Retrieve or create a collection of storage aggregates

REST API reference

NetApp
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Table of Contents

Retrieve or create a collection of storage aggregates . . . 1
- Storage aggregates endpoint overview . . . 1
  - Retrieving storage aggregate information . . . 1
  - Creating storage aggregates . . . 1
  - Examples . . . 2
- Retrieve a collection of aggregates for an entire cluster . . . 15
  - Expensive properties . . . 15
  - Related ONTAP commands . . . 15
  - Parameters . . . 15
  - Response . . . 35
  - Error . . . 44
  - Definitions . . . 45
- Create a collection of aggregates for an entire cluster . . . 68
  - Required properties . . . 68
  - Default values . . . 68
  - Related ONTAP commands . . . 68
  - Example: . . . 68
  - Parameters . . . 69
  - Request Body . . . 70
  - Response . . . 75
  - Error . . . 75
  - Definitions . . . 77

Retrieve or create a collection of storage aggregates

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 usable count for each class of spares does not include reserved spare capacity recommended by ONTAP best practices.

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", "is_spare_low", "space.block_storage.inactive_user_data", "space.block_storage.inactive_user_data_percent", "inode_attributes.version", "inode_attributes.files_private_used", "inode_attributes.file_private_capacity" and "inode_attributes.file_public_capacity" 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. The collection GET does not support queries in conjunction with the "order_by" parameter.

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'. This response will also include any warnings related to any inefficiencies in the storage configuration. Recommended aggregate creation is not supported on ONTAP Cloud and MetroCluster with Fibre Channel (FC). 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.
- data_encryption.software_encryption_enabled - Enable or disable NAE (NetApp Aggregate Encryption) on the aggregate.
- simulate - Simulate the creation of the aggregate with specified input parameters. If the simulate field is specified, the response includes information on the proposed aggregate disk layout, any associated warnings, along with the proposed final size of the aggregate.

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 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": 22,
        "disk_class": "solid_state",
        "raid_type": "raid_dp",
        "disk_type": "ssd",
        "raid_size": 24,
        "simulated_raid_groups": [
           {
             "name": "node_2_SSD_1/plex0/rg0",
             "raid_type": "raid_dp",
             "parity_disk_count": 2,
             "data_disk_count": 9,
             "usable_size": 12309487,
             "is_partition": true
           },
           {
             "name": "node_2_SSD_1/plex1/rg0",
             "raid_type": "raid_dp",
             "parity_disk_count": 2,
             "data_disk_count": 9,
             "usable_size": 12309487,
             "is_partition": false
           }
        ]
      },
      "hybrid_cache": {
        "enabled": true,
        "storage_pools": [
            {
                "allocation_units_count": 1,
```

```
                "storage_pool": {
                    "name": "sp1",
                    "uuid": "1511d084-7290-11ec-ae5b-005056bb2afa",
                    "_links": {
                        "self": {
                            "href": "/api/storage/pools/1511d084-7290-
11ec-ae5b-005056bb2afa"
                        }
                    }
                }
            },
            {
                "allocation_units_count": 1,
                "storage_pool": {
                    "name": "sp2",
                    "uuid": "342d234f-7291-11ec-ae5b-005056bb2afa",
                    "_links": {
                        "self": {
                            "href": "/api/storage/pools/342d234f-7291-
11ec-ae5b-005056bb2afa"
                        }
                    }
                }
            }
        ]
      },
      "mirror": {
        "enabled": true
      }
    },
  },
  {
    "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": 352477184
      }
    },
    "block_storage": {
      "primary": {
        "disk_count": 22,
```

```
        "disk_class": "solid_state",
        "raid_type": "raid_dp",
        "disk_type": "ssd",
        "raid_size": 24,
        "simulated_raid_groups": [
           {
             "name": "node_1_SSD_1/plex0/rg0",
             "raid_type": "raid_dp",
             "parity_disk_count": 2,
             "data_disk_count": 9,
             "usable_size": 12309487,
             "is_partition": true
           },
           {
             "name": "node_1_SSD_1/plex1/rg0",
             "raid_type": "raid_dp",
             "parity_disk_count": 2,
             "data_disk_count": 9,
             "usable_size": 12309487,
             "is_partition": false
           }
         ]
      },
      "hybrid_cache": {
        "enabled": false
      },
      "mirror": {
        "enabled": true
      }
    },
  }
],
"recommendation_spares" [
  {
    "node": {
      "uuid": "795bf7c2-fa4b-11e8-ba65-005056bbe5cl",
      "name": "node-2",
      "_links": {
        "self" {
          "href": "/api/cluster/nodes/795bf7c2-fa4b-11e8-ba65-
005056bbe5c1"
        }
      }
    },
    "disk_class": "solid-state",
    "size": "2856845312",
```

```
    "is_partition": true,
    "disk_type": "ssd",
    "syncmirror_pool": "pool10",
    "usable": 1
  }
],
"num_records": 2,
"warnings": [
  {
    "name": "node_1_SSD_1",
    "warning": {
      "code": 19726347,
      "message": "Unable to use all attached capacity on node \"node_1\".
3 local/remote pool disks not usable for mirroring.",
      "arguments": [
        "node_1",
        "3"
      ]
    },
    "action": {
      "code": 19726348,
      "message": "Contact technical support."
    }
  },
  {
    "name": "node_2_SSD_1",
    "warning": {
      "code": 19726347,
      "message": "Unable to use all attached capacity on node \"node_2\".
3 local/remote pool disks not usable for mirroring.",
      "arguments": [
        "node_2",
        "3"
      ]
    },
    "action": {
      "code": 19726348,
      "message": "Contact technical support."
    }
  }
],
"_links": {
  "self": {
    "href": "/api/storage/aggregates?recommend=true&fields=*"
  }
}
```

```
}
```

Retriving the usable spare information for the cluster

The following example shows the response from retrieving usable spare information according to ONTAP best practices.

```
 # The API:
/api/storage/aggregates?show_spares=true

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

# The response:
{
"records": [],
"num_reecords": 0,
"spares": [
  {
    "node": {
      "uuid": "0cdd84fa-b99c-11eb-b0ed-005056bb4fc2",
      "name": "node-2",
      "_links": {
        "self": {
          "href": "/api/cluster/nodes/0cdd84fa-b99c-11eb-b0ed-
005056bb4fc2"
        }
      }
    },
    "disk_class": "solid_state",
    "disk_type": "ssd",
    "size": 3720609792,
    "checksum_style": "block",
    "syncmirror_pool": "pool0",
    "is_partitioned": true,
    "usable": 12,
    "layout_requirements": [
      {
        "raid_type": "raid_dp",
        "default": true,
        "aggregate_min_disks": 3,
        "raid_group": {
          "min": 3,
          "max": 28,
          "default": 24
```

```
        }
      },
      {
        "raid_type": "raid4",
        "default": false,
        "aggregate_min_disks": 2,
        "raid_group": {
          "min": 2,
          "max": 14,
          "default": 8
        }
      },
      {
        "raid_type": "raid_tec",
        "default": false,
        "aggregate_min_disks": 7,
        "raid_group": {
          "min": 4,
          "max": 29,
          "default": 25
        }
      }
    ]
  },
  {
    "node": {
      "uuid": "0cdd84fa-b99c-11eb-b0ed-005056bb4fc2",
      "name": "node-2",
      "_links": {
        "self": {
          "href": "/api/cluster/nodes/0cdd84fa-b99c-11eb-b0ed-
005056bb4fc2"
        }
      }
    },
    "disk_class": "solid_state",
    "disk_type": "ssd_nvm",
    "size": 8583380992,
    "checksum_style": "block",
    "syncmirror_pool": "pool0",
    "is_partitioned": false,
    "usable": 5,
    "layout_requirements": [
      {
        "raid_type": "raid_dp",
        "default": true,
```

```
        "aggregate_min_disks": 3,
        "raid_group": {
          "min": 3,
          "max": 28,
          "default": 24
        }
      },
      {
        "raid_type": "raid4",
        "default": false,
        "aggregate_min_disks": 2,
        "raid_group": {
          "min": 2,
          "max": 14,
          "default": 8
        }
      },
      {
        "raid_type": "raid_tec",
        "default": false,
        "aggregate_min_disks": 7,
        "raid_group": {
          "min": 4,
          "max": 29,
          "default": 25
        }
      }
    ]
  }
],
"_link": {
  "self": {
    "href": "/api/storage/aggregates?show_spares=true"
  }
}
}
```

Retrieving the total spare count information for the cluster

The following example shows the response from retrieving total spare count information, under advanced privilege.

```
 # The API:
/api/storage/aggregates?show_spares=true&fields=**

# The call:
```

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

# The response:
{
"records": [],
"num_reecords": 0,
"spares": [
  {
    "node": {
      "uuid": "0cdd84fa-b99c-11eb-b0ed-005056bb4fc2",
      "name": "node-2",
      "_links": {
        "self": {
          "href": "/api/cluster/nodes/0cdd84fa-b99c-11eb-b0ed-
005056bb4fc2"
        }
      }
    },
    "disk_class": "solid_state",
    "disk_type": "ssd",
    "size": 3720609792,
    "checksum_style": "block",
    "syncmirror_pool": "pool0",
    "is_partitioned": true,
    "usable": 12,
    "total": 14,
    "layout_requirements": [
      {
        "raid_type": "raid_dp",
        "default": true,
        "aggregate_min_disks": 3,
        "raid_group": {
          "min": 3,
          "max": 28,
          "default": 24
        }
      },
      {
        "raid_type": "raid4",
        "default": false,
        "aggregate_min_disks": 2,
        "raid_group": {
          "min": 2,
          "max": 14,
```

```
          "default": 8
        }
      },
      {
        "raid_type": "raid_tec",
        "default": false,
        "aggregate_min_disks": 7,
        "raid_group": {
          "min": 4,
          "max": 29,
          "default": 25
        }
      }
    ]
  },
  {
    "node": {
      "uuid": "0cdd84fa-b99c-11eb-b0ed-005056bb4fc2",
      "name": "node-2",
      "_links": {
        "self": {
          "href": "/api/cluster/nodes/0cdd84fa-b99c-11eb-b0ed-
005056bb4fc2"
        }
      }
    },
    "disk_class": "solid_state",
    "disk_type": "ssd_nvm",
    "size": 8583380992,
    "checksum_style": "block",
    "syncmirror_pool": "pool0",
    "is_partitioned": false,
    "usable": 5,
    "total": 6,
    "layout_requirements": [
      {
        "raid_type": "raid_dp",
        "default": true,
        "aggregate_min_disks": 3,
        "raid_group": {
          "min": 3,
          "max": 28,
          "default": 24
        }
      },
      {
```

```
        "raid_type": "raid4",
        "default": false,
        "aggregate_min_disks": 2,
        "raid_group": {
          "min": 2,
          "max": 14,
          "default": 8
        }
      },
      {
        "raid_type": "raid_tec",
        "default": false,
        "aggregate_min_disks": 7,
        "raid_group": {
          "min": 4,
          "max": 29,
          "default": 25
        }
      }
    ]
  }
],
"_link": {
  "self": {
    "href": "/api/storage/aggregates?show_spares=true&fields=**"
  }
}
}
```

Simulating the creation of an aggregate using defined parameters

The following example shows the response in the simulation of a manual aggregate creation:

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

# The call
curl -X POST "https://<mgmt-ip>/api/storage/aggregates" -H "accept:
application/json" -d "{\"name\":\"node_2_SSD_1\",\"node\":
{\"name\":\"node-2\"},\"block_storage\": {\"primary\": {\"disk_count\":
\"12\" }},\"simulate\": \"true\"}"

# 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": 12,
        "disk_class": "solid_state",
        "raid_type": "raid_dp",
        "disk_type": "ssd",
        "raid_size": 24,
        "simulated_raid_groups": [
           {
             "name": "node_2_SSD_1/plex0/rg0",
             "raid_type": "raid_dp",
             "parity_disk_count": 2,
             "data_disk_count": 10,
             "usable_size": 558090240,
             "is_partition": true
           },
        ]
      },
      "hybrid_cache": {
        "enabled": false
      },
      "mirror": {
        "enabled": false
      }
    }
    "_links": {
      "self": {
        "href": "/api/storage/aggregates?recommend=true&fields=*"
      }
    }
  }
],
"num_records": 1,
"warnings": [
  {
```

```
    "name": "node-2"
    "warning": {
      "code": 19726347,
      "message": "Number of unassigned disks attached to node \"node-2\":
6.",
      "arguments": [
        "node-2",
        "6"
      ]
    }
  }
]
}
```


Retrieve a collection of aggregates for an entire cluster

GET `/storage/aggregates`

Introduced In: 9.6

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 Requesting specific fields to learn more.

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

Related ONTAP commands

- `storage aggregate show`

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'.
recommendation_spares.checksum_style	string	query	False	Filter by recommendation_spares.checksum_style • Introduced in: 9.10
recommendation_spares.is_partition	boolean	query	False	Filter by recommendation_spares.is_partition • Introduced in: 9.10
recommendation_spares.disk_class	string	query	False	Filter by recommendation_spares.disk_class • Introduced in: 9.10
recommendation_spares.layout_requirements.aggregate_min_disks	integer	query	False	Filter by recommendation_spares.layout_requirements.aggregate_min_disks • Introduced in: 9.10

Name	Type	In	Required	Description
recommendation_spares.layout_requirements.default	boolean	query	False	Filter by recommendation_spares.layout_requirements.default • Introduced in: 9.10
recommendation_spares.layout_requirements.raid_group.max	integer	query	False	Filter by recommendation_spares.layout_requirements.raid_group.max • Introduced in: 9.10
recommendation_spares.layout_requirements.raid_group.default	integer	query	False	Filter by recommendation_spares.layout_requirements.raid_group.default • Introduced in: 9.10
recommendation_spares.layout_requirements.raid_group.min	integer	query	False	Filter by recommendation_spares.layout_requirements.raid_group.min • Introduced in: 9.10
recommendation_spares.layout_requirements.raid_type	string	query	False	Filter by recommendation_spares.layout_requirements.raid_type • Introduced in: 9.10
recommendation_spares.disk_type	string	query	False	Filter by recommendation_spares.disk_type • Introduced in: 9.10

Name	Type	In	Required	Description
recommendation_spares.node.uuid	string	query	False	Filter by recommendation_spares.node.uuid • Introduced in: 9.10
recommendation_spares.node.name	string	query	False	Filter by recommendation_spares.node.name • Introduced in: 9.10
recommendation_spares.total	integer	query	False	Filter by recommendation_spares.total • Introduced in: 9.11
recommendation_spares.size	integer	query	False	Filter by recommendation_spares.size • Introduced in: 9.10
recommendation_spares.usable	integer	query	False	Filter by recommendation_spares.usable • Introduced in: 9.10
recommendation_spares.syncmirror_pool	string	query	False	Filter by recommendation_spares.syncmirror_pool • Introduced in: 9.10
inactive_data_reporting.start_time	string	query	False	Filter by inactive_data_reporting.start_time • Introduced in: 9.8

Name	Type	In	Required	Description
inactive_data_reporting.enabled	boolean	query	False	Filter by inactive_data_reporting.enabled • Introduced in: 9.8
uuid	string	query	False	Filter by uuid
node.uuid	string	query	False	Filter by node.uuid
node.name	string	query	False	Filter by node.name
volume-count	integer	query	False	Filter by volume-count • Introduced in: 9.11
sidl_enabled	boolean	query	False	Filter by sidl_enabled • Introduced in: 9.11
create_time	string	query	False	Filter by create_time
statistics.timestamp	string	query	False	Filter by statistics.timestamp • Introduced in: 9.7
statistics.iops_raw.other	integer	query	False	Filter by statistics.iops_raw.other • Introduced in: 9.7
statistics.iops_raw.read	integer	query	False	Filter by statistics.iops_raw.read • Introduced in: 9.7

Name	Type	In	Required	Description
statistics.iops_raw.write	integer	query	False	Filter by statistics.iops_raw.write • Introduced in: 9.7
statistics.iops_raw.total	integer	query	False	Filter by statistics.iops_raw.total • Introduced in: 9.7
statistics.status	string	query	False	Filter by statistics.status • Introduced in: 9.7
statistics.latency_raw.other	integer	query	False	Filter by statistics.latency_raw.other • Introduced in: 9.7
statistics.latency_raw.read	integer	query	False	Filter by statistics.latency_raw.read • Introduced in: 9.7
statistics.latency_raw.write	integer	query	False	Filter by statistics.latency_raw.write • Introduced in: 9.7
statistics.latency_raw.total	integer	query	False	Filter by statistics.latency_raw.total • Introduced in: 9.7

Name	Type	In	Required	Description
statistics.throughput_raw.other	integer	query	False	Filter by statistics.throughput_raw.other • Introduced in: 9.7
statistics.throughput_raw.read	integer	query	False	Filter by statistics.throughput_raw.read • Introduced in: 9.7
statistics.throughput_raw.write	integer	query	False	Filter by statistics.throughput_raw.write • Introduced in: 9.7
statistics.throughput_raw.total	integer	query	False	Filter by statistics.throughput_raw.total • Introduced in: 9.7
name	string	query	False	Filter by name
metric.iops.other	integer	query	False	Filter by metric.iops.other • Introduced in: 9.7
metric.iops.read	integer	query	False	Filter by metric.iops.read • Introduced in: 9.7
metric.iops.write	integer	query	False	Filter by metric.iops.write • Introduced in: 9.7

Name	Type	In	Required	Description
metric.iops.total	integer	query	False	Filter by metric.iops.total • Introduced in: 9.7
metric.timestamp	string	query	False	Filter by metric.timestamp • Introduced in: 9.7
metric.latency.other	integer	query	False	Filter by metric.latency.other • Introduced in: 9.7
metric.latency.read	integer	query	False	Filter by metric.latency.read • Introduced in: 9.7
metric.latency.write	integer	query	False	Filter by metric.latency.write • Introduced in: 9.7
metric.latency.total	integer	query	False	Filter by metric.latency.total • Introduced in: 9.7
metric.duration	string	query	False	Filter by metric.duration • Introduced in: 9.7
metric.status	string	query	False	Filter by metric.status • Introduced in: 9.7

Name	Type	In	Required	Description
metric.throughput.other	integer	query	False	Filter by metric.throughput.other • Introduced in: 9.7
metric.throughput.read	integer	query	False	Filter by metric.throughput.read • Introduced in: 9.7
metric.throughput.write	integer	query	False	Filter by metric.throughput.write • Introduced in: 9.7
metric.throughput.total	integer	query	False	Filter by metric.throughput.total • Introduced in: 9.7
snapshot.max_files_available	integer	query	False	Filter by snapshot.max_files_available • Introduced in: 9.10
snapshot.max_files_used	integer	query	False	Filter by snapshot.max_files_used • Introduced in: 9.10
snapshot.files_used	integer	query	False	Filter by snapshot.files_used • Introduced in: 9.10

Name	Type	In	Required	Description
snapshot.files_total	integer	query	False	Filter by snapshot.files_total • Introduced in: 9.10
home_node.uuid	string	query	False	Filter by home_node.uuid
home_node.name	string	query	False	Filter by home_node.name
is_spare_low	boolean	query	False	Filter by is_spare_low • Introduced in: 9.11
inode_attributes.max_files_possible	integer	query	False	Filter by inode_attributes.max_files_possible • Introduced in: 9.11
inode_attributes.files_private_used	integer	query	False	Filter by inode_attributes.files_private_used • Introduced in: 9.11
inode_attributes.files_total	integer	query	False	Filter by inode_attributes.files_total • Introduced in: 9.11
inode_attributes.used_percent	integer	query	False	Filter by inode_attributes.used_percent • Introduced in: 9.11 • Max value: 100 • Min value: 0

Name	Type	In	Required	Description
inode_attributes.version	integer	query	False	Filter by inode_attributes.version • Introduced in: 9.11
inode_attributes.max_files_available	integer	query	False	Filter by inode_attributes.max_files_available • Introduced in: 9.11
inode_attributes.file_private_capacity	integer	query	False	Filter by inode_attributes.file_private_capacity • Introduced in: 9.11
inode_attributes.files_used	integer	query	False	Filter by inode_attributes.files_used • Introduced in: 9.11
inode_attributes.max_files_used	integer	query	False	Filter by inode_attributes.max_files_used • Introduced in: 9.11
inode_attributes.file_public_capacity	integer	query	False	Filter by inode_attributes.file_public_capacity • Introduced in: 9.11
dr_home_node.name	string	query	False	Filter by dr_home_node.name
dr_home_node.uuid	string	query	False	Filter by dr_home_node.uuid

Name	Type	In	Required	Description
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.efficiency.ratio	number	query	False	Filter by space.efficiency.ratio
space.snapshot.reserve_percent	integer	query	False	Filter by space.snapshot.reserve_percent • Introduced in: 9.10
space.snapshot.available	integer	query	False	Filter by space.snapshot.available • Introduced in: 9.10
space.snapshot.used_percent	integer	query	False	Filter by space.snapshot.used_percent • Introduced in: 9.10
space.snapshot.used	integer	query	False	Filter by space.snapshot.used • Introduced in: 9.10
space.snapshot.total	integer	query	False	Filter by space.snapshot.total • Introduced in: 9.10
space.footprint	integer	query	False	Filter by space.footprint

Name	Type	In	Required	Description
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_without_snapshots.ratio	number	query	False	Filter by space.efficiency_without_snapshots.ratio
space.cloud_storage.used	integer	query	False	Filter by space.cloud_storage.used
space.efficiency_without_snapshots_flexclones.logical_used	integer	query	False	Filter by space.efficiency_without_snapshots_flexclones.logical_used • Introduced in: 9.9
space.efficiency_without_snapshots_flexclones.savings	integer	query	False	Filter by space.efficiency_without_snapshots_flexclones.savings • Introduced in: 9.9
space.efficiency_without_snapshots_flexclones.ratio	number	query	False	Filter by space.efficiency_without_snapshots_flexclones.ratio • Introduced in: 9.9

Name	Type	In	Required	Description
space.block_storage.data_compaction_space_saved_percent	integer	query	False	Filter by space.block_storage.data_compaction_space_saved_percent • Introduced in: 9.10
space.block_storage.size	integer	query	False	Filter by space.block_storage.size
space.block_storage.volume_deduplication_space_saved_percent	integer	query	False	Filter by space.block_storage.volume_deduplication_space_saved_percent • Introduced in: 9.10
space.block_storage.used	integer	query	False	Filter by space.block_storage.used
space.block_storage.data_compacted_count	integer	query	False	Filter by space.block_storage.data_compacted_count • Introduced in: 9.10
space.block_storage.data_compaction_space_saved	integer	query	False	Filter by space.block_storage.data_compaction_space_saved • Introduced in: 9.10
space.block_storage.volume_deduplication_shared_count	integer	query	False	Filter by space.block_storage.volume_deduplication_shared_count • Introduced in: 9.10

Name	Type	In	Required	Description
space.block_storage.physical_used	integer	query	False	Filter by space.block_storage.physical_used • Introduced in: 9.9
space.block_storage.inactive_user_data_percent	integer	query	False	Filter by space.block_storage.inactive_user_data_percent • Introduced in: 9.10
space.block_storage.volume_deduplication_space_saved	integer	query	False	Filter by space.block_storage.volume_deduplication_space_saved • Introduced in: 9.10
space.block_storage.aggregate_metadata_percent	integer	query	False	Filter by space.block_storage.aggregate_metadata_percent • Introduced in: 9.11
space.block_storage.aggregate_metadata	integer	query	False	Filter by space.block_storage.aggregate_metadata • Introduced in: 9.11
space.block_storage.available	integer	query	False	Filter by space.block_storage.available

Name	Type	In	Required	Description
space.block_storage.physical_used_percent	integer	query	False	Filter by space.block_storage.physical_used_percent • Introduced in: 9.10
space.block_storage.inactive_user_data	integer	query	False	Filter by space.block_storage.inactive_user_data
space.block_storage.used_including_snapshot_reserve	integer	query	False	Filter by space.block_storage.used_including_snapshot_reserve • Introduced in: 9.11
space.block_storage.full_threshold_percent	integer	query	False	Filter by space.block_storage.full_threshold_percent
space.block_storage.used_including_snapshot_reserve_percent	integer	query	False	Filter by space.block_storage.used_including_snapshot_reserve_percent • Introduced in: 9.11
space.block_storage.volume_footprints_percent	integer	query	False	Filter by space.block_storage.volume_footprints_percent • Introduced in: 9.11
state	string	query	False	Filter by state

Name	Type	In	Required	Description
block_storage.uses_partitions	boolean	query	False	Filter by block_storage.uses_partitions • Introduced in: 9.11
block_storage.plexes.name	string	query	False	Filter by block_storage.plexes.name
block_storage.mirror.state	string	query	False	Filter by block_storage.mirror.state
block_storage.mirror.enabled	boolean	query	False	Filter by block_storage.mirror.enabled
block_storage.hybrid_cache.storage_pools.allocation_units_count	integer	query	False	Filter by block_storage.hybrid_cache.storage_pools.allocation_units_count • Introduced in: 9.11
block_storage.hybrid_cache.storage_pools.storage_pool.name	string	query	False	Filter by block_storage.hybrid_cache.storage_pools.storage_pool.name • Introduced in: 9.11
block_storage.hybrid_cache.storage_pools.storage_pool.uuid	string	query	False	Filter by block_storage.hybrid_cache.storage_pools.storage_pool.uuid • Introduced in: 9.11
block_storage.hybrid_cache.disk_count	integer	query	False	Filter by block_storage.hybrid_cache.disk_count

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.enabled	boolean	query	False	Filter by block_storage.hybrid_cache.enabled
block_storage.hybrid_cache.size	integer	query	False	Filter by block_storage.hybrid_cache.size
block_storage.hybrid_cache.used	integer	query	False	Filter by block_storage.hybrid_cache.used
block_storage.primary.disk_type	string	query	False	Filter by block_storage.primary.disk_type • Introduced in: 9.7
block_storage.primary.raid_size	integer	query	False	Filter by block_storage.primary.raid_size
block_storage.primary.simulated_raid_groups.usable_size	integer	query	False	Filter by block_storage.primary.simulated_raid_groups.usable_size • Introduced in: 9.10
block_storage.primary.simulated_raid_groups.existing_data_disk_count	integer	query	False	Filter by block_storage.primary.simulated_raid_groups.existing_data_disk_count • Introduced in: 9.11

Name	Type	In	Required	Description
block_storage.primary.simulated_raid_groups.raid_type	string	query	False	Filter by block_storage.primary.simulated_raid_groups.raid_type • Introduced in: 9.10
block_storage.primary.simulated_raid_groups.existing_parity_disk_count	integer	query	False	Filter by block_storage.primary.simulated_raid_groups.existing_parity_disk_count • Introduced in: 9.11
block_storage.primary.simulated_raid_groups.name	string	query	False	Filter by block_storage.primary.simulated_raid_groups.name • Introduced in: 9.10
block_storage.primary.simulated_raid_groups.added_parity_disk_count	integer	query	False	Filter by block_storage.primary.simulated_raid_groups.added_parity_disk_count • Introduced in: 9.11
block_storage.primary.simulated_raid_groups.is_partition	boolean	query	False	Filter by block_storage.primary.simulated_raid_groups.is_partition • Introduced in: 9.10
block_storage.primary.simulated_raid_groups.added_data_disk_count	integer	query	False	Filter by block_storage.primary.simulated_raid_groups.added_data_disk_count • Introduced in: 9.11

Name	Type	In	Required	Description
block_storage.primary.simulated_raid_groups.parity_disk_count	integer	query	False	Filter by block_storage.primary.simulated_raid_groups.parity_disk_count • Introduced in: 9.10
block_storage.primary.simulated_raid_groups.data_disk_count	integer	query	False	Filter by block_storage.primary.simulated_raid_groups.data_disk_count • Introduced in: 9.10
block_storage.primary.disk_class	string	query	False	Filter by block_storage.primary.disk_class
block_storage.primary.raid_type	string	query	False	Filter by block_storage.primary.raid_type
block_storage.primary.disk_count	integer	query	False	Filter by block_storage.primary.disk_count
block_storage.primary.checksum_style	string	query	False	Filter by block_storage.primary.checksum_style
block_storage.storage_type	string	query	False	Filter by block_storage.storage_type • Introduced in: 9.11
data_encryption.drive_protection_enabled	boolean	query	False	Filter by data_encryption.drive_protection_enabled

Name	Type	In	Required	Description
data_encryption.software_encryption_enabled	boolean	query	False	Filter by data_encryption.software_encryption_enabled
snaplock_type	string	query	False	Filter by snaplock_type
fields	array[string]	query	False	Specify the fields to return.
max_records	integer	query	False	Limit the number of records returned.
return_records	boolean	query	False	The default is true for GET calls. When set to false, only the number of records is returned. • Default value: 1
return_timeout	integer	query	False	The number of seconds to allow the call to execute before returning. When iterating over a collection, the default is 15 seconds. ONTAP returns earlier if either max records or the end of the collection is reached. • Max value: 120 • Min value: 0 • Default value: 1
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]	
warnings	array[aggregate_warning]	List of warnings and remediation advice for the aggregate recommendation.

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": "string",
          "size": 1612709888,
          "storage_pools": [
            {
              "storage_pool": {
                "_links": {
                  "self": {
                    "href": "/api/resourcelink"
                  }
                },
                "name": "storage_pool_1",
                "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
              }
            }
```

```
        ],
        "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",
        "simulated_raid_groups": [
          {
            "name": "string",
            "raid_type": "string"
          }
        ]
      },
      "storage_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"
    },
    "inode_attributes": {
      "file_private_capacity": 31136,
      "file_public_capacity": 31136,
      "files_private_used": 502,
      "files_total": 31136,
      "files_used": 97,
      "max_files_available": 31136,
      "max_files_possible": 2844525,
      "max_files_used": 97,
      "used_percent": 5,
      "version": 4
    },
    "is_spare_low": "",
    "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"
    },
    "recommendation_spares": [
      {
        "checksum_style": "string",
        "disk_class": "solid_state",
        "disk_type": "string",
        "is_partition": 1,
        "layout_requirements": [
          {
            "aggregate_min_disks": 6,
            "raid_group": {
              "default": 16,
              "max": 28,
              "min": 5
            },
            "raid_type": "string"
          }
        ],
        "node": {
          "_links": {
            "self": {
              "href": "/api/resourcelink"
            }
          },
          "name": "node1",
```

```
          "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
        },
        "size": 10156769280,
        "syncmirror_pool": "string",
        "total": 10,
        "usable": 9
      }
    ],
    "snaplock_type": "string",
    "snapshot": {
      "files_total": 10,
      "files_used": 3,
      "max_files_available": 5,
      "max_files_used": 50
    },
    "space": {
      "block_storage": {
        "aggregate_metadata": 2655,
        "aggregate_metadata_percent": 8,
        "available": 10156560384,
        "data_compacted_count": 1990000,
        "data_compaction_space_saved": 1996000,
        "data_compaction_space_saved_percent": 27,
        "full_threshold_percent": 0,
        "inactive_user_data": 304448,
        "inactive_user_data_percent": 0,
        "physical_used": 2461696,
        "physical_used_percent": 50,
        "size": 10156769280,
        "used": 2088960,
        "used_including_snapshot_reserve": 674685,
        "used_including_snapshot_reserve_percent": 35,
        "volume_deduplication_shared_count": 1990000,
        "volume_deduplication_space_saved": 1996000,
        "volume_deduplication_space_saved_percent": 27,
        "volume_footprints_percent": 14
      },
      "cloud_storage": {
        "used": 402743264
      },
      "efficiency": {
        "logical_used": 0,
        "ratio": 0,
        "savings": 0
      },
      "efficiency_without_snapshots": {
```

```
          "logical_used": 0,
          "ratio": 0,
          "savings": 0
        },
        "efficiency_without_snapshots_flexclones": {
          "logical_used": 0,
          "ratio": 0,
          "savings": 0
        },
        "footprint": 608896,
        "snapshot": {
          "available": 2000,
          "reserve_percent": 20,
          "total": 5000,
          "used": 3000,
          "used_percent": 45
        }
      },
      "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",
      "volume-count": 0
    }
  ],
  "spares": [
    {
      "checksum_style": "string",
      "disk_class": "solid_state",
```

```
      "disk_type": "string",
      "is_partition": 1,
      "layout_requirements": [
        {
          "aggregate_min_disks": 6,
          "raid_group": {
            "default": 16,
            "max": 28,
            "min": 5
          },
          "raid_type": "string"
        }
      ],
      "node": {
        "_links": {
          "self": {
            "href": "/api/resourcelink"
          }
        },
        "name": "node1",
        "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
      },
      "size": 10156769280,
      "syncmirror_pool": "string",
      "total": 10,
      "usable": 9
    }
  ],
  "warnings": [
    {
      "action": {
        "arguments": [
          "string"
        ],
        "message": "string"
      },
      "name": "string",
      "warning": {
        "arguments": [
          "string"
        ],
        "message": "string"
      }
    }
  ]
}
```

Error

```
Status: Default
```

ONTAP Error Response Codes

Error Code	Description
787092	The target field cannot be specified for this operation.
918138	Internal error. Failed to get encryption operation status.
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 with Fibre Channel (FC).
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.
19726387	No recommendation can be provided for this cluster within the license capacity.
19726401	Aggregate recommendations are not supported when the DR group is not in the "normal" state.
19726402	Internal error. Unable to determine the MetroCluster configuration state.
19726403	Aggregate recommendation is not supported when there are no healthy target connections to remote storage.
19726404	The recommended mirrored aggregate couldn’t use all the attached capacity in one of the SyncMirror pools. Make sure that the remote and local storage is symmetrically wired.
19726405	Not all local and remote disks attached to the node have been auto-partitioned.
19726406	Aggregate recommendations are not supported on this node because remote and local storage is not symmetrically wired.

Error Code	Description
19726540	The next tag is not supported for recommended aggregates. Retry the operation with a higher "return_timeout" value.
196608055	Aggregate recommendation is not supported on this node because it does not support NetApp Aggregate Encryption (NAE).
196608206	Internal error. Failed to get encryption operation status.

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	

storage_pool_reference

Shared Storage Pool

Name	Type	Description
_links	_links	
name	string	

Name	Type	Description
uuid	string	

storage_pools

Name	Type	Description
allocation_units_count	integer	Allocation count of storage pool.
storage_pool	storage_pool_reference	Shared Storage Pool

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'.
storage_pools	array[storage_pools]	List of storage pool properties and allocation_units_count for aggregate.
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	

simulated_raid_groups

Name	Type	Description
added_data_disk_count	integer	Number of added data disks in RAID group.
added_parity_disk_count	integer	Number of added parity disks in RAID group.
data_disk_count	integer	Number of data disks in RAID group.
existing_data_disk_count	integer	Number of existing data disks in the RAID group.
existing_parity_disk_count	integer	Number of existing parity disks in the RAID group.
is_partition	boolean	Indicates whether the disk is partitioned (true) or whole (false).
name	string	Name of the raid group.
parity_disk_count	integer	Number of parity disks in RAID group.
raid_type	string	RAID type of the aggregate.
usable_size	integer	Usable size of each disk, in bytes.

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.
simulated_raid_groups	array[simulated_raid_groups]	

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.
storage_type	string	Type of aggregate.

Name	Type	Description
uses_partitions	boolean	If true, aggregate is using shared disks.

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	Specifies whether the 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	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	_links	
name	string	
uuid	string	

inactive_data_reporting

Name	Type	Description
enabled	boolean	Specifes 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.

inode_attributes

Name	Type	Description
file_private_capacity	integer	Number of files that can currently be stored on disk for system metadata files. This number will dynamically increase as more system files are created. 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 **.
file_public_capacity	integer	Number of files that can currently be stored on disk for user-visible files. This number will dynamically increase as more user-visible files are created. 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 **.
files_private_used	integer	Number of system metadata files used. If the referenced file system is restricted or offline, a value of 0 is returned. 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 **.
files_total	integer	Maximum number of user-visible files that this referenced file system can currently hold. If the referenced file system is restricted or offline, a value of 0 is returned.

Name	Type	Description
files_used	integer	Number of user-visible files used in the referenced file system. If the referenced file system is restricted or offline, a value of 0 is returned.
max_files_available	integer	The count of the maximum number of user-visible files currently allowable on the referenced file system.
max_files_possible	integer	The largest value to which the maxfiles-available parameter can be increased by reconfiguration, on the referenced file system.
max_files_used	integer	The number of user-visible files currently in use on the referenced file system.
used_percent	integer	The percentage of disk space currently in use based on user-visible file count on the referenced file system.
version	integer	The inofile-version of the aggregate. If the referenced file system is restricted or offline, a value of 0 is returned. 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

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.

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.

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.

Name	Type	Description
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.

Name	Type	Description
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	

raid_group

Name	Type	Description
default	integer	Default number of disks in a RAID group.
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.
disk_type	string	Type of disk.
is_partition	boolean	Indicates whether a disk is partitioned (true) or whole (false)
layout_requirements	array[layout_requirement]	Available RAID protections and their restrictions.
node	node	Node where the spares are assigned.
size	integer	Usable size of each spare, in bytes.
syncmirror_pool	string	SyncMirror spare pool.
total	integer	Total number of spares in the bucket. The total spare count for each class of spares also includes reserved spare capacity recommended by ONTAP best practices. • example: 10 • readOnly: 1 • Introduced in: 9.11

Name	Type	Description
usable	integer	Total number of usable spares in the bucket. The usable count for each class of spares does not include reserved spare capacity recommended by ONTAP best practices. • example: 9 • readOnly: 1 • Introduced in: 9.6

snapshot

Name	Type	Description
files_total	integer	Total files allowed in Snapshot copies
files_used	integer	Total files created in Snapshot copies
max_files_available	integer	Maximum files available for Snapshot copies
max_files_used	integer	Files in use by Snapshot copies

block_storage

Name	Type	Description
aggregate_metadata	integer	Space used by different metafiles and internal operations inside the aggregate, in bytes.
aggregate_metadata_percent	integer	Aggregate metadata as a percentage.
available	integer	Space available in bytes.
data_compacted_count	integer	Amount of compacted data in bytes.
data_compaction_space_saved	integer	Space saved in bytes by compacting the data.

Name	Type	Description
data_compaction_space_saved_percent	integer	Percentage saved by compacting the data.
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 **.
inactive_user_data_percent	integer	The percentage of inactive user data in the block storage. 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_percent or **.
physical_used	integer	Total physical used size of an aggregate in bytes.
physical_used_percent	integer	Physical used percentage.

Name	Type	Description
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.
used_including_snapshot_reserve	integer	Total used including the Snapshot copy reserve, in bytes.
used_including_snapshot_reserve_percent	integer	Total used including the Snapshot reserve as a percentage.
volume_deduplication_shared_count	integer	Amount of shared bytes counted by storage efficiency.
volume_deduplication_space_saved	integer	Amount of space saved in bytes by storage efficiency.
volume_deduplication_space_saved_percent	integer	Percentage of space saved by storage efficiency.
volume_footprints_percent	integer	A summation of volume footprints inside the aggregate, as a percentage. A volume's footprint is the amount of space being used for the volume in the aggregate.

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)

efficiency_without_snapshots_flexclones

Storage efficiency that does not include the savings provided by Snapshot copies and Flexclone volumes.

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)

snapshot

Name	Type	Description
available	integer	Available space for Snapshot copies in bytes
reserve_percent	integer	Percentage of space reserved for Snapshot copies
total	integer	Total space for Snapshot copies in bytes

Name	Type	Description
used	integer	Space used by Snapshot copies in bytes
used_percent	integer	Percentage of disk space used by Snapshot copies

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.
efficiency_without_snapshots_flexclones	efficiency_without_snapshots_flexclones	Storage efficiency that does not include the savings provided by Snapshot copies and Flexclone volumes.
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 **.
snapshot	snapshot	

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 resides after disaster recovery. The value for this field might differ from the 'node' field during switchover.
home_node	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.
inactive_data_reporting	inactive_data_reporting	
inode_attributes	inode_attributes	
is_spare_low	boolean	Specifies whether the aggregate is in a spares low condition on any of the RAID groups. 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 **.
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.
recommendation_spares	array[aggregate_spare]	Information on the aggregate's remaining hot spare disks.

Name	Type	Description
sidl_enabled	boolean	Specifies whether or not SIDL is enabled on the aggregate.
snaplock_type	string	SnapLock type.
snapshot	snapshot	
space	space	
state	string	Operational state of the aggregate.
statistics	statistics	The real time I/O statistics for the aggregate.
uuid	string	Aggregate UUID.
volume-count	integer	Number of volumes in the aggregate.

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	action	
name	string	Name of the entity that returns the warning.
warning	warning	

Create a collection of aggregates for an entire cluster

POST `/storage/aggregates`

Introduced In: 9.6

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. POST operations will be blocked while one or more nodes in the cluster are simulating or implementing automatic aggregate creation.

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"}}}
```

Parameters

Name	Type	In	Required	Description
disk_size	integer	query	False	If set, POST only selects disks of the specified size.
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. • Default value: 1 • Max value: 120 • Min value: 0

Name	Type	In	Required	Description
return_records	boolean	query	False	The default is false. If set to true, the records are returned. • Default value:

Request Body

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.
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 resides after disaster recovery. The value for this field might differ from the 'node' field during switchover.
home_node	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.
inactive_data_reporting	inactive_data_reporting	

Name	Type	Description
is_spare_low	boolean	Specifies whether the aggregate is in a spares low condition on any of the RAID groups. 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 **.
name	string	Aggregate name.
node	node	Node where the aggregate currently resides.
recommendation_spares	array[aggregate_spare]	Information on the aggregate's remaining hot spare disks.
sidl_enabled	boolean	Specifies whether or not SIDL is enabled on the aggregate.
snaplock_type	string	SnapLock type.
snapshot	snapshot	
space	space	
state	string	Operational state of the aggregate.
uuid	string	Aggregate UUID.
volume-count	integer	Number of volumes in the aggregate.

Example request

```
{
  "block_storage": {
    "hybrid_cache": {
      "disk_count": 6,
      "raid_type": "string",
      "size": 1612709888,
      "storage_pools": [
        {
          "storage_pool": {
            "name": "storage_pool_1",
            "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
          }
        }
      ],
      "used": 26501122
    },
    "mirror": {
      "enabled": "",
      "state": "string"
    },
    "plexes": [
      {
        "name": "plex0"
      }
    ],
    "primary": {
      "checksum_style": "string",
      "disk_class": "performance",
      "disk_count": 8,
      "disk_type": "string",
      "raid_size": 16,
      "raid_type": "string",
      "simulated_raid_groups": [
        {
          "name": "string",
          "raid_type": "string"
        }
      ]
    },
    "storage_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": {
    "enabled": null,
    "start_time": "2019-12-12T12:00:00-04:00"
  },
  "is_spare_low": "",
  "name": "node1_aggr_1",
  "node": {
    "name": "node1",
    "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
  },
  "recommendation_spares": [
    {
      "checksum_style": "string",
      "disk_class": "solid_state",
      "disk_type": "string",
      "is_partition": 1,
      "layout_requirements": [
        {
          "aggregate_min_disks": 6,
          "raid_group": {
            "default": 16,
            "max": 28,
            "min": 5
          },
          "raid_type": "string"
        }
      ],
      "node": {
        "name": "node1",
```

```
        "uuid": "1cd8a442-86d1-11e0-ae1c-123478563412"
      },
      "size": 10156769280,
      "syncmirror_pool": "string",
      "total": 10,
      "usable": 9
    }
  ],
  "snaplock_type": "string",
  "snapshot": {
    "files_total": 10,
    "files_used": 3,
    "max_files_available": 5,
    "max_files_used": 50
  },
  "space": {
    "block_storage": {
      "aggregate_metadata": 2655,
      "aggregate_metadata_percent": 8,
      "available": 10156560384,
      "data_compacted_count": 1990000,
      "data_compaction_space_saved": 1996000,
      "data_compaction_space_saved_percent": 27,
      "full_threshold_percent": 0,
      "inactive_user_data": 304448,
      "inactive_user_data_percent": 0,
      "physical_used": 2461696,
      "physical_used_percent": 50,
      "size": 10156769280,
      "used": 2088960,
      "used_including_snapshot_reserve": 674685,
      "used_including_snapshot_reserve_percent": 35,
      "volume_deduplication_shared_count": 1990000,
      "volume_deduplication_space_saved": 1996000,
      "volume_deduplication_space_saved_percent": 27,
      "volume_footprints_percent": 14
    },
    "cloud_storage": {
      "used": 402743264
    },
    "efficiency": {
      "logical_used": 0,
      "ratio": 0,
      "savings": 0
    },
    "efficiency_without_snapshots": {
```

```
      "logical_used": 0,
      "ratio": 0,
      "savings": 0
    },
    "efficiency_without_snapshots_flexclones": {
      "logical_used": 0,
      "ratio": 0,
      "savings": 0
    },
    "footprint": 608896,
    "snapshot": {
      "available": 2000,
      "reserve_percent": 20,
      "total": 5000,
      "used": 3000,
      "used_percent": 45
    }
  },
  "state": "string",
  "uuid": "string",
  "volume-count": 0
}
```


Response

```
Status: 202, Accepted
```

Name	Type	Description
job	job_link	

Example response


```
{
  "job": {
    "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.
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.
918138	Internal error. Failed to get encryption operation status.
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 with Fibre Channel (FC).
19726358	Automatic aggregate creation is not supported on ONTAP Cloud.
19726373	Recommendation specified for creating aggregates is not current.
19726378	Failed to create recommended aggregates on one or more nodes.
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.

Error Code	Description
19726387	No recommendation can be provided for this cluster within the license capacity.
19726401	Aggregate recommendations are not supported when the DR group is not in the "normal" state.
19726402	Internal error. Unable to determine the MetroCluster configuration state.
19726403	Aggregate recommendation is not supported when there are no healthy target connections to remote storage.
196608055	Aggregate recommendation is not supported on this node because it does not support NetApp Aggregate Encryption (NAE).
196608206	Internal error. Failed to get encryption operation status.

Definitions

See Definitions

href

Name	Type	Description
href	string	

_links

storage_pool_reference

Shared Storage Pool

Name	Type	Description
name	string	
uuid	string	

storage_pools

Name	Type	Description
allocation_units_count	integer	Allocation count of storage pool.
storage_pool	storage_pool_reference	Shared Storage Pool

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'.

Name	Type	Description
storage_pools	array[storage_pools]	List of storage pool properties and allocation_units_count for aggregate.
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	

simulated_raid_groups

Name	Type	Description
added_data_disk_count	integer	Number of added data disks in RAID group.
added_parity_disk_count	integer	Number of added parity disks in RAID group.
data_disk_count	integer	Number of data disks in RAID group.
existing_data_disk_count	integer	Number of existing data disks in the RAID group.
existing_parity_disk_count	integer	Number of existing parity disks in the RAID group.
is_partition	boolean	Indicates whether the disk is partitioned (true) or whole (false).

Name	Type	Description
name	string	Name of the raid group.
parity_disk_count	integer	Number of parity disks in RAID group.
raid_type	string	RAID type of the aggregate.
usable_size	integer	Usable size of each disk, in bytes.

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.
simulated_raid_groups	array[simulated_raid_groups]	

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.
storage_type	string	Type of aggregate.
uses_partitions	boolean	If true, aggregate is using shared disks.

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	Specifies whether the 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	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	_links	
name	string	
uuid	string	

inactive_data_reporting

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

inode_attributes

Name	Type	Description
file_private_capacity	integer	Number of files that can currently be stored on disk for system metadata files. This number will dynamically increase as more system files are created. 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 **.
file_public_capacity	integer	Number of files that can currently be stored on disk for user-visible files. This number will dynamically increase as more user-visible files are created. 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 **.
files_private_used	integer	Number of system metadata files used. If the referenced file system is restricted or offline, a value of 0 is returned. 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 **.

Name	Type	Description
files_total	integer	Maximum number of user-visible files that this referenced file system can currently hold. If the referenced file system is restricted or offline, a value of 0 is returned.
files_used	integer	Number of user-visible files used in the referenced file system. If the referenced file system is restricted or offline, a value of 0 is returned.
max_files_available	integer	The count of the maximum number of user-visible files currently allowable on the referenced file system.
max_files_possible	integer	The largest value to which the maxfiles-available parameter can be increased by reconfiguration, on the referenced file system.
max_files_used	integer	The number of user-visible files currently in use on the referenced file system.
used_percent	integer	The percentage of disk space currently in use based on user-visible file count on the referenced file system.
version	integer	The inofile-version of the aggregate. If the referenced file system is restricted or offline, a value of 0 is returned. 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

The rate of I/O operations observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Peformance metric for write I/O operations.

latency

The round trip latency in microseconds observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.
read	integer	Performance metric for read I/O operations.
total	integer	Performance metric aggregated over all types of I/O operations.
write	integer	Peformance metric for write I/O operations.

throughput

The rate of throughput bytes per second observed at the storage object.

Name	Type	Description
other	integer	Performance metric for other I/O operations. Other I/O operations can be metadata operations, such as directory lookups and so on.

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.

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.

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	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	

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.
disk_type	string	Type of disk.
is_partition	boolean	Indicates whether a disk is partitioned (true) or whole (false)
layout_requirements	array[layout_requirement]	Available RAID protections and their restrictions.

Name	Type	Description
node	node	Node where the spares are assigned.
size	integer	Usable size of each spare, in bytes.
syncmirror_pool	string	SyncMirror spare pool.
total	integer	Total number of spares in the bucket. The total spare count for each class of spares also includes reserved spare capacity recommended by ONTAP best practices. • example: 10 • readOnly: 1 • Introduced in: 9.11
usable	integer	Total number of usable spares in the bucket. The usable count for each class of spares does not include reserved spare capacity recommended by ONTAP best practices. • example: 9 • readOnly: 1 • Introduced in: 9.6

snapshot

Name	Type	Description
files_total	integer	Total files allowed in Snapshot copies
files_used	integer	Total files created in Snapshot copies
max_files_available	integer	Maximum files available for Snapshot copies
max_files_used	integer	Files in use by Snapshot copies

block_storage

Name	Type	Description
aggregate_metadata	integer	Space used by different metafiles and internal operations inside the aggregate, in bytes.
aggregate_metadata_percent	integer	Aggregate metadata as a percentage.
available	integer	Space available in bytes.
data_compacted_count	integer	Amount of compacted data in bytes.
data_compaction_space_saved	integer	Space saved in bytes by compacting the data.
data_compaction_space_saved_percent	integer	Percentage saved by compacting the data.
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 **.

Name	Type	Description
inactive_user_data_percent	integer	The percentage of inactive user data in the block storage. 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_percent or **.
physical_used	integer	Total physical used size of an aggregate in bytes.
physical_used_percent	integer	Physical used percentage.
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.
used_including_snapshot_reserve	integer	Total used including the Snapshot copy reserve, in bytes.
used_including_snapshot_reserve_percent	integer	Total used including the Snapshot reserve as a percentage.
volume_deduplication_shared_count	integer	Amount of shared bytes counted by storage efficiency.
volume_deduplication_space_saved	integer	Amount of space saved in bytes by storage efficiency.
volume_deduplication_space_saved_percent	integer	Percentage of space saved by storage efficiency.

Name	Type	Description
volume_footprints_percent	integer	A summation of volume footprints inside the aggregate, as a percentage. A volume's footprint is the amount of space being used for the volume in the aggregate.

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)

efficiency_without_snapshots_flexclones

Storage efficiency that does not include the savings provided by Snapshot copies and Flexclone volumes.

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)

snapshot

Name	Type	Description
available	integer	Available space for Snapshot copies in bytes
reserve_percent	integer	Percentage of space reserved for Snapshot copies
total	integer	Total space for Snapshot copies in bytes
used	integer	Space used by Snapshot copies in bytes
used_percent	integer	Percentage of disk space used by Snapshot copies

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.
efficiency_without_snapshots_flexclones	efficiency_without_snapshots_flexclones	Storage efficiency that does not include the savings provided by Snapshot copies and Flexclone volumes.

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 **.
snapshot	snapshot	

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.
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.
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 resides after disaster recovery. The value for this field might differ from the 'node' field during switchover.
home_node	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.
inactive_data_reporting	inactive_data_reporting	
is_spare_low	boolean	Specifies whether the aggregate is in a spares low condition on any of the RAID groups. 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 **.
name	string	Aggregate name.
node	node	Node where the aggregate currently resides.

Name	Type	Description
recommendation_spares	array[aggregate_spare]	Information on the aggregate's remaining hot spare disks.
sidl_enabled	boolean	Specifies whether or not SIDL is enabled on the aggregate.
snaplock_type	string	SnapLock type.
snapshot	snapshot	
space	space	
state	string	Operational state of the aggregate.
uuid	string	Aggregate UUID.
volume-count	integer	Number of volumes in the aggregate.

job_link

Name	Type	Description
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

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

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