Manage storage aggregate metrics

ONTAP 9.10.1 REST API Documentation

NetApp
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Storage aggregates UUID metrics endpoint overview

Overview

The Storage Aggregate Metrics API provides historical performance metrics for the specified aggregate. The collection GET operation retrieves read, write, other and total metrics for a given aggregate, in terms of IOPS, latency and throughput. The read and write categories display the I/O operations that service user reads and writes across all the hosted volumes on a given aggregate. The other category encompasses background I/O operations that implement data protection services currently running on the aggregate. IOPs are the number of I/O operations reported per second, throughput is the amount of I/O operations measured in bytes per second and latency is the average response time for an IOP, reported in microseconds. Without a specified time interval, the output is limited to statistics collected at 15 second intervals over the last hour.

Examples

Retrieving metrics for an aggregate

In this example, the API returns a set of records that exist for the aggregate with the given UUID for the last hour.

```
# The API:
/api/storage/aggregates/{uuid}/metrics

#The call:
curl -X GET "https://<mgmt-ip>/api/storage/aggregates/538bf337-1b2c-11e8-
bad0-005056b48388/metrics?max_records=4" -H "accept: application/json"

#The response:
{
"records": [
  {
    "timestamp": "2019-01-14T23:33:45Z"
  },
  {
    "timestamp": "2019-01-14T23:33:30Z"
  },
  {
    "timestamp": "2019-01-14T23:33:15Z"
  },
  {
    "timestamp": "2019-01-14T23:33:00Z"
  }
],
"num_records": 4
}
```

Retrieving metrics for an aggregate with a set timestamp

In this example, the API returns metric values for latency, IOPS, and throughput properties such as read, write and total. The status and duration for which the metrics are requested are also returned.

```
#The API:
/api/storage/aggregates/{uuid}/metrics?timestamp={timestamp}

#The call:
curl -X GET "https://<mgmt-ip>/api/storage/aggregates/538bf337-1b2c-11e8-
bad0-005056b48388/metrics?timestamp=2019-01-1T23:33:00Z" -H "accept:
application/json"

#The response:
{
"records": [
  {
    "uuid": "538bf337-1b2c-11e8-bad0-005056b48388",
    "timestamp": "2019-01-01T23:33:00Z",
    "status": "ok",
    "duration": "PT15S",
    "throughput": {
      "read": 6826,
      "write": 205892,
      "other": 0,
      "total": 212718
    },
    "latency": {
      "read": 148,
      "write": 216,
      "other": 0,
      "total": 199
    },
    "iops": {
      "read": 1,
      "write": 5,
      "other": 0,
      "total": 6
    }
  }
]
}
```

Retrieving metrics for an aggregate for a set time interval

In this example, the API returns the requested metrics for the given time interval of 1 week. The interval value can be 1 hour, 1 day, 1 week, 1 month or 1 year. If the interval value is not set, a default value of 1 hour is used.

```
#The API:
```

```
/api/storage/aggregates/{uuid}/metrics

#The call:
  curl -X GET "https://<mgmt-ip>/api/storage/aggregates/538bf337-1b2c-
11e8-bad0-
005056b48388/metrics?return_timeout=15&fields=*&interval=1w&max_records=4"
-H "accept: application/json"

#The response:
{
"records": [
  {
     "timestamp": "2019-01-01T23:30:00Z",
     "status": "ok",
     "duration": "PT30M",
     "throughput": {
       "read": 268328,
       "write": 5556255,
       "other": 0,
       "total": 5824584
     },
     "latency": {
       "read": 156,
       "write": 430,
       "other": 0,
       "total": 318
     },
     "iops": {
       "read": 18,
       "write": 26,
       "other": 0,
       "total": 45
     }
  },
  {
     "timestamp": "2019-01-01T23:00:00Z",
     "status": "ok",
     "duration": "PT30M",
     "throughput": {
       "read": 474266,
       "write": 6121908,
       "other": 0,
       "total": 6596175
     },
     "latency": {
       "read": 154,
```

```
      "write": 448,
      "other": 0,
      "total": 262
    },
    "iops": {
      "read": 48,
      "write": 28,
      "other": 0,
      "total": 76
    }
  },
  {
    "timestamp": "2019-01-01T22:30:00Z",
    "status": "ok",
    "duration": "PT30M",
    "throughput": {
      "read": 540164,
      "write": 2411356,
      "other": 26244685,
      "total": 29196206
    },
    "latency": {
      "read": 159,
      "write": 394,
      "other": 192,
      "total": 193
    },
    "iops": {
      "read": 94,
      "write": 16,
      "other": 437,
      "total": 548
    }
  },
  {
    "timestamp": "2019-01-01T22:00:00Z",
    "status": "ok",
    "duration": "PT30M",
    "throughput": {
      "read": 2842,
      "write": 2765407,
      "other": 0,
      "total": 2768249
    },
    "latency": {
      "read": 189,
```

```
        "write": 540,
        "other": 0,
        "total": 523
      },
      "iops": {
        "read": 0,
        "write": 13,
        "other": 0,
        "total": 13
      }
    }
  ],
  "num_records": 4
}
```


Related ONTAP commands

- `statistics aggregate show`

Retrieve historical performance metrics for an aggregate

GET `/storage/aggregates/{uuid}/metrics`

Introduced In: 9.7

Retrieves historical performance metrics for an aggregate.

Parameters

Name	Type	In	Required	Description
iops.total	integer	query	False	Filter by iops.total
iops.write	integer	query	False	Filter by iops.write
iops.other	integer	query	False	Filter by iops.other
iops.read	integer	query	False	Filter by iops.read
status	string	query	False	Filter by status
throughput.total	integer	query	False	Filter by throughput.total
throughput.write	integer	query	False	Filter by throughput.write

Name	Type	In	Required	Description
throughput.other	integer	query	False	Filter by throughput.other
throughput.read	integer	query	False	Filter by throughput.read
duration	string	query	False	Filter by duration
latency.total	integer	query	False	Filter by latency.total
latency.write	integer	query	False	Filter by latency.write
latency.other	integer	query	False	Filter by latency.other
latency.read	integer	query	False	Filter by latency.read
timestamp	string	query	False	Filter by timestamp
uuid	string	path	True	Unique identifier of the aggregate.

Name	Type	In	Required	Description
interval	string	query	False	The time range for the data. Values can be 1h, 1d, 1w, 1m, or 1y. The period for each time range is as follows: • 1h: Metrics over the most recent hour sampled over 15 seconds. • 1d: Metrics over the most recent day sampled over 5 minutes. • 1w: Metrics over the most recent week sampled over 30 minutes. • 1m: Metrics over the most recent month sampled over 2 hours. • 1y: Metrics over the most recent year sampled over a day. • Default value: 1 • enum: ["1h", "1d", "1w", "1m", "1y"]

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. • Default value: 1 • Max value: 120 • Min value: 0
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

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": "2017-01-25T11:20:13Z"
  }
}
```


Error

```
Status: Default
```

ONTAP Error Response Codes

Error Code	Description
8586225	Encountered unexpected error in retrieving metrics for the requested aggregate.

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	Peformance 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	Peformance 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	Peformance 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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