



## **Retrieve users**

### REST API reference

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# Retrieve users

## Retrieve users

### Overview

You can use this API to retrieve a list of users with the most I/O activity for FlexVol and FlexGroup volumes belonging to a specified SVM, within the past several seconds. To obtain this list, only the volumes which have the activity tracking feature enabled are considered.

This API is used to provide insight into I/O activity and supports ordering by I/O activity types, namely `iops` and `throughput` metrics. Use the `top_metric` parameter to specify which type of I/O activity to filter for. This API supports returning only one I/O activity type per request.

### Enabling and disabling activity tracking feature

The following APIs can be used to enable, disable, and retrieve the activity tracking state for a FlexVol or a FlexGroup volume.

&ndash; PATCH `/api/storage/volumes/{uuid} -d '{"activity_tracking.state":"on"}'`

&ndash; PATCH `/api/storage/volumes/{uuid} -d '{"activity_tracking.state":"off"}'`

&ndash; GET `/api/storage/volumes/{uuid}/?fields=activity_tracking`

### Excluded volumes list

Optionally, the API returns an excluded list of activity tracking-enabled volumes, which were not accounted for when obtaining the list of clients with the most I/O activity for the SVM. This excluded list contains both the volume information and the reason for exclusion.

### Approximate accounting and error bars

When too many users have recent activity, some users might be dropped from the list. In this situation, the spread of values in the `error` field increases, indicating that there are larger error bars on the value for `iops` or `throughput`. As the list becomes increasingly more approximate due to dropped entries, some of the users that would have otherwise been included might not be present in the final list returned by the API.

### Failure to return list of users with most I/O activity

The API can sometimes fail to return the list of users with the most I/O activity, due to the following reasons.

&ndash; The volumes belonging to the SVM do not have the activity tracking feature enabled.

&ndash; The volumes belonging to the SVM have not had any recent NFS/CIFS client traffic.

&ndash; The NFS/CIFS client operations are being served by the client-side filesystem cache.

&ndash; The NFS/CIFS client operations are being buffered by the client operating system.

&ndash; On rare occasions, the incoming traffic pattern is not suitable to obtain the list of users with the most I/O activity.

&ndash; NFSv4 client read operations using Multi-Processor I/O (MPIO) are not tracked.

## Failure to return the usernames

The API can sometimes fail to obtain the usernames for the list of userid entries, due to internal transient errors. In such cases, instead of the username, the API will return "{<user-id>}" for the user entry.</user-id>

## Retrieve a list of the users with the most I/O activity

For a report on the users with the most I/O activity returned in descending order, specify the I/O activity type you want to filter for by passing the `iops` or `throughput` property into the `top_metric` parameter. If the I/O activity type is not specified, by default the API returns a list of the users with the greatest number of the average read operations per second. The current maximum number of users returned by the API for an I/O activity type is 25.

&ndash; GET /api/svm/svms/{svm.uuid}/top-metrics/users

## Examples

**Retrieving a list of the users with the greatest average number of read bytes received per second:**

```
# The API:
GET /api/svm/svms/{svm.uuid}/top-metrics/users

# The Call:
curl -X GET "https://<mgmt-ip>/api/svm/svms/{svm.uuid}/top-
metrics/users?top_metric=throughput.read"

# The Response:
{
  "records": [
    {
      "svm": {
        "name": "vs1"
      },
      "iops": {
        "write": 1495,
        "error": {
          "lower_bound": 1495,
          "upper_bound": 1505
        }
      },
      "user_id": "S-1-5-21-256008430-3394229847-3930036330-1001",
      "user_name": "user1",
      "volumes": [
        {
```

```

    "name": "fv1",
    "uuid": "73b293df-e9d7-46cc-a9ce-2df8e52ef864",
    "_links": {
      "self": {
        "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-2df8e52ef864"
      }
    }
  },
  {
    "name": "fv2",
    "uuid": "2ea74c3e-d5ca-11eb-8fbb-005056ac0f33",
    "_links": {
      "self": {
        "href": "/api/storage/volumes/2ea74c3e-d5ca-11eb-8fbb-005056ac0f33"
      }
    }
  },
  {
    "name": "fv4",
    "uuid": "5bbfc226-3fd8-42c9-a651-fa6167c2cf84",
    "_links": {
      "self": {
        "href": "/api/storage/volumes/5bbfc226-3fd8-42c9-a651-fa6167c2cf84"
      }
    }
  }
],
{
  "svm": {
    "name": "vs1"
  },
  "iops": {
    "write": 1022,
    "error": {
      "lower_bound": 1022,
      "upper_bound": 1032
    }
  },
  "user_id": "S-1-5-21-256008430-3394229847-3930036330-1002",
  "user_name": "user2",
  "volumes": [
    {

```

```

    "name": "fv2",
    "uuid": "2ea74c3e-d5ca-11eb-8fbb-005056ac0f33",
    "_links": {
      "self": {
        "href": "/api/storage/volumes/2ea74c3e-d5ca-11eb-8fbb-005056ac0f33"
      }
    }
  },
  {
    "name": "fv3",
    "uuid": "1ca74c3e-d5ca-11eb-8fbb-005056ac0f88",
    "_links": {
      "self": {
        "href": "/api/storage/volumes/1ca74c3e-d5ca-11eb-8fbb-005056ac0f88"
      }
    }
  }
]
},
{
  "svm": {
    "name": "vs1"
  },
  "iops": {
    "write": 345,
    "error": {
      "lower_bound": 345,
      "upper_bound": 355
    }
  },
  "user_id": "S-1-5-21-256008430-3394229847-3930036330-1003",
  "user_name": "user3",
  "volumes": [
    {
      "name": "fv3",
      "uuid": "1ca74c3e-d5ca-11eb-8fbb-005056ac0f88",
      "_links": {
        "self": {
          "href": "/api/storage/volumes/1ca74c3e-d5ca-11eb-8fbb-005056ac0f88"
        }
      }
    }
  ]
}
]

```

```

},
{
  "svm": {
    "name": "vs1"
  },
  "iops": {
    "write": 235,
    "error": {
      "lower_bound": 235,
      "upper_bound": 245
    }
  },
  "user_id": "1988",
  "user_name": "user4",
  "volumes": [
    {
      "name": "fv4",
      "uuid": "5bbfc226-3fd8-42c9-a651-fa6167c2cf84",
      "_links": {
        "self": {
          "href": "/api/storage/volumes/5bbfc226-3fd8-42c9-a651-
fa6167c2cf84"
        }
      }
    }
  ]
},
{
  "svm": {
    "name": "vs1"
  },
  "iops": {
    "write": 235,
    "error": {
      "lower_bound": 235,
      "upper_bound": 245
    }
  },
  "user_id": "S-1-5-21-256008430-3394229847-3930036330-1005",
  "user_name": "user5",
  "volumes": [
    {
      "name": "fv5",
      "uuid": "5bbfc227-3fd8-42c9-a651-fa6167c2cf85",
      "_links": {
        "self": {

```

```

        "href": "/api/storage/volumes/5bbfc227-3fd8-42c9-a651-
fa6167c2cf85"
    }
    }
    }
    ]
}
],
"num_records": 5,
"excluded_volumes": [
{
    "volume": {
        "uuid": "5bbfc224-3fd8-42c9-a651-fa6167c2cf84",
        "name": "vol1",
        "_links": {
            "self": {
                "href": "/api/storage/volumes/5bbfc224-3fd8-42c9-a651-
fa6167c2cf84"
            }
        }
    },
    "reason": {
        "message": "The volume is offline.",
        "code": 12345
    },
    "_links": {
        "self": {
            "href": "/api/storage/volumes/5bbfc224-3fd8-42c9-a651-
fa6167c2cf84"
        }
    }
},
{
    "volume": {
        "uuid": "5bbfc224-3fd8-42c9-a651-fa6167c2cf85",
        "name": "vol2",
        "_links": {
            "self": {
                "href": "/api/storage/volumes/5bbfc224-3fd8-42c9-a651-
fa6167c2cf85"
            }
        }
    },
    "reason": {
        "message": "The volume is offline.",
        "code": 23456
    }
}
]
}

```



```

    },
    "_links": {
      "self": {
        "href": "/api/storage/volumes/5bbfc224-3fd8-42c9-a651-
fa6167c2cf85"
      }
    }
  },
  "_links": {
    "self": {
      "href": "/api/svm/svms/f5516c44-3e61-11ec-9cd5-005056acae40/top-
metrics/users?top_metric=iops.write&fields=**"
    }
  }
}

```

#### Example showing the behavior of the API where there is no read/write traffic:

```

# The Call:
curl -X GET "https://<mgmt-ip>/api/svm/svms/{svm.uuid}/top-
metrics/users?top_metric=throughput.write"

# The Response:
{
  "records": [
  ],
  "num_records": 0,
  "notice": {
    "message": "The activity tracking report for SVM \"vs1\" returned zero
records. Check whether the activity tracking enabled volumes belonging to
the SVM have read/write traffic. Refer to the REST API documentation for
more information on why there might be no records.",
    "code": "124519405",
  },
  "_links": {
    "self": {
      "href": "/api/svm/svms/f5516c44-3e61-11ec-9cd5-005056acae40/top-
metrics/users?top_metric=throughput.write"
    }
  }
}

```

# List users with the most I/O activity

GET /svm/svms/{svm.uuid}/top-metrics/users

Introduced In: 9.11

Retrieves a list of users with the most I/O activity.

## Parameters

Name	Type	In	Required	Description
svm.uuid	string	path	True	SVM UUID
top_metric	string	query	False	I/O activity type <ul style="list-style-type: none"><li>• Default value: 1</li><li>• enum: ["iops.read", "iops.write", "throughput.read", "throughput.write"]</li></ul>
user_id	string	query	False	Filter by user_id
user_name	string	query	False	Filter by user_name
svm.name	string	query	False	Filter by svm.name
volumes.name	string	query	False	Filter by volumes.name <ul style="list-style-type: none"><li>• Introduced in: 9.12</li></ul>
volumes.uuid	string	query	False	Filter by volumes.uuid <ul style="list-style-type: none"><li>• Introduced in: 9.12</li></ul>
iops.error.upper_bound	integer	query	False	Filter by iops.error.upper_bound

Name	Type	In	Required	Description
iops.error.lower_bound	integer	query	False	Filter by iops.error.lower_bound
iops.read	integer	query	False	Filter by iops.read
iops.write	integer	query	False	Filter by iops.write
throughput.error.upper_bound	integer	query	False	Filter by throughput.error.upper_bound
throughput.error.lower_bound	integer	query	False	Filter by throughput.error.lower_bound
throughput.write	integer	query	False	Filter by throughput.write
throughput.read	integer	query	False	Filter by throughput.read
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	<p>The default is true for GET calls. When set to false, only the number of records is returned.</p> <ul style="list-style-type: none"> <li>• Default value: 1</li> </ul>

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"> <li>• Default value: 15</li> <li>• Max value: 120</li> <li>• Min value: 0</li> </ul>
order_by	array[string]	query	False	Order results by specified fields and optional [asc

## Response

Status: 200, Ok

Name	Type	Description
_links	<a href="#">_links</a>	
excluded_volumes	array[ <a href="#">top_metrics_svm_user_excluded_volume</a> ]	List of volumes that are not included in the SVM activity tracking REST API.
notice	<a href="#">notice</a>	Optional field that indicates why no records are returned by the SVM activity tracking REST API.
num_records	integer	Number of records.
partial_response_reason	<a href="#">partial_response_reason</a>	Indicates that the metric report provides partial data.
records	array[ <a href="#">top_metrics_svm_user</a> ]	

## Example response

```
{
  "_links": {
    "next": {
      "href": "/api/resourcelink"
    },
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "excluded_volumes": [
    {
      "reason": {
        "code": "111411",
        "message": "The volume is offline."
      },
      "volume": {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        },
        "name": "volume1",
        "uuid": "028baa66-41bd-11e9-81d5-00a0986138f7"
      }
    }
  ],
  "notice": {
    "code": "111411207",
    "message": "The volume is offline."
  },
  "num_records": 1,
  "partial_response_reason": {
    "code": "124518424",
    "message": "The top metrics report contains partial data for read operations because NFSv4 reads using Multi-Processor I/O (MPIO) are not tracked."
  },
  "records": [
    {
      "iops": {
        "error": {
          "lower_bound": 34,
          "upper_bound": 54
        }
      }
    }
  ]
}
```

```

    "read": 4,
    "write": 8
  },
  "svm": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "name": "svm1",
    "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
  },
  "throughput": {
    "error": {
      "lower_bound": 34,
      "upper_bound": 54
    },
    "read": 10,
    "write": 7
  },
  "user_id": "S-1-5-21-256008430-3394229847-3930036330-1001",
  "user_name": "James",
  "volumes": [
    {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "volume1",
      "uuid": "028baa66-41bd-11e9-81d5-00a0986138f7"
    }
  ]
}

```

## Error

Status: Default

## ONTAP Error Response Codes

Error Code	Description
124519405	The activity tracking report for SVM svm.name returned zero records. Check whether the activity tracking enabled volumes belonging to the SVM have read/write traffic. Refer to the REST API documentation for more information on why there might be no records.
124519406	Failed to get the activity tracking report for SVM svm.name. Reason:<Reason for="" failure="">.</Reason>
124519407	SVM wildcard queries are not supported for activity tracking reports.
124519408	Activity tracking is not supported on SVM svm.name, because it is configured as a destination for SVM DR.
124519409	Activity tracking is not supported on SVM svm.name, because it is configured as a destination of a MetroCluster SVM relationship and the SVM admin state is stopped.

Also see the table of common errors in the [Response body](#) overview section of this documentation.

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

### Example error

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

## Definitions

## See Definitions

href

Name	Type	Description
href	string	

\_links

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

reason

Name	Type	Description
code	string	Warning code indicating why the volume is not included in the SVM activity tracking REST API.
message	string	Details why the volume is not included in the SVM activity tracking REST API.

\_links

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

volume

Name	Type	Description
_links	<a href="#">_links</a>	
name	string	The name of the volume. This field cannot be specified in a PATCH method.



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"> <li>• example: 028baa66-41bd-11e9-81d5-00a0986138f7</li> <li>• Introduced in: 9.6</li> <li>• x-nullable: true</li> </ul>

top\_metrics\_svm\_user\_excluded\_volume

List of volumes and their details as to why they are not included in the SVM activity tracking REST API.

Name	Type	Description
reason	<a href="#">reason</a>	
volume	<a href="#">volume</a>	

notice

Optional field that indicates why no records are returned by the SVM activity tracking REST API.

Name	Type	Description
code	string	Warning code indicating why no records are returned.
message	string	Details why no records are returned.

partial\_response\_reason

Indicates that the metric report provides partial data.

Name	Type	Description
code	string	Warning code indicating why partial data was reported.
message	string	A message describing the reason for partial data.

top\_metric\_value\_error\_bounds

Name	Type	Description
lower_bound	integer	Lower bound of the nominal value of a metric.
upper_bound	integer	Upper bound of the nominal value of a metric.

#### iops

Name	Type	Description
error	<a href="#">top_metric_value_error_bounds</a>	
read	integer	Average number of read operations per second.
write	integer	Average number of write operations per second.

#### svm

SVM, applies only to SVM-scoped objects.

Name	Type	Description
_links	<a href="#">_links</a>	
name	string	The name of the SVM. This field cannot be specified in a PATCH method.
uuid	string	The unique identifier of the SVM. This field cannot be specified in a PATCH method.

#### throughput

Name	Type	Description
error	<a href="#">top_metric_value_error_bounds</a>	
read	integer	Average number of read bytes received per second.
write	integer	Average number of write bytes received per second.

#### volumes

Name	Type	Description
_links	<a href="#">_links</a>	
name	string	The name of the volume. This field cannot be specified in a PATCH method.
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"> <li>• example: 028baa66-41bd-11e9-81d5-00a0986138f7</li> <li>• Introduced in: 9.8</li> <li>• x-nullable: true</li> </ul>

top\_metrics\_svm\_user

Aggregated information about a user's IO activity at a SVM scope.

Name	Type	Description
iops	<a href="#">iops</a>	
svm	<a href="#">svm</a>	SVM, applies only to SVM-scoped objects.
throughput	<a href="#">throughput</a>	
user_id	string	User ID of the user.
user_name	string	Name of the user.
volumes	array[ <a href="#">volumes</a> ]	List of volumes where the user is generating traffic.

error\_arguments

Name	Type	Description
code	string	Argument code
message	string	Message argument

returned\_error

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

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