    "size": 1073741824,
    "used": 0
},
"statistics": {
    "iops_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "latency_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "status": "ok",
    "throughput_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
},
"status": {
    "container_state": "string",
    "state": "online"
},
"svm": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "svml1",
    "type": "string"
}
```

```
        "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"  
    },  
    "uuid": "1cd8a442-86d1-11e0-aelc-123478563412"  
}
```

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|----------------------------------|
| 5374875 | The specified LUN was not found. |
| 5374876 | The specified LUN was not found. |

| 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 | |

source

The source LUN for a LUN clone operation. This can be specified using property `clone.source.uuid` or `clone.source.name`. If both properties are supplied, they must refer to the same LUN.

Valid in POST to create a new LUN as a clone of the source.

Valid in PATCH to overwrite an existing LUN's data as a clone of another.

clone

This sub-object is used in POST to create a new LUN as a clone of an existing LUN, or PATCH to overwrite an existing LUN as a clone of another. Setting a property in this sub-object indicates that a LUN clone is desired. Consider the following other properties when cloning a LUN: `auto_delete`, `qos_policy`, and `space.guarantee.requested`.

When used in a PATCH, the patched LUN's data is over-written as a clone of the source and the following properties are preserved from the patched LUN unless otherwise specified as part of the PATCH: `class`, `auto_delete`, `lun_maps`, `serial_number`, `status.state`, and `uuid`.

Persistent reservations for the patched LUN are also preserved.

qtree

The qtree in which the LUN is optionally located. Valid in POST and PATCH.

If properties `name` and `location.qtree.name` and/or `location.qtree.uuid` are specified in the same request, they must refer to the same qtree.

A PATCH that modifies the qtree of the LUN is considered a rename operation.

| Name | Type | Description |
|--------|---------|---|
| _links | _links | |
| id | integer | The identifier for the qtree, unique within the qtree's volume. |
| name | string | The name of the qtree. |

volume

The volume in which the LUN is located. Valid in POST and PATCH.

If properties `name` and `location.volume.name` and/or `location.volume.uuid` are specified in the same request, they must refer to the same volume.

A PATCH that modifies the volume of the LUN begins an asynchronous LUN movement operation.

| Name | Type | Description |
|---------------------|------------------------|--|
| <code>_links</code> | _links | |
| <code>name</code> | string | The name of the volume. |
| <code>uuid</code> | string | Unique identifier for the volume. This corresponds to the <code>instance-uuid</code> that is exposed in the CLI and ONTAPI. It does not change due to a volume move. <ul style="list-style-type: none">example: 028baa66-41bd-11e9-81d5-00a0986138f7 |

location

The location of the LUN within the ONTAP cluster. Valid in POST and PATCH.

| Name | Type | Description |
|---------------------------|--------|---|
| <code>logical_unit</code> | string | The base name component of the LUN. Valid in POST and PATCH. If properties <code>name</code> and <code>location.logical_unit</code> are specified in the same request, they must refer to the base name. A PATCH that modifies the base name of the LUN is considered a rename operation. |

| Name | Type | Description |
|--------|--------|--|
| qtree | qtree | <p>The qtree in which the LUN is optionally located. Valid in POST and PATCH.</p> <p>If properties <code>name</code> and <code>location.qtree.name</code> and/or <code>location.qtree.uuid</code> are specified in the same request, they must refer to the same qtree.</p> <p>A PATCH that modifies the qtree of the LUN is considered a rename operation.</p> |
| volume | volume | <p>The volume in which the LUN is located. Valid in POST and PATCH.</p> <p>If properties <code>name</code> and <code>location.volume.name</code> and/or <code>location.volume.uuid</code> are specified in the same request, they must refer to the same volume.</p> <p>A PATCH that modifies the volume of the LUN begins an asynchronous LUN movement operation.</p> |

igroup

The initiator group to which the LUN is mapped.

| Name | Type | Description |
|---------------------|---------------------|---|
| <code>_links</code> | <code>_links</code> | |
| <code>name</code> | string | The name of the initiator group. |
| <code>uuid</code> | string | The unique identifier of the initiator group. |

lun_maps

A LUN map with which the LUN is associated.

| Name | Type | Description |
|---------------------|------------------------|--|
| _links | _links | |
| igroup | igroup | The initiator group to which the LUN is mapped. |
| logical_unit_number | integer | The logical unit number assigned to the LUN for initiators in the initiator group. |

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. |

| Name | Type | Description |
|-------|---------|--|
| write | integer | Performance metric for write I/O operations. |

throughput

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

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

metric

Performance numbers, such as IOPS latency and throughput.

| Name | Type | Description |
|----------|-------------------------|--|
| _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 | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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. |

paths

The fully qualified LUN path names involved in the LUN movement.

| Name | Type | Description |
|-------------|--------|---|
| destination | string | The fully qualified path of the LUN movement destination composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. |

| Name | Type | Description |
|--------|--------|--|
| source | string | The fully qualified path of the LUN movement source composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. |

failure

Error information provided if the asynchronous LUN movement operation fails.

| Name | Type | Description |
|---------|--------|--------------------|
| code | string | The error code. |
| message | string | The error message. |

progress

| Name | Type | Description |
|-------------------------|-------------------------|---|
| elapsed | integer | The amount of time, in seconds, that has elapsed since the start of the LUN movement. |
| failure | failure | Error information provided if the asynchronous LUN movement operation fails. |
| percent_complete | integer | The percentage complete of the LUN movement. |
| state | string | The state of the LUN movement. Valid in PATCH when an LUN movement is active. Set to <i>paused</i> to pause a LUN movement. Set to <i>replicating</i> to resume a paused LUN movement. |
| volume_snapshot_blocked | boolean | This property reports if volume Snapshot copies are blocked by the LUN movement. This property can be polled to identify when volume Snapshot copies can be resumed after beginning a LUN movement. |

movement

This sub-object applies to LUN movement between volumes. A LUN can be moved to a new volume with a PATCH request that changes either the volume portion of property name, location.volume.uuid, or location.volume.name. If the volume is changed using more than one of these properties, the supplied properties used must refer to the same volume.

Moving a LUN between volumes is an asynchronous activity begun by a PATCH request. The data for the LUN is then asynchronously copied from the source volume to the destination volume. The time required to complete the move depends on the size of the LUN and the load on the cluster. The movement sub-object is populated while a LUN movement is in progress and for two (2) minutes following completion of a movement.

While the LUN is being moved, the status of the LUN movement operation can be obtained using a GET for the LUN that requests the movement properties. The LUN movement operation can be further modified using a PATCH on the properties on the movement sub-object.

There is added cost to retrieving property values for movement. They are not populated for either a collection GET or an instance GET unless explicitly requested using the `fields` query parameter. See [DOC Requesting specific fields](#) to learn more.

| Name | Type | Description |
|----------------|----------|---|
| max_throughput | string | <p>The maximum data throughput that should be utilized in support of the LUN movement. This property can be used to throttle a transfer and limit its impact on the performance of the source and destination nodes. The specified value will be rounded up to the nearest megabyte.</p> <p>If this property is not specified in a POST that begins a LUN movement, throttling is not applied to the data transfer.</p> <p>For more information, see <code>Size properties</code> in the <code>docs</code> section of the ONTAP REST API documentation.</p> <p>This property is valid only in a POST that begins a LUN movement or a PATCH when a LUN movement is already in process.</p> |
| paths | paths | The fully qualified LUN path names involved in the LUN movement. |
| progress | progress | |

qos_policy

The QoS policy for the LUN. Both traditional and adaptive QoS policies are supported. If both property `qos_policy.uuid` and `qos_policy.name` are specified in the same request, they must refer to the same QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set property `qos_policy.name` to an empty string ("") in a PATCH request. Valid in POST and PATCH.

Note that a QoS policy can be set on a LUN, or a LUN's volume, but not both.

| Name | Type | Description |
|---------------------|------------------------|--|
| <code>_links</code> | _links | |
| <code>name</code> | string | The name of the QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set this property to an empty string ("") in a PATCH request. Valid in POST and PATCH. |
| <code>uuid</code> | string | The unique identifier of the QoS policy. Valid in POST and PATCH. |

guarantee

Properties that request and report the space guarantee for the LUN.

| Name | Type | Description |
|------------------------|---------|--|
| <code>requested</code> | boolean | The requested space reservation policy for the LUN. If <code>true</code> , a space reservation is requested for the LUN; if <code>false</code> , the LUN is thin provisioned. Guaranteeing a space reservation request for a LUN requires that the volume in which the LUN resides is also space reserved and that the fractional reserve for the volume is 100%. Valid in POST and PATCH. |

| Name | Type | Description |
|----------|---------|---|
| reserved | boolean | <p>Reports if the LUN is space guaranteed.</p> <p>If <i>true</i>, a space guarantee is requested and the containing volume and aggregate support the request. If <i>false</i>, a space guarantee is not requested or a space guarantee is requested and either the containing volume or aggregate do not support the request.</p> |

space

The storage space related properties of the LUN.

| Name | Type | Description |
|-----------|-----------|---|
| guarantee | guarantee | Properties that request and report the space guarantee for the LUN. |
| size | integer | <p>The total provisioned size of the LUN. The LUN size can be increased but not be made smaller using the REST interface.</p> <p>For more information, see <i>Size properties</i> in the <i>docs</i> section of the ONTAP REST API documentation.</p> <ul style="list-style-type: none"> example: 1073741824 |

| Name | Type | Description |
|------|---------|--|
| used | integer | <p>The amount of space consumed by the main data stream of the LUN.</p> <p>This value is the total space consumed in the volume by the LUN, including filesystem overhead, but excluding prefix and suffix streams. Due to internal filesystem overhead and the many ways SAN filesystems and applications utilize blocks within a LUN, this value does not necessarily reflect actual consumption/availability from the perspective of the filesystem or application. Without specific knowledge of how the LUN blocks are utilized outside of ONTAP, this property should not be used as an indicator for an out-of-space condition.</p> <p>For more information, see <i>Size properties</i> in the <i>docs</i> section of the ONTAP REST API documentation.</p> <ul style="list-style-type: none"> • readOnly: 1 |

iops_raw

The number of I/O operations observed at the storage object. This can 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. |

| Name | Type | Description |
|-------|---------|--|
| write | integer | Performance metric for write I/O operations. |

latency_raw

The raw latency in microseconds observed at the storage object. This can 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 can be used along with delta time to calculate the rate of throughput bytes per unit of time.

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

statistics

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

| Name | Type | Description |
|----------------|--------------------------------|---|
| iops_raw | iops_raw | The number of I/O operations observed at the storage object. This can 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 can be divided by the raw IOPS value to calculate the average latency per I/O operation. |
| status | string | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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 can 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. |

status

Status information about the LUN.

| Name | Type | Description |
|-----------------|---------|--|
| container_state | string | The state of the volume and aggregate that contain the LUN. LUNs are only available when their containers are available. |
| mapped | boolean | Reports if the LUN is mapped to one or more initiator groups. There is an added cost to retrieving this property's value. It is not populated for either a collection GET or an instance GET unless it is explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more. |
| read_only | boolean | Reports if the LUN allows only read access. |
| state | string | The state of the LUN. Normal states for a LUN are <code>online</code> and <code>offline</code> . Other states indicate errors. |

svm

The SVM in which the LUN is located.

| Name | Type | Description |
|---------------------|------------------------|-----------------------------------|
| <code>_links</code> | _links | |
| name | string | The name of the SVM. |
| uuid | string | The unique identifier of the SVM. |

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 an existing LUN

PATCH /storage/luns/{uuid}

Updates the properties of a LUN. A PATCH request can also be used to overwrite the contents of a LUN as a clone of another, to begin movement of a LUN between volumes, and to pause and resume the movement of a LUN between volumes.

Related ONTAP commands

- lun modify
- lun move modify
- lun move pause
- lun move resume
- lun move start
- lun resize
- volume file clone autodelete

Learn more

- [DOC /storage/luns](#)

Parameters

| Name | Type | In | Required | Description |
|------|--------|------|----------|---|
| uuid | string | path | True | The unique identifier of the LUN to update. |

Request Body

| Name | Type | Description |
|-------------|------------------------|---|
| _links | _links | |
| auto_delete | boolean | <p>This property marks the LUN for auto deletion when the volume containing the LUN runs out of space. This is most commonly set on LUN clones.</p> <p>When set to <i>true</i>, the LUN becomes eligible for automatic deletion when the volume runs out of space. Auto deletion only occurs when the volume containing the LUN is also configured for auto deletion and free space in the volume decreases below a particular threshold.</p> <p>This property is optional in POST and PATCH. The default value for a new LUN is <i>false</i>.</p> <p>There is an added cost to retrieving this property's value. It is not populated for either a collection GET or an instance GET unless it is explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| class | string | The class of LUN. Only <i>regular</i> LUNs can be created using the REST API. |

| Name | Type | Description |
|-------------|---------|--|
| clone | clone | <p>This sub-object is used in POST to create a new LUN as a clone of an existing LUN, or PATCH to overwrite an existing LUN as a clone of another. Setting a property in this sub-object indicates that a LUN clone is desired. Consider the following other properties when cloning a LUN: <code>auto_delete</code>, <code>qos_policy</code>, and <code>space.guarantee.requested</code>.</p> <p>When used in a PATCH, the patched LUN's data is over-written as a clone of the source and the following properties are preserved from the patched LUN unless otherwise specified as part of the PATCH: <code>class</code>, <code>auto_delete</code>, <code>lun_maps</code>, <code>serial_number</code>, <code>status.state</code>, and <code>uuid</code>.</p> <p>Persistent reservations for the patched LUN are also preserved.</p> |
| comment | string | A configurable comment available for use by the administrator. Valid in POST and PATCH. |
| create_time | string | The time the LUN was created. |
| enabled | boolean | The enabled state of the LUN. LUNs can be disabled to prevent access to the LUN. Certain error conditions also cause the LUN to become disabled. If the LUN is disabled, you can consult the <code>state</code> property to determine if the LUN is administratively disabled (<code>offline</code>) or has become disabled as a result of an error. A LUN in an error condition can be brought online by setting the <code>enabled</code> property to <code>true</code> or brought administratively offline by setting the <code>enabled</code> property to <code>false</code> . Upon creation, a LUN is enabled by default. Valid in PATCH. |

| Name | Type | Description |
|----------|-----------------|--|
| location | location | The location of the LUN within the ONTAP cluster. Valid in POST and PATCH. |
| lun_maps | array[lun_maps] | <p>The LUN maps with which the LUN is associated.</p> <p>There is an added cost to retrieving property values for lun_maps. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| metric | metric | Performance numbers, such as IOPS latency and throughput. |

| Name | Type | Description |
|----------|--------------------------|--|
| movement | movement | <p>This sub-object applies to LUN movement between volumes. A LUN can be moved to a new volume with a PATCH request that changes either the volume portion of property name, <code>location.volume.uuid</code>, or <code>location.volume.name</code>. If the volume is changed using more than one of these properties, the supplied properties used must refer to the same volume.</p> <p>Moving a LUN between volumes is an asynchronous activity begun by a PATCH request. The data for the LUN is then asynchronously copied from the source volume to the destination volume. The time required to complete the move depends on the size of the LUN and the load on the cluster. The movement sub-object is populated while a LUN movement is in progress and for two (2) minutes following completion of a movement.</p> <p>While the LUN is being moved, the status of the LUN movement operation can be obtained using a GET for the LUN that requests the movement properties. The LUN movement operation can be further modified using a PATCH on the properties on the movement sub-object.</p> <p>There is added cost to retrieving property values for movement. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |

| Name | Type | Description |
|---------------|----------------------------|---|
| name | string | <p>The fully qualified path name of the LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. Valid in POST and PATCH.</p> <p>A PATCH that modifies the qtree and/or base name portion of the LUN path is considered a rename operation.</p> <p>A PATCH that modifies the volume portion of the LUN path begins an asynchronous LUN movement operation.</p> |
| qos_policy | qos_policy | <p>The QoS policy for the LUN. Both traditional and adaptive QoS policies are supported. If both property <code>qos_policy.uuid</code> and <code>qos_policy.name</code> are specified in the same request, they must refer to the same QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set property <code>qos_policy.name</code> to an empty string ("") in a PATCH request. Valid in POST and PATCH.</p> <p>Note that a QoS policy can be set on a LUN, or a LUN's volume, but not both.</p> |
| serial_number | string | <p>The LUN serial number. The serial number is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> • <code>maxLength: 12</code> • <code>minLength: 12</code> • <code>readOnly: 1</code> |
| space | space | The storage space related properties of the LUN. |

| Name | Type | Description |
|------------|----------------------------|---|
| statistics | statistics | These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster. |
| status | status | Status information about the LUN. |
| svm | svm | The SVM in which the LUN is located. |
| uuid | string | <p>The unique identifier of the LUN. The UUID is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> • example: 1cd8a442-86d1-11e0-ae1c-123478563412 • readOnly: 1 |

Example request

```
{  
  "_links": {  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "class": "string",  
  "clone": {  
    "source": {  
      "name": "/vol/volumel/lun1",  
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"  
    }  
  },  
  "comment": "string",  
  "create_time": "2018-06-04 19:00:00 UTC",  
  "location": {  
    "logical_unit": "lun1",  
    "qtree": {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "id": 1,  
      "name": "qtl1"  
    },  
    "volume": {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "name": "volumel",  
      "uuid": "028baa66-41bd-11e9-81d5-00a0986138f7"  
    }  
  },  
  "lun_maps": [  
    {  
      "_links": {  
        "self": {  
          "href": "/api/resourcelink"  
        }  
      },  
      "igroup": {  
        "name": "igroup1",  
        "volume": {  
          "name": "volumel",  
          "uuid": "028baa66-41bd-11e9-81d5-00a0986138f7"  
        }  
      }  
    }  
  ]  
}
```

```
        "_links": {
            "self": {
                "href": "/api/resourcelink"
            }
        },
        "name": "igroup1",
        "uuid": "4ea7a442-86d1-11e0-ae1c-123478563412"
    },
    "logical_unit_number": 0
}
],
"metric": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "duration": "PT15S",
    "iops": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "latency": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "status": "ok",
    "throughput": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
},
"movement": {
    "max_throughput": "string",
    "paths": {
        "destination": "/vol/vol1/lun1",
        "source": "/vol/vol2/lun2"
    }
},
"progress": {
    "elapsed": 0,
    "failure": {
        "code": "4"
    }
}
```

```

        "message": "Destination volume is offline."
    },
    "percent_complete": 0,
    "state": "string"
}
},
"name": "/vol/volume1/qtree1/lun1",
"qos_policy": {
    "_links": {
        "self": {
            "href": "/api/resourcelink"
        }
    },
    "name": "qos1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"serial_number": "string",
"space": {
    "size": 1073741824,
    "used": 0
},
"statistics": {
    "iops_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "latency_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "status": "ok",
    "throughput_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
},
"status": {
    "container_state": "string",
    "state": "online"
},
"svm": {
    "_links": {

```

```

    "self": {
        "href": "/api/resourcelink"
    },
    "name": "svm1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
},
"uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
}

```

Response

Status: 200, Ok

Error

Status: Default

ONTAP Error Response Codes

| Error Code | Description |
|------------|--|
| 917927 | The specified volume was not found. |
| 918236 | The specified <code>location.volume.uuid</code> and <code>location.volume.name</code> do not refer to the same volume. |
| 5242927 | The specified qtree was not found. |
| 5242950 | The specified <code>location.qtree.id</code> and <code>location.qtree.name</code> do not refer to the same qtree. |
| 5374124 | The specified LUN size is too small. |
| 5374125 | The specified LUN size is too large. |
| 5374130 | An invalid size value was provided. |
| 5374241 | A size value with invalid units was provided. |
| 5374480 | Modifying the LUN is not allowed because it is in a foreign LUN import relationship. |
| 5374858 | The volume specified by <code>name</code> is not the same as that specified by <code>location.volume</code> . |
| 5374860 | The qtree specified by <code>name</code> is not the same as that specified by <code>location.qtree</code> . |

| Error Code | Description |
|------------|---|
| 5374861 | The LUN base name specified by <code>name</code> is not the same as that specified by <code>location.logical_unit</code> . |
| 5374864 | An error occurred after successfully overwriting data for the LUN as a clone. Some properties were not modified. |
| 5374865 | The LUN's aggregate is offline. The aggregate must be online to modify or remove the LUN. |
| 5374866 | The LUN's volume is offline. The volume must be online to modify or remove the LUN. |
| 5374874 | The specified <code>clone.source.uuid</code> and <code>clone.source.name</code> do not refer to the same LUN. |
| 5374875 | The specified LUN was not found. This can apply to <code>clone.source</code> or the target LUN. The <code>target</code> property of the error object identifies the property. |
| 5374876 | The specified LUN was not found. This can apply to <code>clone.source</code> or the target LUN. The <code>target</code> property of the error object identifies the property. |
| 5374885 | An error occurred after successfully modifying some of the properties of the LUN. Some properties were not modified. |
| 5374889 | An invalid value was specified for <code>movement.progress.state</code> . Active LUN movement operations can be PATCHed to only <i>paused</i> or <i>replicating</i> . |
| 5374892 | An attempt was made to reduce the size of a LUN. |
| 13565952 | The LUN clone request failed. |

| 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 | |

source

The source LUN for a LUN clone operation. This can be specified using property `clone.source.uuid` or `clone.source.name`. If both properties are supplied, they must refer to the same LUN.

Valid in POST to create a new LUN as a clone of the source.

Valid in PATCH to overwrite an existing LUN's data as a clone of another.

| Name | Type | Description |
|------|--------|---|
| name | string | The fully qualified path name of the clone source LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. Valid in POST and PATCH. |
| uuid | string | The unique identifier of the clone source LUN. Valid in POST and PATCH. |

clone

This sub-object is used in POST to create a new LUN as a clone of an existing LUN, or PATCH to overwrite an existing LUN as a clone of another. Setting a property in this sub-object indicates that a LUN clone is desired. Consider the following other properties when cloning a LUN: `auto_delete`, `qos_policy`, and `space.guarantee.requested`.

When used in a PATCH, the patched LUN's data is over-written as a clone of the source and the following properties are preserved from the patched LUN unless otherwise specified as part of the PATCH: `class`, `auto_delete`, `lun_maps`, `serial_number`, `status.state`, and `uuid`.

Persistent reservations for the patched LUN are also preserved.

| Name | Type | Description |
|--------|--------|---|
| source | source | <p>The source LUN for a LUN clone operation. This can be specified using property <code>clone.source.uuid</code> or <code>clone.source.name</code>. If both properties are supplied, they must refer to the same LUN.</p> <p>Valid in POST to create a new LUN as a clone of the source.</p> <p>Valid in PATCH to overwrite an existing LUN's data as a clone of another.</p> |

qtree

The qtree in which the LUN is optionally located. Valid in POST and PATCH.

If properties `name` and `location.qtree.name` and/or `location.qtree.uuid` are specified in the same request, they must refer to the same qtree.

A PATCH that modifies the qtree of the LUN is considered a rename operation.

| Name | Type | Description |
|---------------------|---------------------|---|
| <code>_links</code> | <code>_links</code> | |
| id | integer | The identifier for the qtree, unique within the qtree's volume. |
| name | string | The name of the qtree. |

volume

The volume in which the LUN is located. Valid in POST and PATCH.

If properties `name` and `location.volume.name` and/or `location.volume.uuid` are specified in the same request, they must refer to the same volume.

A PATCH that modifies the volume of the LUN begins an asynchronous LUN movement operation.

| Name | Type | Description |
|---------------------|---------------------|-------------------------|
| <code>_links</code> | <code>_links</code> | |
| name | string | The name of the volume. |

| Name | Type | Description |
|------|--------|--|
| uuid | string | <p>Unique identifier for the volume. This corresponds to the instance-uuid that is exposed in the CLI and ONTAPI. It does not change due to a volume move.</p> <ul style="list-style-type: none"> example: 028baa66-41bd-11e9-81d5-00a0986138f7 |

location

The location of the LUN within the ONTAP cluster. Valid in POST and PATCH.

| Name | Type | Description |
|--------------|--------|---|
| logical_unit | string | <p>The base name component of the LUN. Valid in POST and PATCH.</p> <p>If properties <code>name</code> and <code>location.logical_unit</code> are specified in the same request, they must refer to the base name.</p> <p>A PATCH that modifies the base name of the LUN is considered a rename operation.</p> |
| qtree | qtree | <p>The qtree in which the LUN is optionally located. Valid in POST and PATCH.</p> <p>If properties <code>name</code> and <code>location.qtree.name</code> and/or <code>location.qtree.uuid</code> are specified in the same request, they must refer to the same qtree.</p> <p>A PATCH that modifies the qtree of the LUN is considered a rename operation.</p> |

| Name | Type | Description |
|--------|--------|--|
| volume | volume | <p>The volume in which the LUN is located. Valid in POST and PATCH.</p> <p>If properties <code>name</code> and <code>location.volume.name</code> and/or <code>location.volume.uuid</code> are specified in the same request, they must refer to the same volume.</p> <p>A PATCH that modifies the volume of the LUN begins an asynchronous LUN movement operation.</p> |

igroup

The initiator group to which the LUN is mapped.

| Name | Type | Description |
|---------------------|------------------------|---|
| <code>_links</code> | _links | |
| <code>name</code> | string | The name of the initiator group. |
| <code>uuid</code> | string | The unique identifier of the initiator group. |

lun_maps

A LUN map with which the LUN is associated.

| Name | Type | Description |
|----------------------------------|------------------------|--|
| <code>_links</code> | _links | |
| <code>igroup</code> | igroup | The initiator group to which the LUN is mapped. |
| <code>logical_unit_number</code> | integer | The logical unit number assigned to the LUN for initiators in the initiator group. |

iops

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

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

latency

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

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

throughput

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

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

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

metric

Performance numbers, such as IOPS latency and throughput.

| Name | Type | Description |
|----------|-------------------------|--|
| _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 | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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. |

paths

The fully qualified LUN path names involved in the LUN movement.

| Name | Type | Description |
|-------------|--------|---|
| destination | string | The fully qualified path of the LUN movement destination composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. |

| Name | Type | Description |
|--------|--------|--|
| source | string | The fully qualified path of the LUN movement source composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. |

failure

Error information provided if the asynchronous LUN movement operation fails.

| Name | Type | Description |
|---------|--------|--------------------|
| code | string | The error code. |
| message | string | The error message. |

progress

| Name | Type | Description |
|-------------------------|-------------------------|---|
| elapsed | integer | The amount of time, in seconds, that has elapsed since the start of the LUN movement. |
| failure | failure | Error information provided if the asynchronous LUN movement operation fails. |
| percent_complete | integer | The percentage complete of the LUN movement. |
| state | string | The state of the LUN movement. Valid in PATCH when an LUN movement is active. Set to <i>paused</i> to pause a LUN movement. Set to <i>replicating</i> to resume a paused LUN movement. |
| volume_snapshot_blocked | boolean | This property reports if volume Snapshot copies are blocked by the LUN movement. This property can be polled to identify when volume Snapshot copies can be resumed after beginning a LUN movement. |

movement

This sub-object applies to LUN movement between volumes. A LUN can be moved to a new volume with a PATCH request that changes either the volume portion of property name, location.volume.uuid, or location.volume.name. If the volume is changed using more than one of these properties, the supplied properties used must refer to the same volume.

Moving a LUN between volumes is an asynchronous activity begun by a PATCH request. The data for the LUN is then asynchronously copied from the source volume to the destination volume. The time required to complete the move depends on the size of the LUN and the load on the cluster. The movement sub-object is populated while a LUN movement is in progress and for two (2) minutes following completion of a movement.

While the LUN is being moved, the status of the LUN movement operation can be obtained using a GET for the LUN that requests the movement properties. The LUN movement operation can be further modified using a PATCH on the properties on the movement sub-object.

There is added cost to retrieving property values for movement. They are not populated for either a collection GET or an instance GET unless explicitly requested using the `fields` query parameter. See [DOC Requesting specific fields](#) to learn more.

| Name | Type | Description |
|----------------|----------|---|
| max_throughput | string | <p>The maximum data throughput that should be utilized in support of the LUN movement. This property can be used to throttle a transfer and limit its impact on the performance of the source and destination nodes. The specified value will be rounded up to the nearest megabyte.</p> <p>If this property is not specified in a POST that begins a LUN movement, throttling is not applied to the data transfer.</p> <p>For more information, see <code>Size properties</code> in the <code>docs</code> section of the ONTAP REST API documentation.</p> <p>This property is valid only in a POST that begins a LUN movement or a PATCH when a LUN movement is already in process.</p> |
| paths | paths | The fully qualified LUN path names involved in the LUN movement. |
| progress | progress | |

qos_policy

The QoS policy for the LUN. Both traditional and adaptive QoS policies are supported. If both property `qos_policy.uuid` and `qos_policy.name` are specified in the same request, they must refer to the same QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set property `qos_policy.name` to an empty string ("") in a PATCH request. Valid in POST and PATCH.

Note that a QoS policy can be set on a LUN, or a LUN's volume, but not both.

| Name | Type | Description |
|---------------------|------------------------|--|
| <code>_links</code> | _links | |
| <code>name</code> | string | The name of the QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set this property to an empty string ("") in a PATCH request. Valid in POST and PATCH. |
| <code>uuid</code> | string | The unique identifier of the QoS policy. Valid in POST and PATCH. |

guarantee

Properties that request and report the space guarantee for the LUN.

| Name | Type | Description |
|------------------------|---------|--|
| <code>requested</code> | boolean | The requested space reservation policy for the LUN. If <code>true</code> , a space reservation is requested for the LUN; if <code>false</code> , the LUN is thin provisioned. Guaranteeing a space reservation request for a LUN requires that the volume in which the LUN resides is also space reserved and that the fractional reserve for the volume is 100%. Valid in POST and PATCH. |

| Name | Type | Description |
|----------|---------|---|
| reserved | boolean | <p>Reports if the LUN is space guaranteed.</p> <p>If <i>true</i>, a space guarantee is requested and the containing volume and aggregate support the request. If <i>false</i>, a space guarantee is not requested or a space guarantee is requested and either the containing volume or aggregate do not support the request.</p> |

space

The storage space related properties of the LUN.

| Name | Type | Description |
|-----------|-----------|---|
| guarantee | guarantee | Properties that request and report the space guarantee for the LUN. |
| size | integer | <p>The total provisioned size of the LUN. The LUN size can be increased but not be made smaller using the REST interface.</p> <p>For more information, see <i>Size properties</i> in the <i>docs</i> section of the ONTAP REST API documentation.</p> <ul style="list-style-type: none"> example: 1073741824 |

| Name | Type | Description |
|------|---------|--|
| used | integer | <p>The amount of space consumed by the main data stream of the LUN.</p> <p>This value is the total space consumed in the volume by the LUN, including filesystem overhead, but excluding prefix and suffix streams. Due to internal filesystem overhead and the many ways SAN filesystems and applications utilize blocks within a LUN, this value does not necessarily reflect actual consumption/availability from the perspective of the filesystem or application. Without specific knowledge of how the LUN blocks are utilized outside of ONTAP, this property should not be used as an indicator for an out-of-space condition.</p> <p>For more information, see <i>Size properties</i> in the <i>docs</i> section of the ONTAP REST API documentation.</p> <ul style="list-style-type: none"> • readOnly: 1 |

iops_raw

The number of I/O operations observed at the storage object. This can 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. |

| Name | Type | Description |
|-------|---------|--|
| write | integer | Performance metric for write I/O operations. |

latency_raw

The raw latency in microseconds observed at the storage object. This can 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 can be used along with delta time to calculate the rate of throughput bytes per unit of time.

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

statistics

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

| Name | Type | Description |
|----------------|--------------------------------|---|
| iops_raw | iops_raw | The number of I/O operations observed at the storage object. This can 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 can be divided by the raw IOPS value to calculate the average latency per I/O operation. |
| status | string | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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 can 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. |

status

Status information about the LUN.

| Name | Type | Description |
|-----------------|---------|--|
| container_state | string | The state of the volume and aggregate that contain the LUN. LUNs are only available when their containers are available. |
| mapped | boolean | Reports if the LUN is mapped to one or more initiator groups. There is an added cost to retrieving this property's value. It is not populated for either a collection GET or an instance GET unless it is explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more. |
| read_only | boolean | Reports if the LUN allows only read access. |
| state | string | The state of the LUN. Normal states for a LUN are <code>online</code> and <code>offline</code> . Other states indicate errors. |

svm

The SVM in which the LUN is located.

| Name | Type | Description |
|---------------------|------------------------|-----------------------------------|
| <code>_links</code> | _links | |
| name | string | The name of the SVM. |
| uuid | string | The unique identifier of the SVM. |

lun

A LUN is the logical representation of storage in a storage area network (SAN).

In ONTAP, a LUN is located within a volume. Optionally, it can be located within a qtree in a volume.

A LUN can be created to a specified size using thin or thick provisioning. A LUN can then be renamed, resized, cloned, and moved to a different volume. LUNs support the assignment of a quality of service

(QoS) policy for performance management or a QoS policy can be assigned to the volume containing the LUN. See the LUN object model to learn more about each of the properties supported by the LUN REST API.

A LUN must be mapped to an initiator group to grant access to the initiator group's initiators (client hosts). Initiators can then access the LUN and perform I/O over a Fibre Channel (FC) fabric using the Fibre Channel Protocol or a TCP/IP network using iSCSI.

| Name | Type | Description |
|-------------|------------------------|---|
| _links | _links | |
| auto_delete | boolean | <p>This property marks the LUN for auto deletion when the volume containing the LUN runs out of space. This is most commonly set on LUN clones.</p> <p>When set to <i>true</i>, the LUN becomes eligible for automatic deletion when the volume runs out of space. Auto deletion only occurs when the volume containing the LUN is also configured for auto deletion and free space in the volume decreases below a particular threshold.</p> <p>This property is optional in POST and PATCH. The default value for a new LUN is <i>false</i>.</p> <p>There is an added cost to retrieving this property's value. It is not populated for either a collection GET or an instance GET unless it is explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| class | string | The class of LUN. Only <i>regular</i> LUNs can be created using the REST API. |

| Name | Type | Description |
|-------------|--------|---|
| clone | clone | <p>This sub-object is used in POST to create a new LUN as a clone of an existing LUN, or PATCH to overwrite an existing LUN as a clone of another. Setting a property in this sub-object indicates that a LUN clone is desired. Consider the following other properties when cloning a LUN: <code>auto_delete</code>, <code>qos_policy</code>, and <code>space.guarantee.requested</code>.</p> <p>When used in a PATCH, the patched LUN's data is overwritten as a clone of the source and the following properties are preserved from the patched LUN unless otherwise specified as part of the PATCH: <code>class</code>, <code>auto_delete</code>, <code>lun_maps</code>, <code>serial_number</code>, <code>status.state</code>, and <code>uuid</code>.</p> <p>Persistent reservations for the patched LUN are also preserved.</p> |
| comment | string | A configurable comment available for use by the administrator. Valid in POST and PATCH. |
| create_time | string | The time the LUN was created. |

| Name | Type | Description |
|----------|-----------------|--|
| enabled | boolean | The enabled state of the LUN. LUNs can be disabled to prevent access to the LUN. Certain error conditions also cause the LUN to become disabled. If the LUN is disabled, you can consult the state property to determine if the LUN is administratively disabled (<i>offline</i>) or has become disabled as a result of an error. A LUN in an error condition can be brought online by setting the enabled property to <i>true</i> or brought administratively offline by setting the enabled property to <i>false</i> . Upon creation, a LUN is enabled by default. Valid in PATCH. |
| location | location | The location of the LUN within the ONTAP cluster. Valid in POST and PATCH. |
| lun_maps | array[lun_maps] | <p>The LUN maps with which the LUN is associated.</p> <p>There is an added cost to retrieving property values for lun_maps. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |
| metric | metric | Performance numbers, such as IOPS latency and throughput. |

| Name | Type | Description |
|----------|--------------------------|---|
| movement | movement | <p>This sub-object applies to LUN movement between volumes. A LUN can be moved to a new volume with a PATCH request that changes either the volume portion of property <code>name</code>, <code>location.volume.uuid</code>, or <code>location.volume.name</code>. If the volume is changed using more than one of these properties, the supplied properties used must refer to the same volume.</p> <p>Moving a LUN between volumes is an asynchronous activity begun by a PATCH request. The data for the LUN is then asynchronously copied from the source volume to the destination volume. The time required to complete the move depends on the size of the LUN and the load on the cluster. The <code>movement</code> sub-object is populated while a LUN movement is in progress and for two (2) minutes following completion of a movement.</p> <p>While the LUN is being moved, the status of the LUN movement operation can be obtained using a GET for the LUN that requests the <code>movement</code> properties. The LUN movement operation can be further modified using a PATCH on the properties on the <code>movement</code> sub-object.</p> <p>There is added cost to retrieving property values for <code>movement</code>. They are not populated for either a collection GET or an instance GET unless explicitly requested using the <code>fields</code> query parameter. See DOC Requesting specific fields to learn more.</p> |

| Name | Type | Description |
|---------------|----------------------------|---|
| name | string | <p>The fully qualified path name of the LUN composed of a "/vol" prefix, the volume name, the (optional) qtree name, and base name of the LUN. Valid in POST and PATCH.</p> <p>A PATCH that modifies the qtree and/or base name portion of the LUN path is considered a rename operation.</p> <p>A PATCH that modifies the volume portion of the LUN path begins an asynchronous LUN movement operation.</p> |
| qos_policy | qos_policy | <p>The QoS policy for the LUN. Both traditional and adaptive QoS policies are supported. If both property <code>qos_policy.uuid</code> and <code>qos_policy.name</code> are specified in the same request, they must refer to the same QoS policy. To remove the QoS policy from a LUN, leaving it with no QoS policy, set property <code>qos_policy.name</code> to an empty string ("") in a PATCH request. Valid in POST and PATCH.</p> <p>Note that a QoS policy can be set on a LUN, or a LUN's volume, but not both.</p> |
| serial_number | string | <p>The LUN serial number. The serial number is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> • <code>maxLength: 12</code> • <code>minLength: 12</code> • <code>readOnly: 1</code> |
| space | space | The storage space related properties of the LUN. |

| Name | Type | Description |
|------------|------------|---|
| statistics | statistics | These are raw performance numbers, such as IOPS latency and throughput. These numbers are aggregated across all nodes in the cluster and increase with the uptime of the cluster. |
| status | status | Status information about the LUN. |
| svm | svm | The SVM in which the LUN is located. |
| uuid | string | <p>The unique identifier of the LUN. The UUID is generated by ONTAP when the LUN is created.</p> <ul style="list-style-type: none"> example: 1cd8a442-86d1-11e0-ae1c-123478563412 readOnly: 1 |

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 historical performance metrics for a LUN

GET /storage/luns/{uuid}/metrics

Retrieves historical performance metrics for a LUN.

Parameters

| Name | Type | In | Required | Description |
|------------------|---------|-------|----------|----------------------------|
| iops.other | integer | query | False | Filter by iops.other |
| iops.write | integer | query | False | Filter by iops.write |
| iops.read | integer | query | False | Filter by iops.read |
| iops.total | integer | query | False | Filter by iops.total |
| timestamp | string | query | False | Filter by timestamp |
| status | string | query | False | Filter by status |
| duration | string | query | False | Filter by duration |
| latency.other | integer | query | False | Filter by latency.other |
| latency.write | integer | query | False | Filter by latency.write |
| latency.read | integer | query | False | Filter by latency.read |
| latency.total | integer | query | False | Filter by latency.total |
| throughput.other | integer | query | False | Filter by throughput.other |
| throughput.write | integer | query | False | Filter by throughput.write |
| throughput.read | integer | query | False | Filter by throughput.read |
| throughput.total | integer | query | False | Filter by throughput.total |

| Name | Type | In | Required | Description |
|---|----------------|---------|----------|--|
| 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. |
| 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. | uuid | string | path | True |
| • Default value: 1 | | | | |
| Unique identifier of the LUN. | interval | string | query | False |

Response

Status: 200, Ok

| Name | Type | Description |
|--------|--------|-------------|
| _links | _links | |

| Name | Type | Description |
|-------------|----------------|-------------------|
| num_records | integer | Number of records |
| records | array[records] | |

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "records": [  
    {  
      "_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 |
|-------|---------|--|
| 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. |

records

Performance numbers, such as IOPS latency and throughput.

| Name | Type | Description |
|--------|------------------------|-------------|
| _links | _links | |

| Name | Type | Description |
|------------|------------|---|
| 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. |
| status | string | Errors associated with the sample. For example, if the aggregation of data over multiple nodes fails, then any partial errors might return "ok" on success or "error" on an 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. |

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. |

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