



# **Manage storage aggregates**

## **REST API reference**

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# Manage storage aggregates

## Storage aggregates UUID endpoint overview

### 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. PATCH operations on the aggregate's disk count will be blocked while one or more nodes in the cluster are simulating or implementing automatic aggregate creation.

The following is a list of properties that can be modified using the PATCH operation including a brief description for each:

- `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.
- `data_encryption.software_encryption_enabled` - This property enables or disables NAE on the aggregate.

### Aggregate expansion

The PATCH operation also supports automatically expanding an aggregate based on the spare disks which are present within the system. Running PATCH with the query "auto\_provision\_policy" set to "expand" starts the recommended expansion job. In order to see the expected change in capacity before starting the job, call GET on an aggregate instance with the query "auto\_provision\_policy" set to "expand".

### Manual simulated aggregate expansion

The PATCH operation also supports simulated manual expansion of an aggregate. Running PATCH with the query "simulate" set to "true" and "block\_storage.primary.disk\_count" set to the final disk count will start running the prechecks associated with expanding the aggregate to the proposed size. The response body will include information on how many disks the aggregate can be expanded to, any associated warnings, along with the proposed final size of the aggregate.

### 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 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](#)

## Simulating aggregate expansion

The following example shows the response for a simulated data aggregate expansion based on the values of the 'block\_storage.primary.disk\_count' attribute passed in. The query does not modify the existing aggregate but returns how the aggregate will look after the expansion along with any associated warnings. Simulated data aggregate expansion will be blocked while one or more nodes in the cluster are simulating or implementing automatic aggregate creation. This will be reflected in the following attributes:

- space.block\_storage.size - Total usable space in bytes, not including WAFL reserve and aggregate Snapshot copy reserve.
- block\_storage.primary.disk\_count - Number of disks that could be used to create the aggregate.

```

# The API:
/api/storage/aggregates/{uuid}?simulate=true

# The call:
curl -X PATCH "https://<mgmt-ip>/api/storage/aggregates/cae60cfe-deae-42bd-babb-ef437d118314?simulate=true" -H "accept: application/json" -d '{"block_storage": {"primary": {"disk_count": 14}}}'

# The response:
{
  "warnings": [
    {
      "name": "node_2_SSD_1",
      "warning": {
        "message": "One or more disks will not be added. 14 disks specified, 13 disks will be added.",
        "code": 787170,
        "arguments": [
          "14",
          "13"
        ]
      }
    }
  ],
  "num_records": 1,
  "records": [
    {
      "uuid": "cae60cfe-deae-42bd-babb-ef437d118314",

```

```

"name": "node_2_SSD_1",
"node": {
  "uuid": "4046dda8-f802-11e8-8f6d-005056bb2030",
  "name": "node-2",
  "_links": {
    "self": {
      "href": "/api/cluster/nodes/4046dda8-f802-11e8-8f6d-005056bb2030"
    }
  }
},
"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
  }
},
}
],
"job": {
  "_links": {
    "self": {
      "href": "/api/storage/aggregates/cae60cfe-deae-42bd-babb-ef437d118314"
    }
  }
}
}

```

### Retrieving a recommendation for an aggregate expansion

The following example shows the response with the recommended data aggregate expansion based on what disks are present within the system. The query does not modify the existing aggregate but returns how the



aggregate will look after the expansion. The recommendation will be reflected in the attributes - 'space.block\_storage.size' and 'block\_storage.primary.disk\_count'. Recommended data aggregate expansion will be blocked while one or more nodes in the cluster are simulating or implementing automatic aggregate creation.

```
# The API:
/api/storage/aggregates/{uuid}?auto_provision_policy=expand

# The call:
curl -X GET "https://<mgmt-ip>/api/storage/aggregates/cae60cfe-deae-42bd-babb-ef437d118314?auto_provision_policy=expand" -H "accept: application/json"

# The response:
{
  "uuid": "cae60cfe-deae-42bd-babb-ef437d118314",
  "name": "node_2_SSD_1",
  "node": {
    "uuid": "4046dda8-f802-11e8-8f6d-005056bb2030",
    "name": "node-2",
    "_links": {
      "self": {
        "href": "/api/cluster/nodes/4046dda8-f802-11e8-8f6d-005056bb2030"
      }
    }
  },
  "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
    }
  },
  "_links": {
```

```
"self": {
  "href": "/api/storage/aggregates/cae60cfe-deae-42bd-babb-ef437d118314"
}
}
```

## 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
    }
  },
}
```

The following example shows the workflow to enable software encryption on an aggregate.

Step 1: Check the current software encryption status of the aggregate.

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

# The call:
curl -X GET "https://<mgmt-ip>/api/storage/aggregates/f3aafdc6-be35-4d93-9590-5a402bffb4b?fields=data_encryption.software_encryption_enabled" -H
"accept: application/json"

# The response:
{
  "uuid": "f3aafdc6-be35-4d93-9590-5a402bffb4b",
  "name": "aggr5",
  "data_encryption": {
    "software_encryption_enabled": false
  },
}
```

Step 2: Update the aggregate with the encryption status in 'data\_encryption.software\_encryption\_enabled'. 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/f3aafdc6-be35-4d93-9590-5a402bffb4b" -H "accept: application/hal+json" -d
'{"data_encryption": {"software_encryption_enabled": "true"}}'

# The response:
{
  "job": {
    "uuid": "6b7ab28e-168d-11ea-8a50-0050568eca76",
    "_links": {
      "self": {
        "href": "/api/cluster/jobs/6b7ab28e-168d-11ea-8a50-0050568eca76"
      }
    }
  }
}
```

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/f3aafdc6-be35-4d93-9590-5a402bfffbe4b?fields=data_encryption.software_encryption_enabled" -H
"accept: application/json"

# The response:
{
  "uuid": "f3aafdc6-be35-4d93-9590-5a402bfffbe4b",
  "name": "aggr5",
  "data_encryption": {
    "software_encryption_enabled": true
  },
}
```

## Delete an aggregate specified by the UUID

DELETE /storage/aggregates/{uuid}

**Introduced In:** 9.6

Deletes the aggregate specified by the UUID. This request starts a job and returns a link to that job.

### Related ONTAP commands

- `storage aggregate delete`

### Parameters

Name	Type	In	Required	Description
uuid	string	path	True	Aggregate UUID

Name	Type	In	Required	Description
return_timeout	integer	query	False	<p>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.</p> <ul style="list-style-type: none"> <li>• Default value: 1</li> <li>• Max value: 120</li> <li>• Min value: 0</li> </ul>

## Response

Status: 202, Accepted

Name	Type	Description
job	<a href="#">job_link</a>	

## Example response

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

## Error

Status: Default

### ONTAP Error Response Codes

Error Code	Description
460770	The aggregate delete job failed to delete the aggregate.
460777	Failed to get information on the delete job.
786435	Internal Error. Failed to create a communication handle.
786451	Failed to delete specified aggregate.
786468	VLDB is offline.
786472	Node that hosts the aggregate is offline.
786497	Cannot delete an aggregate that has volumes.
786771	Aggregate does not exist.
786867	Specified aggregate resides on the remote cluster.
786897	Specified aggregate cannot be deleted as it is a switched-over root 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
self	<a href="#">href</a>	

job\_link

Name	Type	Description
_links	<a href="#">_links</a>	
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[ <a href="#">error_arguments</a> ]	Message arguments
code	string	Error code
message	string	Error message
target	string	The target parameter that caused the error.

## Retrieve an aggregate specified by the UUID

GET /storage/aggregates/{uuid}

## Introduced In: 9.6

Retrieves the aggregate specified by the UUID. The recommend query cannot be used for this operation.

## 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 [Requesting specific fields](#) to learn more.

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

## Related ONTAP commands

- `storage aggregate show`

## Parameters

Name	Type	In	Required	Description
uuid	string	path	True	Aggregate UUID
auto_provision_policy	string	query	False	If set to expand, a query is run on the system for the recommended optimal expansion layout of the aggregate.  • Introduced in: 9.8
fields	array[string]	query	False	Specify the fields to return.

## Response

Status: 200, Ok

Name	Type	Description
<code>_links</code>	<a href="#">_links</a>	

Name	Type	Description
block_storage	<a href="#">block_storage</a>	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	<a href="#">cloud_storage</a>	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	<a href="#">data_encryption</a>	
dr_home_node	<a href="#">dr_home_node</a>	Node where the aggregate resides after disaster recovery. The value for this field might differ from the 'node' field during switchover.
home_node	<a href="#">home_node</a>	Node where the aggregate resides after giveback. The value for this field might differ from the value of the 'node' field during takeover.
inactive_data_reporting	<a href="#">inactive_data_reporting</a>	
metric	<a href="#">metric</a>	The most recent sample of I/O metrics for the aggregate.
name	string	Aggregate name
node	<a href="#">node</a>	Node where the aggregate currently resides.
snaplock_type	string	SnapLock type
space	<a href="#">space</a>	
state	string	Operational state of the aggregate
statistics	<a href="#">statistics</a>	The real time I/O statistics for the aggregate.
uuid	string	Aggregate UUID

## Example response

```
{
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "block_storage": {
    "hybrid_cache": {
      "disk_count": "6",
      "raid_type": "string",
      "size": "1612709888",
      "used": "26501122"
    },
    "mirror": {
      "enabled": "",
      "state": "string"
    },
    "plexes": [
      {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        },
        "name": "plex0"
      }
    ],
    "primary": {
      "checksum_style": "string",
      "disk_class": "performance",
      "disk_count": "8",
      "disk_type": "string",
      "raid_size": "16",
      "raid_type": "string"
    }
  },
  "cloud_storage": {
    "stores": [
      {
        "cloud_store": {
          "_links": {
            "self": {
              "href": "/api/resourcelink"
            }
          }
        }
      }
    ]
  }
}
```

```

        },
        "name": "store1",
        "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    },
    "used": 0
}
]
},
"create_time": "2018-01-01T12:00:00-04:00",
"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"
},
"inactive_data_reporting": {
    "start_time": "2019-12-12T12:00:00-04:00"
},
"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": "2017-01-25T11:20:13Z"
},
"name": "node1_aggr_1",
"node": {
  "_links": {
    "self": {
      "href": "/api/resourcelink"
    }
  },
  "name": "node1",
  "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"snaplock_type": "string",
"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": "string",
"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": "2017-01-25T11:20:13Z"
},
"uuid": "string"
}

```

## Error

Status: Default

### ONTAP Error Response Codes

Error Code	Description
787092	The target field cannot be specified for this operation.
7209049	Cannot perform the operation because the aggregate is currently expanding.
8586225	Unexpected error encountered when retrieving metrics and statistics for this aggregate.
19726382	Another provisioning operation is in progress on this cluster. Wait a few minutes, and try the operation again.
19726390	Unable to provide a recommendation to expand the aggregate.
19726391	Too many unassigned disks visible to the node that owns this aggregate.
19726392	Layout of this aggregate is not a supported configuration.
19726393	Failed to expand the aggregate. Aggregate expansion is not supported on this system.
19726394	Automatic aggregate expansion is not supported on systems with multiple data aggregates.
19726395	Automatic aggregate expansion is not supported when MetroCluster is not configured

Error Code	Description
19726396	Automatic aggregate expansion is not supported when the DR group is not in a normal state
19726397	Aggregates must contain disks with identical disk-types and disk-sizes.
19726538	Cannot perform the operation because the aggregate is not in a healthy state.

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	<a href="#">href</a>	

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	Specifies whether the 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	<a href="#">_links</a>	
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	string	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	<a href="#">hybrid_cache</a>	Contains the configuration for the hybrid cache. The hybrid cache is made up of either whole SSDs or storage pool SSDs.
mirror	<a href="#">mirror</a>	

Name	Type	Description
plexes	array[ <a href="#">plex_reference</a> ]	Plex reference for each plex in the aggregate.
primary	<a href="#">primary</a>	Configuration information for the primary storage portion of the aggregate. This excludes the hybrid cache details.

cloud\_store

Cloud store

Name	Type	Description
_links	<a href="#">_links</a>	
name	string	
uuid	string	

cloud\_storage\_tier

Name	Type	Description
cloud_store	<a href="#">cloud_store</a>	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	Specifies whether the aggregate is eligible for a cloud store to be attached.
stores	array[ <a href="#">cloud_storage_tier</a> ]	Configuration information for each cloud storage portion of the aggregate.

Name	Type	Description
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	Specifies whether the aggregate uses self-encrypting drives with data protection enabled.
software_encryption_enabled	boolean	Specifies whether NetApp aggregate encryption is enabled. All data in the aggregate is encrypted.

#### dr\_home\_node

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

Name	Type	Description
_links	<a href="#">_links</a>	
name	string	
uuid	string	

#### inactive\_data\_reporting

Name	Type	Description
enabled	boolean	Specifies whether or not inactive data reporting is enabled on the aggregate.

Name	Type	Description
start_time	string	Timestamp at which inactive data reporting was enabled on the aggregate.

## 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	Performance 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	Performance 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	Performance metric for write I/O operations.

metric

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

Name	Type	Description
_links	<a href="#">_links</a>	
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	<a href="#">iops</a>	The rate of I/O operations observed at the storage object.
latency	<a href="#">latency</a>	The round trip latency in microseconds observed at the storage object.

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	<a href="#">throughput</a>	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	<a href="#">_links</a>	
name	string	
uuid	string	

block\_storage

Name	Type	Description
available	integer	Space available in bytes.

Name	Type	Description
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 <i>fields</i> query parameter containing either <code>block_storage.inactive_user_data</code> or <code>**</code> .
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 aggregates 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	<a href="#">block_storage</a>	
cloud_storage	<a href="#">cloud_storage</a>	
efficiency	<a href="#">efficiency</a>	Storage efficiency
efficiency_without_snapshots	<a href="#">efficiency_without_snapshots</a>	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 <i>fields</i> 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	Performance 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	Performance 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	Performance metric for write I/O operations.

#### statistics

The real time I/O statistics for the aggregate.

Name	Type	Description
iops_raw	<a href="#">iops_raw</a>	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	<a href="#">latency_raw</a>	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	<a href="#">throughput_raw</a>	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.

#### error\_arguments

Name	Type	Description
code	string	Argument code
message	string	Message argument

#### error

Name	Type	Description
arguments	array[ <a href="#">error_arguments</a> ]	Message arguments

Name	Type	Description
code	string	Error code
message	string	Error message
target	string	The target parameter that caused the error.

## Update an aggregate specified by the UUID

PATCH /storage/aggregates/{uuid}

**Introduced In:** 9.6

Updates the aggregate specified by the UUID with the properties in the body. This request starts a job and returns a link to that job.

### Related ONTAP commands

- `storage aggregate add-disks`
- `storage aggregate mirror`
- `storage aggregate modify`
- `storage aggregate relocation start`
- `storage aggregate rename`

### Parameters

Name	Type	In	Required	Description
uuid	string	path	True	Aggregate UUID
auto_provision_policy	string	query	False	<p>If set to expand, the PATCH operation runs the recommended expansion of the aggregate.</p> <ul style="list-style-type: none"> <li>• Introduced in: 9.8</li> </ul>

Name	Type	In	Required	Description
simulate	boolean	query	False	<p>If set to true, the PATCH operation runs a simulated aggregate expansion with the provided input disk count and returns the proposed size of the new aggregate along with any associated warnings.</p> <ul style="list-style-type: none"> <li>• Introduced in: 9.8</li> </ul>
disk_size	integer	query	False	<p>If set, PATCH only selects disks of the specified size.</p>

Name	Type	In	Required	Description
return_timeout	integer	query	False	<p>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.</p> <ul style="list-style-type: none"> <li>• Default value: 1</li> <li>• Max value: 120</li> <li>• Min value: 0</li> </ul>

## Request Body

Name	Type	Description
block_storage	<a href="#">block_storage</a>	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	<a href="#">cloud_storage</a>	Configuration information for the cloud storage portion of the aggregate. This is referred to as the capacity tier.

Name	Type	Description
create_time	string	Timestamp of aggregate creation
data_encryption	<a href="#">data_encryption</a>	
dr_home_node	<a href="#">dr_home_node</a>	Node where the aggregate resides after disaster recovery. The value for this field might differ from the 'node' field during switchover.
home_node	<a href="#">home_node</a>	Node where the aggregate resides after giveback. The value for this field might differ from the value of the 'node' field during takeover.
inactive_data_reporting	<a href="#">inactive_data_reporting</a>	
name	string	Aggregate name
node	<a href="#">node</a>	Node where the aggregate currently resides.
space	<a href="#">space</a>	
state	string	Operational state of the aggregate
uuid	string	Aggregate UUID



## Example request

```
{
  "block_storage": {
    "hybrid_cache": {
      "disk_count": "6",
      "raid_type": "string",
      "size": "1612709888",
      "used": "26501122"
    },
    "mirror": {
      "enabled": "",
      "state": "string"
    },
    "plexes": [
      {
        "name": "plex0"
      }
    ],
    "primary": {
      "disk_count": "8",
      "disk_type": "string",
      "raid_size": "16",
      "raid_type": "string"
    }
  },
  "cloud_storage": {
    "stores": [
      {
        "cloud_store": {
          "name": "store1",
          "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
        },
        "used": 0
      }
    ]
  },
  "create_time": "2018-01-01T12:00:00-04:00",
  "dr_home_node": {
    "name": "node1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "home_node": {
    "name": "node1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
}
```

```

"inactive_data_reporting": {
  "start_time": "2019-12-12T12:00:00-04:00"
},
"name": "node1_aggr_1",
"node": {
  "name": "node1",
  "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
},
"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": "string",
"uuid": "string"
}

```

## Response

Status: 202, Accepted

Name	Type	Description
job	<a href="#">job_link</a>	
num_records	integer	Number of records

Name	Type	Description
records	array[ <a href="#">aggregate</a> ]	
warnings	array[ <a href="#">aggregate_warning</a> ]	List of validation warnings and remediation advice for the aggregate simulate behavior.

## Example response

```
{
  "job": {
    "uuid": "string"
  },
  "records": [
    {
      "block_storage": {
        "hybrid_cache": {
          "disk_count": "6",
          "raid_type": "string",
          "size": "1612709888",
          "used": "26501122"
        },
        "mirror": {
          "enabled": "",
          "state": "string"
        },
        "plexes": [
          {
            "name": "plex0"
          }
        ],
        "primary": {
          "disk_count": "8",
          "disk_type": "string",
          "raid_size": "16",
          "raid_type": "string"
        }
      },
      "cloud_storage": {
        "stores": [
          {
            "cloud_store": {
              "name": "store1",
              "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
            },
            "used": 0
          }
        ]
      },
      "create_time": "2018-01-01T12:00:00-04:00",
      "dr_home_node": {
        "name": "node1",
        "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
      }
    }
  ]
}
```

```

    },
    "home_node": {
      "name": "node1",
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    },
    "inactive_data_reporting": {
      "start_time": "2019-12-12T12:00:00-04:00"
    },
    "name": "node1_aggr_1",
    "node": {
      "name": "node1",
      "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
    },
    "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": "string",
    "uuid": "string"
  }
],
"warnings": [
  {
    "action": {
      "arguments": [
        "string"
      ]
    }
  ]
]

```

```

        "message": "string"
    },
    "name": "string",
    "warning": {
        "arguments": [
            "string"
        ],
        "message": "string"
    }
}
]
}

```

## Error

Status: Default

### ONTAP Error Response Codes

Error Code	Description
262247	The value is invalid for the field.
460777	Failed to get information on the job.
786434	Cannot connect to node where the aggregate resides.
786435	Internal Error. Failed to create a communication handle.
786439	An aggregate already uses the specified name.
786447	Failed to modify the aggregate.
786456	Failed to add disks to the aggregate.
786458	Failed to rename aggregate.
786468	VLDB is offline.
786472	Node that hosts the aggregate is offline.
786479	Cannot find node ID for the node.
786491	Not enough spares on the node.
786730	Internal Error
786771	Aggregate does not exist.
786787	Aggregate is not online.
786808	Aggregate mirror failed.
786867	Specified aggregate resides on the remote cluster.

Error Code	Description
786911	Not every node in the cluster has the Data ONTAP version required for the feature.
786923	This operation is not allowed during the pre-commit phase of a 7-mode to clustered Data ONTAP transition.
786924	Internal error for an aggregate that is in the pre-commit phase of a 7-mode to clustered Data ONTAP transition.
786955	Modifying raidtype to raid_tec requires a minimum of six disks in the RAID Group.
786956	Modifying raidtype to raid_dp requires a minimum of four disks in the RAID Group.
786965	Spare Selection in userspace failed.
787046	Mirroring of a FabricPool is not allowed.
787092	The target field cannot be specified for this operation.
787144	Aggregate is not a FabricPool.
787156	Modifying the attributes of mirror object store is not allowed.
787169	Only one field can be modified per operation.
787170	Failed to patch the "block_storage.primary.disk_count" because the disk count specified is smaller than existing disk count.
787172	This query is only allowed during the modification of the specified field.
787178	Unmirroring an aggregate with a PATCH operation is not supported.
787187	Internal error. Failed to check if the aggregate is a FabricPool.
1258699	Cannot use all the disks specified for the requested operation.
1263500	Operation will lead to creation of new raid group.
1263501	Operation will exceed half of the maximum volume sizes allowed on the node.
1263502	One spare data partition from at least one of the chosen root-data1-data2 disks will not be used.
1263503	Operation will lead to downsizing of one or more disks.
1263504	Operation will lead to a spares low condition.
1263598	One or more selected disks will be partitioned.

Error Code	Description
1263624	Operation will lead to a no sparecore condition.
2425736	No matching node found for the UUID provided.
7209049	Cannot perform the operation because the aggregate is currently expanding.
7209075	Cannot perform the operation because the volume size limit for this system type would be exceeded.
13108106	Cannot run aggregate relocation because volume expand is in progress.
19726347	There are a number of unassigned disks visible to the node that owns this aggregate.
19726382	Another provisioning operation is in progress on this cluster. Wait a few minutes, and try the operation again.
19726390	Unable to automatically expand this aggregate.
19726391	Too many unassigned disks visible to the node that owns this aggregate.
19726392	Layout of this aggregate is not a supported configuration.
19726393	Failed to expand the aggregate. Aggregate expansion is not supported on this system.
19726394	Automatic aggregate expansion is not supported on systems with multiple data aggregates.
19726395	Automatic aggregate expansion is not supported when MetroCluster is not configured.
19726396	Automatic aggregate expansion is not supported when the DR group is not in a normal state.
19726397	Aggregates must contain disks with identical disk-types and disk-sizes.
19726538	Cannot perform the operation because the aggregate is not in a healthy state.
26542083	Destination node is at higher Data ONTAP version than source node.
26542084	Source node is at higher Data ONTAP version than destination node.
26542097	Unable to get D-blade ID of destination.
26542101	Unable to contact the source node.
26542102	Unable to contact the destination node.
26542120	An SVM migrate operation is in progress. When the migrate operation completes, try the operation again.



Error Code	Description
26542121	A MetroCluster disaster recovery operation is in progress. When the recovery operation completes, try the operation again.
196608334	Failed to modify the aggregate because it contains NAE volumes.
196608335	Failed to modify the aggregate because it contains non-encrypted volumes.

## Definitions

## See Definitions

href

Name	Type	Description
href	string	

\_links

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	Specifies whether the 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
name	string	

#### primary

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

Name	Type	Description
disk_count	integer	Number of disks used in the aggregate. This includes parity disks, but excludes disks in the hybrid cache.
disk_type	string	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	<a href="#">hybrid_cache</a>	Contains the configuration for the hybrid cache. The hybrid cache is made up of either whole SSDs or storage pool SSDs.
mirror	<a href="#">mirror</a>	
plexes	array[ <a href="#">plex_reference</a> ]	Plex reference for each plex in the aggregate.
primary	<a href="#">primary</a>	Configuration information for the primary storage portion of the aggregate. This excludes the hybrid cache details.

#### cloud\_store

Cloud store

Name	Type	Description
name	string	
uuid	string	

#### cloud\_storage\_tier

Name	Type	Description
cloud_store	<a href="#">cloud_store</a>	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	Specifies whether the aggregate is eligible for a cloud store to be attached.
stores	array[ <a href="#">cloud_storage_tier</a> ]	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	Specifies whether the aggregate uses self-encrypting drives with data protection enabled.
software_encryption_enabled	boolean	Specifies whether NetApp aggregate encryption is enabled. All data in the aggregate is encrypted.

## dr\_home\_node

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

Name	Type	Description
name	string	
uuid	string	

## inactive\_data\_reporting

Name	Type	Description
enabled	boolean	Specifies whether or not inactive data reporting is enabled on the aggregate.
start_time	string	Timestamp at which inactive data reporting was enabled on the aggregate.

## 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	Performance 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	Performance 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	Performance metric for write I/O operations.

## metric

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

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.

node

Node where the aggregate currently resides.

Name	Type	Description
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 <i>fields</i> query parameter containing either <code>block_storage.inactive_user_data</code> or <code>**</code> .
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 aggregates 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	<a href="#">block_storage</a>	
cloud_storage	<a href="#">cloud_storage</a>	
efficiency	<a href="#">efficiency</a>	Storage efficiency
efficiency_without_snapshots	<a href="#">efficiency_without_snapshots</a>	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 <i>fields</i> 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	Performance 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	Performance 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	Performance metric for write I/O operations.

#### statistics

The real time I/O statistics for the aggregate.

Name	Type	Description
iops_raw	<a href="#">iops_raw</a>	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	<a href="#">latency_raw</a>	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	<a href="#">throughput_raw</a>	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
block_storage	<a href="#">block_storage</a>	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	<a href="#">cloud_storage</a>	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	<a href="#">data_encryption</a>	
dr_home_node	<a href="#">dr_home_node</a>	Node where the aggregate resides after disaster recovery. The value for this field might differ from the 'node' field during switchover.
home_node	<a href="#">home_node</a>	Node where the aggregate resides after giveback. The value for this field might differ from the value of the 'node' field during takeover.
inactive_data_reporting	<a href="#">inactive_data_reporting</a>	
name	string	Aggregate name
node	<a href="#">node</a>	Node where the aggregate currently resides.
space	<a href="#">space</a>	
state	string	Operational state of the aggregate
uuid	string	Aggregate UUID

job\_link

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

## action

Name	Type	Description
arguments	array[string]	Arguments present in the specified action message.
code	integer	Corrective action code of the specified action.
message	string	Specifies the corrective action to be taken to resolve the issue.

## warning

Name	Type	Description
arguments	array[string]	Arguments present in the warning message encountered.
code	integer	Warning code of the warning encountered.
message	string	Details of the warning encountered by the aggregate simulate query.

## aggregate\_warning

Name	Type	Description
action	<a href="#">action</a>	
name	string	Name of the entity that returns the warning.
warning	<a href="#">warning</a>	

## error\_arguments

Name	Type	Description
code	string	Argument code
message	string	Message argument

## error

Name	Type	Description
arguments	array[ <a href="#">error_arguments</a> ]	Message arguments
code	string	Error code
message	string	Error message
target	string	The target parameter that caused the error.

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