Retrieve directories

REST API reference

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Retrieve directories

Storage volumes volume.uuid top-metrics directories endpoint overview

Overview

You can use this API to retrieve a list of directories with the most IO activity for a specified volume. Use the `top_metric` parameter to specify which type of IO activity to filter for. This API is used to provide insight into IO activity and supports ordering by IO activity types, namely `iops` and `throughput` metrics. This API supports only returning one IO activity type per request.

Retrieve a list of the directories with the most IO activity

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

Failure to return list of directories with most IO activity

The API can sometimes fail to return the list of directories with the most IO activity, due to the following reasons:

– The volume does not have the activity tracking feature enabled.

– The volume does not have read/write traffic.

– The read traffic is served by the NFS/CIFS client filesystem cache.

– On rare occasions, the incoming traffic pattern is not suitable to obtain the list of directories with the most IO activity.

– GET /api/storage/volumes/{volume.uuid}/top-metrics/directories

Failure to return the pathnames for the list of directories with most IO activity

The API can sometimes fail to obtain the filesystem pathnames for the list of directory entries, due to internal transient errors. In such cases, instead of the pathname, the API will return "{<volume_instance_uuid>:<fileid>" for every directory entry. You can get more information about the directory entry by invoking the GET on the below API using the above obtained fileid. "GET /api/storage/volumes/{<volume_instance_uuid>}/files/{path}?inode_number=<fileid>"</fileid></volume_instance_uuid></fileid></volume_instance_uuid>

Examples

Retrieving a list of the directories with the greatest average number of read operations per second:

```
# The API:
```

```
GET /api/storage/volumes/{volume.uuid}/top-metrics/directories

# The Call:
curl -X GET "https://<mgmt-ip>/api/storage/volumes/{volume.uuid}/top-
metrics/directories?top_metric=iops.read"

# The Response:
{
"records": [
  {
    "volume": {
      "name": "vol1",
    },
    "iops": {
      "read": 1495,
      "error": {
        "lower_bound": 1495,
        "upper_bound": 1505
      }
    },
    "path": "/dir1/dir2",
    "svm": {
      "uuid": "572361f3-e769-439d-9c04-2ba48a08ff43",
      "name": "vs1",
      "_links": {
        "self": {
          "href": "/api/svm/svms/572361f3-e769-439d-9c04-2ba48a08ff43"
        }
      }
    },
    "_links": {
      "directory": {
        "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-
2df8e52ef864/files/dir1%2Fdir2"
      },
      "metadata": {
        "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-
2df8e52ef864/files/dir1%2Fdir2?return_metadata=true"
      }
    }
  },
  {
    "volume": {
      "name": "vol1",
    },
    "iops": {
```

```
      "read": 1022,
      "error": {
        "lower_bound": 1022,
        "upper_bound": 1032
      }
    },
    "path": "/dir3/dir4",
    "svm": {
      "uuid": "572361f3-e769-439d-9c04-2ba48a08ff43",
      "name": "vs1",
      "_links": {
        "self": {
          "href": "/api/svm/svms/572361f3-e769-439d-9c04-2ba48a08ff43"
        }
      }
    },
    "_links": {
      "directory": {
        "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-
2df8e52ef864/files/dir3%2Fdir4"
      },
      "metadata": {
        "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-
2df8e52ef864/files/dir3%2Fdir4?return_metadata=true"
      }
    }
  },
  {
    "volume": {
      "uuid": "73b293df-e9d7-46cc-a9ce-2df8e52ef864",
      "name": "vol1",
      "_links": {
        "self": {
          "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-
2df8e52ef864"
        }
      }
    },
    "iops": {
      "read": 345,
      "error": {
        "lower_bound": 345,
        "upper_bound": 355
      }
    },
    "path": "/dir12",
```

```
    "svm": {
      "uuid": "572361f3-e769-439d-9c04-2ba48a08ff43",
      "name": "vs1",
      "_links": {
        "self": {
          "href": "/api/svm/svms/572361f3-e769-439d-9c04-2ba48a08ff43"
        }
      }
    },
    "_links": {
      "directory": {
        "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-
2df8e52ef864/files/dir12"
      },
      "metadata": {
        "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-
2df8e52ef864/files/dir12?return_metadata=true"
      }
    }
  }
],
"num_records": 3,
"_links": {
  "self": {
    "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-
2df8e52ef864/top-metrics/directories?top_metric=iops.read"
  }
}
}
```

Retrieving a list of the directories with the most traffic with failure in obtaining the pathnames for the directories:

```
# The Call:
curl -X GET "https://<mgmt-ip>/api/storage/volumes/{volume.uuid}/top-
metrics/directories?top_metric=throughput.write"

# The Response:
{
"records": [
  {
    "volume": {
      "name": "fv"
    },
    "throughput": {
```

```
      "write": 24,
      "error": {
        "lower_bound": 24,
        "upper_bound": 29
      }
    },
    "path": "{4ec6d1ea-d5da-11eb-a25f-005056ac0f77:1232}",
    "svm": {
      "uuid": "0ba74c3e-d5ca-11eb-8fbb-005056ac0f77",
      "name": "vs0",
      "_links": {
        "self": {
          "href": "/api/svm/svms/0ba74c3e-d5ca-11eb-8fbb-005056ac0f77"
        }
      }
    }
  },
  {
    "volume": {
      "name": "fv"
    },
    "throughput": {
      "write": 12,
      "error": {
        "lower_bound": 12,
        "upper_bound": 22
      }
    },
    "path": "{4ec6d1ea-d5da-11eb-a25f-005056ac0f77:6754}",
    "svm": {
      "uuid": "0ba74c3e-d5ca-11eb-8fbb-005056ac0f77",
      "name": "vs0",
      "_links": {
        "self": {
          "href": "/api/svm/svms/0ba74c3e-d5ca-11eb-8fbb-005056ac0f77"
        }
      }
    }
  },
  {
    "volume": {
      "name": "fv"
    },
    "throughput": {
      "write": 8,
      "error": {
```

```
        "lower_bound": 8,
        "upper_bound": 10
      }
    },
    "path": "{4ec6d1ea-d5da-11eb-a25f-005056ac0f77:8654}",
    "svm": {
      "uuid": "0ba74c3e-d5ca-11eb-8fbb-005056ac0f77",
      "name": "vs0",
      "_links": {
        "self": {
          "href": "/api/svm/svms/0ba74c3e-d5ca-11eb-8fbb-005056ac0f77"
        }
      }
    }
  }
],
"num_records": 3,
"_links": {
  "self": {
    "href": "/api/storage/volumes/4ec6d1ea-d5da-11eb-a25f-
005056ac0f77/top-metrics/directories?top_metric=throughput.write"
  }
}
}
```


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

```
# The Call:
curl -X GET "https://<mgmt-ip>/api/storage/volumes/{volume.uuid}/top-
metrics/directories?top_metric=throughput.write"

# The Response:
{
"records": [
],
"num_records": 0,
"notice": {
  "message": "The activity tracking report for volume \"FV\" in SVM
\"vs0\" returned zero records. Check whether the volume have read/write
traffic. Refer to the REST API documentation for more information on why
there might be no records.",
  "code": "124518418"
},
"_links": {
  "self": {
    "href": "/api/storage/volumes/9af63729-8ac8-11ec-b1bc-
005056a79da4/top-metrics/directories?top_metric=throughput.write"
  }
}
}
```

Retrieve directories with the greatest value performance metric or capacity metric

GET `/storage/volumes/{volume.uuid}/top-metrics/directories`

Introduced In: 9.10

Retrieves a list of directories with the most IO activity.

Parameters

Name	Type	In	Required	Description
volume.uuid	string	path	True	Volume UUID

Name	Type	In	Required	Description
top_metric	string	query	False	IO activity type • Default value: 1 • enum: ["iops.read", "iops.write", "throughput.read", "throughput.write"]
max_records_per_volume	integer	query	False	Max records per volume.
throughput.read	integer	query	False	Filter by throughput.read
throughput.write	integer	query	False	Filter by throughput.write
throughput.error.lower_bound	integer	query	False	Filter by throughput.error.lower_bound
throughput.error.upper_bound	integer	query	False	Filter by throughput.error.upper_bound
svm.uuid	string	query	False	Filter by svm.uuid
svm.name	string	query	False	Filter by svm.name
iops.error.lower_bound	integer	query	False	Filter by iops.error.lower_bound
iops.error.upper_bound	integer	query	False	Filter by iops.error.upper_bound
iops.write	integer	query	False	Filter by iops.write
iops.read	integer	query	False	Filter by iops.read
volume.name	string	query	False	Filter by volume.name

Name	Type	In	Required	Description
path	string	query	False	Filter by path
notice.message	string	query	False	Filter by notice.message
notice.code	string	query	False	Filter by notice.code
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. • Default value: 1
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. • Default value: 1 • 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	
notice	notice	Optional field that indicates why no records are returned by the volume activity tracking REST API.
num_records	integer	Number of records.
records	array[top_metrics_directory]	

Example response


```
{
  "_links": {
    "next": {
      "href": "/api/resourcelink"
    },
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "notice": {
    "code": "111411207",
    "message": "No read/write traffic on volume."
  },
  "records": [
    {
      "_links": {
        "metadata": {
          "href": "/api/resourcelink"
        },
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "iops": {
        "error": {
          "lower_bound": 34,
          "upper_bound": 54
        },
        "read": 10,
        "write": 5
      },
      "notice": {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        },
        "code": "111411207",
        "message": "No read/write traffic on volume."
      },
      "path": "/dir_abc/dir_123/dir_20",
      "svm": {
        "_links": {
          "self": {
```

```
            "href": "/api/resourcelink"
          }
        },
        "name": "svm1",
        "uuid": "02c9e252-41be-11e9-81d5-00a0986138f7"
      },
      "throughput": {
        "error": {
          "lower_bound": 34,
          "upper_bound": 54
        },
        "read": 3,
        "write": 20
      },
      "volume": {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        },
        "name": "volume1",
        "uuid": "028baa66-41bd-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	

notice

Optional field that indicates why no records are returned by the volume 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.

_links

Name	Type	Description
metadata	href	
self	href	

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	

Name	Type	Description
read	integer	Average number of read operations per second.
write	integer	Average number of write operations per second.

_links

Name	Type	Description
self	href	

notice

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

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

svm

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

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.

volume

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. • example: 028baa66-41bd-11e9-81d5-00a0986138f7 • Introduced in: 9.6

top_metrics_directory

Information about a directory's IO activity.

Name	Type	Description
_links	_links	
iops	iops	
notice	notice	Optional field that indicates why no records are returned by the volume activity tracking REST API.
path	string	Path of the directory.
svm	svm	
throughput	throughput	
volume	volume	

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.

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