Retrieve directories

REST API reference

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Table of Contents

Retrieve directories . . . 1
Storage volumes volume.uuid top-metrics directories endpoint overview . . . 1
Overview . . . 1
Retrieve a list of the directories with the most IO activity . . . 1
Retrieve a list of the largest directories . . . 1
Failure to return list of directories with most IO activity . . . 1
Failure to return list of largest directories . . . 1
Failure to return the pathnames for the list of directories with most IO activity . . . 2
Examples . . . 2
Example showing the behavior of the API when there is no read/write traffic: . . . 11
Retrieve directories with the greatest value performance metric or capacity metric . . . 12
Parameters . . . 12
Response . . . 15
Error . . . 17
Definitions . . . 19

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 greatest value performance metric or capacity metric for a specified volume. Use the `top_metric` parameter to specify which type of metric to filter for. This API is used to provide insight into IO metrics, namely `iops`, `throughput`, and `non_recursive_bytes_used`. This API only supports returning one metric 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.

Retrieve a list of the largest directories

For a report on the largest directories returned in descending order, specify the capacity metric by passing the `non_recursive_bytes_used` property into the top_metric parameter. If the metric type is not specified, by default the API returns a list of directories with the greatest number of 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.

Failure to return list of largest directories

The API can sometimes fail to return the list of largest directories, due to the following reasons:

– The volume does not have file system analytics enabled.

– The volume’s file system analytics database version doesn’t support this report.

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"
  }
}
}
```

Retrieving a list of the largest directories

The following example shows how to retrieve a list of the largest directories based on the non-recursive bytes used by the contents of a directory.

```
# 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=non_recursive_bytes_used"

# The Response:
{
"records": [
  {
    "volume": {
      "name": "vol1"
    },
    "non_recursive_bytes_used": 345,
    "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"
    },
    "non_recursive_bytes_used": 345,
    "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": {
      "name": "vol1"
    },
    "non_recursive_bytes_used": 345,
    "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=non_recursive_bytes_used"
  }
}
}
```

Retrieving a list of the largest directories where incomplete data is reported

The following example retrieves a list of the largest directories when partial data is returned.

```
# 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=non_recursive_bytes_used"

# The Response:
{
"records": [
  {
    "volume": {
      "name": "vol1"
    },
    "non_recursive_bytes_used": 1022,
    "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"
    },
    "non_recursive_bytes_used": 261,
    "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": 2,
"incomplete_response_reason": {
  "message": "Partial data has been returned for this metric report.
Reason: Data collection for the large directory report is in progress.",
  "code": "111411234",
  "arguments": [
    {
      "message": "Data collection for the large directory report is in
progress."
    }
  ]
},
"_links": {
  "self": {
    "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-
2df8e52ef864/top-metrics/directories?top_metric=non_recursive_bytes_used"
  }
}
}
```

Retrieving a list of the largest directories when the file system analytics database version doesn’t support this report

The following example shows the behavior of the API when the file system analytics database version doesn’t support the large directory report.

```
# 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=non_recursive_bytes_used"

# The Response:
{
"records": [
],
"num_records": 0,
"_links": {
  "self": {
    "href": "/api/storage/volumes/73b293df-e9d7-46cc-a9ce-
2df8e52ef864/top-metrics/directories?top_metric=non_recursive_bytes_used"
  }
},
"error": {
  "message": "The large directory report for volume \"FV\" in Vserver
\"vs0\" is not available because the file system analytics database
version doesn't support this report. Use the \"volume analytics off\"
command to disable analytics on the volume, then use the \"volume
analytics on\" command to re-enable analytics.",
  "code": "124519410"
}
}
```

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 greatest value performance metric or capacity metric.

Parameters

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

Name	Type	In	Required	Description
top_metric	string	query	False	Type of performance metric or capacity metric. • Default value: 1 • enum: ["iops.read", "iops.write", "throughput.read", "throughput.write", "non_recursive_bytes_used"]
max_records_per_volume	integer	query	False	Max records per volume.
non_recursive_bytes_used	integer	query	False	Filter by non_recursive_bytes_used • Introduced in: 9.12
throughput.read	integer	query	False	Filter by throughput.read
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
throughput.write	integer	query	False	Filter by throughput.write
svm.uuid	string	query	False	Filter by svm.uuid
svm.name	string	query	False	Filter by svm.name
iops.write	integer	query	False	Filter by iops.write

Name	Type	In	Required	Description
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.read	integer	query	False	Filter by iops.read
path	string	query	False	Filter by path
volume.name	string	query	False	Filter by volume.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. • 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

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	
incomplete_response_reason	incomplete_response_reason	Indicates that the metric report provides incomplete data.
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"
    }
  },
  "incomplete_response_reason": {
    "code": "111411207",
    "message": "Partial data has been returned for this metric report.
Reason: Data collection for the large directory report is in progress."
  },
  "notice": {
    "code": "111411207",
    "message": "No read/write traffic on volume."
  },
  "num_records": 1,
  "records": [
    {
      "_links": {
        "metadata": {
          "href": "/api/resourcelink"
        },
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "iops": {
        "error": {
          "lower_bound": 34,
          "upper_bound": 54
        },
        "read": 10,
        "write": 5
      },
      "non_recursive_bytes_used": 300,
      "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
```

ONTAP Error Response Codes

Error Code	Description
124518405	Volume activity tracking is not supported on volumes that contain LUNs.
124518407	Volume activity tracking is not supported on FlexCache volumes.
124518408	Volume activity tracking is not supported on audit staging volumes.
124518409	Volume activity tracking is not supported on object store server volumes.
124518410	Volume activity tracking is not supported on SnapMirror destination volumes.

Error Code	Description
124518411	Enabling or disabling volume activity tracking is not supported on individual FlexGroup constituents.
124518412	Volume activity tracking is not supported on SnapLock volumes.
124518414	Volume activity tracking is not supported on volumes that contain NVMe namespaces.
124518415	Failed to get the volume activity tracking report on volume volume.name in SVM svm.name.
124518416	Internal error. Volume activity tracking report timed out for volume volume.name in SVM svm.name.
124518417	Volume wildcard queries are not supported for activity tracking reports.
124518418	The activity tracking report for volume volume.name in SVM svm.name returned zero records. Check whether the volume has read/write traffic. Refer to the REST API documentation for more information.
124519410	The large directory report for volume volume.name in SVM svm.name is not available because the file system analytics database version doesn't support this report.
124519413	Volume activity tracking is not enabled on the volume.

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	

incomplete_response_reason

Indicates that the metric report provides incomplete data.

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

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	
read	integer	Average number of read operations per second.
write	integer	Average number of write operations per second.

_links

Name	Type	Description
self	href	

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 • x-nullable: true

top_metrics_directory

Information about a directory's IO metrics.

Name	Type	Description
_links	_links	
iops	iops	
non_recursive_bytes_used	integer	Non-recursive bytes used by the contents of a directory.
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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