Retrieve or create a collection of storage aggregates

ONTAP 9.7 REST API reference

NetApp
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Storage aggregates endpoint overview

Retrieving storage aggregate information

The Storage Aggregate GET API retrieves all data aggregates in the cluster. System owned root aggregates are not included in the output. This API also supports specific queries, in addition to queries on aggregate body properties, which affect the output of the API. The parameters for these queries are "recommend" and "show_spares". Using the "recommend" query returns the list of aggregates that are recommended for creation in the cluster. The "show_spares" query returns a response outside of the records body, which includes the groups of usable spares in the cluster.

The collection GET returns the aggregate identifiers, UUID and name, and the node on which the aggregate resides. The instance GET, by default, returns all of the properties defined in the aggregates object, except advanced properties. The properties "space.footprint" and "space.block_storage.inactive_user_data" are considered advanced properties and only returned when requested using the "fields" query parameter. Performance "metric" and "statistics" for aggregates are also only returned when requested. The "statistics" property accounts for the cumulative raw values collected by ONTAP for an aggregate, while the "metric" property displays the incremental average for latency and incremental changes in IOPs and throughput over the last 15 seconds. Any external application can use the raw statistics to derive its own incremental performance metrics.

Creating storage aggregates

When the POST command is issued with no properties, the system evaluates the cluster attached storage, determines the optimal aggregate layout and configures the aggregates. This layout is completely controlled by the system. To view the recommended optimal layout rather than creating it, use the GET endpoint, setting the "recommend" query to 'true'. Alternatively, POST can be used with specific properties to create an aggregate as requested. At a minimum, the aggregate name, disk count, and the node where it should reside are required if any properties are provided.

When using POST with input properties, three properties are required. These are:

- name
- node.name or node.uuid
- block_storage.primary.disk_count

Remaining properties are optional

The following properties can be specified in POST:

- name - Name of the aggregate.
- node.name and node.uuid - Node on which the aggregate will be created.
- block_storage.primary.disk_count - Number of disks to be used to create the aggregate.
- block_storage.mirror.enabled - Specifies whether or not the aggregate should be created using SyncMirror.
- block_storage.primary.checksum_style - Checksum style of the disks to be use for the aggregate.

- block_storage.primary.disk_class - Class of disks to be use to for the aggregate.
- block_storage.primary.raid_size - Desired RAID size of the aggregate.
- block_storage.primary.raid_type - Desired RAID type of the aggregate.
- snaplock_type - SnapLock type to use on the aggregate.

Updating storage aggregates

The PATCH operation is used to modify properties of the aggregate. There are several properties that can be modified on an aggregate. Only one property can be modified for each PATCH request.

The list of patchable properties with a brief description for each is as follows:

- name - This property can be changed to rename the aggregate.
- node.name and node.uuid - Either property can be updated in order to relocate the aggregate to a different node in the cluster.
- block_storage.mirror.enabled - This property can be changed from 'false' to 'true' in order to mirror the aggregate, if the system is capable of doing so.
- block_storage.primary.disk_count - This property can be updated to increase the number of disks in an aggregate.
- block_storage.primary.raid_size - This property can be updated to set the desired RAID size.
- block_storage.primary.raid_type - This property can be updated to set the desired RAID type.
- cloud_storage.tiering_fullness_threshold - This property can be updated to set the desired tiering fullness threshold if using FabricPool.

Deleting storage aggregates

If volumes exist on an aggregate, they must be deleted or moved before the aggregate can be deleted. See the /storage/volumes API for details on moving or deleting volumes.

Examples

Retrieving a list of aggregates from the cluster

The following example shows the response with a list of data aggregates in the cluster:

```
# The API:
/api/storage/aggregates

# The call:
curl -X GET "https://<mgmt-ip>/api/storage/aggregates" -H "accept:
application/json"

# The response:
{
"records": [
  {
    "uuid": "19425837-f2fa-4a9f-8f01-712f626c983c",
    "name": "test1",
    "node": {
      "uuid": "caf95bec-f801-11e8-8af9-005056bbe5c1",
      "name": "node-1",
    },
  },
  {
    "uuid": "4a7e4139-ca7a-420b-9a11-3f040d2189fd",
    "name": "test4",
    "node": {
      "uuid": "4046dda8-f802-11e8-8f6d-005056bb2030",
      "name": "node-2",
    },
  }
],
"num_records": 2,
}
```

Retrieving a specific aggregate from the cluster

The following example shows the response of the requested aggregate. If there is no aggregate with the requested UUID, an error is returned.

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

# The call:
curl -X GET "https://<mgmt-ip>/api/storage/aggregates/870dd9f2-bdfa-4167-
b692-57d1cec874d4" -H "accept: application/json"

# The response:
{
"uuid": "19425837-f2fa-4a9f-8f01-712f626c983c",
```

```
"name": "test1",
"node": {
  "uuid": "caf95bec-f801-11e8-8af9-005056bbe5c1",
  "name": "node-1",
},
"home_node": {
  "uuid": "caf95bec-f801-11e8-8af9-005056bbe5c1",
  "name": "node-1",
},
"space": {
  "block_storage": {
    "size": 235003904,
    "available": 191942656,
    "used": 43061248,
    "full_threshold_percent": 98
  },
  "cloud_storage": {
    "used": 0
  },
  "efficiency": {
    "savings": 1408029,
    "ratio": 6.908119720880661,
    "logical_used": 1646350
  },
  "efficiency_without_snapshots": {
    "savings": 0,
    "ratio": 1,
    "logical_used": 737280
  }
},
"state": "online",
"snaplock_type": "non_snaplock",
"create_time": "2018-12-04T15:40:38-05:00",
"data_encryption": {
  "software_encryption_enabled": false,
  "drive_protection_enabled": false
},
"block_storage": {
  "primary": {
    "disk_count": 6,
    "disk_class": "solid_state",
    "raid_type": "raid_dp",
    "raid_size": 24,
    "checksum_style": "block",
    "disk_type": "ssd"
  },
```

```
  "hybrid_cache": {
    "enabled": false
  },
  "mirror": {
    "enabled": false,
    "state": "unmirrored"
  }
},
"plexes": [
  {
    "name": "plex0",
  }
],
"cloud_storage": {
  "attach_eligible": false
},
}
```

Retrieving statistics and metric for an aggregate

In this example, the API returns the "statistics" and "metric" properties for the aggregate requested.

```
#The API:
/api/storage/aggregates/{uuid}?fields=statistics,metric

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

#The response:
{
"uuid": "538bf337-1b2c-11e8-bad0-005056b48388",
"name": "aggr4",
"metric": {
     "timestamp": "2019-07-08T22:16:45Z",
     "duration": "PT15S",
     "status": "ok",
     "throughput": {
       "read": 7099,
       "write": 840226,
       "other": 193293789,
       "total": 194141115
       }
     "latency": {
       "read": 149,
```

```
        "write": 230,
        "other": 123,
        "total": 124
      },
      "iops": {
        "read": 1,
        "write": 17,
        "other": 11663,
        "total": 11682
      },
  },
   "statistics": {
      "timestamp": "2019-07-08T22:17:09Z",
      "status": "ok",
      "throughput_raw": {
        "read": 3106045952,
        "write": 63771742208,
        "other": 146185560064,
        "total": 213063348224
      },
      "latency_raw": {
        "read": 54072313,
        "write": 313354426,
        "other": 477201985,
        "total": 844628724
      },
      "iops_raw": {
        "read": 328267,
        "write": 1137230,
        "other": 1586535,
        "total": 3052032
      }
   },
}
```

For more information and examples on viewing historical performance metrics for any given aggregate, see DOC /storage/aggregates/{uuid}/metrics

Retrieving a list of aggregates recommended for creation from the cluster

The following example shows the response with a list of recommended data aggregates in the cluster.

> Each aggregate UUID provided in this response is not guaranteed to be the same UUID for the aggregate if it is created.

```
# The API:
```

```
/api/storage/aggregates

# The call:
curl -X GET "https://<mgmt-
ip>/api/storage/aggregates?recommend=true&fields=*" -H "accept:
application/json"

# The response:
{
"records": [
  {
    "uuid": "795bf7c2-fa4b-11e8-ba65-005056bbe5c1",
    "name": "node_2_SSD_1",
    "node": {
      "uuid": "4046dda8-f802-11e8-8f6d-005056bb2030",
      "name": "node-2",
    },
    "space": {
      "block_storage": {
        "size": 1116180480
      }
    },
    "block_storage": {
      "primary": {
        "disk_count": 23,
        "disk_class": "solid_state",
        "raid_type": "raid_dp",
        "disk_type": "ssd"
      },
      "hybrid_cache": {
        "enabled": false
      },
      "mirror": {
        "enabled": false
      }
    },
  },
  {
    "uuid": "795c0a15-fa4b-11e8-ba65-005056bbe5c1",
    "name": "node_1_SSD_1",
    "node": {
      "uuid": "caf95bec-f801-11e8-8af9-005056bbe5c1",
      "name": "node-1",
    },
    "space": {
      "block_storage": {
```

```
        "size": 176238592
      }
    },
    "block_storage": {
      "primary": {
        "disk_count": 5,
        "disk_class": "solid_state",
        "raid_type": "raid_dp",
        "disk_type": "ssd"
      },
      "hybrid_cache": {
        "enabled": false
      },
      "mirror": {
        "enabled": false
      }
    },
  }
],
"num_records": 2,
}
```


Updating an aggregate in the cluster

The following example shows the workflow of adding disks to the aggregate.

Step 1: Check the current disk count on the aggregate.

```
# The API:
/api/storage/aggregates

# The call:
curl -X GET "https://<mgmt-ip>/api/storage/aggregates/19425837-f2fa-4a9f-
8f01-712f626c983c?fields=block_storage.primary.disk_count" -H "accept:
application/json"

# The response:
{
"uuid": "19425837-f2fa-4a9f-8f01-712f626c983c",
"name": "test1",
"block_storage": {
  "primary": {
    "disk_count": 6
  }
},
}
```

Step 2: Update the aggregate with the new disk count in 'block_storage.primary.disk_count'. The response to PATCH is a job unless the request is invalid.

```
# The API:
/api/storage/aggregates

# The call:
curl -X PATCH "https://<mgmt-ip>/api/storage/aggregates/19425837-f2fa-
4a9f-8f01-712f626c983c" -H "accept: application/hal+json" -d
"{\"block_storage\": {\"primary\": {\"disk_count\": 8}}}"

# The response:
{
"job": {
  "uuid": "c103d15e-730b-11e8-a57f-005056b465d6",
  "_links": {
    "self": {
      "href": "/api/cluster/jobs/c103d15e-730b-11e8-a57f-005056b465d6"
    }
  }
}
}
```

Step 3: Wait for the job to finish, then call GET to see the reflected change.

```
# The API:
/api/storage/aggregates

# The call:
curl -X GET "https://<mgmt-ip>/api/storage/aggregates/19425837-f2fa-4a9f-
8f01-712f626c983c?fields=block_storage.primary.disk_count" -H "accept:
application/json"

# The response:
{
"uuid": "19425837-f2fa-4a9f-8f01-712f626c983c",
"name": "test1",
"block_storage": {
  "primary": {
    "disk_count": 8
  }
},
}
```

Retrieve a collection of aggregates for an entire cluster

GET `/storage/aggregates`

Retrieves the collection of aggregates for the entire cluster.

Expensive properties

There is an added cost to retrieving values for these properties. They are not included by default in GET results and must be explicitly requested using the `fields` query parameter. See DOC Requesting specific fields to learn more.

- `metrics.*`
- `space.block_storage.inactive_user_data`
- `space.footprint`
- `statistics.*`

Related ONTAP commands

- `storage aggregate show`

Learn more

- DOC /storage/aggregates

Parameters

Name	Type	In	Required	Description
recommend	boolean	query	False	If set to 'true', it queries the system for the recommended optimal layout for creating new aggregates. The default setting is 'false'.
show_spares	boolean	query	False	If set to 'true', the spares object is returned instead of records to show the spare groups in the cluster. The default setting is 'false'.
name	string	query	False	Filter by name
block_storage.primary.raid_type	string	query	False	Filter by block_storage.primary.raid_type
block_storage.primary.disk_class	string	query	False	Filter by block_storage.primary.disk_class
block_storage.primary.checksum_style	string	query	False	Filter by block_storage.primary.checksum_style
block_storage.primary.raid_size	integer	query	False	Filter by block_storage.primary.raid_size
block_storage.primary.disk_count	integer	query	False	Filter by block_storage.primary.disk_count
block_storage.primary.disk_type	enum	query	False	Filter by block_storage.primary.disk_type

Name	Type	In	Required	Description
block_storage.hybrid_cache.raid_type	string	query	False	Filter by block_storage.hybrid_cache.raid_type
block_storage.hybrid_cache.size	integer	query	False	Filter by block_storage.hybrid_cache.size
block_storage.hybrid_cache.disk_count	integer	query	False	Filter by block_storage.hybrid_cache.disk_count
block_storage.hybrid_cache.enabled	boolean	query	False	Filter by block_storage.hybrid_cache.enabled
block_storage.hybrid_cache.used	integer	query	False	Filter by block_storage.hybrid_cache.used
block_storage.plexes.name	string	query	False	Filter by block_storage.plexes.name
block_storage.mirror.enabled	boolean	query	False	Filter by block_storage.mirror.enabled
block_storage.mirror.state	string	query	False	Filter by block_storage.mirror.state
metric.timestamp	string	query	False	Filter by metric.timestamp
metric.iops.other	integer	query	False	Filter by metric.iops.other
metric.iops.write	integer	query	False	Filter by metric.iops.write
metric.iops.read	integer	query	False	Filter by metric.iops.read
metric.iops.total	integer	query	False	Filter by metric.iops.total

Name	Type	In	Required	Description
metric.status	string	query	False	Filter by metric.status
metric.duration	string	query	False	Filter by metric.duration
metric.latency.other	integer	query	False	Filter by metric.latency.other
metric.latency.write	integer	query	False	Filter by metric.latency.write
metric.latency.read	integer	query	False	Filter by metric.latency.read
metric.latency.total	integer	query	False	Filter by metric.latency.total
metric.throughput.other	integer	query	False	Filter by metric.throughput.other
metric.throughput.write	integer	query	False	Filter by metric.throughput.write
metric.throughput.read	integer	query	False	Filter by metric.throughput.read
metric.throughput.total	integer	query	False	Filter by metric.throughput.total
state	string	query	False	Filter by state
space.cloud_storage.used	integer	query	False	Filter by space.cloud_storage.used
space.block_storage.inactive_user_data	integer	query	False	Filter by space.block_storage.inactive_user_data

Name	Type	In	Required	Description
space.block_storage.size	integer	query	False	Filter by space.block_storage.size
space.block_storage.available	integer	query	False	Filter by space.block_storage.available
space.block_storage.full_threshold_percent	integer	query	False	Filter by space.block_storage.full_threshold_percent
space.block_storage.used	integer	query	False	Filter by space.block_storage.used
space.efficiency_without_snapshots.ratio	number	query	False	Filter by space.efficiency_without_snapshots.ratio
space.efficiency_without_snapshots.logical_used	integer	query	False	Filter by space.efficiency_without_snapshots.logical_used
space.efficiency_without_snapshots.savings	integer	query	False	Filter by space.efficiency_without_snapshots.savings
space.efficiency.ratio	number	query	False	Filter by space.efficiency.ratio
space.efficiency.logical_used	integer	query	False	Filter by space.efficiency.logical_used
space.efficiency.savings	integer	query	False	Filter by space.efficiency.savings
space.footprint	integer	query	False	Filter by space.footprint

Name	Type	In	Required	Description
statistics.iops_raw.other	integer	query	False	Filter by statistics.iops_raw.other
statistics.iops_raw.write	integer	query	False	Filter by statistics.iops_raw.write
statistics.iops_raw.read	integer	query	False	Filter by statistics.iops_raw.read
statistics.iops_raw.total	integer	query	False	Filter by statistics.iops_raw.total
statistics.timestamp	string	query	False	Filter by statistics.timestamp
statistics.throughput_raw.other	integer	query	False	Filter by statistics.throughput_raw.other
statistics.throughput_raw.write	integer	query	False	Filter by statistics.throughput_raw.write
statistics.throughput_raw.read	integer	query	False	Filter by statistics.throughput_raw.read
statistics.throughput_raw.total	integer	query	False	Filter by statistics.throughput_raw.total
statistics.status	string	query	False	Filter by statistics.status
statistics.latency_raw.other	integer	query	False	Filter by statistics.latency_raw.other
statistics.latency_raw.write	integer	query	False	Filter by statistics.latency_raw.write

Name	Type	In	Required	Description
statistics.latency_raw.read	integer	query	False	Filter by statistics.latency_raw.read
statistics.latency_raw.total	integer	query	False	Filter by statistics.latency_raw.total
create_time	string	query	False	Filter by create_time
snaplock_type	string	query	False	Filter by snaplock_type
data_encryption.drive_protection_enabled	boolean	query	False	Filter by data_encryption.drive_protection_enabled
data_encryption.software_encryption_enabled	boolean	query	False	Filter by data_encryption.software_encryption_enabled
home_node.uuid	string	query	False	Filter by home_node.uuid
home_node.name	string	query	False	Filter by home_node.name
node.uuid	string	query	False	Filter by node.uuid
node.name	string	query	False	Filter by node.name
dr_home_node.uuid	string	query	False	Filter by dr_home_node.uuid
dr_home_node.name	string	query	False	Filter by dr_home_node.name
uuid	string	query	False	Filter by uuid
fields	array[string]	query	False	Specify the fields to return.

Name	Type	In	Required	Description
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.
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.
order_by	array[string]	query	False	Order results by specified fields and optional [asc

Response

```
Status: 200, Ok
```

Name	Type	Description
_links	_links	
error	error	
num_records	integer	Number of records
records	array[aggregate]	
spares	array[aggregate_spare]	

Example response


```
{
  "_links": {
    "next": {
      "href": "/api/resourcelink"
    },
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "error": {
    "arguments": {
      "code": "string",
      "message": "string"
    },
    "code": "4",
    "message": "entry doesn't exist",
    "target": "uuid"
  },
  "records": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "block_storage": {
      "hybrid_cache": {
        "disk_count": 6,
        "raid_type": "raid_dp",
        "size": 1612709888,
        "used": 26501122
      },
      "mirror": {
        "enabled": "",
        "state": "unmirrored"
      },
      "plexes": {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        },
        "name": "plex0"
      },
      "primary": {
```

```
        "checksum_style": "block",
        "disk_class": "performance",
        "disk_count": 8,
        "disk_type": "fc",
        "raid_size": 16,
        "raid_type": "raid_dp"
      }
    },
    "cloud_storage": {
      "stores": {
        "cloud_store": {
          "_links": {
            "self": {
              "href": "/api/resourcelink"
            }
          },
          "name": "store1",
          "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
        },
        "used": 0
      }
    },
    "create_time": "2018-01-01 12:00:00 -0400",
    "dr_home_node": {
      "name": "node1",
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    },
    "home_node": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "node1",
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    },
    "metric": {
      "_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": "2017-01-25 11:20:13 UTC"
    },
    "name": "node1_aggr_1",
    "node": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "node1",
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    },
    "snaplock_type": "non_snaplock",
    "space": {
      "block_storage": {
        "available": 10156560384,
        "full_threshold_percent": 0,
        "inactive_user_data": 304448,
        "size": 10156769280,
        "used": 2088960
      },
      "cloud_storage": {
        "used": 402743264
      },
      "efficiency": {
        "logical_used": 0,
        "ratio": 0,
        "savings": 0
      },
      "efficiency_without_snapshots": {
        "logical_used": 0,
        "ratio": 0,
        "savings": 0
```

```
      },
      "footprint": 608896
    },
    "state": "online",
    "statistics": {
      "iops_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
      },
      "latency_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
      },
      "status": "ok",
      "throughput_raw": {
        "read": 200,
        "total": 1000,
        "write": 100
      },
      "timestamp": "2017-01-25 11:20:13 UTC"
    },
    "uuid": "string"
  },
  "spares": {
    "checksum_style": "block",
    "disk_class": "solid_state",
    "layout_requirements": {
      "aggregate_min_disks": 6,
      "raid_group": {
        "default": 16,
        "max": 28,
        "min": 5
      },
      "raid_type": "raid_dp"
    },
    "node": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "node1",
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    },
```

```
    "size": 10156769280,
    "syncmirror_pool": "pool0",
    "usable": 9
  }
}
```


Error

```
Status: Default
```

ONTAP Error Response Codes

Error Code	Description
787092	The target field cannot be specified for this operation.
8586225	Encountered unexpected error in retrieving metrics and statistics for an aggregate.
19726341	Not enough eligible spare disks are available on the node.
19726344	No recommendation can be made for this cluster.
19726357	Aggregate recommendations are not supported on MetroCluster.
19726358	Aggregate recommendations are not supported on ONTAP Cloud.
19726382	Another provisioning operation is in progress on this cluster. Wait a few minutes, and try the operation again.
19726386	Encountered an error when retrieving licensing information on this cluster.

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	

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.

_links

Name	Type	Description
self	href	

hybrid_cache

Contains the configuration for the hybrid cache. The hybrid cache is made up of either whole SSDs or storage pool SSDs.

Name	Type	Description
disk_count	integer	Number of disks used in the cache tier of the aggregate. Only provided when hybrid_cache.enabled is 'true'.
enabled	boolean	Aggregate uses HDDs with SSDs as a cache
raid_type	string	RAID type for SSD cache of the aggregate. Only provided when hybrid_cache.enabled is 'true'.
size	integer	Total usable space in bytes of SSD cache. Only provided when hybrid_cache.enabled is 'true'.
used	integer	Space used in bytes of SSD cache. Only provided when hybrid_cache.enabled is 'true'.

mirror

Name	Type	Description
enabled	boolean	Aggregate is SyncMirror protected
state	string	

plex_reference

Plex

Name	Type	Description
_links	_links	
name	string	

primary

Configuration information for the primary storage portion of the aggregate. This excludes the hybrid cache details.

Name	Type	Description
checksum_style	string	The checksum style used by the aggregate.

Name	Type	Description
disk_class	string	The class of disks being used by the aggregate.
disk_count	integer	Number of disks used in the aggregate. This includes parity disks, but excludes disks in the hybrid cache.
disk_type	enum	The type of disk being used by the aggregate.
raid_size	integer	Option to specify the maximum number of disks that can be included in a RAID group.
raid_type	string	RAID type of the aggregate.

block_storage

Configuration information for the locally attached portion of the aggregate. When a cloud store is also used by this aggregate, this is referred to as the performance tier.

Name	Type	Description
hybrid_cache	hybrid_cache	Contains the configuration for the hybrid cache. The hybrid cache is made up of either whole SSDs or storage pool SSDs.
mirror	mirror	
plexes	array[plex_reference]	Plex reference for each plex in the aggregate.
primary	primary	Configuration information for the primary storage portion of the aggregate. This excludes the hybrid cache details.

cloud_store

Cloud store

Name	Type	Description
_links	_links	
name	string	

Name	Type	Description
uuid	string	

cloud_storage_tier

Name	Type	Description
cloud_store	cloud_store	Cloud store
used	integer	Capacity used in bytes in the cloud store by this aggregate. This is a cached value calculated every 5 minutes.

cloud_storage

Configuration information for the cloud storage portion of the aggregate. This is referred to as the capacity tier.

Name	Type	Description
attach_eligible	boolean	Aggregate is eligible for a cloud store to be attached.
stores	array[cloud_storage_tier]	Configuration information for each cloud storage portion of the aggregate.
tiering_fullness_threshold	integer	The percentage of space in the performance tier that must be used before data is tiered out to the cloud store. Only valid for PATCH operations.

data_encryption

Name	Type	Description
drive_protection_enabled	boolean	Aggregate uses self-encrypting drives with data protection enabled.
software_encryption_enabled	boolean	NetApp Aggregate Encryption enabled. All data in the aggregate is encrypted.

dr_home_node

Node where the aggregate belongs after disaster recovery. The value for this field might differ from the

'node' field during switchover.

Name	Type	Description
name	string	
uuid	string	

home_node

Node where the aggregate belongs after giveback. The value for this field might differ from the value of the 'node' field during takeover.

Name	Type	Description
_links	_links	
name	string	
uuid	string	

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.

Name	Type	Description
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.

metric

The most recent sample of I/O metrics for the aggregate.

Name	Type	Description
_links	_links	
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.

Name	Type	Description
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.

node

Node where the aggregate currently resides.

Name	Type	Description
_links	_links	
name	string	
uuid	string	

block_storage

Name	Type	Description
available	integer	Space available in bytes
full_threshold_percent	integer	The aggregate used percentage at which 'monitor.volume.full' EMS is generated.
inactive_user_data	integer	The size that is physically used in the block storage and has a cold temperature, in bytes. This property is only supported if the aggregate is either attached to a cloud store or can be attached to a cloud store. This is an advanced property; there is an added cost to retrieving its value. The field is not populated for either a collection GET or an instance GET unless it is explicitly requested using the *fields* query parameter containing either block_storage.inactive_user_data or **.
size	integer	Total usable space in bytes, not including WAFL reserve and aggregate Snapshot copy reserve.
used	integer	Space used or reserved in bytes. Includes volume guarantees and aggregate metadata.

cloud_storage

Name	Type	Description
used	integer	Used space in bytes in the cloud store. Only applicable for aggregate with a cloud store tier.

efficiency

Storage efficiency

Name	Type	Description
logical_used	integer	Logical used

Name	Type	Description
ratio	number	Data reduction ratio (logical_used / used)
savings	integer	Space saved by storage efficiencies (logical_used - used)

efficiency_without_snapshots

Storage efficiency that does not include the savings provided by Snapshot copies

Name	Type	Description
logical_used	integer	Logical used
ratio	number	Data reduction ratio (logical_used / used)
savings	integer	Space saved by storage efficiencies (logical_used - used)

space

Name	Type	Description
block_storage	block_storage	
cloud_storage	cloud_storage	
efficiency	efficiency	Storage efficiency
efficiency_without_snapshots	efficiency_without_snapshots	Storage efficiency that does not include the savings provided by Snapshot copies
footprint	integer	A summation of volume footprints (including volume guarantees), in bytes. This includes all of the volume footprints in the block_storage tier and the cloud_storage tier. This is an advanced property; there is an added cost to retrieving its value. The field is not populated for either a collection GET or an instance GET unless it is explicitly requested using the *fields* query parameter containing either footprint or **.

iops_raw

The number of I/O operations observed at the storage object. This can be used along with delta time to calculate the rate of I/O operations per unit of time.

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_raw

The raw latency in microseconds observed at the storage object. This can be divided by the raw IOPS value to calculate the average latency per I/O operation.

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_raw

Throughput bytes observed at the storage object. This can be used along with delta time to calculate the rate of throughput bytes per unit of time.

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.

statistics

The real time I/O statistics for the aggregate.

Name	Type	Description
iops_raw	iops_raw	The number of I/O operations observed at the storage object. This can be used along with delta time to calculate the rate of I/O operations per unit of time.
latency_raw	latency_raw	The raw latency in microseconds observed at the storage object. This can be divided by the raw IOPS value to calculate the average latency per I/O operation.

Name	Type	Description
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_raw	throughput_raw	Throughput bytes observed at the storage object. This can be used along with delta time to calculate the rate of throughput bytes per unit of time.
timestamp	string	The timestamp of the performance data.

aggregate

Name	Type	Description
_links	_links	
block_storage	block_storage	Configuration information for the locally attached portion of the aggregate. When a cloud store is also used by this aggregate, this is referred to as the performance tier.

Name	Type	Description
cloud_storage	cloud_storage	Configuration information for the cloud storage portion of the aggregate. This is referred to as the capacity tier.
create_time	string	Timestamp of aggregate creation
data_encryption	data_encryption	
dr_home_node	dr_home_node	Node where the aggregate belongs after disaster recovery. The value for this field might differ from the 'node' field during switchover.
home_node	home_node	Node where the aggregate belongs after giveback. The value for this field might differ from the value of the 'node' field during takeover.
metric	metric	The most recent sample of I/O metrics for the aggregate.
name	string	Aggregate name
node	node	Node where the aggregate currently resides.
snaplock_type	string	SnapLock type
space	space	
state	string	Operational state of the aggregate
statistics	statistics	The real time I/O statistics for the aggregate.
uuid	string	Aggregate UUID

raid_group

Name	Type	Description
default	integer	Default number of disks in a RAID group

Name	Type	Description
max	integer	Maximum number of disks allowed in a RAID group
min	integer	Minimum number of disks allowed in a RAID group

layout_requirement

Name	Type	Description
aggregate_min_disks	integer	Minimum number of disks to create an aggregate
default	boolean	Indicates if this RAID type is the default
raid_group	raid_group	
raid_type	string	RAID type

node

Node where the spares are assigned

Name	Type	Description
_links	_links	
name	string	
uuid	string	

aggregate_spare

Name	Type	Description
checksum_style	string	The checksum type that has been assigned to the spares
disk_class	string	Disk class of spares
layout_requirements	array[layout_requirement]	Available RAID protections and their restrictions
node	node	Node where the spares are assigned

Name	Type	Description
size	integer	Usable size of each spare in bytes
syncmirror_pool	string	SyncMirror spare pool
usable	integer	Total number of usable spares

Create a collection of aggregates for an entire cluster

POST `/storage/aggregates`

Automatically creates aggregates based on an optimal layout recommended by the system. Alternatively, properties can be provided to create an aggregate according to the requested specification. This request starts a job and returns a link to that job.

Required properties

Properties are not required for this API. The following properties are only required if you want to specify properties for aggregate creation:

- `name` - Name of the aggregate.
- `node.name` or `node.uuid` - Node on which the aggregate will be created.
- `block_storage.primary.disk_count` - Number of disks to be used to create the aggregate.

Default values

If not specified in POST, the following default values are assigned. The remaining unspecified properties will receive system dependent default values.

- `block_storage.mirror.enabled` - *false*
- `snaplock_type` - *non_snaplock*

Related ONTAP commands

- `storage aggregate auto-provision`
- `storage aggregate create`

Example:

```
POST /api/storage/aggregates {"node": {"name": "node1"}, "name": "test",
"block_storage": {"primary": {"disk_count": "10"}}}
```

Learn more

- DOC /storage/aggregates

Parameters

Name	Type	In	Required	Description
return_timeout	integer	query	False	The number of seconds to allow the call to execute before returning. When doing a POST, PATCH, or DELETE operation on a single record, the default is 0 seconds. This means that if an asynchronous operation is started, the server immediately returns HTTP code 202 (Accepted) along with a link to the job. If a non-zero value is specified for POST, PATCH, or DELETE operations, ONTAP waits that length of time to see if the job completes so it can return something other than 202.
return_records	boolean	query	False	The default is false. If set to true, the records are returned.
disk_size	integer	query	False	If set, POST only selects disks of the specified size.

Request Body

Name	Type	Description
_links	_links	

Name	Type	Description
block_storage	block_storage	Configuration information for the locally attached portion of the aggregate. When a cloud store is also used by this aggregate, this is referred to as the performance tier.
cloud_storage	cloud_storage	Configuration information for the cloud storage portion of the aggregate. This is referred to as the capacity tier.
create_time	string	Timestamp of aggregate creation
data_encryption	data_encryption	
dr_home_node	dr_home_node	Node where the aggregate belongs after disaster recovery. The value for this field might differ from the 'node' field during switchover.
home_node	home_node	Node where the aggregate belongs after giveback. The value for this field might differ from the value of the 'node' field during takeover.
metric	metric	The most recent sample of I/O metrics for the aggregate.
name	string	Aggregate name
node	node	Node where the aggregate currently resides.
snaplock_type	string	SnapLock type
space	space	
state	string	Operational state of the aggregate
statistics	statistics	The real time I/O statistics for the aggregate.
uuid	string	Aggregate UUID

Example request


```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "block_storage": {
    "hybrid_cache": {
      "disk_count": 6,
      "raid_type": "raid_dp",
      "size": 1612709888,
      "used": 26501122
    },
    "mirror": {
      "enabled": "",
      "state": "unmirrored"
    },
    "plexes": {
      "_links": {
        "self": {
          "href": "/api/resourcelink"
        }
      },
      "name": "plex0"
    },
    "primary": {
      "checksum_style": "block",
      "disk_class": "performance",
      "disk_count": 8,
      "disk_type": "fc",
      "raid_size": 16,
      "raid_type": "raid_dp"
    }
  },
  "cloud_storage": {
    "stores": {
      "cloud_store": {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        },
        "name": "store1",
        "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
```

```
      },
      "used": 0
    }
  },
  "create_time": "2018-01-01 12:00:00 -0400",
  "dr_home_node": {
    "name": "node1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "home_node": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "name": "node1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "metric": {
    "_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": "2017-01-25 11:20:13 UTC"
  },
  "name": "node1_aggr_1",
  "node": {
    "_links": {
```

```
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "name": "node1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "snaplock_type": "non_snaplock",
  "space": {
    "block_storage": {
      "available": 10156560384,
      "full_threshold_percent": 0,
      "inactive_user_data": 304448,
      "size": 10156769280,
      "used": 2088960
    },
    "cloud_storage": {
      "used": 402743264
    },
    "efficiency": {
      "logical_used": 0,
      "ratio": 0,
      "savings": 0
    },
    "efficiency_without_snapshots": {
      "logical_used": 0,
      "ratio": 0,
      "savings": 0
    },
    "footprint": 608896
  },
  "state": "online",
  "statistics": {
    "iops_raw": {
      "read": 200,
      "total": 1000,
      "write": 100
    },
    "latency_raw": {
      "read": 200,
      "total": 1000,
      "write": 100
    },
    "status": "ok",
    "throughput_raw": {
      "read": 200,
```

```
      "total": 1000,
      "write": 100
    },
    "timestamp": "2017-01-25 11:20:13 UTC"
  },
  "uuid": "string"
}
```


Response

```
Status: 202, Accepted
```

Name	Type	Description
job	job_link	

Example response


```
{
  "job": {
    "_links": {
      "self": {
        "href": "/api/resourcelink"
      }
    },
    "uuid": "string"
  }
}
```


Error

```
Status: Default
```

ONTAP Error Response Codes

Error Code	Description
460770	The aggregate create job failed to create the aggregate.
786438	Failed to create an aggregate on the node.
786439	An aggregate already uses the specified name.

Error Code	Description
786446	The node is not in cluster.
786468	VLDB is offline.
786819	The value is invalid for the specified option at the current privilege level.
786902	RAID-TEC aggregate is not fully supported.
786911	Not every node in the cluster has the Data ONTAP version required for the feature.
787069	Node is setup for MetroCluster over IP configuration; creating an unmirrored aggregate is not supported in this configuration.
787092	The target field cannot be specified for this operation.
1114292	The required SnapLock license is not installed.
2425736	No matching node found for the target UUID.
19726341	Not enough eligible spare disks are available on the node.
19726344	No recommendation can be made for this cluster.
19726357	Automatic aggregate creation is not supported on MetroCluster.
19726358	Automatic aggregate creation is not supported on ONTAP Cloud.
19726373	Recommendation specified for creating aggregates is not current.
19726382	Another provisioning operation is in progress on this cluster. Wait a few minutes, and try the operation again.
19726386	Encountered an error when retrieving licensing information on this cluster.

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
self	href	

hybrid_cache

Contains the configuration for the hybrid cache. The hybrid cache is made up of either whole SSDs or storage pool SSDs.

Name	Type	Description
disk_count	integer	Number of disks used in the cache tier of the aggregate. Only provided when hybrid_cache.enabled is 'true'.
enabled	boolean	Aggregate uses HDDs with SSDs as a cache
raid_type	string	RAID type for SSD cache of the aggregate. Only provided when hybrid_cache.enabled is 'true'.
size	integer	Total usable space in bytes of SSD cache. Only provided when hybrid_cache.enabled is 'true'.
used	integer	Space used in bytes of SSD cache. Only provided when hybrid_cache.enabled is 'true'.

mirror

Name	Type	Description
enabled	boolean	Aggregate is SyncMirror protected
state	string	

plex_reference

Plex

Name	Type	Description
_links	_links	
name	string	

primary

Configuration information for the primary storage portion of the aggregate. This excludes the hybrid cache details.

Name	Type	Description
checksum_style	string	The checksum style used by the aggregate.
disk_class	string	The class of disks being used by the aggregate.
disk_count	integer	Number of disks used in the aggregate. This includes parity disks, but excludes disks in the hybrid cache.
disk_type	enum	The type of disk being used by the aggregate.
raid_size	integer	Option to specify the maximum number of disks that can be included in a RAID group.
raid_type	string	RAID type of the aggregate.

block_storage

Configuration information for the locally attached portion of the aggregate. When a cloud store is also used by this aggregate, this is referred to as the performance tier.

Name	Type	Description
hybrid_cache	hybrid_cache	Contains the configuration for the hybrid cache. The hybrid cache is made up of either whole SSDs or storage pool SSDs.
mirror	mirror	
plexes	array[plex_reference]	Plex reference for each plex in the aggregate.

Name	Type	Description
primary	primary	Configuration information for the primary storage portion of the aggregate. This excludes the hybrid cache details.

cloud_store

Cloud store

Name	Type	Description
_links	_links	
name	string	
uuid	string	

cloud_storage_tier

Name	Type	Description
cloud_store	cloud_store	Cloud store
used	integer	Capacity used in bytes in the cloud store by this aggregate. This is a cached value calculated every 5 minutes.

cloud_storage

Configuration information for the cloud storage portion of the aggregate. This is referred to as the capacity tier.

Name	Type	Description
attach_eligible	boolean	Aggregate is eligible for a cloud store to be attached.
stores	array[cloud_storage_tier]	Configuration information for each cloud storage portion of the aggregate.
tiering_fullness_threshold	integer	The percentage of space in the performance tier that must be used before data is tiered out to the cloud store. Only valid for PATCH operations.

data_encryption

Name	Type	Description
drive_protection_enabled	boolean	Aggregate uses self-encrypting drives with data protection enabled.
software_encryption_enabled	boolean	NetApp Aggregate Encryption enabled. All data in the aggregate is encrypted.

dr_home_node

Node where the aggregate belongs after disaster recovery. The value for this field might differ from the 'node' field during switchover.

Name	Type	Description
name	string	
uuid	string	

home_node

Node where the aggregate belongs after giveback. The value for this field might differ from the value of the 'node' field during takeover.

Name	Type	Description
_links	_links	
name	string	
uuid	string	

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.

Name	Type	Description
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.

metric

The most recent sample of I/O metrics for the aggregate.

Name	Type	Description
_links	_links	
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.

node

Node where the aggregate currently resides.

Name	Type	Description
_links	_links	
name	string	
uuid	string	

block_storage

Name	Type	Description
available	integer	Space available in bytes
full_threshold_percent	integer	The aggregate used percentage at which 'monitor.volume.full' EMS is generated.
inactive_user_data	integer	The size that is physically used in the block storage and has a cold temperature, in bytes. This property is only supported if the aggregate is either attached to a cloud store or can be attached to a cloud store. This is an advanced property; there is an added cost to retrieving its value. The field is not populated for either a collection GET or an instance GET unless it is explicitly requested using the *fields* query parameter containing either block_storage.inactive_user_data or **.
size	integer	Total usable space in bytes, not including WAFL reserve and aggregate Snapshot copy reserve.
used	integer	Space used or reserved in bytes. Includes volume guarantees and aggregate metadata.

cloud_storage

Name	Type	Description
used	integer	Used space in bytes in the cloud store. Only applicable for aggregate with a cloud store tier.

efficiency

Storage efficiency

Name	Type	Description
logical_used	integer	Logical used
ratio	number	Data reduction ratio (logical_used / used)
savings	integer	Space saved by storage efficiencies (logical_used - used)

efficiency_without_snapshots

Storage efficiency that does not include the savings provided by Snapshot copies

Name	Type	Description
logical_used	integer	Logical used
ratio	number	Data reduction ratio (logical_used / used)
savings	integer	Space saved by storage efficiencies (logical_used - used)

space

Name	Type	Description
block_storage	block_storage	
cloud_storage	cloud_storage	
efficiency	efficiency	Storage efficiency
efficiency_without_snapshots	efficiency_without_snapshots	Storage efficiency that does not include the savings provided by Snapshot copies

Name	Type	Description
footprint	integer	A summation of volume footprints (including volume guarantees), in bytes. This includes all of the volume footprints in the block_storage tier and the cloud_storage tier. This is an advanced property; there is an added cost to retrieving its value. The field is not populated for either a collection GET or an instance GET unless it is explicitly requested using the *fields* query parameter containing either footprint or **.

iops_raw

The number of I/O operations observed at the storage object. This can be used along with delta time to calculate the rate of I/O operations per unit of time.

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_raw

The raw latency in microseconds observed at the storage object. This can be divided by the raw IOPS value to calculate the average latency per I/O operation.

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.

Name	Type	Description
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_raw

Throughput bytes observed at the storage object. This can be used along with delta time to calculate the rate of throughput bytes per unit of time.

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.

statistics

The real time I/O statistics for the aggregate.

Name	Type	Description
iops_raw	iops_raw	The number of I/O operations observed at the storage object. This can be used along with delta time to calculate the rate of I/O operations per unit of time.

Name	Type	Description
latency_raw	latency_raw	The raw latency in microseconds observed at the storage object. This can be divided by the raw IOPS value to calculate the average latency per I/O operation.
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_raw	throughput_raw	Throughput bytes observed at the storage object. This can be used along with delta time to calculate the rate of throughput bytes per unit of time.
timestamp	string	The timestamp of the performance data.

aggregate

Name	Type	Description
_links	_links	

Name	Type	Description
block_storage	block_storage	Configuration information for the locally attached portion of the aggregate. When a cloud store is also used by this aggregate, this is referred to as the performance tier.
cloud_storage	cloud_storage	Configuration information for the cloud storage portion of the aggregate. This is referred to as the capacity tier.
create_time	string	Timestamp of aggregate creation
data_encryption	data_encryption	
dr_home_node	dr_home_node	Node where the aggregate belongs after disaster recovery. The value for this field might differ from the 'node' field during switchover.
home_node	home_node	Node where the aggregate belongs after giveback. The value for this field might differ from the value of the 'node' field during takeover.
metric	metric	The most recent sample of I/O metrics for the aggregate.
name	string	Aggregate name
node	node	Node where the aggregate currently resides.
snaplock_type	string	SnapLock type
space	space	
state	string	Operational state of the aggregate
statistics	statistics	The real time I/O statistics for the aggregate.
uuid	string	Aggregate UUID

job_link

Name	Type	Description
_links	_links	
uuid	string	The UUID of the asynchronous job that is triggered by a POST, PATCH, or DELETE operation.

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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