



Retrieve clients

REST API reference

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Table of Contents

Retrieve clients	1
Retrieve clients	1
Overview	1
Approximate accounting and error bars	1
Enabling and disabling activity tracking feature	1
Excluded volumes list	1
Failure to return list of clients with most I/O activity	1
Retrieve a list of the clients with the most I/O activity	2
Examples	2
List clients with the most I/O activity	5
Parameters	5
Response	7
Error	10
Definitions	11

Retrieve clients

Retrieve clients

Overview

You can use this API to retrieve a list of clients 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.

Approximate accounting and error bars

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

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.

– PATCH /api/storage/volumes/{uuid} -d '{"activity_tracking.state":"on"}'

– PATCH /api/storage/volumes/{uuid} -d '{"activity_tracking.state":"off"}'

– 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.

Failure to return list of clients with most I/O activity

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

– The volumes belonging to the SVM do not have the activity tracking feature enabled.

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

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

– The NFS/CIFS client operations are being buffered by the client operating system.

– On rare occasions, the incoming traffic pattern is not suitable to obtain the list of clients with the most I/O activity.

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

Retrieve a list of the clients with the most I/O activity

For a report on the clients 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` I/O activity type into the `top_metric` parameter. If the I/O activity type is not specified, by default the API returns a list of clients with the greatest number of average read operations per second. The current maximum number of clients returned by the API for an I/O activity type is 25.

– GET /api/svm/svms/{svm.uuid}/top-metrics/clients

Examples

Retrieving a list of the clients with the greatest average number of write operations per second:

```
# The API:  
GET /api/svm/svms/{svm.uuid}/top-metrics/clients  
  
# The Call:  
curl -X GET "https://<mgmt-ip>/api/svm/svms/{svm.uuid}/top-  
metrics/clients?top_metric=iops.write"  
  
# The Response:  
{  
  "records": [  
    {  
      "svm": {  
        "name": "vs1"  
      },  
      "iops": {  
        "write": 1495,  
        "error": {  
          "lower_bound": 1495,  
          "upper_bound": 1505  
        }  
      },  
      "client_ip": "172.28.71.128"  
    },  
    {  
      "svm": {  
        "name": "vs1"  
      },  
      "iops": {  
        "write": 1022,  
        "error": {  
          "lower_bound": 1022,  
          "upper_bound": 1022  
        }  
      }  
    }  
  ]  
}
```

```

        "lower_bound": 1022,
        "upper_bound": 1032
    }
},
"client_ip": "172.28.71.179"
},
{
    "svm": {
        "name": "vs1"
    },
    "iops": {
        "write": 345,
        "error": {
            "lower_bound": 345,
            "upper_bound": 355
        }
    },
    "client_ip": "172.28.51.62"
}
],
"num_records": 3,
"excluded_volumes": [
{
    "volume": {
        "uuid": "5bbfc226-3fd8-42c9-a651-fa6167c2cf84",
        "name": "vol10",
        "_links": {
            "self": {
                "href": "/api/storage/volumes/5bbfc226-3fd8-42c9-a651-
fa6167c2cf84"
            }
        }
    },
    "reason": {
        "message": "resource limit exceeded",
        "code": "12345"
    },
    "_links": {
        "self": {
            "href": "/api/storage/volumes/5bbfc226-3fd8-42c9-a651-
fa6167c2cf84"
        }
    }
},
{
    "volume": {

```

```

"uuid": "5bbfc227-3fd8-42c9-a651-fa6167c2cf85",
"name": "vol22",
"_links": {
  "self": {
    "href": "/api/storage/volumes/5bbfc227-3fd8-42c9-a651-
fa6167c2cf85"
  }
},
"reason": {
  "message": "The volume is offline.",
  "code": "23456"
},
"_links": {
  "self": {
    "href": "/api/storage/volumes/5bbfc227-3fd8-42c9-a651-
fa6167c2cf85"
  }
}
},
],
"_links": {
  "self": {
    "href": "/api/svm/svms/572361f3-e769-439d-9c04-2ba48a08ff43/top-
metrics/clients?top_metric=iops.write"
  }
}
}

```

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

```

# The Call:
curl -X GET "https://<mgmt-ip>/api/svm/svms/{svm.uuid}/top-
metrics/clients?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/572361f3-e769-439d-9c04-2ba48a08ff43/top-
metrics/clients?top_metric=throughput.write"
    }
  }
}

```

List clients with the most I/O activity

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

Introduced In: 9.11

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

Parameters

Name	Type	In	Required	Description
svm.uuid	string	path	True	SVM UUID

Name	Type	In	Required	Description
top_metric	string	query	False	I/O activity type <ul style="list-style-type: none"> • Default value: 1 • enum: ["iops.read", "iops.write", "throughput.read", "throughput.write"]
svm.name	string	query	False	Filter by svm.name
iops.read	integer	query	False	Filter by iops.read
iops.write	integer	query	False	Filter by iops.write
iops.error.upper_bound	integer	query	False	Filter by iops.error.upper_bound
iops.error.lower_bound	integer	query	False	Filter by iops.error.lower_bound
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
client_ip	string	query	False	Filter by client_ip
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	<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"> • Default value: 1
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: 15 • Max value: 120 • Min value: 0
order_by	array[string]	query	False	Order results by specified fields and optional [asc]

Response

Status: 200, Ok

Name	Type	Description
_links	_links	
excluded_volumes	array[top_metrics_svm_client_excluded_volume]	List of volumes that are not included in the SVM activity tracking REST API.
notice	notice	Optional field that indicates why no records are returned by the SVM activity tracking REST API.

Name	Type	Description
num_records	integer	Number of records.
partial_response_reason	partial_response_reason	Indicates that the metric report provides partial data.
records	array[top_metrics_svm_client]	

Example response

```
{  
  "_links": {  
    "next": {  
      "href": "/api/resourcelink"  
    },  
    "self": {  
      "href": "/api/resourcelink"  
    }  
  },  
  "excluded_volumes": [  
    {  
      "reason": {  
        "code": "111411207",  
        "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": [  
    {  
      "client_ip": "192.168.185.170",  
      "iops": {  
        "error": {  
          "lower_bound": 34,  
          "upper_bound": 54  
        }  
      }  
    }  
  ]  
}
```

```

        },
        "read": 5,
        "write": 10
    },
    "svm": {
        "_links": {
            "self": {
                "href": "/api/resourcelink"
            }
        },
        "name": "svm1",
        "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
    },
    "throughput": {
        "error": {
            "lower_bound": 34,
            "upper_bound": 54
        },
        "read": 12,
        "write": 2
    }
}
]
}

```

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.

Error Code	Description
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	returned_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	

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	href	

volume

Name	Type	Description
_links	_links	
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"> example: 028baa66-41bd-11e9-81d5-00a0986138f7 Introduced in: 9.6 x-nullable: true

top_metrics_svm_client_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	reason	
volume	volume	

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	top_metric_value_error_bounds	
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	_links	
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	top_metric_value_error_bounds	
read	integer	Average number of read bytes received per second.
write	integer	Average number of write bytes received per second.

top_metrics_svm_client

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

Name	Type	Description
client_ip	string	IP address of the client. Both IPv4 and IPv6 IP addresses are supported.
iops	iops	
svm	svm	SVM, applies only to SVM-scoped objects.
throughput	throughput	

error_arguments

Name	Type	Description
code	string	Argument code
message	string	Message argument

returned_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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