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Welcome to the *Developer Manual* for Bright Cluster Manager 9.1.

### 0.1 About This Manual

This manual is aimed at helping developers who would like to program the Bright Cluster Manager in order to enhance or alter its functionality. It is not intended for end users who simply wish to submit jobs that run programs to workload managers, which is discussed in the *User Manual*. The developer is expected to be reasonably familiar with the parts of the *Administrator Manual* that is to be dealt with—primarily CMDaemon, of which *cmsh* and *cmgui* are the front ends.

This manual discusses the Python API to CMDaemon, and also covers how to program for metric collections.

### 0.2 About The Manuals In General

Regularly updated versions of the Bright Cluster Manager 9.1 manuals are available on updated clusters by default at `/cm/shared/docs/cm`. The latest updates are always online at [http://support.brightcomputing.com/manuals](http://support.brightcomputing.com/manuals).

- The *Administrator Manual* describes the general management of the cluster.
- The *Installation Manual* describes installation procedures for a basic cluster.
- The *User Manual* describes the user environment and how to submit jobs for the end user.
- The *Cloudbursting Manual* describes how to deploy the cloud capabilities of the cluster.
- The *Developer Manual* has useful information for developers who would like to program with Bright Cluster Manager.
- The *Edge Manual* describes how to deploy Bright Edge with Bright Cluster Manager.
- The *Machine Learning Manual* describes how to install and configure machine learning capabilities with Bright Cluster Manager.

If the manuals are downloaded and kept in one local directory, then in most pdf viewers, clicking on a cross-reference in one manual that refers to a section in another manual opens and displays that section in the second manual. Navigating back and forth between documents is usually possible with keystrokes or mouse clicks.

For example: `<Alt>-<Backarrow>` in Acrobat Reader, or clicking on the bottom leftmost navigation button of xpdf, both navigate back to the previous document.

The manuals constantly evolve to keep up with the development of the Bright Cluster Manager environment and the addition of new hardware and/or applications. The manuals also regularly incorporate customer feedback. Administrator and user input is greatly valued at Bright Computing. So any comments, suggestions or corrections will be very gratefully accepted at manuals@brightcomputing.com.

There is also a feedback form available via Bright View, via the Account icon, following the clickpath:

[≡]→Help→Feedback
0.3 Getting Administrator-Level Support

If the reseller from whom Bright Cluster Manager was bought offers direct support, then the reseller should be contacted.

Otherwise the primary means of support is via the website https://support.brightcomputing.com. This allows the administrator to submit a support request via a web form, and opens up a trouble ticket. It is a good idea to try to use a clear subject header, since that is used as part of a reference tag as the ticket progresses. Also helpful is a good description of the issue. The followup communication for this ticket goes via standard e-mail. Section 17.2 of the Administrator Manual has more details on working with support.

0.4 Getting Developer-Level Support

Developer support is given free, within reason. For more extensive support, Bright Computing can be contacted in order to arrange a support contract.

0.5 Getting Professional Services

Bright Computing normally differentiates between

- professional services (customer asks Bright Computing to do something or asks Bright Computing to provide some service), and

- support (customer has a question or problem that requires an answer or resolution).

Professional services can be provided after consulting with the reseller, or the Bright account manager.
This chapter introduces the Python API of Bright Cluster Manager. The Python API package was completely overhauled in Bright Cluster Manager 8.2. The cmdaemon-pythoncm package now provides a pure Python connection to the cluster manager, making it possible for cluster administrators to automate cluster operations via Python.

It also makes it possible to run Python code on any operating system that supports Python 3.5 and higher.

The Bright Cluster Manager Python API uses the following extra modules:

1. pyOpenSSL
2. ply
3. lxml
4. tabulate
5. monotonic
6. humanfriendly
7. six

### 1.1 Getting Started

On the cluster head node itself the python3 module can simply be loaded:

**Example**

```
[root@bright91 ~]# module load python3
```

To execute or develop the Python code on any other machine usually requires some extra steps:

- Python 3 (3.5, 3.6, 3.7, 3.8 will work) should be installed
- The 7 extra modules listed previously should be installed using Pip
- The /cm/local/apps/python3/lib/python3.7/site-packages/pythoncm directory should be copied over to the site-packages directory of the development machine

The pythoncm module should then be loaded, to confirm everything was set up correctly:

**Example**
If connecting from outside the cluster, then port 8081 must not be blocked by a firewall. A certificate is needed by the Python API to identify itself to CMDaemon. The existence of the certificate on the head node should be checked. It should be copied over to the development machine, if it is needed there.

Example

```
[root@bright91 ~]# ls -al .cm/
-rw------- 1 root root 1708 Dec 11 09:25 admin.key
-rw------- 1 root root 1269 Dec 11 09:25 admin.pem
```

Example

```
[alice@bright91 ~]# ls -al .cm/
-rw------- 1 root root 1708 Dec 11 09:25 cert.key
-rw------- 1 root root 1269 Dec 11 09:25 cert.pem
```

The developer may need to contact the cluster administrator to get a certificate.

1.2 Connecting To A Cluster

The first step when working with the Python API is to establish a connection to the CMDaemon process on the cluster:

```python
#!/usr/bin/env python

from pythoncm.cluster import Cluster
from pythoncm.settings import Settings

cluster = Cluster()
```

If working outside the cluster, then the settings for connecting to the cluster must be specified:

```python
settings = Settings(host='<head-node-hostname>',
                    port=8081,
                    cert_file='/some/path/cert.pem',
                    key_file='/some/path/cert.key',
                    ca_file='.../site-packages/pythoncm/etc/cacert.pem')
```

```python
if not settings.check_certificate_files():
    print('Unable to load certificates')
else:
    cluster = Cluster(settings)
```

1.3 Inspecting Settings

All settings in Bright Cluster Manager are stored inside an entity. Each entity has a type and a unique name among the entities of the same type. To inspect an entity it should first be found inside the cluster:

```python
node001 = cluster.get_by_name('node001')
```

If the name node001 was also given a different entity, then the type must be specified to ensure that the correct entity is returned:

```python
node001 = cluster.get_by_name('node001', pythoncm.entity.Node)
node001 = cluster.get_by_name('node001', 'Node')
```
Once the node entity is found, inspecting the settings is a matter of printing the desired field:

```python
print(node001.hostname)
print(node001.mac)
```

Complex settings, such as network interfaces, have their own settings:

```python
for interfaces in node001.interfaces:
    print(interface.name, interface.ip)
```

Because many nodes could have a network interface called `eth0`, such a setting cannot be found from the cluster: The following code will return `None`.

```python
eth0 = cluster.get_by_name('eth0')
```

To find all `eth0` interfaces, all nodes need to be found, and then iterated over:

```python
nodes = cluster.get_by_type(pythoncm.entity.Node)
all_eth0 = [interface
    for node in nodes
    for interface in node.interfaces
    if interface.name == 'eth0']
```

## 1.4 Modifying Settings

Basic entity settings are exported as Python properties and can simply be changed:

```python
node001.mac = '00:00:00:00:00:00'
node001.category = cluster.get_by_name('gpu', 'Category')
```

Similarly interfaces settings can be accessed and changed directly:

```python
node001.interfaces[0].ip = '1.2.3.4'
node001.interfaces[0].network = cluster.get_by_name('ib', 'Network')
```

Removing an interface from a node can be done in various Pythonic ways:

```python
node001.interfaces.remove(0)
del node001.interfaces[0]
node001.interfaces = [interface for interface in node001.interfaces
    if interface.name != 'eth0']
```

To add a new interface, the entity instance needs to be created first, and then added to the node:

```python
eth1 = pythoncm.entity.NetworkPhysicalInterface()
eth1.name = 'eth1'
eth1.ip = '1.2.3.4'
eth1.network = cluster.get_by_name('ib', 'Network')
node001.interfaces.append(eth1)
```

All changes are made on a local copy of the entity. The cluster has no knowledge of the changes until they are committed. It is recommended to make many changes locally, and only commit once at the end. The return value of the commit operation should always be checked. Committing a badly-configured node will be blocked by the head node:

```python
commit_result = node001.commit()
if not commit_result.good:
    print(commit_result)
```

An entity found from via the `cluster` object is removed differently. As with commit, the result should always be checked: a removal can fail if a node is UP:

```python
remove_result = node001.remove()
if not remove_result.good:
    print(remove_result)
```
1.5 Inspecting The Entire Cluster

The example directory contains a script to inspect the entire cluster.

Example

[root@bright91 ~]# cd /cm/local/examples/cmd/pythoncm/
[root@bright91 pythoncm]# module load python3
[root@bright91 pythoncm]# ./print-all.py

The example directory also contains a script that prints all metadata for all available entities in Bright Cluster Manager:

Example

[root@bright91 pythoncm]# ./entity_info.py

1.6 Performing Operations On Entities

All Python API functionality is contained in /cm/local/apps/python3/lib/python3.7/site-packages/pythoncm.

Methods are documented inside the python code itself.

```python
def node001 = cluster.get_by_name('node001')
node001.power_on()
```

When operating on multiple entities, it is possible to iterate over them and do each operation individually.

```python
nodes = cluster.get_by_type('Node')
for node in nodes:
    node.power_on()
```

However, the same can also be done with a parallel version of the operation. When possible the parallel version should be used, because it is faster and requires less network traffic.

```python
nodes = cluster.get_by_type('Node')
cluster.parallel.power_on(nodes)
```

1.7 Monitoring

All monitoring data can be accessed using the Python API.

Monitoring is a set of operations performed on entities.

For example, to get latest data for a single entity:

```python
print(node001.get_latest_monitoring_data())
```

Monitoring operations on multiple operations should be done using the monitoring module:

```python
data = cluster.monitoring.get_latest_monitoring_data([node001, node002, node003])
```
1.8 Examples

The best way to get going is by looking at the examples. These can be found on the head node, at `/cm/local/examples/cmd/pythoncm`:

Example

```
[root@bright91 pythoncm]# ls
add-collection.py  entity_info.py  power-parallel-status.py
add-healthcheck.py  events.py  power-status.py
add-metric.py  execute.py
add-node-group.py  free_port.py  range-expander-test.py
add-role.py  get-status.py  remove-node-group.py
add-user.py  health-overview.py  sample-now-checks.py
all-nodes.py  instance_by_name.py  sample-now-parallel.py
certificate-info.py  latest-counter-data.py  select-devices.py
clone-node-group.py  latest-health-data.py  service.py
clone-node.py  new-nodes.py  service-status.py
cm-job-analytics.py  open-close.py  set-node-image.py
create-certificate.py  parallel-execute-async.py  wait-for-provisioning.py
create-ramdisk-task.py  parallel-execute-check-status.py  wait-for-up.py
dump-monitoring-data.py  parallel-execute.py
```

The examples can be tried out after loading the Python environment:

Example

```
[root@bright91 ~]# cd /cm/local/examples/cmd/pythoncm/
[root@bright91 pythoncm]# module load python3
[root@bright91 pythoncm]# ./power-status.py
success: True
[
  "uniqueKey": 1125899906842642,
  "oldLocalUniqueKey": 0,
  "baseType": "PowerStatus",
  "childType": ",",
  "revision": ",",
  "modified": false,
  "toBeRemoved": false,
  "readonly": false,
  "not_set_fields": [],
  "device": 38654705666,
  "host": 38654705665,
  "powerDistributionUnit": 0,
  "gpu": -1,
  "prt": 0,
  "name": "custom",
  "state": "ON",
  "msg": ",",
  "extendedMsg": ",",
  "indexes": [
    2
  ]
]
```

© Bright Computing, Inc.
"tracker": 0,
"retries": 0
]
INFO   (25-May-2020 18:29:28) [entity_change.py : 38] Stop event change watcher
[root@bright91 pythoncm]#
Monitoring Data Producers

This chapter covers how to add a new metrics and health checks scripts with cmsh.

Five different types of Monitoring Data Producers can be added:

- **metric**: a script which produces a single value.
- **health check**: a script which produces a PASS, FAIL, UNKNOWN, or no data value.
- **collection**: a script that produces zero or more metrics, health checks, or a combination of both.
- **perpetual**: a script that is started once over the lifetime of the Bright Cluster Manager cmd process. The script produces zero or more metrics, health checks, or a combination of both on its own timing mechanism.
- **prometheus**: one or more URLs to Prometheus metric exporters.

A monitoring data producer cannot be plotted in cmsh or Bright View, because it contains no data. A producer defines measurables: metrics and/or health checks. It also generates data for these measurables, which can be plotted.

### 2.1 Measurables

There are three types of measurable:

- **metric**: a numeric value, or no data.
- **health check**: PASS/FAIL/UNKNOWN/no data.
- **enum metric**: one of a set of user-defined string based values, or no data.

### 2.2 Measurables Classes

All measurables are grouped into classes. A class is a user-defined free string field, with / as delimiters. Bright View uses this class to build a tree for easy search and access.

### 2.3 Metric Monitoring Data Producers

A metric data producer script generates one data point. For example, as in the following script:

**Example**
Monitoring Data Producers

The script can be defined as a metric script via the monitoring setup mode of cmsh:

Example

```
[root@bright91 ~]# cat /path/to/my/metric
#!/bin/bash
echo $(RANDOM)
# Optionally provide extra information
echo "Extra information" >&3
```

All nodes then execute the script every minute, and produce a random number.

2.4 Health Check Monitoring Data Producers

A health check data producer script generates one data point. The data point can be one of four possible values expected of it: PASS, FAIL, UNKNOWN, or no data. Other file descriptors can be used to provide extra information.

For example, as in the following script:

Example

```
[root@bright91 ~]# cat /path/to/my/health-check
#!/bin/bash
if [ $((RANDOM)) -gt 8000 ]; then
    echo "PASS"
else
    echo "FAIL"
    # Optionally provide extra information
    echo "Extra information" >&3
fi
```

The script can be defined as a health check script via the monitoring setup mode of cmsh:

Example

```
[bright91]% monitoring setup
[bright91->monitoring->setup]% add healthcheck my-health-check
[...my-check]% set script /path/to/my/health-check
[...my-check]% set class My/Class
[...my-check]% set interval 1m
[...my-check]% commit
```

All nodes then execute the script every minute, and produce data values with roughly 75% PASS and 25% FAIL.
2.5 Collection Monitoring Data Producers

A collection data producer script can generate multiple data points in one run. Data points can be a combination of metrics and health checks. Collection scripts are also allowed to produce no data.

A collection script has two modes: initialize mode and sample mode.

- initialize: defines the measurables that data values are generated for.
- sample: returns the data values for all the measurables defined in initialize mode.

During normal cluster operation the initialize mode is called only once, during boot. Afterwards, the script is called in sample mode at the desired interval.

The following example combines both of the metric and health check examples from earlier on. However, this time it is written as a single script, using JSON as the output format:

Example

```
[root@bright91 ~]# cat /path/to/my/collection
#!/usr/bin/python
import sys
import json
import random

def initialize():
    metric = {"metric": "my.collection.metric",
              "unit": "B",
              "class": "My/Collection"}
    check = {"check": "my.collection.check",
             "class": "My/Collection"}
    return [metric, check]

def sample():
    metric = {"metric": "my.collection.metric",
              "value": random.randint(0, 32767)}
    check = {"check": "my.collection.check",
             "info": "random with 25% failure rate",
             "value": 'PASS' if random.randint(0, 32767) > 8000 else 'FAIL'}
    return [metric, check]

def main():
    if len(sys.argv) > 1 and sys.argv[1] == "--initialize":
        data = initialize()
    else:
        data = sample()
    print json.dumps(data, indent=4)

if __name__ == '__main__':
    main()
```

The script can be defined as a collection script via the `monitoring setup` mode of cmsh:

Example

```
[bright91]% monitoring setup
[bright91->monitoring->setup]% add collection my-collection
[...my-collection]% set script /path/to/my/collection
[...my-collection]% set format JSON
```
All nodes then execute the script every minute and produce two data points upon each execution. That is, one metric and one health check per execution.

2.6 Perpetual Monitoring Data Producers

A perpetual data producer script is a special case of a collection data producer script. It is intended to be used if the script needs permanent memory storage.

Example

```python
[root@bright91 ~]# cat /path/to/my/perpetual
#!/usr/bin/python
import my_sampler_module
import json
import time

# create single instance
sampler = my_sampler_module.MySampler()
# load important data into memory
sampler.load()

# Infinite loop with its own timing
delay = 0
while True:
    time.sleep(delay)
    (definitions, values, delay) = sampler.process()
    if definitions:
        # Print new measurables
        print json.dumps(definitions)
    # Print data
    print json.dumps(values)

The `my_sampler_module` is the part which does the important work.

Example

```python
[root@bright91 ~]# cat /path/to/my/my_sampler_module.py
class MySampler:
    def __init__(self):
        self.initialized = False
        self.definitions = None

    def load(self):
        # Do time consuming work here
        metric = {
            "metric": "my.collection.metric",
            "unit": "B",
            "class": "My/Collection"
        }
        check = {
            "check": "my.collection.check",
            "class": "My/Collection"
        }
        self.definitions = [metric, check]

    def process(self):
        metric = {
            "metric": "my.collection.metric",
```
Prometheus Monitoring Data Producers

Prometheus is a monitoring and alerting toolkit (https://prometheus.io). A Prometheus monitoring data producer script parses data from a Prometheus exporter (https://prometheus.io/docs/instrumenting/exporters/).

The script can be defined as a Prometheus script via the monitoring setup mode of cmsh:

Example

[bright91]% monitoring setup
[bright91->monitoring->setup]% add prometheus my-prometheus-exporter
[...my-prometheus-exporter]% set urls http://my.prometheus.exporter:80
[...my-prometheus-exporter]% set interval 1m
[...my-prometheus-exporter]% commit

If multiple URLs are defined, then only the data values from the first successful HTTP GET are used.

Node Execution Filters

By default a monitoring data producer script is executed on every node. When this is not desirable, a node execution filter should be created. A node execution filter defines the nodes on which the producer script should be executed.

For example, a filter to execute the script only on cloud nodes can be configured as follows:

Example

[bright91]% monitoring setup use my-check
[...my-check]% nodeexecutionfilters
[...nodeexecutionfilters]% add type Cloud
[...nodeexecutionfilters*[Cloud*]]% set cloudnode yes
[...nodeexecutionfilters*[Cloud*]]% show
Parameter  Value
-----------------------------
Base type     MonitoringExecutionFilter
Name          Cloud
Type          Type
Head node     no

© Bright Computing, Inc.
Physical node no
Cloud node yes
Virtual node no
Lite node no

[...nodeexecutionfilters*{Cloud*}]% commit

It is also possible to filter based on the specific resources associated with a node:

Example

[bright91]% monitoring setup use my-IB-check
[...my-IB-check]% nodeexecutionfilters
[...nodeexecutionfilters]% add resource IB
[...nodeexecutionfilters*{IB*}]% set resources IB
[...nodeexecutionfilters*{IB*}]% commit

Because of high availability, a special resource, active, is defined for the active head node.

Example

[bright91]% monitoring setup use my-metric
[...my-metric]% nodeexecutionfilters
[...nodeexecutionfilters]% active
Added active resource filter
[...nodeexecutionfilters*]% commit

2.9 Execution Multiplexers

By default a monitoring data producer script is executed once: the node executes the script only for itself.

However, some scripts, such as BMC samplers, must be sampled from the active head node for all nodes.

In the following example a BMC script is run on each node that has the ipmi or drac resource:

Example

[bright91]% monitoring setup use my-ipmi-collection
[...my-ipmi-collection]% executionmultiplexers
[...executionmultiplexers]% add resource ipmi
[...executionmultiplexers*{ipmi*}]% set resources ipmi drac
[...executionmultiplexers*{ipmi*}]% set operator OR
[...executionmultiplexers*{ipmi*}]% commit

If an execution multiplexer <multiplexer> is defined, then there should also be a node execution filter <filter> associated with it to restrict the number of nodes on which the script runs.

This is because having the script run on many nodes for many other nodes is unlikely to be a desired configuration.

The combination of the execution filter and the multiplexer should be read as:

for every node that matches filter, run script, for each node that matches multiplexer.

A more specific example, using two of the preceding examples, with a filter based on the resource IB, and multiplexers based on the IPMI/Drac resources, the combination should be read as:

for every node that matches IB, run script, for each node that matches ipmi or drac.
2.10 Monitoring Resources

Every device in Bright Cluster Manager has one or more resources. These resources are automatically calculated from:

- Roles
- Hardware
- Settings

Resources for a specific node can be viewed as follows:

Example

```
[bright91] % device use node001
[bright91] % monitoringresources
CentOS7u5
Ethernet
category:default
```

It is possible to add one or more custom resources to a device:

Example

```
[bright91] % device use node001
[bright91] % add userdefinedresources MyResource
[bright91] % append userdefinedresources MyOtherResource
[bright91] % # wait ~10 seconds for the settings to propagate
[bright91] % monitoringresources
CentOS7u5
Ethernet
category:default
MyResource
MyOtherResource
```

Any of these resources can be used to filter and multiplex monitoring data producers.

If a resources changes because of a settings change, then monitoring automatically stops or starts sampling.

2.11 Collection Monitoring Data Producers With Filter And Multiplexer

If a script has an execution multiplexer set, then it needs to determine for which nodes the script runs:

Example

```
[root@bright91 ~] # cat /path/to/my/collection
#!/usr/bin/python
import sys
import json
import random

def initialize(entity):
    metric = {
        "metric": "my.collection.metric",
        "entity": entity,
        "unit": "B",
        "class": "My/Collection"
    }
    check = {
        "check": "my.collection.check",
```
"entity": entity,
"class": "My/Collection"
return [metric, check]

def sample(entity):
    metric = {
        "metric": "my.collection.metric",
        "entity": entity,
        "value": random.randint(0, 32767)
    }
    check = {
        "check": "my.collection.check",
        "entity": entity,
        "value": 'PASS' if random.randint(0, 32767) > 8000 else 'FAIL'
    }
    return [metric, check]

def main():
    try:
        # determine for which node we are sampling
        entity = os.environ['CMD_HOSTNAME']
    except:
        sys.stderr.write('Target device not specified in environment\n')
        return

    if len(sys.argv) > 1 and sys.argv[1] == "--initialize":
        data = initialize(entity)
    else:
        data = sample(entity)
    print json.dumps(data, indent=4)

    if __name__ == '__main__':
        main()

It can be defined with a filter to run on the active head for all nodes in the GPU category:

Example

[bright91]% monitoring setup
[bright91->monitoring->setup]% add collection my-collection
[...my-collection]% set script /path/to/my/collection
[...my-collection]% set format JSON
[...my-collection]% set interval 1m
[...my-collection]% nodeexecutionfilters
[...nodeexecutionfilters]% active
   Added active resource filter
[...nodeexecutionfilters]% exit
[...my-collection]% executionmultiplexers
[...executionmultiplexers]% add category
[...executionmultiplexers*[GPU]*]% add category GPU
[...executionmultiplexers*[GPU]*]% commit

The script is then executed on the head, once for each node in the category of GPU.

2.12 Collection Monitoring Data Producers For Standalone Entities

Sometimes monitoring data does not belong to a Bright Cluster Manager entity.
For this reason the standalone monitored entity was added in Bright Cluster Manager 8.0.
This entity can be anything with a name and custom type.

Bright Cluster Manager does nothing with this kind of entity, except allow it to store monitoring data.
Each standalone entity which needs to be monitored should be added:

**Example**

```
[bright91] % monitoring_standalone
[bright91->monitoring->standalone] % add MSD.0
[...standalone*[MSD.0*]]% set type Lustre
[...standalone*[MSD.0*]]% commit
[...standalone*[MSD.0*]]% add MSD.1
[...standalone*[MSD.1*]]% set type Lustre
[...standalone*[MSD.1*]]% commit
```

A script can be created that produces data for all MSD entities:

**Example**

```bash
[root@bright91 ~]# cat /path/to/my/collection
#!/usr/bin/python
import sys
import json
def initialize():
    msd_0 = {
        "metric": "lustre.free.space",
        "entity": "MSD.0",
        "unit": "B",
        "class": "Lustre"
    }
    msd_1 = {
        "metric": "lustre.free.space",
        "entity": "MSD.1",
        "unit": "B",
        "class": "Lustre"
    }
    return [msd_0, msd_1]
def sample():
    msd_0 = {
        "metric": "lustre.free.space",
        "entity": "MSD.0",
        "value": 12345,
        "class": "Lustre"
    }
    msd_1 = {
        "metric": "lustre.free.space",
        "entity": "MSD.1",
        "value": 54321,
        "class": "Lustre"
    }
    return [msd_0, msd_1]

def main():
    if len(sys.argv) > 1 and sys.argv[1] == "--initialize":
        data = initialize()
    else:
        data = sample()
    print json.dumps(data, indent=4)

if __name__ == '__main__':
    main()
```

It can be defined to run on only the active head node:

**Example**
The script is then executed on the active head every 5 minutes and collects one data point for each MSD.

Data for a standalone script can be viewed with the same commands as for regular Bright Cluster Manager nodes.

Example

```
[bright91] % monitoring standalone
[bright91->monitoring->standalone] % use MSD.0
[...standalone*MSD.0*] % latestmetricdata
...
lustre.free.space 12345 3m 47s
```

### 2.13 Debugging Standalone Scripts

Page 583 of the Administrator Manual describes how debugging information can be obtained when running `samplenow` with the `--debug` option with the `ntp` healthcheck script.

Many scripts under `/cm/local/apps/cmd/scripts/` can have their debug output inspected with `samplenow --debug`.

A recursive `grep` on the head node, similar to the following, should show which scripts have a settable debug environment:

```
grep -r CMD_DEBUG /cm/local/apps/cmd/scripts/
```

The debug output in the script can be specified along the lines of the following code snippet:

Example

```
dump = os.environ.get('CMD_DEBUG', '0') == '1'
if debug:
    # print stuff to fd 3
```
This chapter covers how to manage monitoring-driven actions with cmsh.

### 3.1 Actions And Triggers

A monitoring action is a script that is executed by CMDaemon. It runs when triggered by the monitored data.

An action by itself does nothing—it needs a trigger (section 13.4.5 of the *Administrator Manual*) to be defined to execute the action.

By default, several actions (section 13.4.4 of the *Administrator Manual*) are predefined:

- **Drain**: Drain node (node refuses new WLM jobs)
- **Event**: Send an event to users with connected client
- **ImageUpdate**: Update the image on the node
- **PowerOff**: Power off a device
- **PowerOn**: Power on a device:
- **PowerReset**: Power reset a device
- **Reboot**: Reboot a node
- **Send e-mail to administrators**: Send e-mail
- **Shutdown**: Shutdown a node
- **Undrain**: Undrain node (node accepts new WLM jobs)
- **killprocess**: `/cm/local/apps/cmd/scripts/actions/killprocess.pl`
- **remount**: `/cm/local/apps/cmd/scripts/actions/remount`
- **testaction**: `/cm/local/apps/cmd/scripts/actions/testaction`

A new action script can be created as follows:

**Example**

[bright91]% monitoring action
[bright91->monitoring->action]% add script MyScript
[...MyScript*]% set script /path/to/MyScript
[...MyScript*]% commit
3.2 Time Restrictions

It is possible to allow actions to only be executed at certain times, with the `allowedtime` setting.

Example

```
[bright91]%% monitoring action
[bright91->monitoring->action]%% add script MyScript
[...MyScript*]%% set script /path/to/MyScript
[...MyScript*]%% set allowedtime "9:00-17:00"
[...MyScript*]%% commit
```

More complex timing restrictions are possible:

Example

```
monday-friday9:00-17:00
monday-friday00:00-09:00;17:00-00:00;saturday-sunday
november-marchmonday-saturday13:00-17:00
may-septembermonday-friday09:00-18:00;saturday-sunday13:00-17:00
```

Further examples can be seen in section 13.4.4 of the Administrator Manual, page 556.

3.2.1 Time Restriction Syntax In BNF Notation

The allowed values can be written as a BNF grammar:

Example

```
<start> =
  time_intervals
  | ""
<time_intervals> = <time_interval> (; <time_interval>)*
<time_interval> = <inner_time_interval>{<time_intervals}
<inner_time_interval> =
  <day_of_week_interval>
  | <time_of_day_interval>
  | <day_of_month_interval>
  | <month_interval>
<day_of_week_interval> =
  (<day_of_week>-<day_of_week>)
  | (<day_of_week> (, day_of_week)*)
<day_of_week> = sunday | monday | tuesday | wednesday | thursday | friday | saturday
<time_of_day_interval> = <time_of_day>-<time_of_day>
<time_of_day> = \d?\d:\d\d
<month_interval> = (<month>-<month>)
  | (<month> (, month)*)
<month> = january | february | march | april | may | june | july | august | september
  | october | november | december
<day_of_month_interval> = (<day_of_month>-<day_of_month>)
  | (<day_of_month> (, day_of_month)*)
<day_of_month> = \d?\d
```

3.3 CMDaemon Environment Variables

3.3.1 Standard Environment Variables Available In Action Scripts
### 3.3 CMDaemon Environment Variables

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_ENTITY_KEY</td>
<td>The unique key of the entity that triggered the action.</td>
</tr>
<tr>
<td>CMD_ENTITY_NAME</td>
<td>The name of the entity that triggered the action.</td>
</tr>
<tr>
<td>CMD_ENTITY_TYPE</td>
<td>The type of entity that triggered the action.</td>
</tr>
<tr>
<td>CMD_MEASURABLE_NAME</td>
<td>The name of the measurable that triggered the action.</td>
</tr>
<tr>
<td>CMD_MEASURABLE_PARAMETER</td>
<td>The parameter of the measurable that triggered the action.</td>
</tr>
<tr>
<td>CMD_MEASURABLE_TYPE</td>
<td>The type of the measurable.</td>
</tr>
<tr>
<td>CMD_VALUE</td>
<td>The value that triggered the action.</td>
</tr>
<tr>
<td>CMD_RAW_VALUE</td>
<td>The raw value.</td>
</tr>
<tr>
<td>CMD_VALUE_TIME</td>
<td>The time on which the value was measured.</td>
</tr>
<tr>
<td>CMD_INFO_MESSAGE</td>
<td>Extra information sampled along with the value.</td>
</tr>
<tr>
<td>CMD_PRODUCER_NAME</td>
<td>The name of the monitoring data producer that samples the measurable.</td>
</tr>
</tbody>
</table>

...continues
<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_ACTION_NAME</td>
<td>The name of the action that was triggered.</td>
</tr>
<tr>
<td>CMD_TRIGGER_NAME</td>
<td>The name of the trigger.</td>
</tr>
<tr>
<td>CMD_TRIGGER_EXPRESSION</td>
<td>The expression that was evaluated.</td>
</tr>
<tr>
<td>CMD_VALUE_EVAL</td>
<td>The result of the evaluated expression.</td>
</tr>
<tr>
<td>CMD_VALUE_COUNT</td>
<td>The number of times the expression evaluated to the same value.</td>
</tr>
<tr>
<td>CMD_SEVERITY</td>
<td>The assigned severity of the trigger.</td>
</tr>
</tbody>
</table>

All action scripts have the preceding standard environment variables set.

In cmsh, if the action object has its `node environment` parameter set to the value `yes`, then scripts running on a node are enabled with an extended environment that provides many more `CMD_*` environment variables. Otherwise they run in the standard environment.

A list of the standard or extended environment variables can be dumped by running the system command `env > /tmp/dumpfile` within an action script, such as the test example script, and triggering the script to run.

Many of the environment variables are similar to the ones used by initialize and finalize scripts (section E.3 of the Administrator Manual) in the node-installer environment.

### 3.3.2 Extended Environment Variables Available To Action Scripts

If the action object has its `node environment` parameter set to the value `yes`, then scripts run in an extended environment that provides many more `CMD_*` environment variables. Otherwise they run in the standard environment of section 3.3.1.

The following table shows the additionally available environment variables with some example values:

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_ACTIVE_MASTER_IP</td>
<td>10.141.255.254</td>
</tr>
<tr>
<td>CMD_ADDED_NODES</td>
<td>...continues</td>
</tr>
</tbody>
</table>
Table 3.3.2: Environment Variables For Nodes In The Extended Environment ...continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_BASE_TYPE</td>
<td></td>
</tr>
<tr>
<td>CMD_BMCIP</td>
<td></td>
</tr>
<tr>
<td>CMD_BMC_PASSWORD</td>
<td>doQNeV1qkasXr590</td>
</tr>
<tr>
<td>CMD_BMCUSERID</td>
<td>4</td>
</tr>
<tr>
<td>CMD_BMC_USERNAME</td>
<td></td>
</tr>
<tr>
<td>CMD_BMC_TYPE</td>
<td>2</td>
</tr>
<tr>
<td>CMD_CATEGORY</td>
<td>default</td>
</tr>
<tr>
<td>CMD_CEPH_MDS_SOCKET</td>
<td></td>
</tr>
<tr>
<td>CMD_CEPH_MGR_SOCKET</td>
<td></td>
</tr>
<tr>
<td>CMD_CEPH_MON_SOCKET</td>
<td></td>
</tr>
<tr>
<td>CMD_CEPH_NAME</td>
<td></td>
</tr>
<tr>
<td>CMD_CEPH_OSD_ID</td>
<td></td>
</tr>
<tr>
<td>CMD_CEPH_OSD_SOCKET</td>
<td></td>
</tr>
<tr>
<td>CMD_CHASSIS</td>
<td>chassis01</td>
</tr>
<tr>
<td>CMD_CHASSIS_IP</td>
<td>10.141.1.1</td>
</tr>
<tr>
<td>CMD_CHASSIS_MEMBERS</td>
<td></td>
</tr>
<tr>
<td>CMD_CHASSIS_PASSWORD</td>
<td>secr3t</td>
</tr>
<tr>
<td>CMD_CHASSIS_SLOT</td>
<td>1</td>
</tr>
<tr>
<td>CMD_CHASSIS_USERNAME</td>
<td>ADMIN</td>
</tr>
</tbody>
</table>

...continues
Table 3.3.2: Environment Variables For Nodes In The Extended Environment ...continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_CHILD_TYPE</td>
<td></td>
</tr>
<tr>
<td>CMD_CLUSTERNAME</td>
<td>Bright 9.1 Cluster</td>
</tr>
<tr>
<td>CMD_CONFIGURATION_CREATE_DIRECTORY</td>
<td></td>
</tr>
<tr>
<td>CMD_CONFIGURATION_FILENAME</td>
<td></td>
</tr>
<tr>
<td>CMD_CONFIGURATION_GROUP_NAME</td>
<td></td>
</tr>
<tr>
<td>CMD_CONFIGURATION_MASK</td>
<td></td>
</tr>
<tr>
<td>CMD_CONFIGURATION_NAME</td>
<td></td>
</tr>
<tr>
<td>CMD_CONFIGURATION_USER_NAME</td>
<td></td>
</tr>
<tr>
<td>CMD_CREATE_RAMDISK_TOKEN_CATS</td>
<td></td>
</tr>
<tr>
<td>CMD_CREATE_RAMDISK_TOKEN_NODES</td>
<td></td>
</tr>
<tr>
<td>CMD_CURRENT_NODES</td>
<td></td>
</tr>
<tr>
<td>CMD_DATA</td>
<td></td>
</tr>
<tr>
<td>CMD_DELLFW_FTP_PASSWORD</td>
<td></td>
</tr>
<tr>
<td>CMD_DELLFW_FTP_USERNAME</td>
<td></td>
</tr>
<tr>
<td>CMD_DELLFW_PATH</td>
<td></td>
</tr>
<tr>
<td>CMD_DESTINATION_REVISION</td>
<td></td>
</tr>
<tr>
<td>CMD_DESTINATION_VERSION</td>
<td></td>
</tr>
<tr>
<td>CMD_DEVICE_HEIGHT</td>
<td>1</td>
</tr>
<tr>
<td>CMD_DEVICE_POSITION</td>
<td>10</td>
</tr>
</tbody>
</table>

...continues
### Table 3.3.2: Environment Variables For Nodes In The Extended Environment...continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_DEVICE_TYPE</td>
<td>ComputeNode</td>
</tr>
<tr>
<td>CMD_DIRECTOR</td>
<td></td>
</tr>
<tr>
<td>CMD_DIRECTOR_IP</td>
<td></td>
</tr>
<tr>
<td>CMD_DOCKER_ENDPOINTS</td>
<td></td>
</tr>
<tr>
<td>CMD_EDGE_SITE</td>
<td></td>
</tr>
<tr>
<td>CMD_ETCD_CA</td>
<td></td>
</tr>
<tr>
<td>CMD_ETCD_CAKEY</td>
<td></td>
</tr>
<tr>
<td>CMD_ETCD_CLIENT_CA</td>
<td></td>
</tr>
<tr>
<td>CMD_ETCD_CLIENT_CERT</td>
<td></td>
</tr>
<tr>
<td>CMD_ETCD_CLIENT_KEY</td>
<td></td>
</tr>
<tr>
<td>CMD_ETCD_MEMBER_CERT</td>
<td></td>
</tr>
<tr>
<td>CMD_ETCD_MEMBER_KEY</td>
<td></td>
</tr>
<tr>
<td>CMD_ETHERNETSWITCH</td>
<td>switch01:1</td>
</tr>
<tr>
<td>CMD_EXISTING_REVISION</td>
<td></td>
</tr>
<tr>
<td>CMD_EXISTING_VERSION</td>
<td></td>
</tr>
<tr>
<td>CMD_EXPORTS</td>
<td></td>
</tr>
<tr>
<td>CMD_FAILONMISSINGBMC</td>
<td></td>
</tr>
<tr>
<td>CMD_FAIL_ON_FAILED_BMC_COMMAND</td>
<td>YES</td>
</tr>
<tr>
<td>CMD_FSEXPORTS</td>
<td></td>
</tr>
</tbody>
</table>

...continues
Table 3.3.2: Environment Variables For Nodes In The Extended Environment ...continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_FSEXPORT_&lt;name&gt;_ALLOWWRITE</td>
<td></td>
</tr>
<tr>
<td>CMD_FSEXPORT_&lt;name&gt;_HOSTS</td>
<td></td>
</tr>
<tr>
<td>CMD_FSEXPORT_&lt;name&gt;_PATH</td>
<td></td>
</tr>
<tr>
<td>CMD_FSMOUNTS</td>
<td></td>
</tr>
<tr>
<td>CMD_FSMOUNT_&lt;name&gt;_DEVICE</td>
<td></td>
</tr>
</tbody>
</table>

where `<name>` takes these SLASH substitutions:

<table>
<thead>
<tr>
<th><code>name</code></th>
<th>example value</th>
</tr>
</thead>
<tbody>
<tr>
<td>_SLASH_cm_SLASH_shared</td>
<td>$localnfsserver:/cm/shared</td>
</tr>
<tr>
<td>_SLASH_dev_SLASH_pts</td>
<td>none</td>
</tr>
<tr>
<td>_SLASH_dev_SLASH_shm</td>
<td>none</td>
</tr>
<tr>
<td>_SLASH_home</td>
<td>$localnfsserver:/home</td>
</tr>
<tr>
<td>_SLASH_proc</td>
<td>none</td>
</tr>
<tr>
<td>_SLASH_sys</td>
<td>none</td>
</tr>
</tbody>
</table>

CMD_FSMOUNT_<name>_FILESYSTEM

where `<name>` takes these SLASH substitutions:

<table>
<thead>
<tr>
<th><code>name</code></th>
<th>example value</th>
</tr>
</thead>
<tbody>
<tr>
<td>_SLASH_cm_SLASH_shared</td>
<td>nfs</td>
</tr>
<tr>
<td>_SLASH_dev_SLASH_pts</td>
<td>devpts</td>
</tr>
<tr>
<td>_SLASH_dev_SLASH_shm</td>
<td>tmpfs</td>
</tr>
<tr>
<td>_SLASH_home</td>
<td>nfs</td>
</tr>
<tr>
<td>_SLASH_proc</td>
<td>proc</td>
</tr>
<tr>
<td>_SLASH_sys</td>
<td>sysfs</td>
</tr>
</tbody>
</table>

CMD_FSMOUNT_<name>_MOUNTPOINT

where `<name>` takes these SLASH substitutions:

<table>
<thead>
<tr>
<th><code>name</code></th>
<th>example value</th>
</tr>
</thead>
<tbody>
<tr>
<td>_SLASH_cm_SLASH_shared</td>
<td>/cm/shared</td>
</tr>
<tr>
<td>_SLASH_dev_SLASH_pts</td>
<td>/dev/pts</td>
</tr>
<tr>
<td>_SLASH_dev_SLASH_shm</td>
<td>/dev/shm</td>
</tr>
<tr>
<td>_SLASH_home</td>
<td>/home</td>
</tr>
<tr>
<td>_SLASH_proc</td>
<td>/proc</td>
</tr>
<tr>
<td>_SLASH_sys</td>
<td>/sys</td>
</tr>
</tbody>
</table>

CMD_FSMOUNT_<name>_OPTIONS

...continues
Table 3.3.2: Environment Variables For Nodes In The Extended Environment...continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>where <code>&lt;name&gt;</code> takes these SLASH substitutions:</td>
<td></td>
</tr>
<tr>
<td><code>&lt;name&gt;</code></td>
<td>example value</td>
</tr>
<tr>
<td>_SLASH_cm_SLASH_shared</td>
<td>rsize=32768, wsize=32768, hard, intr, async</td>
</tr>
<tr>
<td>_SLASH_dev_SLASH_pts</td>
<td>gid=5, mode=620</td>
</tr>
<tr>
<td>_SLASH_dev_SLASH_shm</td>
<td>defaults</td>
</tr>
<tr>
<td>_SLASH_home</td>
<td>rsize=32768, wsize=32768, hard, intr, async</td>
</tr>
<tr>
<td>_SLASH_proc</td>
<td>defaults, nosuid</td>
</tr>
<tr>
<td>_SLASH_sys</td>
<td>/defaults</td>
</tr>
<tr>
<td>CMD_GATEWAY</td>
<td>10.141.255.254</td>
</tr>
<tr>
<td>CMD_GUID</td>
<td></td>
</tr>
<tr>
<td>CMD_HAPROXY_HOST</td>
<td></td>
</tr>
<tr>
<td>CMD_HOSTNAME</td>
<td>node004</td>
</tr>
<tr>
<td>CMD_INITRD</td>
<td></td>
</tr>
<tr>
<td>CMD_INITRD_KERNEL_PARAMS</td>
<td></td>
</tr>
<tr>
<td>CMD_INITRD_KERNEL_VERSION</td>
<td></td>
</tr>
<tr>
<td>CMD_INITRD_TMPFS_SIZE</td>
<td></td>
</tr>
<tr>
<td>CMD_INSTALLMODE</td>
<td>AUTO</td>
</tr>
<tr>
<td>CMD_INSTANCE_ID</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACES</td>
<td>BOOTIF</td>
</tr>
<tr>
<td>CMDINTERFACE_&lt;interface&gt;_BOND</td>
<td></td>
</tr>
<tr>
<td>CMDINTERFACE_&lt;interface&gt;_BRIDGE</td>
<td></td>
</tr>
<tr>
<td>CMDINTERFACE_&lt;interface&gt;_DHCP</td>
<td></td>
</tr>
<tr>
<td>CMDINTERFACE_&lt;interface&gt;_GATEWAY</td>
<td></td>
</tr>
<tr>
<td>CMDINTERFACE_&lt;interface&gt;_IP</td>
<td>10.141.0.5</td>
</tr>
</tbody>
</table>

...continues
### Table 3.3.2: Environment Variables For Nodes In The Extended Environment...continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_LANCHANNEL</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_MAC</td>
<td>00:00:00:00:00:00:00</td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_MODE</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_MTU</td>
<td>1500</td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_NETMASK</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_REVISION</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_SLAVES</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_SPEED</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_STARTIF</td>
<td>ALWAYS</td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_TYPE</td>
<td>NetworkPhysicalInterface</td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_VLANID</td>
<td></td>
</tr>
</tbody>
</table>

In the preceding CMD_INTERFACE\_** variables, `<interface>` can take the following substitutions for the network interface:

**possible values for `<interface>`**

- BOOTIF
  - drac0, drac1, drac2...
  - cimc0, cimc1, cimc2...
  - eth0, eth1, eth1...
  - ib0, ib1, ib2...
  - iio0, iio1, iio2...
  - ipmi0, ipmi1, ipmi2...
  - rf0, rf1, rf2...
  - eno1, enp0s18f2, and other names consistent with the RHEL7 interface naming convention

| CMD_IP | 10.141.0.1 |
| CMD_JOBNODELIST |               |
| CMD_KUBERNETES_ADMIN_CERT |               |
| CMD_KUBERNETES_ADMIN_CERT_KEY |               |

...continues
### Environment Variables for Nodes in the Extended Environment

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_KUBERNETES_ADMIN_KUBECONFIG</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBERNETES_APISERVER_ENDPOINT</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBERNETES_CACERT</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBERNETES_CLIENT_CERTIFICATE</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBERNETES_CLIENT_KEY</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBERNETES_ETCD_ACTIVE</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBERNETES_ETCD_CLIENT_ENDPOINTS</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBERNETES_KUBELET_CERTIFICATE</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBERNETES_KUBELET_ENDPOINT</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBERNETES_KUBELET_KEY</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBE_DNS_IP</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBE_DOMAIN</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBE_INTERNAL_NETWORK_CIDR</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBE_POD_NETWORK_CIDR</td>
<td></td>
</tr>
<tr>
<td>CMD_KUBE_SERVICE_NETWORK_CIDR</td>
<td></td>
</tr>
<tr>
<td>CMD_LOGGING_CONFIG</td>
<td></td>
</tr>
<tr>
<td>CMD_MAC</td>
<td>FA:16:3E:64:8E:1E</td>
</tr>
<tr>
<td>CMD_MODEL</td>
<td></td>
</tr>
<tr>
<td>CMD_MODULES</td>
<td></td>
</tr>
</tbody>
</table>

...continues
Table 3.3.2: Environment Variables For Nodes In The Extended Environment ...continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_MODULE_&lt;name&gt;</td>
<td></td>
</tr>
<tr>
<td>CMD_MOUNTS</td>
<td></td>
</tr>
<tr>
<td>CMD_NAME</td>
<td></td>
</tr>
<tr>
<td>CMD_NODEGROUPS</td>
<td></td>
</tr>
<tr>
<td>CMD_NODEGROUP_NAME</td>
<td></td>
</tr>
<tr>
<td>CMD_NODEGROUP_UID</td>
<td></td>
</tr>
<tr>
<td>CMD_OWNED_INDEX</td>
<td></td>
</tr>
<tr>
<td>CMD_PARTITION base</td>
<td>base</td>
</tr>
<tr>
<td>CMD_PASSIVE_MASTER_IP 10.141.255.253</td>
<td></td>
</tr>
<tr>
<td>CMD_PDUS</td>
<td></td>
</tr>
<tr>
<td>CMD_PORT 8081</td>
<td></td>
</tr>
<tr>
<td>CMD_PORTS</td>
<td></td>
</tr>
<tr>
<td>CMD_POWER_CONTROL custom</td>
<td></td>
</tr>
<tr>
<td>CMD_PROTOCOL https</td>
<td></td>
</tr>
<tr>
<td>CMD_RACADM_PATH</td>
<td></td>
</tr>
<tr>
<td>CMD_RACK rack01</td>
<td></td>
</tr>
<tr>
<td>CMD_RACK_HEIGHT 42</td>
<td></td>
</tr>
<tr>
<td>CMD_RACK_ROOM serverroom</td>
<td></td>
</tr>
<tr>
<td>CMD_READ_STRING</td>
<td></td>
</tr>
</tbody>
</table>

...continues
Table 3.3.2: Environment Variables For Nodes In The Extended Environment ...continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_REMOVED_NODES</td>
<td></td>
</tr>
<tr>
<td>CMD_RESOLVE_NAME</td>
<td></td>
</tr>
<tr>
<td>CMD_ROLES</td>
<td></td>
</tr>
<tr>
<td>CMD_SCRIPT_TIMEOUT</td>
<td>5</td>
</tr>
<tr>
<td>CMD_SCRIPT_TIMEOUT</td>
<td>5</td>
</tr>
<tr>
<td>CMD_SHARED_MASTER_IP</td>
<td>10.141.255.252</td>
</tr>
<tr>
<td>CMD_SKIPBMC</td>
<td></td>
</tr>
<tr>
<td>CMD_SOFTWAREIMAGE</td>
<td>default-image</td>
</tr>
<tr>
<td>CMD_SOFTWAREIMAGE_PATH</td>
<td>/cm/images/default-image</td>
</tr>
<tr>
<td>CMD_STATE</td>
<td></td>
</tr>
<tr>
<td>CMD_STATUS</td>
<td></td>
</tr>
<tr>
<td>CMD_STATUS_CLOSED</td>
<td>NO</td>
</tr>
<tr>
<td>CMD_STATUS_HEALTHCHECK_FAILED</td>
<td>NO</td>
</tr>
<tr>
<td>CMD_STATUS_HEALTHCHECK_UNKNOWN</td>
<td>NO</td>
</tr>
<tr>
<td>CMD_STATUS_MESSAGE</td>
<td></td>
</tr>
<tr>
<td>CMD_STATUS_RESTART_REQUIRED</td>
<td>NO</td>
</tr>
<tr>
<td>CMD_STATUS_STATEFLAPPING</td>
<td>NO</td>
</tr>
<tr>
<td>CMD_STATUS_USERMESSAGE</td>
<td></td>
</tr>
<tr>
<td>CMD STRICTUSERID</td>
<td></td>
</tr>
</tbody>
</table>

...continues
### Table 3.3.2: Environment Variables For Nodes In The Extended Environment...continued

<table>
<thead>
<tr>
<th>Variable</th>
<th>Example Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>CMD_SUBNET_MANAGER</td>
<td></td>
</tr>
<tr>
<td>CMD_SWITCH_CONTROL_SCRIPT</td>
<td></td>
</tr>
<tr>
<td>CMD_SWITCH_CONTROL_SCRIPT_TIMEOUT</td>
<td></td>
</tr>
<tr>
<td>CMD_SYSINFO_SYSTEM_MANUFACTURER</td>
<td>RDO</td>
</tr>
<tr>
<td>CMD_SYSINFO_SYSTEM_NAME</td>
<td>OpenStack Compute</td>
</tr>
<tr>
<td>CMD_TAG</td>
<td>00000000a000</td>
</tr>
<tr>
<td>CMD_TARGET_NAME</td>
<td></td>
</tr>
<tr>
<td>CMD_TARGET_NODES</td>
<td></td>
</tr>
<tr>
<td>CMD_TYPE</td>
<td></td>
</tr>
<tr>
<td>CMD_TYPES</td>
<td></td>
</tr>
<tr>
<td>CMD_UCS_DN</td>
<td>sys/rack-unit-1</td>
</tr>
<tr>
<td>CMD_USERDEFINED1</td>
<td>var1</td>
</tr>
<tr>
<td>CMD_USERDEFINED2</td>
<td>var2</td>
</tr>
<tr>
<td>CMD_VMLINUZ</td>
<td></td>
</tr>
<tr>
<td>CMD_WRITE_STRING</td>
<td></td>
</tr>
</tbody>
</table>
Some data from CMDaemon can be accessed via its REST API.
The REST API only allows data to be retrieved at the time of writing of this section (October 2018). Data cannot currently be updated or removed.

4.1 Authentication, And Definition Of <curlauth>

Two forms of authentication are supported:

- Basic: HTTP authentication (--basic option of curl)

The following three commands give identical results:

```
[alice@bright91 ~]$ curl -k --basic --user "alice:password" "https://master:8081/rest"
[alice@bright91 ~]$ curl -k --basic --user "alice:$(path to password file)" "https://master:8081/rest"
[alice@bright91 ~]$ curl --cert ~/.cm/cert.pem --key ~/.cm/cert.key -k "https://master:8081/rest"
```

For security, it is best to use the certificate key-based version.

For convenience, the command and authority parts of the preceding three commands—that is the string in the line that includes the text from curl to 8081 in the three curl commands—is designated by <curlauth> in this chapter. Thus, each of the commands can be represented by:

```
Example

[alice@bright91 ~]$ <curlauth>/rest
```

This allows the reader to focus on the path segment and variables part of the API.

4.2 Browsing The API

A summary diagram of the REST API is shown in figure 4.1:
The remainder of this section elaborates upon the diagram. The API directory structure is documented within the directory itself. A GET operation on the main `/rest` entry point can list all subdirectories:

**Example**

```
[alice@bright91 ~]$ <curlauth>/rest
["v1"]
```

New lines are not part of the output by default. Setting a parameter of 1 or 2 for the `indent` variable uses newlines and an indentation of one or two spaces, which makes the API output more readable for all API resource paths.

**Example**

```
[alice@bright91 ~]$ <curlauth>/rest?indent=1
[ "v1"
]
```
Appending /v1 to the URL gives the functionality available in the first version of the REST API.

Example

[alice@bright91 ~]$ <curlauth>/rest/v1?indent=1
[
  "monitoring",
  "status",
  "session",
  "check"]
]

Appending /monitoring to the URL lists the subdirectory functionality available for monitoring.

Example

[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring?indent=1
[
  "entity",
  "measurable",
  "latest",
  "dump",
  "usage"
]

4.2.1 Returning A Status Using /v1/status

The status resource path returns the UP/DOWN status for all devices:

Example

[alice@bright91 ~]$ <curlauth>/rest/v1/status?indent=2
[
  {
    "hostname": "bright91",
    "status": "UP"
  },
  {
    "hostname": "node001",
    "status": "UP"
  },
  {
    "hostname": "node002",
    "status": "DOWN"
  }
]

The status can also be requested for a single device:

Example

[alice@bright91 ~]$ <curlauth>/rest/v1/status?name=node001&indent=2
[
  {
    "hostname": "node001",
    "status": "UP"
  }
]
The “two dots” list specification format (section 2.5.5 of the Administrator Manual) used in Bright View and cmsh can also be used in the API:

Example

```
[alice@bright91 ~]$ curlauth/rest/v1/status?name=node001..node002&indent=2
[
  {
    "hostname": "node001",
    "status": "UP"
  },
  {
    "hostname": "node002",
    "status": "DOWN"
  }
]
```

For more detailed information, the verbose parameter can be added (output truncated):

Example

```
[alice@bright91 ~]$ curlauth/rest/v1/status?verbose=1&indent=2
[
  {
    "health_check_failed": true,
    "health_check_unknown": false,
    "hostname": "bright91",
    "provisioning_failed": false,
    "restart_required": false,
    "status": "UP"
  },
  {
    "health_check_failed": true,
    "health_check_unknown": false,
    "hostname": "node001",
    "provisioning_failed": false,
    ...
```

### 4.2.2 Monitoring Using /v1/monitoring

#### Entities Via /v1/monitoring/entity

The entity resource returns information about the entities that are known to the monitoring system. It is possible for an entity known to the monitoring system to have no data.

Example

```
[alice@bright91 ~]$ curlauth/rest/v1/monitoring/entity?indent=1
{
  "entities": [
    {
      "key": 12884901889,
      "name": "default",
      "type": "Category"
    },
    {
      "key": 17179869185,
      "name": "globalnet",
      "type": "Network"
    }
  ]
```
A regex matcher can be used to find entities based on a name match:
Example

[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/entity?like=lobal&indent=1"
{
  "entities": [
  {
    "key": 17179869185,
    "name": "globalnet",
    "type": "Network"
  }
  ]
}

[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/entity?like=nod.0*1&indent=1"
{
  "entities": [
  {
    "key": 38654705666,
    "name": "node001",
    "type": "PhysicalNode"
  }
  ]
}

Measurables Via /v1/monitoring/measurable
This entry returns information about the defined measurables.

Example

[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/measurable?indent=1"
{
  "measurables": [
  {
    "key": 261993005057,
    "name": "IpForwDatagrams",
    "type": "metric"
  },
  {
    "key": 261993005058,
    "name": "IpFragCreates",
    "type": "metric"
  },
  {
    "key": 261993005059,
    "name": "IpFragFails",
    "type": "metric"
  },
  ...
typically hundreds more lines...
  
  [alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/measurable?name=loadone&indent=1"
{
  "measurables": [
  {
    "key": 261993005138,
    "name": "LoadOne",
    "type": "metric"
  }
  ]
}
Data Usage Via /v1/monitoring/usage

The usage resource is intended to show which (entity, measurable) pairs have data. For example, nodes with only 1 disk do not have data, if their associated measurables have the string sdb in their name.

To get the complete usage:

Example

```
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/usage?indent=1
{
    "data": [
        {
            "entity": "default",
            "measurable": "CoresTotal"
        },
        {
            "entity": "default",
            "measurable": "CoresUp"
        },
        ...typically hundreds more lines...
    ]
}
```

It is also possible to get all the measurables for which a specific entity, such as node001, has data.

Example

```
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/usage?entity=node001&indent=1
{
    "data": [
        {
            "entity": "node001",
            "measurable": "IPForwDatagrams"
        },
        {
            "entity": "node001",
```
"measurable": "IpFragCreates"
},
{
"entity": "node001",
"measurable": "IpFragFails"
}
...typically hundreds more lines...

Or all entities which have data for a specific measurable such as loadone:

**Example**

```
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/usage?measurable=loadone&indent=1
{
"data": [
{
"entity": "bright91",
"measurable": "LoadOne"
},
{
"entity": "node001",
"measurable": "LoadOne"
}
]
```

**The Latest Monitoring Data Via /v1/monitoring/latest**

The latest resource can be used to retrieve the last known sampled data points. It is possible to get the latest monitoring data for all (entity, measurable) pairs. This may result in a lot of information: about 125 bytes per (entity, measurable) pair.

**Example**

```
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/latest?indent=1
{
"data": [
{
"age": 47.868,
"entity": "default",
"measurable": "CoresTotal",
"raw": 1.0,
"time": 1540476088861,
"value": "1"
},
{
"age": 47.868,
"entity": "default",
"measurable": "CoresUp",
"raw": 1.0,
"time": 1540476088861,
"value": "1"
},
{
"age": 47.868,
"entity": "default",
"measurable": "NodesClosed",
"raw": 1.0,
"time": 1540476088861,
"value": "1"
}
```
4.2 Browsing The API

The latest data can be requested for a selection of entities and measurables.

Example

```
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/latest?entity=node001&indent=1
{
  "data": [
    {
      "age": 138.625,
      "entity": "node001",
      "measurable": "IpForwDatagrams",
      "raw": 0.0,
      "time": 1540476100389,
      "value": "0/s"
    },
    {
      "age": 138.625,
      "entity": "node001",
      "measurable": "IpFragCreates",
      "raw": 0.0,
      "time": 1540476100389,
      "value": "0/s"
    },
    {
      "age": 138.625,
      "entity": "node001",
      "measurable": "IpFragFails",
      "raw": 0.0,
      "time": 1540476100389,
      "value": "0/s"
    },
    ...
  }
}
```

...as for previous output but for the range of nodes001..node004...

```
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/latest?measurable=LoadOne&indent=1
{
  "data": [
    {
      "age": 114.099,
      ...
    }
  ]
}
```

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"entity": "bright91",
"measurable": "LoadOne",
"raw": 0.03,
"time": 1540476351361,
"value": "0.03"
},
{
"age": 155.07,
"entity": "node001",
"measurable": "LoadOne",
"raw": 0.0,
"time": 1540476310390,
"value": "0"
}
]
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/latest?entity=node001&measurable=LoadOne&indent=1"
{
"data": [
{
"age": 106.706,
"entity": "node001",
"measurable": "LoadOne",
"raw": 0.0,
"time": 1540476790390,
"value": "0"
}
]
}

Historic Data Dump Via /v1/monitoring/dump

Dumping historic data can be done using the entry point:

**Example**

[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/dump?<options>"

The dump resource has several options:

- **entity**: name or range of entities
- **measurable**: name of the measurable
- **start**: time to be plotted (default: -1h)
- **end**: end to be plotted (default: now)
- **intervals**: number of interpolation intervals (default: 0, raw data)
- **epoch**: display timestamps as unix epoch (default: 0)

The time specification format is the same one used for the dumpmonitoringdata command (section 13.6.4 of the Administrator Manual).

To prevent gigabytes of data being retrieved when no options are specified, entity and measurable must be specified.

If there is a need to dump all the monitoring data, then it can be done by specifying empty strings for both entity and measurable. For example, the following command dumps all raw data for the default last hour:
Example

```bash
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/dump?entity=&measurable=&indent=1
{
    "data": [
        {
            "entity": "default",
            "measurable": "CoresTotal",
            "raw": 1.0,
            "time": "2018/10/25 13:15:28",
            "value": "1"
        },
        {
            "entity": "default",
            "measurable": "CoresTotal",
            "raw": 1.0,
            "time": "2018/10/25 16:35:28",
            "value": "1"
        },
        {
            "entity": "default",
            "measurable": "CoresUp",
            "raw": 1.0,
            "value": "1"
        }
    ];
}
... typically thousands more lines...
```

4.2.3 Session Using /v1/session

The response to the sessions method is similar to the output from listing in session mode of cmsh (cmsh -c "session list")

The method lists the sessions that the cluster manager is involved with.

Example

```bash
[alice@bright91 ~]$ <curlauth>/rest/v1/session/indent=1
[
    {
        "address": "127.0.0.1",
        "group": "admin",
        "node": "bright91",
        "type": "node",
        "username": ""
    },
    {
        "address": "10.141.255.254",
        "group": "admin",
        "type": "node",
        "username": ""
    },
    {
        "address": "10.141.0.1",
        "group": "node",
        "node": "node001",
        "type": "node",
        "username": ""
    }
]```


```json
{
  "address": "10.141.0.2",
  "group": "node",
  "node": "node002",
  "type": "node",
  "username": ""
}
```
This chapter gives an alphabetical list of the JSON API services and entities available for Bright Cluster Manager. The API reference documentation for all available services and entities is available on the head node at:

/cm/local/apps/cmd/etc/htdocs/userportal/download/json/index.html.

It can also be accessed via the user portal of the cluster by clicking on the JSON API documentation link in the documentation section of the home page (Section 13.8.4 of the Administrator Manual).

Some examples of JSON usage are given in section 5.3

5.1 Services
5.1.1 auth
5.1.2 ceph
5.1.3 cert
5.1.4 cloud
5.1.5 device
5.1.6 etcd
5.1.7 gui
5.1.8 job
5.1.9 keyvalue
5.1.10 kube
5.1.11 main
5.1.12 mon
5.1.13 net
5.1.14 part
5.1.15 proc
5.1.16 prov
5.1.17 serv
5.1.18 session
5.1.19 status
5.1.20 test
5.1.21 user

5.2 Entities
5.2.1 AMDGPUSettings: GPUSettings

**parent**: GPUSettings

- **Parameter**: gpuClockLevel
  - **Type**: unsigned integer
  - **Description**: Set the GPU clock frequency level

- **Parameter**: memClockLevel
  - **Type**: unsigned integer
  - **Description**: Set the GPU memory clock frequency level

- **Parameter**: powerplay
  - **Type**: string
  - **Description**: Set powerplay level

- **Parameter**: overdrive
  - **Type**: unsigned integer
  - **Description**: This sets the percentage above maximum for the max Performance Level.

- **Parameter**: fanspeed
  - **Type**: unsigned integer
  - **Description**: Fan speed value

- **Parameter**: minimalGPUclock
  - **Type**: unsigned integer
  - **Description**: Minimum GPU clock speed in MHz

- **Parameter**: minimalMemoryClock
  - **Type**: unsigned integer
  - **Description**: Minimum GPU Memory clock speed in MHz

- **Parameter**: activityThreshold
  - **Type**: unsigned integer
  - **Description**: Workload required before clock levels change (%)

- **Parameter**: hystereresisUp
  - **Type**: unsigned integer
  - **Description**: Delay before clock level is increased in milliseconds

- **Parameter**: hystereresisDown
  - **Type**: unsigned integer
  - **Description**: Delay before clock level is decreased in milliseconds

5.2.2 ANFVolume: Entity

**parent**: Entity

- **Parameter**: id
  - **Type**: string
Description: Unique identifier

Parameter: name
Type: string
Description: Name of the ANF volume.

Parameter: owner
Type: string
Description: Owner of the Azure NetApp pool and volume

Parameter: resourceGroup
Type: string
Description: The resource group where the volume was created

Parameter: netAppAccount
Type: string
Description: The NetApp account name where the volume was created

Parameter: location
Type: string
Description: The Azure location where the volume was created

Parameter: size
Type: unsigned integer
Description: Size in TB. Should be at least 4

Parameter: status
Type: string
Description: Status of the volume

Parameter: mountPath
Type: string
Description: String containing IP and mount path of the volume

Parameter: management
Type: enum
Description: Volume management type

Parameter: creationTime
Type: string
Description: Creation time

Parameter: sharedWith
Type: list of strings
Description: Other cmjob users that can use this volume for jobs.
5.2.3 ArchOSInfo: Entity
parent: Entity

Parameter: arch
Type: enum
Description: Architecture

Parameter: os
Type: enum
Description: Operating system

5.2.4 ArchOS: ArchOSInfo
parent: ArchOSInfo

Parameter: primaryImage
Type: reference to SoftwareImage or None
Description: Image used to boot new nodes and keep /cm/shared up to date, empty if head node is to be used

Parameter: shared
Type: reference to FSPart or None
Description: Shared directory

Parameter: installer
Type: reference to FSPart or None
Description: Node installer

Parameter: priority
Type: unsigned integer
Description: Priority

5.2.5 AWSIntermediateStorage: CMJobIntermediateStorage
parent: CMJobIntermediateStorage

Parameter: bucket
Type: string
Description: S3 Bucket name

Parameter: region
Type: string
Description: Region for S3 bucket

Parameter: maxObjectLifetime
Type: float
Description: Max time to store data in bucket (0 for infinite)

Parameter: maxFSxInstanceCapacity
Type: unsigned integer
5.2 Entities

Description: Maximum FSx instance size (GiB) that user can request.

Parameter: maxFSxInstanceCountPerUser
Type: unsigned integer
Description: Maximum amount of FSx instances that a user can have simultaneously.

Parameter: defaultFSxInstanceCapacity
Type: unsigned integer
Description: Default capacity of an FSx instance, used if not specified during creation.

Parameter: securityGroupFSx
Type: string
Description: Security group ID of the FSx instances

5.2.6 AzureDataDisk: AzureDisk
parent: AzureDisk

Parameter: lun
Type: unsigned integer
Description: Logical unit number of a block device to be attached

Parameter: removeOnTermination
Type: boolean
Description: If true, the drive will be removed when the instance it is attached to gets terminated

5.2.7 AzureDisk: Entity
parent: Entity

Parameter: name
Type: string
Description: Name of the data disk

Parameter: size
Type: unsigned integer
Description: Size of the drive

Parameter: image
Type: string
Description: URL to a source image for the disk

Parameter: storageAccountName
Type: string
Description: Name of a storage account to hold the disk

Parameter: imageContainerName
Type: string
Description: If the disk has the image url set, the image will be copied to a container with this name

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Parameter:  containerName
Type:  string
Description:  Name of a container in storage account to hold the disk

Parameter:  managedDiskParameters
Type:  AzureManagedDiskParameters
Description:  Azure Managed Disk parameters

5.2.8 AzureExtension: Entity
parent: Entity

Parameter:  name
Type:  string
Description:  User-defined name of the private cloud

Parameter:  location
Type:  reference to AzureLocation
Description:  Region of the cluster extension

Parameter:  resourceGroup
Type:  string
Description:  Azure resource group name for all resources in the extension

Parameter:  network
Type:  reference to Network
Description:  Network associated with the extension

Parameter:  extraField
Type:  list of strings
Description:  Reserved

5.2.9 AzureIntermediateStorage: CMJobIntermediateStorage
parent: CMJobIntermediateStorage

Parameter:  storageAccount
Type:  string
Description:  Azure storage account name

Parameter:  accessKey
Type:  string
Description:  Azure storage account access key

Parameter:  container
Type:  string
Description:  Container name to place data into

Parameter:  netAppSubnet
Type:  string

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Description: Subnet where ANF volumes will be created

Parameter: netAppNetwork
Type: string
Description: Network where the NetApp Subnet was created

Parameter: netAppAccountName
Type: string
Description: Name of the NetApp account to create ANF volumes

Parameter: netAppServiceLevel
Type: string
Description: Service Level for newly created ANF volumes

Parameter: maxANFVolumeCapacity
Type: unsigned integer
Description: Maximum ANF volume size(TiB) that user can request.

Parameter: maxANFVolumeCountPerUser
Type: unsigned integer
Description: Maximum amount of ANF volumes that a user can have simultaneously.

Parameter: defaultANFVolumeCapacity
Type: unsigned integer
Description: Default capacity of an ANF volume, used if not specified during creation.

5.2.10 AzureLocation: CloudRegion
parent: CloudRegion

5.2.11 AzureManagedDiskParameters: Entity
parent: Entity

Parameter: id
Type: string
Description: Managed disks resource ID

Parameter: storageAccountType
Type: string
Description: Storage account type for managed disks

5.2.12 AzureOSDisk: AzureDisk
parent: AzureDisk

Parameter: cachingType
Type: enum
Description: Disk caching type

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5.2.13 AzureProvider: CloudProvider

parent: CloudProvider

Parameter: subscriptionId
Type: string
Description: Azure Subscription ID.

Parameter: clientId
Type: string
Description: Azure Client ID.

Parameter: clientSecret
Type: string
Description: Azure Client Secret.

Parameter: tenantId
Type: string
Description: Tenant ID.

Parameter: defaultLocation
Type: reference to AzureLocation or None
Description: Default location to start virtual machine in.

Parameter: defaultVMSize
Type: reference to AzureVMSize or None
Description: Default cloud node VM size.

Parameter: defaultDirectorVMSize
Type: reference to AzureVMSize or None
Description: Default cloud director VM size.

Parameter: extensions
Type: list of AzureExtension
Description: List of extensions

Parameter: defaultNodeInstallerImage
Type: string
Description: Default node-installer image, can be overridden in the OS disk.

Parameter: marketplaceUsePolicy
Type: enum
Description: Preference towards using marketplace images

Parameter: freeImageType
Type: enum
Description: What kind of image to use for cloud nodes within the license
5.2 Entities

5.2.14 AzureSettings: CloudSettings

**parent**: CloudSettings

**Parameter**: instanceId

**Type**: string

**Description**: Instance-ID provided by Azure

**Parameter**: availabilitySetName

**Type**: string

**Description**: Availability set name

**Parameter**: nicId

**Type**: string

**Description**: Network interface identifier

**Parameter**: externalIP

**Type**: IP

**Description**: The external IP address as set by the cloud provider

**Parameter**: useKernelAndInitrdFromTheSoftwareImage

**Type**: boolean

**Description**: Make the cloud node’s node-installer download the kernel and the initrd from the software image configured for this cloud node and then reboot the cloud node to use those, instead of using the kernel and initrd already present on the node-installer’s cloud image.

**Parameter**: location

**Type**: reference to AzureLocation

**Description**: Virtual Machine location

**Parameter**: resourceGroupName

**Type**: string

**Description**: Azure Resource Group Name

**Parameter**: storageAccountName

**Type**: string

**Description**: Name of a storage account where boot diagnostics will be stored for this instance

**Parameter**: deploymentName

**Type**: string

**Description**: Name of the Azure deployment associated with this node

**Parameter**: publicIpName

**Type**: string

**Description**: Name of a public ip object to be assigned to the node

**Parameter**: VMSize

**Type**: reference to AzureVMSize

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Description: Virtual Machine size

Parameter: disks
Type: list of AzureDisk
Description: Storage disks.

Parameter: marketplaceUsePolicy
Type: enum
Description: Preference towards using marketplace Images

Parameter: availabilityZone
Type: string
Description: Azure Availability zone where all the resources related to this VM will be allocated

Parameter: freeImageType
Type: enum
Description: What kind of image to use for cloud nodes within the license

5.2.15 AzureVMSize: CloudType
parent: CloudType

5.2.16 BackupInfo: Entity
parent: Entity

Parameter: refSourceNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: refBackupNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: refFSPartUniqueKey
Type: unsigned integer
Description: FSPart

Parameter: timestamp
Type: unsigned integer
Description: Timestamp of the completion of the backup

Parameter: index
Type: unsigned integer
Description: Index of the backup

5.2.17 BackupRole: Role
parent: Role

Parameter: directory
5.2 Entities

**Type:** string  
**Description:** Directory where backups for other nodes are saved

**Parameter:** disabled  
**Type:** boolean  
**Description:** Disabled nodes will no longer be used

**Parameter:** backupRing  
**Type:** unsigned integer  
**Description:** Only backup to nodes within the same ring

**Parameter:** maximumNumberOfBackups  
**Type:** unsigned integer  
**Description:** Maximum number of backups this node should be used for, set 0 for unlimited

### 5.2.18 BadEntityManagers: Entity
**parent:** Entity

**Parameter:** name  
**Type:** string  
**Description:** Name

**Parameter:** managers  
**Type:** list of strings  
**Description:** Managers

### 5.2.19 BasicResource: Entity
**parent:** Entity

**Parameter:** name  
**Type:** string  
**Description:** Name

**Parameter:** dependency  
**Type:** unsigned integer  
**Description:** Dependency on another resource, run this resource on the same node as the dependency

**Parameter:** exclude  
**Type:** list of unsigned numbers  
**Description:** Do not run this resource on any node running one of the excluded resources

**Parameter:** disabled  
**Type:** boolean  
**Description:** Disable the resource from being given to any node

**Parameter:** stopOnRemove  
**Type:** boolean
Description: Automatically stop resource when removed

5.2.20 BeeGFSAdmonRole: Role
parent: Role

Parameter: databaseFile
Type: string
Description: Path to the database

Parameter: managementNode
Type: reference to Node
Description: Node with a management role

Parameter: clearDatabase
Type: boolean
Description: Delete database on startup

Parameter: queryInterval
Type: unsigned integer
Description: Interval for querying servers for new statistics data

Parameter: authFile
Type: string
Description: Path to the shared secret authentication file

Parameter: fallbackExpiration
Type: unsigned integer
Description: Time after which a connection to a fallback interface expires

Parameter: interfacesFile
Type: string
Description: Path to the file with a list of interfaces for communication

Parameter: maxInternodeNumber
Type: unsigned integer
Description: Max number of simultaneous connections to the same node

Parameter: httpPort
Type: unsigned integer
Description: TCP port for built-in web server

Parameter: admonPortUDP
Type: unsigned integer
Description: UDP port for admon service

Parameter: netFilterFile
Type: string
5.2 Entities

**Description:** Path to a file with a list of allowed IP subnets

**Parameter:** tcpOnlyFilterFile

**Type:** string

**Description:** Path to a file with a list of no DRMA IP ranges

**Parameter:** logLevel

**Type:** unsigned integer

**Description:** Log level

**Parameter:** noLogDate

**Type:** boolean

**Description:** Do not show date along with time in log

**Parameter:** numberOfLogLines

**Type:** unsigned integer

**Description:** Number of lines in log file, after which it will be rotated

**Parameter:** numberOfLogRotatedFiles

**Type:** unsigned integer

**Description:** Number of old log files to keep

**Parameter:** logFile

**Type:** string

**Description:** Path to the log file, empty means logs go to the journal

**Parameter:** enableMail

**Type:** boolean

**Description:** Enable email notification

**Parameter:** smtpSendType

**Type:** string

**Description:** How to send the email to an smtp server

**Parameter:** sendmailPath

**Type:** string

**Description:** Path to the sendmail binary

**Parameter:** checkIntervalTime

**Type:** unsigned integer

**Description:** Interval for checking for new events that must be mailed

**Parameter:** minimalDownTime

**Type:** unsigned integer

**Description:** Interval of node downtime after which it should be reported

**Parameter:** mailRecipients
Type: list of strings
Description: Email addresses to send notifications to

Parameter: resendMailTime
Type: unsigned integer
Description: Amount of time to sent email again as a reminder

Parameter: mailSender
Type: string
Description: Email address to send notifications from

Parameter: smtpServer
Type: string
Description: SMTP server to use for sending emails

Parameter: numberOfWorkers
Type: unsigned integer
Description: Number of worker threads

5.2.21 BeeGFSClientRole: Role

parent: Role

Parameter: managementNode
Type: reference to Node
Description: Node with a management role

Parameter: authFile
Type: string
Description: Path to the shared secret authentication file

Parameter: clientPortUDP
Type: unsigned integer
Description: UDP port for client service

Parameter: helperPortTCP
Type: unsigned integer
Description: TCP port for helper service

Parameter: communicationRetry
Type: unsigned integer
Description: Time for retries in case of a network failure

Parameter: fallbackExpiration
Type: unsigned integer
Description: Time after which a connection to a fallback interface expires

Parameter: interfacesFile
Type: string
5.2 Entities

Description: Path to the file with a list of interfaces for communication

Parameter: maxInternodeNumber
Type: unsigned integer
Description: Max number of simultaneous connections to the same node

Parameter: netFilterFile
Type: string
Description: Path to a file with a list of allowed IP subnets

Parameter: useRDMA
Type: boolean
Description: Use RDMA

Parameter: rdmaBuffersNumber
Type: unsigned integer
Description: Number of RDMA buffers

Parameter: rdmaBufferSize
Type: unsigned integer
Description: Maximum size of a buffer that will be sent over the network

Parameter: rdmaTypeOfService
Type: unsigned integer
Description: RDMA type of service

Parameter: tcpOnlyFilterFile
Type: string
Description: Path to a file with a list of no DRMA IP ranges

Parameter: mountpoint
Type: string
Description: Path to a beegfs filesystem mountpoint

Parameter: logLevel
Type: unsigned integer
Description: Log level

Parameter: noLogDate
Type: boolean
Description: Do not show date along with time in log

Parameter: numberOfLogLines
Type: unsigned integer
Description: Number of lines in log file, after which it will be rotated

Parameter: numberOfLogRotatedFiles
Type: unsigned integer
Description: Number of old log files to keep

Parameter: logFile
Type: string
Description: Path to the log file, empty means logs go to the journal

Parameter: enableQuota
Type: boolean
Description: Enable quota

Parameter: createHardlinksAsSymlinks
Type: boolean
Description: Create a symlink when an application tries to create a hardlink

Parameter: mountSanityCheckMs
Type: unsigned integer
Description: Time in ms server has to respond after mount sanity check

Parameter: sessionCheckOnClose
Type: boolean
Description: Check for valid sessions on storage server when a file is closed

Parameter: syncOnClose
Type: boolean
Description: Sync file content on close

Parameter: targetOfflineTimeout
Type: unsigned integer
Description: Timeout until all storage targets are considered offline when no target state updates can be fetched from management server

Parameter: updateTargetStates
Type: unsigned integer
Description: Interval for storage targets states check

Parameter: enableXAttrs
Type: boolean
Description: Enable xattrs

Parameter: enableACLs
Type: boolean
Description: Enable ACLs

Parameter: fileCacheType
Type: string
5.2 Entities

Description: File read/write cache type

Parameter: preferredMetaFile
Type: string
Description: Path to a file with preferred metadata servers

Parameter: preferredStorageFile
Type: string
Description: Path to a file with preferred storage targets

Parameter: remoteFSync
Type: boolean
Description: Should fsync be executed on server to flush cached file

Parameter: useGlobalAppendLocks
Type: boolean
Description: Should files, opened in append mode, be protected by locks on local machine (false) or on servers (true)

Parameter: useGlobalFileLocks
Type: boolean
Description: Should advisory locks be checked on local machine (false) or on servers (true)

Parameter: helperWorkersNumber
Type: unsigned integer
Description: Number of worker threads for helper service

5.2.22 BeeGFSManagementRole: Role

parent: Role

Parameter: dataDir
Type: string
Description: Path to the data directory

Parameter: allowNewServers
Type: boolean
Description: Allow new servers registration

Parameter: allowNewTargets
Type: boolean
Description: Allow new storage targets registration

Parameter: authFile
Type: string
Description: Path to the shared secret authentication file

Parameter: backlogTCP
Type: unsigned integer

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Description: TCP listen backlog

Parameter: interfacesFile
Type: string
Description: Path to the file with a list of interfaces for communication

Parameter: managementPortTCP
Type: unsigned integer
Description: TCP port for management service

Parameter: managementPortUDP
Type: unsigned integer
Description: UDP port for management service

Parameter: netFilterFile
Type: string
Description: Path to a file with a list of allowed IP subnets

Parameter: logLevel
Type: unsigned integer
Description: Log level

Parameter: noLogDate
Type: boolean
Description: Do not show date along with time in log

Parameter: numberOfLogLines
Type: unsigned integer
Description: Number of lines in log file, after which it will be rotated

Parameter: numberOfLogRotatedFiles
Type: unsigned integer
Description: Number of old log files to keep

Parameter: logFile
Type: string
Description: Path to the log file, empty means logs go to the journal

Parameter: enableQuota
Type: boolean
Description: Enable quota

Parameter: quotaQueryGIDFile
Type: string
Description: Path to a file with GIDs to be checked by quota

Parameter: quotaQueryGIDRange
5.2 Entities

Type: string
Description: GID range to be checked by quota

Parameter: quotaQueryUIDFile
Type: string
Description: Path to a file with UIDs to be checked by quota

Parameter: quotaQueryUIDRange
Type: string
Description: UID range to be checked by quota

Parameter: quotaQueryType
Type: string
Description: Query type for quota

Parameter: quotaQueryWithSystemUsersGroups
Type: boolean
Description: Allow also system users/groups to be checked by quota

Parameter: quotaUpdateInterval
Type: unsigned integer
Description: Quota update interval

Parameter: targetOfflineTimeout
Type: unsigned integer
Description: Timeout until tagrets on a storage server are considered offline when no target status is received

Parameter: clientAutoRemove
Type: unsigned integer
Description: Time after which an unreachable node is considered dead

Parameter: numberOfWorkers
Type: unsigned integer
Description: Number of worker threads

Parameter: metaDynamicPools
Type: boolean
Description: Raise lower limits if difference in capacity becomes too large between targets

Parameter: metaInodesLowLimit
Type: string
Description: Metadata inode free space pool threshold

Parameter: metaInodesEmergencyLimit
Type: string
Description: Metadata inode free space pool threshold

Parameter: metaSpaceLowLimit
Type: string
Description: Metadata space free space pool threshold

Parameter: metaSpaceEmergencyLimit
Type: string
Description: Metadata space free space pool threshold

Parameter: storageDynamicPools
Type: boolean
Description: Raise lower limits if difference in capacity becomes too large between targets

Parameter: storageInodesLowLimit
Type: string
Description: Storage inode free space pool threshold

Parameter: storageInodesEmergencyLimit
Type: string
Description: Storage inode free space pool threshold

Parameter: storageSpaceLowLimit
Type: string
Description: Storage space free space pool threshold

Parameter: storageSpaceEmergencyLimit
Type: string
Description: Storage space free space pool threshold

5.2.23 BeeGFSMetadataRole: Role
parent: Role

Parameter: dataDir
Type: string
Description: Path to the data directory

Parameter: managementNode
Type: reference to Node
Description: Node with a management role

Parameter: authFile
Type: string
Description: Path to the shared secret authentication file

Parameter: backlogTCP
Type: unsigned integer
Description: TCP listen backlog

Parameter: fallbackExpiration
Type: unsigned integer
Description: Time after which a connection to a fallback interface expires

Parameter: interfacesFile
Type: string
Description: Path to the file with a list of interfaces for communication

Parameter: maxInternodeNumber
Type: unsigned integer
Description: Max number of simultaneous connections to the same node

Parameter: metaPortTCP
Type: unsigned integer
Description: TCP port for metadata service

Parameter: metaPortUDP
Type: unsigned integer
Description: UDP port for metadata service

Parameter: netFilterFile
Type: string
Description: Path to a file with a list of allowed IP subnets

Parameter: useRDMA
Type: boolean
Description: Use RDMA

Parameter: rdmaTypeOfService
Type: unsigned integer
Description: RDMA type of service

Parameter: tcpOnlyFilterFile
Type: string
Description: Path to a file with a list of no DRMA IP ranges

Parameter: logLevel
Type: unsigned integer
Description: Log level

Parameter: noLogDate
Type: boolean
Description: Do not show date along with time in log

Parameter: numberOfLogLines

Type: unsigned integer
Description: Number of lines in log file, after which it will be rotated

Parameter: numberOfLogRotatedFiles
Type: unsigned integer
Description: Number of old log files to keep

Parameter: logFile
Type: string
Description: Path to the log file, empty means logs go to the journal

Parameter: clientXAttrs
Type: boolean
Description: Enable client-side extended attributes

Parameter: clientACLs
Type: boolean
Description: Enable handling and storage of client-side ACLs

Parameter: useExtendedAttributes
Type: boolean
Description: Store metadata as extended attributes or not

Parameter: targetAttachmentFile
Type: string
Description: File with a list of targets to be grouped within the same domain for random internode

Parameter: targetOfflineTimeout
Type: unsigned integer
Description: Timeout until targets on a storage server are considered offline when no target status is received

Parameter: allowUserSetPattern
Type: boolean
Description: Allow non-privileged users to modify stripe pattern settings for directories they own

Parameter: bindToNumaZone
Type: string
Description: Zero-based NUMA zone number to which all threads of metadata process should be bound

Parameter: numberOfStreamListeners
Type: unsigned integer
Description: The number of threads waiting for incoming data events

Parameter: numberOfWorkers
Type: unsigned integer

5.2 Entities

Description: Number of worker threads

Parameter: targetChooser
Type: string
Description: The algorithm to choose storage targets for file creation

Parameter: useAggressiveStreamPoll
Type: boolean
Description: Actively poll for events instead of sleeping until an event occur

Parameter: usePerUserMsgQueues
Type: boolean
Description: Use per-user queues for pending requests

5.2.24 BeeGFSStorageRole: Role

parent: Role

Parameter: dataDirs
Type: list of strings
Description: Path to the data directories

Parameter: managementNode
Type: reference to Node
Description: Node with a management role

Parameter: authFile
Type: string
Description: Path to the shared secret authentication file

Parameter: backlogTCP
Type: unsigned integer
Description: TCP listen backlog

Parameter: interfacesFile
Type: string
Description: Path to the file with a list of interfaces for communication

Parameter: maxInternodeNumber
Type: unsigned integer
Description: Max number of simultaneous connections to the same node

Parameter: storagePortTCP
Type: unsigned integer
Description: TCP port for storage service

Parameter: storagePortUDP
Type: unsigned integer

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**Description:** UDP port for storage service

**Parameter:** `netFilterFile`
- **Type:** string
- **Description:** Path to a file with a list of allowed IP subnets

**Parameter:** `useRDMA`
- **Type:** boolean
- **Description:** Use RDMA

**Parameter:** `rdmaTypeOfService`
- **Type:** unsigned integer
- **Description:** RDMA type of service

**Parameter:** `tcpOnlyFilterFile`
- **Type:** string
- **Description:** Path to a file with a list of no DRMA IP ranges

**Parameter:** `logLevel`
- **Type:** unsigned integer
- **Description:** Log level

**Parameter:** `noLogDate`
- **Type:** boolean
- **Description:** Do not show date along with time in log

**Parameter:** `numberOfLogLines`
- **Type:** unsigned integer
- **Description:** Number of lines in log file, after which it will be rotated

**Parameter:** `numberOfLogRotatedFiles`
- **Type:** unsigned integer
- **Description:** Number of old log files to keep

**Parameter:** `logFile`
- **Type:** string
- **Description:** Path to the log file, empty means logs go to the journal

**Parameter:** `resyncSafetyThreshold`
- **Type:** unsigned integer
- **Description:** Add an extra amount of time to the last successful communication timestamp, in case of a potential cache loss

**Parameter:** `targetOfflineTimeout`
- **Type:** unsigned integer
- **Description:** Timeout until targets on a storage server are considered offline when no target status is received
Parameter: bindToNumaZone  
Type: string  
Description: Zero-based NUMA zone number to which all threads of metadata process should be bound

Parameter: fileReadAheadSize  
Type: string  
Description: Byte range submitted to the kernel for read-ahead after number of bytes was already read from target

Parameter: fileReadAheadTriggerSize  
Type: string  
Description: Number of bytes after reading which the read-ahead is triggered

Parameter: fileReadSize  
Type: string  
Description: Maximum amount of data server should read in a single operation

Parameter: fileWriteSize  
Type: string  
Description: Maximum amount of data server should write in a single operation

Parameter: fileWriteSyncSize  
Type: string  
Description: Number of bytes after which kernel will be advised to commit data

Parameter: numberOfResyncGatherSlaves  
Type: unsigned integer  
Description: Number of threads to gather filesystem information for a buddy mirror resync

Parameter: numberOfResyncSlaves  
Type: unsigned integer  
Description: Number of threads to sync filesystem information for a buddy mirror resync

Parameter: numberOfStreamListeners  
Type: unsigned integer  
Description: Number of threads waiting for incoming data events

Parameter: numberOfWorkers  
Type: unsigned integer  
Description: Number of worker threads

Parameter: useAggressiveStreamPoll  
Type: boolean  
Description: Actively poll for events instead of sleeping until an event occur

Parameter: usePerTargetWorkers

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Type: boolean  
Description: Create a separate set of workers and attach it for each storage target

Parameter: usePerUserMsgQueues  
Type: boolean  
Description: Use per-user queues for pending requests

Parameter: workerBufferSize  
Type: string  
Description: Size of network and io buffers, allocated for each worker

5.2.25 BlockingOperation: Entity
parent: Entity

Parameter: refNodeUniqueKey  
Type: unsigned integer  
Description: Node

Parameter: message  
Type: string  
Description: Message

5.2.26 BlockingProvisioningOperation: BlockingOperation
parent: BlockingOperation

Parameter: requestIDs  
Type: list of unsigned numbers  
Description: Request IDs

5.2.27 BlockingWarningOperation: BlockingOperation  
parent: BlockingOperation

5.2.28 BMCSettings: Entity  
parent: Entity

Parameter: userName  
Type: string  
Description: Username used to send BMC commands

Parameter: userID  
Type: integer  
Description: User ID to send BMC commands

Parameter: password  
Type: string  
Description: Password used to send BMC commands

Parameter: powerResetDelay  
Type: unsigned integer
Description: Delay used for BMC power reset, if set to > 0 power off; sleep \( X \); power on is used

Parameter: extraArguments
Type: string
Description: Extra arguments passed to BMC commands

Parameter: privilege
Type: enum
Description: none

5.2.29 BootRole: Role

parent: Role

Parameter: nodegroups
Type: list of references to NodeGroup
Description: List of node groups which can boot from this node

Parameter: categories
Type: list of references to Category
Description: List of categories which can boot from this node

Parameter: racks
Type: list of references to Rack
Description: List of racks which can boot from this node

Parameter: softwareImages
Type: list of references to SoftwareImage
Description: List of software images from which can be booted, leave empty for all images

Parameter: allowRamdiskCreation
Type: boolean
Description: Allow the node to create ramdisks by itself, instead of waiting for them to be rsynced from the headnode

Parameter: disableAutomaticExports
Type: boolean
Description: Disable creation of automatic filesystem exports

Parameter: unmanagedNodes
Type: boolean
Description: Allow unmanged nodes to boot

Parameter: syncFSParts
Type: enum
Description: Sync FSParts mode

Parameter: fsparts
Type: list of references to FSPart
Description: FSParts

**5.2.30 BurnConfig: Entity**

**parent:** Entity

**Parameter:** name
**Type:** string
**Description:** A short name to identify this burn configuration.

**Parameter:** description
**Type:** string
**Description:** A more extensive description of this burn configuration.

**Parameter:** configuration
**Type:** string
**Description:** This XML data describes which burn tests should be used.

**5.2.31 BurnStatus: Entity**

**parent:** Entity

**Parameter:** refNodeUniqueKey
**Type:** unsigned integer
**Description:** Node

**Parameter:** startNewBurn
**Type:** boolean
**Description:** Starting new burn on next reboot

**Parameter:** burning
**Type:** boolean
**Description:** Currently burning

**Parameter:** information
**Type:** string
**Description:** Information

**Parameter:** configuration
**Type:** string
**Description:** Configuration

**Parameter:** error
**Type:** string
**Description:** Error message.

**Parameter:** warnings
**Type:** unsigned integer
**Description:** Number of warnings which have occurred so far.

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5.2 Entities

Parameter: phaseName
Type: string
Description: Name of the current phase.

Parameter: phaseTime
Type: string
Description: Time past since the current phase was started.

Parameter: burnComplete
Type: string
Description: Set if the burn cycle has completed.

Parameter: burnFailed
Type: boolean
Description: Set if the burn cycle has failed.

Parameter: testStatusList
Type: list of BurnTestStatus
Description: none

Parameter: tag
Type: string
Description: Hardware tag.

5.2.32 BurnTestStatus: Entity

parent: Entity

Parameter: name
Type: string
Description: Test name.

Parameter: status
Type: string
Description: Test status.

Parameter: started
Type: boolean
Description: Indicates if test was started.

Parameter: passed
Type: boolean
Description: Indicates if test has passed.

Parameter: failed
Type: boolean
Description: Indicates if test has failed.

Parameter: warning

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Type: boolean
Description: Indicates if test produced a warning.

### 5.2.33 Category: Entity

**parent:** Entity

**Parameter:** name
Type: string
Description: Name of category

**Parameter:** fsmounts
Type: list of FSMount
Description: Configure the entries placed in /etc/fstab

**Parameter:** staticRoutes
Type: list of StaticRoute
Description: Configure static routes for the interfaces

**Parameter:** roles
Type: list of Role
Description: Assign the roles the node should play

**Parameter:** notes
Type: string
Description: Administrator notes

**Parameter:** cpuspeedGovernor
Type: string
Description: Current governor for frequency scaling

**Parameter:** gpuSettings
Type: list of GPUSettings
Description: Configure the GPUs

**Parameter:** softwareImageProxy
Type: SoftwareImageProxy
Description: Software image the category will use

**Parameter:** defaultGateway
Type: IP
Description: Default gateway for the category

**Parameter:** nameServers
Type: list of strings
Description: List of name servers the category will use

**Parameter:** timeServers
Type: list of strings
Description:  List of time servers the category will use

Parameter:  searchDomains
Type:  list of strings
Description:  Search domains for the category

Parameter:  disksetup
Type:  string
Description:  Node specific disk setup

Parameter:  biosSetup
Type:  string
Description:  BIOS setup

Parameter:  installMode
Type:  string
Description:  Installmode to be used by default, if none is specified in the node

Parameter:  newNodeInstallMode
Type:  string
Description:  Installmode to be used by default, for new nodes

Parameter:  excludeListFull
Type:  string
Description:  Exclude list for full install

Parameter:  excludeListSync
Type:  string
Description:  Exclude list for sync install

Parameter:  excludeListUpdate
Type:  string
Description:  Exclude list for update

Parameter:  excludeListGrab
Type:  string
Description:  Exclude list for grabbing to an existing image

Parameter:  excludeListGrabnew
Type:  string
Description:  Exclude list for grabbing to a new image

Parameter:  initialize
Type:  string
Description:  Initialize script to be used for category

Parameter:  finalize

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Type: string
Description: Finalize script to be used for category

Parameter: raidconf
Type: string
Description: Node specific Hardware RAID configuration

Parameter: fseexports
Type: list of FSExport
Description: Configure the entries placed in /etc/exports

Parameter: services
Type: list of OSServiceConfig
Description: Manage operating system services

Parameter: bmcSettings
Type: BMCSettings or None
Description: Configure the baseboard management controller settings

Parameter: proxySettings
Type: ProxySettings or None
Description: Configure the proxy server settings

Parameter: nodeInstallerDisk
Type: boolean
Description: The node has its own node installer disk

Parameter: installBootRecord
Type: boolean
Description: Install boot record on local disk

Parameter: managementNetwork
Type: reference to Network or None
Description: Determines what network should be used for management traffic. If not set, partition setting is used.

Parameter: interactiveUser
Type: enum
Description: Allow user login on node

Parameter: fspartAssociations
Type: list of FSPartAssociation
Description: none

Parameter: dataNode
Type: boolean
Description: If enabled the node will never do a FULL install without explicit user confirmation

Parameter: allowNetworkingRestart
Type: boolean
Description: Allow nodes to update ifcfg files and restart networking

Parameter: excludeListManipulateScript
Type: string
Description: A user defined script that can be used to do custom last minute changes to the exclude lists used by cmdaemon to rsync

Parameter: ioScheduler
Type: string
Description: The I/O scheduler for the disks

Parameter: useExclusivelyFor
Type: string
Description: Use node exclusively for desired function: stop all other services

Parameter: kernelVersion
Type: string
Description: Kernel version used

Parameter: kernelParameters
Type: string
Description: Kernel parameters passed to the kernel at boot time

Parameter: kernelOutputConsole
Type: string
Description: Kernel output console used at boot time

Parameter: modules
Type: list of KernelModule
Description: Manage kernel modules loaded in this image

Parameter: versionConfigFiles
Type: boolean
Description: Keep old versions of all config files for all nodes in this category

Parameter: bootLoader
Type: enum
Description: Boot loader

Parameter: bootLoaderProtocol
Type: enum
Description: Boot loader protocol for retrieving initrd and vmlinuz
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bootLoaderFile</td>
<td>Alternative boot loader file</td>
</tr>
<tr>
<td>timeZoneSettings</td>
<td>Time zone</td>
</tr>
<tr>
<td>mdsBeaconInterval</td>
<td>The frequency (in seconds) of beacon messages sent to the monitor.</td>
</tr>
<tr>
<td>mdsBeaconGrace</td>
<td>The interval without beacons before Ceph declares an MDS laggy (and possibly replace it).</td>
</tr>
<tr>
<td>mdsTickInterval</td>
<td>How frequently the MDS performs internal periodic tasks.</td>
</tr>
<tr>
<td>extraConfig</td>
<td>Extra config parameters</td>
</tr>
<tr>
<td>modulePath</td>
<td>Path to load modules from</td>
</tr>
<tr>
<td>dataPath</td>
<td>Path to load daemon data (such as keyring)</td>
</tr>
<tr>
<td>beaconPeriod</td>
<td>How many seconds between mgr beacons to monitors</td>
</tr>
<tr>
<td>extraConfig</td>
<td>Extra config parameters</td>
</tr>
</tbody>
</table>
5.2 Entities

5.2.36 CephMonitorRole: Role

parent: Role

Parameter: dataPath
Type: string
Description: Path to the Monitor data

Parameter: extraConfig
Type: list of strings
Description: Extra config parameters

5.2.37 CephOSDBlueStoreConfig: CephOSDConfig

parent: CephOSDConfig

Parameter: osdDevice
Type: string
Description: Device to store OSD data

Parameter: osdWalDevice
Type: string
Description: Optional device to store write-ahead-log

Parameter: osdDbDevice
Type: string
Description: Optional device to store internal metadata

Parameter: extra1
Type: string
Description: Just in case

5.2.38 CephOSDConfig: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: extraConfig
Type: list of strings
Description: Extra config parameters

5.2.39 CephOSDFileStoreConfig: CephOSDConfig

parent: CephOSDConfig

Parameter: dataPath
Type: string
Description: Path to the OSD data

Parameter: osdDevice
Type: string
Description: Device for storing OSD data

Parameter: journalDevice
Type: string
Description: Device for storing journal data

Parameter: journalOnOSDPartition
Type: boolean
Description: Store the journal on a partition of the OSD device

Parameter: journalSize
Type: unsigned integer
Description: Journal size in MiB

5.2.40 CephOSDPool: Entity

Parameter: id
Type: unsigned integer
Description: Id

Parameter: name
Type: string
Description: Name

Parameter: size
Type: unsigned integer
Description: Number of replicas

Parameter: pgp_num
Type: unsigned integer
Description: Number of Placement Groups for Placement

Parameter: pg_num
Type: unsigned integer
Description: Number of Placement Groups

Parameter: pg_autoscale_mode
Type: enum
Description: Placement groups auto management mode

Parameter: crush_ruleset
Type: unsigned integer
Description: CRUSH Map Ruleset

Parameter: application
Type: string
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Description:  Associated application (typically one of rgw,rbd,cephfs)

Parameter:  auid
Type:  unsigned integer
Description:  none

Parameter:  min_size
Type:  unsigned integer
Description:  none

Parameter:  crash_replay_interval
Type:  unsigned integer
Description:  none

Parameter:  hit_set_type
Type:  string
Description:  none

Parameter:  hashpspool
Type:  unsigned integer
Description:  none

Parameter:  hit_set_count
Type:  unsigned integer
Description:  none

Parameter:  hit_set_period
Type:  unsigned integer
Description:  none

Parameter:  hit_set_fpp
Type:  float
Description:  none

Parameter:  cache_target_dirty_ratio
Type:  float
Description:  none

Parameter:  cache_target_full_ratio
Type:  float
Description:  none

Parameter:  target_max_bytes
Type:  unsigned integer
Description:  none

Parameter:  target_max_objects
Type:  unsigned integer
Description:  none

Parameter:  cache_min_flush_age
Type:  unsigned integer
Description:  none

Parameter:  cache_min_evict_age
Type:  unsigned integer
Description:  none

Parameter:  extraField1
Type:  string
Description:  none

Parameter:  extraField2
Type:  integer
Description:  none

Parameter:  extraField3
Type:  unsigned integer
Description:  none

Parameter:  extraField4
Type:  float
Description:  none

Parameter:  extraField5
Type:  list of strings
Description:  none

Parameter:  extraField6
Type:  list of unsigned numbers
Description:  none

5.2.41  CephOSDRole: Role
parent:  Role

Parameter:  osdconfigs
Type:  list of CephOSDConfig
Description:  OSD configurations

Parameter:  extraConfig
Type:  list of strings
Description:  none
5.2.42  CephState: Entity

parent: Entity

Parameter: version
Type: unsigned integer
Description: none

Parameter: cephNodeKeys
Type: list of unsigned numbers
Description: none

Parameter: cephNodeValues
Type: list of signed numbers
Description: none

Parameter: OSDMapIds
Type: list of unsigned numbers
Description: none

Parameter: OSDMapNodes
Type: list of unsigned numbers
Description: none

Parameter: OSDMapConfigs
Type: list of unsigned numbers
Description: none

Parameter: OSDMapConfigNames
Type: list of strings
Description: none

Parameter: OSDMapStatuses
Type: list of unsigned numbers
Description: to mark status (e.g. NEED_DELETE) using numeric constants

Parameter: OSDMapDevices
Type: list of strings
Description: in case we need to keep track of changing device names

Parameter: extraField1
Type: string
Description: none

Parameter: extraField2
Type: string
Description: none
Parameter: extraField3
Type: string
Description: none

Parameter: extraField4
Type: string
Description: none

Parameter: extraField5
Type: string
Description: none

Parameter: extraList1
Type: list of strings
Description: none

Parameter: extraList2
Type: list of strings
Description: none

Parameter: extraList3
Type: list of unsigned numbers
Description: none

Parameter: extraList4
Type: list of unsigned numbers
Description: none

Parameter: extraList5
Type: list of unsigned numbers
Description: none

5.2.43 Ceph: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: fsid
Type: string
Description: Ceph ID

Parameter: configFilePath
Type: string
Description: Path to the Ceph config file

Parameter: adminKeyringFilePath

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Type: string
Description: Path to the Ceph admin keyring file

Parameter: monitorKeyringFilePath
Type: string
Description: Path to the Ceph monitor keyring file

Parameter: adminKey
Type: string
Description: Ceph client admin key

Parameter: monitorKey
Type: string
Description: Ceph monitor key

Parameter: publicNetworks
Type: list of references to Network
Description: Public networks

Parameter: clusterNetworks
Type: list of references to Network
Description: Cluster networks

Parameter: creationTime
Type: timestamp
Description: Date on which the Ceph was defined

Parameter: setupState
Type: enum
Description: Flag to keep track of the installation state

Parameter: version
Type: string
Description: Ceph version of the cluster

Parameter: monmap
Type: string
Description: none

Parameter: bootstrapped
Type: boolean
Description: Bootstrapped

Parameter: monitorPortV1
Type: unsigned integer
Description: Monitor daemon port

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>monitorPortV2</td>
<td>unsigned integer</td>
<td>Monitor daemon port (msgr2)</td>
</tr>
<tr>
<td>filestoreXattrUseOmap</td>
<td>boolean</td>
<td>filestore xattr use omap</td>
</tr>
<tr>
<td>monAllowPoolDelete</td>
<td>boolean</td>
<td>mon allow pool delete</td>
</tr>
<tr>
<td>monOsdFullRatio</td>
<td>float</td>
<td>mon osd full ratio</td>
</tr>
<tr>
<td>monOsdNearfullRatio</td>
<td>float</td>
<td>mon osd nearfull ratio</td>
</tr>
<tr>
<td>monMaxOsd</td>
<td>unsigned integer</td>
<td>mon max osd</td>
</tr>
<tr>
<td>osdPoolDefaultSize</td>
<td>unsigned integer</td>
<td>osd pool default size</td>
</tr>
<tr>
<td>osdPoolDefaultMinSize</td>
<td>unsigned integer</td>
<td>osd pool default min size</td>
</tr>
<tr>
<td>osdPoolDefaultPgNum</td>
<td>unsigned integer</td>
<td>osd pool default pg num</td>
</tr>
<tr>
<td>osdPoolDefaultPgpNum</td>
<td>unsigned integer</td>
<td>osd pool default pgp num</td>
</tr>
<tr>
<td>authClusterCephx</td>
<td>boolean</td>
<td>auth cluster required cephx</td>
</tr>
<tr>
<td>authServiceCephx</td>
<td>boolean</td>
<td></td>
</tr>
</tbody>
</table>
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Description: auth service required cephx

Parameter: authClientCephx
Type: boolean
Description: auth client required cephx

Parameter: extraConfig
Type: list of strings
Description: Extra config parameters

Parameter: autoAdjustCrushMap
Type: boolean
Description: Automatically Adjust CRUSH Map

Parameter: rbdCache
Type: boolean
Description: Enable caching for RADOS Block Device (RBD).

Parameter: rbdCacheSize
Type: unsigned integer
Description: The RBD cache size in bytes.

Parameter: rbdCacheMaxDirty
Type: unsigned integer
Description: The dirty limit in bytes at which the cache triggers write-back. If 0, uses write-through caching. Constraint: Must be less than rbd cache size.

Parameter: rbdCacheTargetDirty
Type: unsigned integer
Description: The dirty target before the cache begins writing data to the data storage. Does not block writes to the cache. Constraint: Must be less than rbd cache max dirty.

Parameter: rbdCacheMaxDirtyAge
Type: float
Description: The number of seconds dirty data is in the cache before writeback starts.

Parameter: rbdCacheWritethroughUntilFlush
Type: boolean
Description: Start out in write-through mode, and switch to write-back after the first flush request is received.

Parameter: rbdReadaheadTriggerRequests
Type: integer
Description: Number of sequential read requests necessary to trigger read-ahead.

Parameter: rbdReadaheadMaxBytes
Type: unsigned integer

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Description: Maximum size of a read-ahead request. If zero, read-ahead is disabled.

Parameter: rbdReadaheadDisableAfterBytes
Type: unsigned integer
Description: After this many bytes have been read from an RBD image, read-ahead is disabled for that image until it is closed. If zero, read-ahead stays enabled.

5.2.44 CertificateInfo: Entity
parent: Entity

Parameter: certificate
Type: Certificate
Description: Certificate

Parameter: private_key
Type: string
Description: Optional private key field.

5.2.45 CertificateRequest: Entity
parent: Entity

Parameter: CSR
Type: string
Description: none

Parameter: sessionId
Type: unsigned integer
Description: Session id

Parameter: clientType
Type: unsigned integer
Description: Client type

Parameter: requestId
Type: unsigned integer
Description: Request id

Parameter: country
Type: string
Description: Country

Parameter: state
Type: string
Description: State

Parameter: locality
Type: string
Description:  Locality

Parameter:  organization
Type:  string
Description:  Organization

Parameter:  organizationalUnit
Type:  string
Description:  Organizational unit

Parameter:  commonName
Type:  string
Description:  Common name

Parameter:  subjectAlternativeNames
Type:  list of strings
Description:  Subject alternative names

Parameter:  allowAutosign
Type:  boolean
Description:  Allow autosign

Parameter:  hasEdgeSecret
Type:  boolean
Description:  Has an edge secret

5.2.46 CertificateSubjectName: Entity

parent:  Entity

Parameter:  country
Type:  string
Description:  Country

Parameter:  state
Type:  string
Description:  State

Parameter:  locality
Type:  string
Description:  Locality

Parameter:  organization
Type:  string
Description:  Organization

Parameter:  organizationalUnit
Type:  string

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Description: Organizational unit

Parameter: commonName
Type: string
Description: CommonName

Parameter: profile
Type: string
Description: Profile

Parameter: syslogin
Type: string
Description: Syslogin

Parameter: component
Type: string
Description: Component

Parameter: days
Type: integer
Description: Days

Parameter: ca
Type: boolean
Description: CA

Parameter: subjectAlternativeNames
Type: list of strings
Description: Alternative names

5.2.47 Certificate: Entity
parent: Entity

Parameter: PEM
Type: string
Description: none

Parameter: revoked
Type: boolean
Description: Certificate has been revoked and cannot be used

Parameter: serialNumber
Type: integer
Description: Serial number

Parameter: remaining
Type: integer

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Description: Remaining time until certificate expires

Parameter: startTime
Type: timestamp
Description: Date when certificate is valid

Parameter: expireTime
Type: timestamp
Description: Date when certificate expires

Parameter: CA
Type: boolean
Description: A CA certificate can be used sign other certificates

Parameter: hasEdgeSecret
Type: boolean
Description: Has an edge secret

Parameter: profile
Type: string
Description: Profile

Parameter: sysLogin
Type: string
Description: System log in

Parameter: component
Type: string
Description: Component

Parameter: subjectName
Type: string
Description: Subject

Parameter: issuerName
Type: string
Description: Issuer

Parameter: subjectAlternativeNames
Type: list of strings
Description: Alternative names

Parameter: country
Type: string
Description: Country

Parameter: state
Type: string
Description: State

Parameter: locality
Type: string
Description: Locality

Parameter: organization
Type: string
Description: Organization

Parameter: organizationalUnit
Type: string
Description: Organizational unit

Parameter: commonName
Type: string
Description: Name

5.2.48 ChargeBackRequest: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: groupByUser
Type: boolean
Description: Group by user

Parameter: groupByGroup
Type: boolean
Description: Group by group

Parameter: groupByAccount
Type: boolean
Description: Group by account

Parameter: groupByJobName
Type: boolean
Description: Group by job name

Parameter: groupByJobId
Type: boolean
Description: Group by job ID

Parameter: groupByParentId
Type: boolean
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Description: Group by parent ID

Parameter: users
Type: list of strings
Description: Users

Parameter: groups
Type: list of strings
Description: Users

Parameter: accounts
Type: list of strings
Description: Accounts

Parameter: jobNames
Type: list of strings
Description: Job names

Parameter: jobIds
Type: list of strings
Description: Job IDs

Parameter: parentIds
Type: list of strings
Description: Parent IDs

Parameter: wlmClusters
Type: list of references to WlmCluster
Description: List of wlm clusters which to include, empty for all

Parameter: pricePerCPUSecond
Type: float
Description: Price per CPU second

Parameter: pricePerCPUCoreSecond
Type: float
Description: Price per CPU core second

Parameter: pricePerGPUSec
Type: float
Description: Price per GPU second

Parameter: pricePerMemoryByteSecond
Type: float
Description: Price per memory byte-second

Parameter: pricePerSlotSecond
Parameter: currency
Type: string
Description: Currency

Parameter: startTime
Type: string
Description: Start time

Parameter: endTime
Type: string
Description: End time

Parameter: utc
Type: boolean
Description: Time in UTC

Parameter: includeRunning
Type: boolean
Description: Include running

Parameter: calculatePrediction
Type: boolean
Description: Calculate prediction

Parameter: preference
Type: unsigned integer
Description: The request with the highest preference be shown by default

Parameter: notes
Type: string
Description: Administrator notes

5.2.49 Chassis: Device
parent: Device

Parameter: ip
Type: IP
Description: Ip address

Parameter: network
Type: reference to Network or None
Description: Network to which this switch is connected

Parameter: model
Type: string
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Description:  Device model name

Parameter:  username
Type:  string
Description:  Chassis username

Parameter:  password
Type:  string
Description:  Chassis password

Parameter:  members
Type:  list of references to Device
Description:  List of devices belonging to this chassis

Parameter:  slots
Type:  list of strings
Description:  Slot description per device in chassis

Parameter:  layout
Type:  string
Description:  Layout definition for rackview (Format: [1-]x,y e.g: |8,3 or -2,6)

5.2.50 CloudDirectorRole: DirectorRole
parent: DirectorRole

Parameter:  dependents
Type:  reference to NodeGroup or None
Description:  List of nodes that depend on this cloud director

5.2.51 CloudGatewayRole: Role
parent: Role

5.2.52 CloudImage: Entity
parent: Entity

Parameter:  name
Type:  string
Description:  The name of the image.

Parameter:  provider
Type:  reference to CloudProvider
Description:  Cloud provider

Parameter:  version
Type:  string
Description:  The version of the image.

Parameter:  description
**Type:** string
**Description:** The description.

**Parameter:** apiHash
**Type:** string
**Description:** The API hash used to select compatible images.

### 5.2.53 CloudJobDescription: Entity

**parent:** Entity

**Parameter:** name
**Type:** string
**Description:** Job name

**Parameter:** script
**Type:** string
**Description:** Script path

**Parameter:** workloadManagerJobId
**Type:** string
**Description:** Job identifier according to the workload manager

**Parameter:** user
**Type:** string
**Description:** Owner of a job

**Parameter:** sizeOfInputData
**Type:** unsigned integer
**Description:** Size of job’s input data

**Parameter:** sizeOfOutputData
**Type:** unsigned integer
**Description:** Size of job’s output data

**Parameter:** expectedSizeOfOutputData
**Type:** unsigned integer
**Description:** Expected size of job’s output data

**Parameter:** inputFiles
**Type:** list of strings
**Description:** Input files list

**Parameter:** expandedInputFiles
**Type:** list of strings
**Description:** Internal list of input files after labeled wildcards are resolved

**Parameter:** outputFiles
**Type:** list of strings
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Description: Output files list

Parameter: doNotDownloadFiles
Type: list of strings
Description: List of output files to leave in the cloud without downloading

Parameter: remoteOutputLists
Type: list of strings
Description: List of remote files which contain job output file names

Parameter: workloadManager
Type: string
Description: Workload manager type

Parameter: workingDirectory
Type: string
Description: Job’s working directory

Parameter: region
Type: string
Description: Cloud region

Parameter: jobQueue
Type: string
Description: WLM queue where the job runs

Parameter: storageStrategy
Type: enum
Description: none

Parameter: storageVolumeId
Type: string
Description: Storage Volume ID

Parameter: storageVolumeSize
Type: unsigned integer
Description: Size of Storage Volume

Parameter: storageVolumeDevicePath
Type: string
Description: OS device path

Parameter: fsxInstanceId
Type: string
Description: none

Parameter: fsxInstanceUrl

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Type: string
Description: none

Parameter: fsxInstancePathOnDirector
Type: string
Description: none

Parameter: anfVolumeId
Type: string
Description: none

Parameter: anfVolumeUrl
Type: string
Description: none

Parameter: anfVolumePathOnDirector
Type: string
Description: none

Parameter: jobType
Type: enum
Description: Defines the set of operations that will run on job.

Parameter: storageNode
Type: reference to CloudNode
Description: Storage Node

Parameter: excludedStorageNodes
Type: list of references to CloudNode
Description: Job will not run on those nodes

Parameter: stdOutFileNames
Type: list of strings
Description: Standard output stream filenames list

Parameter: stdErrFileNames
Type: list of strings
Description: Standard error stream filenames list

Parameter: uploadTime
Type: float
Description: Time spent on input data transfer and job pre-run preparations

Parameter: downloadTime
Type: float
Description: Time spent on jobs job results transfer and post-run activities
Parameter: maxUploadTime
Type: float
Description: none

Parameter: maxDownloadTime
Type: float
Description: none

Parameter: jobState
Type: enum
Description: Current state of the job

Parameter: jobStatusMsg
Type: string
Description: Job status

Parameter: jobStatusTimestamp
Type: timestamp
Description: Time when the job status was last changed

Parameter: computeNodes
Type: list of references to Node
Description: List of compute nodes the job was running on

Parameter: numThreads
Type: unsigned integer
Description: none

Parameter: submissionTimestamp
Type: timestamp
Description: Time when the job was submitted

Parameter: endTimestamp
Type: timestamp
Description: Time when the job finished execution

Parameter: extraOptions
Type: list of strings
Description: none

5.2.54 CloudJobSubmissionStatus: Entity
parent: Entity

Parameter: availableExpectedTransferTimes
Type: boolean
Description: none

Parameter: expectedInputDataTransferTimeInSeconds

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Type: unsigned integer  
Description: none

Parameter: jobName  
Type: string  
Description: none

Parameter: errMsg  
Type: string  
Description: none

Parameter: extraOptions  
Type: list of strings  
Description: none

5.2.55 CloudNode: ComputeNode  
parent: ComputeNode

Parameter: cloudSettings  
Type: CloudSettings  
Description: Submode containing all cloud node settings

5.2.56 CloudProvider: Entity  
parent: Entity

Parameter: name  
Type: string  
Description: Name

Parameter: tags  
Type: list of strings  
Description: List of tags that will be assigned to all resources created by BCM under this cloud provider

5.2.57 CloudRegion: Entity  
parent: Entity

Parameter: name  
Type: string  
Description: The name of the cloud region.

Parameter: provider  
Type: reference to CloudProvider  
Description: Cloud provider

Parameter: timeZoneSettings  
Type: TimeZoneSettings or None  
Description: Time zone
5.2.58  CloudSettings: Entity

parent: Entity

Parameter:  provider
Type: reference to CloudProvider
Description: Cloud provider

Parameter:  isStorageTemplate
Type: boolean
Description: none

Parameter:  isStorageNode
Type: boolean
Description: none

Parameter:  tags
Type: list of strings
Description: List of tags that will be assigned to cloud instance (for supported providers)

5.2.59  CloudStorageActionData: Entity

parent: Entity

Parameter:  jobDescription
Type: reference to CloudJobDescription
Description: none

Parameter:  typeString
Type: string
Description: none

Parameter:  index
Type: unsigned integer
Description: none

Parameter:  totalActions
Type: unsigned integer
Description: none

Parameter:  status
Type: enum
Description: none

Parameter:  errorMessage
Type: string
Description: none

Parameter:  isReverse
Type: boolean

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Description: none

Parameter: timeoutSecs
Type: unsigned integer
Description: none

Parameter: startTime
Type: timestamp
Description: none

Parameter: retries
Type: unsigned integer
Description: none

Parameter: workloadManager
Type: string
Description: none

Parameter: workloadManagerJobId
Type: string
Description: none

Parameter: jobName
Type: string
Description: none

Parameter: executionNode
Type: reference to Node
Description: none

Parameter: extraOptions
Type: list of strings
Description: none

5.2.60 CloudType: Entity

parent: Entity

Parameter: name
Type: string
Description: The name of the VM type.

Parameter: provider
Type: reference to CloudProvider
Description: Cloud provider

Parameter: cpu
Type: string
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Description: The amount of CPU cores.

Parameter: gpu
Type: string

Description: The amount of GPUs.

Parameter: memory
Type: string

Description: The amount of operating system memory.

Parameter: disks
Type: string

Description: AWS: The amount of disks coming with the type. Azure: the maximum amount of data disk which can be attached to the VMs of this type.

Parameter: description
Type: string

Description: The description.

5.2.61 ClusterSetup: Entity

parent: Entity

Parameter: refPartitionUniqueKey
Type: unsigned integer
Description: Partition

Parameter: CMID
Type: unsigned integer
Description: CMID

Parameter: databaseVersion
Type: unsigned integer
Description: Database version

Parameter: organization
Type: string
Description: Organization

Parameter: powerOnDelay
Type: float
Description: Delay in seconds between powering on nodes

Parameter: powerOffDelay
Type: float
Description: Delay in seconds between powering off nodes
```markdown
**5.2.62** CMDaemonBackgroundTask: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: subjects
Type: list of unsigned numbers
Description: Subjects

Parameter: updates
Type: list of strings
Description: Updates

Parameter: exitCode
Type: integer
Description: Exit code

Parameter: runningStatus
Type: enum
Description: Running status

Parameter: startTime
Type: timestamp
Description: Start time

Parameter: endTime
Type: timestamp
Description: End time

Parameter: isCancelable
Type: boolean
Description: Cancelable

Parameter: parentTask
Type: unsigned integer
Description: Parent task

Parameter: subtasks
Type: list of unsigned numbers
Description: Sub tasks

Parameter: nodeKey
Type: unsigned integer
Description: Node key
```
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5.2.63 CMDaemonFailoverGroupStatus: Entity

parent: Entity

Parameter: failoverStage
Type: integer
Description: Failover stage

Parameter: activeNodeKey
Type: unsigned integer
Description: Active node key

Parameter: activeUpTime
Type: timestamp
Description: Active up time

Parameter: activeDownTime
Type: timestamp
Description: Active down time

Parameter: activeUpCount
Type: unsigned integer
Description: Active up count

Parameter: failoverThreadRunning
Type: boolean
Description: Failover thread running

Parameter: infoMessage
Type: string
Description: Information messages gather during the last failover

Parameter: errorMessage
Type: string
Description: Error messages gather during the last failover

Parameter: activeGraciousShutdown
Type: boolean
Description: True if the previous active head reported a graceful shutdown

5.2.64 CMDaemonFailoverGroup: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: nodes
Type: list of references to ComputeNode
Description: List of nodes belonging to this group

Parameter: alsoTakeOverAfterGraciousShutdown
Type: boolean
Description: Also perform automatic failover if the active group member was gracefully shut down

Parameter: disableAutomaticFailover
Type: boolean
Description: When automatic failover is disabled the no node in the group will not take over if the active node is dead

Parameter: warntime
Type: unsigned integer
Description: How quickly to issue a 'late' warning

Parameter: deadtime
Type: unsigned integer
Description: How quickly to decide that a node in a group is dead

Parameter: mountScript
Type: string
Description: Script that mounts the shared storage device when a node becomes the active head node

Parameter: unmountScript
Type: string
Description: Script that unmounts the shared storage device when a node stops being the active head node

Parameter: preFailoverScript
Type: string
Description: Prefailover script will be run on all nodes before failover has begun

Parameter: postFailoverScript
Type: string
Description: Postfailover script will be run on all nodes after failover has completed

5.2.65 CMDaemonFailoverPeer: Entity
parent: Entity

Parameter: key
Type: unsigned integer
Description: Node key

Parameter: status
Type: list of strings
Description: Status

Parameter: failCount
5.2 Entities

Type: list of unsigned numbers
Description: Number of sequential times failure was detected

5.2.66 CMDaemonFailoverStatus: Entity

parent: Entity

Parameter: myKey
Type: unsigned integer
Description: Unique key of head node to which handled request

Parameter: masterKey
Type: unsigned integer
Description: Unique key of active head node

Parameter: masterTime
Type: unsigned integer
Description: Master time (not used)

Parameter: failoverId
Type: unsigned integer
Description: Head node with the highest failover ID will be active

Parameter: error
Type: boolean
Description: Head node is in error state

Parameter: peers
Type: list of CMDaemonFailoverPeer
Description: Peer status per head node in the failover group

5.2.67 CMDaemonFailover: Entity

parent: Entity

Parameter: secondaryHeadNode
Type: reference to HeadNode or None
Description: Secondary/failover head node

Parameter: keepalive
Type: unsigned integer
Description: Interval between pings

Parameter: warntime
Type: unsigned integer
Description: How quickly to issue a ‘late’ warning

Parameter: deadtime
Type: unsigned integer

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**Description:** How quickly to decide that a node in a cluster is dead

**Parameter:** initdead
**Type:** unsigned integer
**Description:** Time between starting failover and declaring a cluster node dead

**Parameter:** quorumTime
**Type:** unsigned integer
**Description:** Time before deciding quorum ended in failure

**Parameter:** mountScript
**Type:** string
**Description:** Script that mounts the shared storage device when a node becomes the active headnode

**Parameter:** unmountScript
**Type:** string
**Description:** Script that unmounts the shared storage device when a node stops being the active headnode

**Parameter:** failoverNetwork
**Type:** reference to Network or None
**Description:** Network for failover ping

**Parameter:** disableAutomaticFailover
**Type:** boolean
**Description:** When automatic failover is disabled the passive headnode will not take over if it detects the active headnode is dead

**Parameter:** preFailoverScript
**Type:** string
**Description:** Prefailover script will be run on both headnodes before failover has begun

**Parameter:** postFailoverScript
**Type:** string
**Description:** Postfailover script will be run on both headnodes after failover has completed

**5.2.68 CMDaemonStatus:**
parent: Entity

**Parameter:** version
**Type:** string
**Description:** CMDaemon version

**Parameter:** state
**Type:** string
**Description:** CMDaemon state

**Parameter:** myTime
Type: timestamp
Description: System time

Parameter: startTime
Type: timestamp
Description: CMDaemon start time

Parameter: uptime
Type: unsigned integer
Description: System uptime

Parameter: utime
Type: float
Description: User time spend by CMDaemon

Parameter: stime
Type: float
Description: System time spend by CMDaemon

Parameter: memused
Type: unsigned integer
Description: Memory used by CMDaemon

Parameter: sessionCount
Type: unsigned integer
Description: Total Number of cmsh/cmgui/python/node sessions

Parameter: activeSessionCount
Type: unsigned integer
Description: Number of currently active sessions

Parameter: httpdNumWorkers
Type: unsigned integer
Description: Number of threads handing http requests

Parameter: httpdNumFreeWorkers
Type: unsigned integer
Description: Number of threads free to handle http requests

Parameter: httpdConnectionCounter
Type: unsigned integer
Description: Total number of http connections handled by CMDaemon

Parameter: httpdRequestCounter
Type: unsigned integer
Description: Total number of http request handled by CMDaemon
Parameter: httpdBytesRead
Type: unsigned integer
Description: Bytes read from http request

Parameter: httpdBytesWritten
Type: unsigned integer
Description: Bytes written in response to http requests

5.2.69 CMJobConfig: Entity
parent: Entity

Parameter: name
Type: string
Description: CMJob config name

Parameter: storageNodePolicies
Type: list of StorageNodePolicy
Description: Storage node policies

Parameter: activeStorageNodePolicy
Type: element of storageNodePolicies or None
Description: This policy will be used to start new storage nodes

Parameter: extraOptions
Type: list of strings
Description: Extra options

5.2.70 CMJobIntermediateStorage: Entity
parent: Entity

5.2.71 CMService: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: tokens
Type: list of strings
Description: Tokens belonging to this service

5.2.72 ComputeNode: Node
parent: Node

Parameter: installMode
Type: string
Description: Installmode to be used by default, if empty use category installMode

Parameter: nextBootInstallMode
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Type: string
Description: Installmode to be used during the next boot, will be cleared during boot

Parameter: blockDevicesClearedOnNextBoot
Type: list of strings
Description: List of block devices that will be cleared during the next boot

Parameter: initialize
Type: string
Description: Node specific initialize script

Parameter: finalize
Type: string
Description: Node specific finalize script

Parameter: raidconf
Type: string
Description: Node specific Hardware RAID configuration

Parameter: category
Type: reference to Category
Description: Category to which this node belongs

Parameter: disksetup
Type: string
Description: Node specific disk setup

Parameter: excludeListFull
Type: string
Description: Exclude list for full install

Parameter: excludeListSync
Type: string
Description: Exclude list for sync install

Parameter: excludeListUpdate
Type: string
Description: Exclude list for update

Parameter: excludeListGrab
Type: string
Description: Exclude list for grabbing to an existing image

Parameter: excludeListGrabnew
Type: string
Description: Exclude list for grabbing to a new image

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Parameter: nodeInstallerDisk
Type: boolean
Description: The node has its own node installer disk

Parameter: installBootRecord
Type: boolean
Description: Install boot record on local disk

Parameter: managementNetwork
Type: reference to Network or None
Description: Determines what network should be used for management traffic. If not set, category or partition setting is used.

Parameter: dataNode
Type: boolean
Description: If enabled the node will never do a FULL install without explicit user confirmation

Parameter: allowNetworkingRestart
Type: boolean
Description: Allow node to update ifcfg files and restart networking

Parameter: softwareImageProxy
Type: SoftwareImageProxy or None
Description: Software image used by node

Parameter: fspartAssociations
Type: list of FSPartAssociation
Description: none

Parameter: kernelVersion
Type: string
Description: Kernel version used

Parameter: kernelParameters
Type: string
Description: Kernel parameters passed to the kernel at boot time

Parameter: kernelOutputConsole
Type: string
Description: Kernel output console used at boot time

Parameter: modules
Type: list of KernelModule
Description: Manage kernel modules loaded in this node

Parameter: bootLoader
Type: enum
5.2 Entities

Description: Boot loader

Parameter: bootLoaderProtocol
Type: enum
Description: Boot loader protocol for retrieving initrd and vmlinuz

Parameter: bootLoaderFile
Type: string
Description: Alternative boot loader file

5.2.73 ConfigFileVersion: Entity
parent: Entity

Parameter: nodeKey
Type: unsigned integer
Description: Node key

Parameter: filename
Type: string
Description: File name

Parameter: content
Type: string
Description: Content of the file

Parameter: creationTime
Type: timestamp
Description: Creation time

5.2.74 ConfigurationOverlay: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: allHeadNodes
Type: boolean
Description: All head nodes

Parameter: nodes
Type: list of references to Node
Description: List of nodes belonging to this group

Parameter: categories
Type: list of references to Category
Description: List of categories belonging to this group

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**Parameter:** customizationFiles  
**Type:** list of CustomizationFile  
**Description:** Config file customizations

**Parameter:** roles  
**Type:** list of Role  
**Description:** Assign the roles

**Parameter:** priority  
**Type:** integer  
**Description:** Priority of the roles, node roles have a 750 priority, and category roles 250, set to -1 disable the overlay

---

### 5.2.75 ConnectivityCheckerSubSystemInfo: SubSystemInfo

**parent:** SubSystemInfo

**Parameter:** stopped  
**Type:** unsigned integer  
**Description:** Stopped

**Parameter:** updateCallback  
**Type:** unsigned integer  
**Description:** Update callback defined

**Parameter:** changeCallback  
**Type:** unsigned integer  
**Description:** Change callback defined

**Parameter:** ttl  
**Type:** unsigned integer  
**Description:** ttl

**Parameter:** idOffset  
**Type:** unsigned integer  
**Description:** Ping ID offset

**Parameter:** interval  
**Type:** unsigned integer  
**Description:** Interval

**Parameter:** timeout  
**Type:** unsigned integer  
**Description:** Timeout

**Parameter:** sequence  
**Type:** unsigned integer  
**Description:** Sequence ID
Parameter: activeSequences
Type: unsigned integer
Description: Active ping sequences still being waited for

Parameter: activeNodeSequences
Type: unsigned integer
Description: Number of nodes in active ping sequences still being waited for

Parameter: nodes
Type: unsigned integer
Description: Nodes being pinged

Parameter: nodeSequences
Type: unsigned integer
Description: Number of pings nodes are waiting for

Parameter: updates
Type: unsigned integer
Description: Total number of handled updates

Parameter: changes
Type: unsigned integer
Description: Total number of handled changes

5.2.76 Consolidator: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: maxAge
Type: float
Description: Maximal age of historic data, 0 for infinite

Parameter: maxSamples
Type: unsigned integer
Description: Maximal samples of historic data, 0 for infinite

Parameter: interval
Type: float
Description: Sampling interval

Parameter: offset
Type: float
Description: Time offset for sampling interval

Parameter: kind
Type: enum
Description: Kind of consolidation to be done

5.2.77 ContainerInfo: Entity
parent: Entity

Parameter: name
Type: string
Description: The name of the container

Parameter: containerId
Type: string
Description: The id

Parameter: image
Type: string
Description: The name of the image

Parameter: imageId
Type: string
Description: The sha id of the image

Parameter: state
Type: string
Description: The state of the container

Parameter: startTime
Type: timestamp
Description: The time when the container started

Parameter: lastTerminationState
Type: string
Description: The last state when the container terminated

Parameter: reason
Type: string
Description: The reason for the termination

Parameter: lastExitCode
Type: integer
Description: The exit code of the container

Parameter: previousStartTime
Type: timestamp
Description: The previous start time

Parameter: previousFinishTime
Type: timestamp
Description: The previous start time
5.2 Entities

Description: The previous finish time

Parameter: ready
Type: boolean
Description: Whether the container is ready or not

Parameter: restartCount
Type: integer
Description: The number of restarts of the container

Parameter: environmentVariables
Type: list of strings
Description: The environment variables passed to the container

5.2.78 CustomizationEntry: Entity

Parameter: key
Type: string
Description: Name of the key

Parameter: value
Type: string
Description: Value for the key

Parameter: enabled
Type: boolean
Description: none

Parameter: action
Type: enum
Description: Determines how entries are added

Parameter: formatting
Type: string
Description: none

Parameter: extraField
Type: boolean
Description: Reserved for future use

Parameter: separator
Type: string
Description: none

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5.2.79  **CustomizationFile: Entity**

Parent: Entity

Parameter: name
Type: string
Description: none

Parameter: entries
Type: list of CustomizationEntry
Description: Config file customization entries

Parameter: label
Type: string
Description: none

Parameter: type
Type: enum
Description: Determines file type

Parameter: managedsection
Type: enum
Description: Determines how cmdaemon should customize the file

Parameter: formatting
Type: string
Description: none

Parameter: enabled
Type: boolean
Description: none

5.2.80  **DeviceStatus: Entity**

Parent: Entity

Parameter: refDeviceUniqueKey
Type: unsigned integer
Description: Device

Parameter: status
Type: enum
Description: Status determined by ping and report

Parameter: reportedStatus
Type: enum
Description: Reported status

Parameter: reportedStatusTimestamp
Type: unsigned integer
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Description: Reported status timestamp in steady clock epoch milliseconds

Parameter: terminated
Type: boolean
Description: none

Parameter: closed
Type: boolean
Description: none

Parameter: muted
Type: boolean
Description: none

Parameter: burning
Type: boolean
Description: none

Parameter: unassigned
Type: boolean
Description: none

Parameter: noPingMethod
Type: boolean
Description: none

Parameter: nullIdentifier
Type: boolean
Description: none

Parameter: additionalCost
Type: boolean
Description: none

Parameter: restartRequired
Type: boolean
Description: none

Parameter: healthCheckFailed
Type: boolean
Description: none

Parameter: healthCheckUnknown
Type: boolean
Description: none

Parameter: provisioningFailed
Type: boolean
Description: none

Parameter: stateFlapping
Type: boolean
Description: none

Parameter: stateFlappingCheckTime
Type: unsigned integer
Description: none

Parameter: pingable
Type: boolean
Description: none

Parameter: sshable
Type: boolean
Description: none

Parameter: infoMessage
Type: string
Description: none

Parameter: userMessage
Type: string
Description: none

Parameter: toolMessage
Type: string
Description: none

Parameter: restartRequiredReasons
Type: list of strings
Description: none

Parameter: gracePeriod
Type: unsigned integer
Description: none

Parameter: powerResetOnUnreachableCount
Type: unsigned integer
Description: none

Parameter: failBeforeDown
Type: unsigned integer
Description: none
5.2 Entities

Parameter: updateIndex
Type: unsigned integer
Description: none

Parameter: updateDisplay
Type: boolean
Description: none

Parameter: hasClientDaemon
Type: boolean
Description: none

Parameter: allowDataNodeFullInstall
Type: boolean
Description: none

5.2.81 Device: Entity

Parameter: tag
Type: string
Description: Hardware tag

Parameter: hostname
Type: string
Description: Hostname

Parameter: mac
Type: MAC
Description: MAC address

Parameter: defaultGateway
Type: IP
Description: Default gateway for the device

Parameter: creationTime
Type: timestamp
Description: Date on which node was defined

Parameter: partition
Type: reference to Partition
Description: Partition to which this device belongs

Parameter: networkSwitches
Type: list of SwitchPort
Description: Switch ports

Parameter: powerDistributionUnits
**Type:** list of PDUPort
**Description:** List of outlets on powerdistributionunits

**Parameter:** rack  
**Type:** RackPosition or None  
**Description:** Name of the rack in which the device resides

**Parameter:** indexInsideContainer  
**Type:** unsigned integer  
**Description:** Index inside container object (used for drawing twins/chassis inside rackview)

**Parameter:** powerControl  
**Type:** string  
**Description:** Specifies which type of power control feature is being used (values: none, apc, custom, cloud, ipmi0, ilo0, drac0, rf0 or cimc0)

**Parameter:** customPowerScript  
**Type:** string  
**Description:** Script that will be used to perform power on/off/reset/status operations

**Parameter:** customPowerScriptArgument  
**Type:** string  
**Description:** Argument for the custom power script

**Parameter:** customPingScript  
**Type:** string  
**Description:** Script that will be used to ping a device

**Parameter:** customPingScriptArgument  
**Type:** string  
**Description:** Argument for the custom ping script

**Parameter:** notes  
**Type:** string  
**Description:** Administrator notes

**Parameter:** userdefined1  
**Type:** string  
**Description:** A free text field passed to custom scripts

**Parameter:** userdefined2  
**Type:** string  
**Description:** A free text field passed to custom scripts

**Parameter:** userDefinedResources  
**Type:** list of strings

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Description: User defined resources used to filter monitoring data producers

5.2.82 DIGITSRole: Role

desc: DIGITS version

type: string

description: DIGITS version

desc: DIGITS port

type: unsigned integer

description: DIGITS port

desc: Location where job files are stored. Defined in DIGITS_JOBS_DIR

type: string

description: Location where job files are stored. Defined in DIGITS_JOBS_DIR

desc: File for saving log messages. Defined in DIGITS_LOGFILE_FILENAME

type: string

description: File for saving log messages. Defined in DIGITS_LOGFILE_FILENAME

desc: Minimum log message level to be saved (DEBUG/INFO/WARNING/ERROR/CRITICAL). Defined in DIGITS_LOGFILE_LEVEL

type: enum

description: Minimum log message level to be saved (DEBUG/INFO/WARNING/ERROR/CRITICAL). Defined in DIGITS_LOGFILE_LEVEL

desc: The name of the server (accessible in the UI under ‘Info’). Default is the system hostname. Defined in DIGITS_SERVER_NAME

type: string

description: The name of the server (accessible in the UI under ‘Info’). Default is the system hostname. Defined in DIGITS_SERVER_NAME

desc: A list of URL’s, separated by comma. Default is the official NVIDIA store. Defined in DIGITS_MODEL_STORE_URL

type: string

description: A list of URL’s, separated by comma. Default is the official NVIDIA store. Defined in DIGITS_MODEL_STORE_URL

desc: A path to prepend before every URL. Sets the home-page to be at ‘http://localhost/custom-prefix’ instead of ‘http://localhost/’. Defined in DIGITS_URL_PREFIX

type: string

description: A path to prepend before every URL. Sets the home-page to be at ‘http://localhost/custom-prefix’ instead of ‘http://localhost/’. Defined in DIGITS_URL_PREFIX

desc: Path to your local Caffe build. Should contain build/tools/caffe and python/caffe/. Defined in CAFFE_ROOT

type: string

description: Path to your local Caffe build. Should contain build/tools/caffe and python/caffe/. Defined in CAFFE_ROOT

desc: Path to your local Caffe build. Should contain build/tools/caffe and python/caffe/. Defined in CAFFE_ROOT

type: string

Description: Path to your local Torch build. Should contain install/bin/th. Defined in TORCH_ROOT

Parameter: tensorflowRoot
Type: string
Description: Path to your local TensorFlow build. Defined in TENSORFLOW_ROOT

5.2.83 DirectorRole: Role

parent: Role

Parameter: syncFSParts
Type: enum
Description: Sync FSParts mode

Parameter: fsparts
Type: list of references to FSPart
Description: FSParts

Parameter: disableAutomaticExports
Type: boolean
Description: Disable creation of automatic filesystem exports

Parameter: createHomeDirectories
Type: enum
Description: Create home directories for ldap users

Parameter: whitelistUsers
Type: list of strings
Description: Whitelist users

Parameter: whitelistGroups
Type: list of strings
Description: Whitelist groups

5.2.84 DiskAssertion: Entity

parent: Entity

Parameter: name
Type: string
Description: Name.

Parameter: script
Type: string
Description: Assertion script.

Parameter: args
Type: string
Description: Script arguments.
5.2.85 DiskDevice: Entity
parent: Entity

Parameter: requiredSize
Type: string
Description: Required Size

Parameter: vendor
Type: string
Description: Required Vendor

Parameter: blockDevs
Type: list of strings
Description: Block Devices

Parameter: partitions
Type: list of DiskPartition
Description: Partitions

Parameter: assertions
Type: list of DiskAssertion
Description: Assertions

5.2.86 DiskInfo: Entity
parent: Entity

Parameter: name
Type: string
Description: none

Parameter: model
Type: string
Description: none

Parameter: vendor
Type: string
Description: none

Parameter: size
Type: unsigned integer
Description: none

Parameter: rev
Type: string
Description: none

Parameter: ioScheduler
Type: string

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Description:  none

5.2.87  DiskPartition: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: size
Type: string
Description: Size

Parameter: type
Type: string
Description: Type

Parameter: mountpoint
Type: string
Description: Mount point

Parameter: mountoptions
Type: string
Description: Mount options

Parameter: filesystem
Type: string
Description: Filesystem

5.2.88  DiskRaid: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: size
Type: string
Description: Size

Parameter: level
Type: integer
Description: Level

Parameter: partitions
Type: list of strings
Description: Partitions
Parameter: mountpoint  
Type: string  
Description: Mount point

Parameter: mountoptions  
Type: string  
Description: Mount options

Parameter: filesystem  
Type: string  
Description: Filesystem

Parameter: swap  
Type: boolean  
Description: Use for swap

5.2.89 DiskSetup: Entity
parent: Entity

Parameter: devices  
Type: list of DiskDevice  
Description: List of block devices.

Parameter: raids  
Type: list of DiskRaid  
Description: List of raid devices.

Parameter: volumeGroups  
Type: list of DiskVolumeGroup  
Description: List of volume groups.

Parameter: diskless  
Type: boolean  
Description: If set the node will have its root file-system in RAM.

Parameter: maxMemSize  
Type: string  
Description: Maximum amount (in bytes) of RAM the root file-system can use.

5.2.90 DiskVolumeGroup: Entity
parent: Entity

Parameter: name  
Type: string  
Description: Name

Parameter: extentSize  
Type: string
Description: Size

Parameter: physicalVolumes
Type: list of strings
Description: Physical volumes

Parameter: logicalVolumes
Type: list of DiskVolume
Description: Logical volumes

5.2.91 DiskVolume: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: size
Type: string
Description: Size

Parameter: mountpoint
Type: string
Description: Mount point

Parameter: mountoptions
Type: string
Description: Mount options

Parameter: filesystem
Type: string
Description: Filesystem

5.2.92 DnsRole: Role
parent: Role

Parameter: nodegroups
Type: list of references to NodeGroup
Description: List of node groups which can boot from this node

Parameter: categories
Type: list of references to Category
Description: List of categories which can boot from this node

Parameter: racks
Type: list of references to Rack
Description: List of racks which can boot from this node
Parameter: allowQuery  
Type: list of strings  
Description: List of additional free hosts to allow queries from

Parameter: options  
Type: list of strings  
Description: List of additional key=value pairs to add to the options

Parameter: maxCacheSize  
Type: unsigned integer  
Description: Maximum cache size

Parameter: cleaningInterval  
Type: unsigned integer  
Description: Cleaning cache interval

Parameter: maxCacheTTL  
Type: unsigned integer  
Description: Maximal cache TTL

Parameter: maxNegativeCacheTTL  
Type: unsigned integer  
Description: Maximal cache negative response TTL

5.2.93 DockerHostRole: Role  
parent: Role

Parameter: spool  
Type: string  
Description: Root of the Docker runtime

Parameter: tmpDir  
Type: string  
Description: Location used for temporary files (token $spool is replaced to path to docker runtime root directory)

Parameter: enableSelinux  
Type: boolean  
Description: Enable selinux support in docker daemon

Parameter: defaultUlimits  
Type: list of strings  
Description: Set the default ulimit options to use for all containers

Parameter: debug  
Type: boolean  
Description: Enable debug mode

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Parameter: logLevel
Type: string
Description: Set the logging level

Parameter: bridgeIp
Type: string
Description: Network bridge IP

Parameter: bridge
Type: string
Description: Attach containers to a network bridge

Parameter: mtu
Type: unsigned integer
Description: Set the containers network MTU (in bytes)

Parameter: apiSockets
Type: list of strings
Description: Daemon socket(s) to connect to (-H docker daemon option)

Parameter: iptables
Type: boolean
Description: Enable addition of iptables rules

Parameter: userNamespaceRemap
Type: string
Description: User/Group setting for user namespaces

Parameter: insecureRegistries
Type: list of strings
Description: If you have a registry secured with https but do not have proper certs distributed, you can tell docker to not look for full authorization by adding the registry to this list. Accepted Format: CIDR or hostname:port

Parameter: enableTls
Type: boolean
Description: Use TLS

Parameter: verifyTls
Type: boolean
Description: Use TLS and verify the remote

Parameter: tlsCa
Type: string
Description: Trust certs signed only by this CA

Parameter: tlsCertificate

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Type: string
Description: Path to TLS certificate file

Parameter: tlsKey
Type: string
Description: Path to TLS key file

Parameter: certificatesPath
Type: string
Description: Path to docker certificates

Parameter: storageBackends
Type: list of DockerStorageBackend
Description: Docker storage backends

Parameter: containerdSocket
Type: string
Description: Path to containerd socket

Parameter: runtime
Type: string
Description: Docker runtime

Parameter: options
Type: list of strings
Description: Additional parameters for docker daemon

5.2.94 DockerStorageAufsBackend: DockerStorageBackend
parent: DockerStorageBackend

Parameter: options
Type: list of strings
Description: Extra options used for the AUFS storage backend

5.2.95 DockerStorageBackend: Entity
parent: Entity

Parameter: name
Type: string
Description: Docker storage backend name

5.2.96 DockerStorageDeviceMapperBackend: DockerStorageBackend
parent: DockerStorageBackend

Parameter: loopDataSize
Type: string
Description: Size to use when creating the loopback file for the ‘data’ device which is used for the thin pool (driver option: dm.loopdatasize)
Parameter: loopMetadataSize
Type: string
Description: Size to use when creating the loopback file for the ‘metadadata’ device which is used for the thin pool (driver option: dm.loopmetadatasize)

Parameter: baseSize
Type: string
Description: Size to use when creating the base device, which limits the size of images and container (driver option: dm.basesize)

Parameter: poolDevice
Type: string
Description: Custom block storage device to use for the thin pool (driver option: dm.thinpooldev)

Parameter: filesystem
Type: string
Description: Filesystem type to use for the base device (driver option: dm.fs)

Parameter: blockSize
Type: string
Description: Custom blocksize to use for the thin pool (driver option: dm.blocksize)

Parameter: blkDiscard
Type: boolean
Description: Enables or disables the use of blkdiscard when removing devicemapper devices (driver option: dm.blkdiscard)

Parameter: mkfsArguments
Type: list of strings
Description: Extra mkfs arguments to be used when creating the base device (drive option: dm.mkfsarg)

Parameter: mountOptions
Type: list of strings
Description: Extra mount options used when mounting the thin devices (drive option: dm.mountopt)

5.2.97 DockerStorageOverlay2Backend: DockerStorageBackend
parent: DockerStorageBackend

Parameter: overrideKernelCheck
Type: boolean
Description: Override the kernel check to allow overlay2

Parameter: size
Type: string
Description: Default max size of the container (empty = unlimited)

Parameter: options
Type: list of strings

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Description: Extra options used for the AUFS storage backend

5.2.98 DrainAction: Entity

parent: Entity

Parameter: node
Type: reference to Node
Description: Node

Parameter: actions
Type: list of references to MonitoringAction
Description: Actions to execute after the node has been drained

5.2.99 DrainResult: Entity

parent: Entity

Parameter: scheduler
Type: string
Description: Scheduler

Parameter: success
Type: boolean
Description: Success

Parameter: node
Type: list of unsigned numbers
Description: Node

Parameter: queue
Type: list of unsigned numbers
Description: Queue

Parameter: reason
Type: list of strings
Description: Reason

Parameter: result
Type: enum
Description: Result

5.2.100 EC2AMI: CloudImage

parent: CloudImage

Parameter: regionAMI
Type: list of EC2RegionAMI
Description: The AMI.

Parameter: paid
Type: boolean

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Description: Whether or not this AMI, when used, is charged for extra by cloud provider

5.2.101 EC2AvailabilityZone: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

5.2.102 EC2EBSStorage: EC2Storage
parent: EC2Storage

Parameter: volumeId
Type: string
Description: Volume ID assigned by EC2

Parameter: size
Type: unsigned integer
Description: Size

Parameter: persistent
Type: boolean
Description: Persistent storage will not be removed when instance is removed

Parameter: availabilityZone
Type: string
Description: Availability zone set by EC2

Parameter: creationTime
Type: timestamp
Description: Time of creation in EC2

Parameter: status
Type: string
Description: Status of EBS volume in EC2

Parameter: volumeType
Type: enum
Description: Specifies what type of EBS volume to use

Parameter: iops
Type: unsigned integer
Description: Specifies the IOPS rate for the provisioned IOPS volume type

Parameter: encrypted
Type: boolean
Description: None
Parameter:  snapshotId
Type:  string
Description:  ID of the snapshot which should be used to instantiate the new disk. This field can be used to speed up node provisioning by first provisioning a cloud compute node, creating a snapshot of its volumes, and then setting that snapshot ID in this field for remaining cloud compute nodes.

5.2.103 EC2EphemeralStorage: EC2Storage
parent: EC2Storage

Parameter:  volumeId
Type:  string
Description:  Ephemral ID

Parameter:  size
Type:  unsigned integer
Description:  Size

5.2.104 EC2Provider: CloudProvider
parent: CloudProvider

Parameter:  username
Type:  string
Description:  AWS region to be used for listing available regions

Parameter:  accountId
Type:  string
Description:  AWS Account ID

Parameter:  accessKeyId
Type:  string
Description:  AWS access key ID

Parameter:  accessKeySecret
Type:  string
Description:  AWS secret access key

Parameter:  VPCs
Type:  list of EC2VPC
Description:  List of VPCs

Parameter:  defaultRegion
Type:  reference to EC2Region or None
Description:  Default region to start instances in

Parameter:  defaultAMI
Type:  reference to EC2AMI or None
Description:  Default AMI to start instances with

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Parameter: **defaultType**
Type: reference to EC2Type or None
Description: Default type for instances

Parameter: **defaultDirectorType**
Type: reference to EC2Type or None
Description: Default type for cloud director instances

Parameter: **imageOwners**
Type: list of strings
Description: AWS Account IDs to be used to search for images

Parameter: **addJobBasedTag**
Type: boolean
Description: Enable automatic tagging of cloud resources with information of running cloud jobs to allow cost monitoring

Parameter: **JobIdTagName**
Type: string
Description: The name of the tag that contains the job ID when using job based tagging

Parameter: **JobAccountTagName**
Type: string
Description: The name of the tag that contains the job account when using job based tagging

Parameter: **JobUserTagName**
Type: string
Description: The name of the tag that contains the user name when using job based tagging

Parameter: **JobNameTagName**
Type: string
Description: The name of the tag that contains the job name when using job based tagging

Parameter: **billingAccessKeyId**
Type: string
Description: AWS billing access key ID

Parameter: **billingAccessKeySecret**
Type: string
Description: AWS billing secret access key

Parameter: **useMarketplaceAMIs**
Type: enum
Description: Preference towards using marketplace AMIs
5.2 Entities

5.2.105 EC2RegionAMI: Entity

parent: Entity

Parameter: region
Type: reference to EC2Region
Description: The cloud region containing this AMI

Parameter: amiID
Type: string
Description: The AMI ID

5.2.106 EC2Region: CloudRegion

parent: CloudRegion

Parameter: url
Type: string
Description: url

Parameter: availabilityZones
Type: list of EC2AvailabilityZone
Description: Availability zones

5.2.107 EC2Settings: CloudSettings

parent: CloudSettings

Parameter: instanceId
Type: string
Description: Instance-ID provided by EC2

Parameter: spotId
Type: string
Description: Spot-request-ID provided by EC2

Parameter: sshConnectString
Type: string
Description: SSH connection string provided by EC2

Parameter: externalIP
Type: IP
Description: The external IP address as set by the cloud provider

Parameter: releaseStaticIPOnTermination
Type: boolean
Description: Release Static IP on termination of the instance

Parameter: useKernelAndInitrdFromTheSoftwareImage
Type: boolean
Description: Make the cloud node’s node-installer download the kernel and the initrd from the software image configured for this cloud node and then reboot the cloud node to use those, instead of using the kernel and initrd already present on the node-installer’s cloud image.

Parameter: type
Type: reference to EC2Type or None
Description: Type for instance

Parameter: region
Type: reference to EC2Region
Description: Region for instance

Parameter: ami
Type: reference to EC2AMI or None
Description: AMI used to create instance

Parameter: allocatePublicIP
Type: boolean
Description: Whether to allocate a public IP for this instance. Always true for cloud directors.

Parameter: sourceDestinationCheck
Type: boolean
Description: Whether to perform source/destination checks on the instance traffic.

Parameter: kernel
Type: string
Description: Kernel used to create instance

Parameter: initrd
Type: string
Description: Initial ramdisk used to create instance

Parameter: options
Type: string
Description: User defined options passed to EC2 on instance creation

Parameter: storage
Type: list of EC2Storage
Description: Assign EC2 storage

Parameter: cpuOptions
Type: string
Description: CPU Options in AWS shorthand syntax (e.g: CoreCount=8,ThreadsPerCore=1)

Parameter: spotPrice
Type: float
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**Description:** Maximum price to start instance with

**Parameter:** spotPersistent
**Type:** boolean
**Description:** Persistent spot instances are requested again after they are automatically stopped, because price became to high

**Parameter:** useNonDefaultVirtualizationType
**Type:** boolean
**Description:** none

**Parameter:** placementGroup
**Type:** string
**Description:** Start instance in the specified placement group

**Parameter:** iamInstanceProfile
**Type:** string
**Description:** Name or ARN of instance profile to associate with

5.2.108 **EC2Storage:** Entity
**parent:** Entity

**Parameter:** name
**Type:** string
**Description:** Name

**Parameter:** drive
**Type:** string
**Description:** Mount device as /dev/?

**Parameter:** tags
**Type:** list of strings
**Description:** List of tags that will be assigned to storage

5.2.109 **EC2Type:** CloudType
**parent:** CloudType

**Parameter:** virtualizationType
**Type:** string
**Description:** Virtualization type.

**Parameter:** ondemandPrices
**Type:** list of strings
**Description:** List of on-demand prices for VMs of this type.

5.2.110 **EC2VPC:** Entity
**parent:** Entity

**Parameter:** name

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Type: string
Description: User-defined name of the private cloud

Parameter: vpcID
Type: string
Description: AWS VPC identifier

Parameter: mainRouteTable
Type: string
Description: Main route table AWS ID

Parameter: defaultACL
Type: string
Description: Default network access control list ID

Parameter: internetGatewayID
Type: string
Description: The AWS ID of the internet gateway assigned to this VPC

Parameter: region
Type: reference to EC2Region
Description: AWS region of the VPC

Parameter: subnets
Type: list of references to Network
Description: Subnets (networks) associated with the VPC

Parameter: baseAddress
Type: IP
Description: Base IP address of the VPC

Parameter: netmaskBits
Type: integer
Description: Number of netmask Bits

Parameter: securityGroupNode
Type: string
Description: Security group ID of the cloud nodes

Parameter: securityGroupDirector
Type: string
Description: Security group ID of the cloud director

Parameter: routeTableIdPublic
Type: string
Description: Routing table ID for the public subnet
5.2 Entities

Parameter: routeTableIdPrivate
Type: string
Description: Routing table ID for private subnets

Parameter: manageVPCInAWS
Type: boolean
Description: Whether to create/remove VPC in AWS as they are created/removed in Bright.

Parameter: manageSecurityGroupsInAWS
Type: boolean
Description: Whether to ensure security groups are created in AWS.

Parameter: manageSubnetsInAWS
Type: boolean
Description: Whether to create/remove VPC subnets in AWS as they are created/removed in Bright.

Parameter: manageRouteTableSetupInAWS
Type: boolean
Description: Whether to create routing table entries in the VPC.

Parameter: useInternalIPForDirectorIP
Type: boolean
Description: If specified, CMDaemon will use cloud director’s internal IP, instead of a public/external IP. Useful when you have existing IP connectivity to your VPC.

Parameter: enforceDirectorIP
Type: IP
Description: If specified, CMDaemon will assume this is the cloud director’s IP address.

Parameter: customDefaultGWPrivateSubnet
Type: string
Description: Use this to override the default gateway which will be set for the routing tables of the VPC’s private subnet.

Parameter: customDefaultGWPUBLICSubnet
Type: string
Description: Use this to override the default gateway which will be set for the routing tables of the VPC’s public subnet.

Parameter: defaultGWPrivateSubnetType
Type: string
Description: Default gateway private subnet type.

Parameter: vpcextraField2
Type: list of strings
Description: A list of various advanced options.
5.2.111 EdgeDirectorRole: DirectorRole

parent: DirectorRole

Parameter: nodePowerOperations
Type: boolean
Description: Execute all power operations of nodes in the edge site on the director

Parameter: directorPowerOperations
Type: boolean
Description: Execute all power operation of the director on the director, note that this means it cannot be powered on

Parameter: nodeSelectionBootRole
Type: boolean
Description: Use the edge site as a node selection mechanism for the boot role

Parameter: nodeSelectionDnsRole
Type: boolean
Description: Use the edge site as a node selection mechanism for the DNS role

Parameter: nodeSelectionProvisioningRole
Type: boolean
Description: Use the edge site as a node selection mechanism for the provisioning role

Parameter: openTCPPortsOnHeadNode
Type: list of unsigned numbers
Description: The list of TCP ports that will be opened in shorewall on the head node

Parameter: openUDPPortsOnHeadNode
Type: list of unsigned numbers
Description: The list of UDP ports that will be opened in shorewall on the head node

Parameter: externallyVisibleIp
Type: IP
Description: IP that will be seen by other nodes when the director connects

Parameter: externallyVisibleHeadNodeIp
Type: IP
Description: Head node IP that will be use by this director

5.2.112 EdgeSite: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: contact
5.2 Entities

Type: list of strings
Description: Names of contacts

Parameter: adminEmail
Type: list of strings
Description: Administrator's email

Parameter: address
Type: string
Description: Address

Parameter: city
Type: string
Description: City

Parameter: country
Type: string
Description: Country

Parameter: timeZoneSettings
Type: TimeZoneSettings or None
Description: Time zone

Parameter: notes
Type: string
Description: Notes

Parameter: nodes
Type: list of references to ComputeNode
Description: List of nodes in this site

Parameter: switches
Type: list of references to Switch
Description: List of switches in this site

Parameter: genericDevices
Type: list of references to GenericDevice
Description: List of generic devices in this site

Parameter: unmanagedNodes
Type: list of references to UnmanagedNode
Description: List of unmanaged nodes in this site

Parameter: secret
Type: string
Description: Edge site secret

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Parameter: createISO
Type: enum
Description: Edge site site ISO/script for USB

Parameter: createIMG
Type: enum
Description: Edge site site IMG/script for MMC

5.2.113 EntityManagersMD5: Entity
parent: Entity

Parameter: name
Type: list of strings
Description: Name

Parameter: md5
Type: list of strings
Description: MD5

5.2.114 Entity
Parameter: uniqueKey
Type: 64 bit unsigned
Description: Unique identifier

Parameter: baseType
Type: string
Description: Basis instance type

Parameter: childType
Type: string
Description: Specialized instance type

Parameter: revision
Type: string
Description: A free text revision field

5.2.115 EtcdCluster: Entity
parent: Entity

Parameter: name
Type: string
Description: Name of the Etcd cluster

Parameter: heartBeatInterval
Type: unsigned integer
Description: Time (in milliseconds) of a heartbeat interval

Parameter: electionTimeout
Type: unsigned integer
Description: Time (in milliseconds) for an election to timeout

Parameter: notes
Type: string
Description: Notes

Parameter: ca
Type: string
Description: The Certificate Authority (CA) Certificate path for Etcd, used to generate certificates for Etcd.

Parameter: cakey
Type: string
Description: The Certificate Authority (CA) Key path for Etcd, used to generate certificates for Etcd.

Parameter: memberCertificate
Type: string
Description: The Certificate path to use for Etcd cluster members, signed with the Etcd CA.

Parameter: memberCertificateKey
Type: string
Description: The Key path to use for Etcd cluster members, signed with the Etcd CA.

Parameter: clientCertificate
Type: string
Description: The Client Certificate used for Etcdctl for example.

Parameter: clientCertificateKey
Type: string
Description: The Client Certificate Key used for Etcdctl for example.

Parameter: clientCA
Type: string
Description: The Certificate Authority (CA) used for client certificates. When set it is assumed client certificate and key will be generated and signed with this CA by another party. Etcd still expects the path to be correct for the Client Certificate and Key.

Parameter: clientTypeEtcd
Type: unsigned integer
Description: client type in the CLIENT_TYPE_ETCD range

Parameter: moduleFileTemplate
Type: string
Description: Template for system module file

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5.2.116  **EtcdHostRole: Role**

**parent:** Role

**Parameter:**  **memberName**
  **Type:**  string
  **Description:**  Human-readable name for this member ($hostname will be replaced to the node host-name)

**Parameter:**  **spool**
  **Type:**  string
  **Description:**  Path to the data directory

**Parameter:**  **listenClientUrls**
  **Type:**  list of strings
  **Description:**  List of URLs to listen on for client traffic

**Parameter:**  **listenPeerUrls**
  **Type:**  list of strings
  **Description:**  List of URLs to listen on for peer traffic

**Parameter:**  **advertiseClientUrls**
  **Type:**  list of strings
  **Description:**  List of this member’s client URLs to advertise to the public

**Parameter:**  **advertisePeerUrls**
  **Type:**  list of strings
  **Description:**  List of this member’s peer URLs to advertise to the rest of the cluster

**Parameter:**  **snapshotCount**
  **Type:**  unsigned integer
  **Description:**  Number of committed transactions to trigger a snapshot to disk

**Parameter:**  **maxSnapshots**
  **Type:**  unsigned integer
  **Description:**  Maximum number of snapshot files to retain (0 is unlimited)

**Parameter:**  **debug**
  **Type:**  boolean
  **Description:**  Drop the default log level to DEBUG for all subpackages

**Parameter:**  **options**
  **Type:**  list of strings
  **Description:**  Additional parameters for etcd daemon

**Parameter:**  **etcdCluster**
  **Type:**  reference to EtcdCluster
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Description: The Etcd cluster instance

Parameter: memberCertificate
Type: string
Description: Etcd member certificate, signed with CA specified in the Etcd Cluster. When set it will overrule the value from the EtcdCluster object.

Parameter: memberCertificateKey
Type: string
Description: Etcd member certificate key, signed with CA specified in the Etcd Cluster. When set it will overrule the value from the EtcdCluster object.

5.2.117 EthernetSwitch: Switch

parent: Switch

Parameter: lowestPort
Type: integer
Description: Lowest port

Parameter: uplinks
Type: list of unsigned numbers
Description: List of ports connected to other switches.

Parameter: disablePortDetection
Type: boolean
Description: Disable port detection for this switch

Parameter: disablePortMapping
Type: boolean
Description: Disable port index mapping

Parameter: vlanCacheTime
Type: unsigned integer
Description: Time to cache VLAN information

5.2.118 ExcludeListSnippet: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: excludeList
Type: list of strings
Description: Excluded paths in the node image update

Parameter: disabled
Type: boolean

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**Description:** Disabled

**Parameter:** noNewFiles
Type: boolean
Description: No new files

**Parameter:** modeSync
Type: boolean
Description: Include this snippet when mode is sync

**Parameter:** modeFull
Type: boolean
Description: Include this snippet when mode is full

**Parameter:** modeUpdate
Type: boolean
Description: Include this snippet when mode is update

**Parameter:** modeGrab
Type: boolean
Description: Include this snippet when mode is grab

**Parameter:** modeGrabNew
Type: boolean
Description: Include this snippet when mode is grab new

### 5.2.119 ExternalOperationResult: Entity

**parent:** Entity

**Parameter:** refNodeUniqueKey
Type: unsigned integer
Description: Node

**Parameter:** result
Type: enum
Description: Result

**Parameter:** output
Type: string
Description: Output

**Parameter:** error
Type: string
Description: Error
5.2.120  **FailoverRole: Role**

*parent: Role*

**Parameter:** syncCmShared  
**Type:** boolean  
**Description:** Passive head node has a local copy of /cm/shared

5.2.121  **FileContent: Entity**

*parent: Entity*

**Parameter:** filename  
**Type:** string  
**Description:** Filename

**Parameter:** content  
**Type:** string  
**Description:** Content

**Parameter:** username  
**Type:** string  
**Description:** Username

**Parameter:** permissions  
**Type:** integer  
**Description:** Permissions

5.2.122  **FirewallInterface: Entity**

*parent: Entity*

**Parameter:** zone  
**Type:** string  
**Description:** Zone

**Parameter:** interface  
**Type:** string  
**Description:** Interface

**Parameter:** broadcast  
**Type:** string  
**Description:** Broadcast

**Parameter:** options  
**Type:** string  
**Description:** Options

5.2.123  **FirewallOpenPort: Entity**

*parent: Entity*

**Parameter:** action

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Type: enum
Description: Specifies the action to be taken if the connection request matches the rule

Parameter: network
Type: string
Description: Network

Parameter: port
Type: unsigned integer
Description: Port

Parameter: protocol
Type: enum
Description: Protocol

Parameter: address
Type: CIDR
Description: Network Address

Parameter: destination
Type: string
Description: Destination hosts to which the rule applies.

Parameter: description
Type: string
Description: Description

5.2.124 FirewallPolicy: Entity

parent: Entity

Parameter: source
Type: string
Description: Source

Parameter: dest
Type: string
Description: Dest

Parameter: policy
Type: enum
Description: Policy

Parameter: log
Type: string
Description: Log

Parameter: options
Type: string
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Description: Options

5.2.125 FirewallRole: Role

parent: Role

Parameter: shorewall
Type: boolean
Description: Manage shorewall

Parameter: openPorts
Type: list of FirewallOpenPort
Description: The list of ports that will be opened on the node’s firewall

Parameter: zones
Type: list of FirewallZone
Description: The list of extra zones that will be defined in the node’s firewall

Parameter: interfaces
Type: list of FirewallInterface
Description: The list of extra interfaces that will be defined in the node’s firewall

Parameter: policies
Type: list of FirewallPolicy
Description: The list of extra policies that will be defined in the node’s firewall

5.2.126 FirewallZone: Entity

parent: Entity

Parameter: zone
Type: string
Description: Zone

Parameter: zone_type
Type: enum
Description: Type

Parameter: options
Type: string
Description: Options

5.2.127 FPGAInfo: Entity

parent: Entity

Parameter: vendor
Type: string
Description: none

Parameter: bdf
Type: string

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<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
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</tr>
<tr>
<td>mac1</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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5.2 Entities

Type: MAC
Description: none

Parameter: mac2
Type: MAC
Description: none

Parameter: mac3
Type: MAC
Description: none

5.2.128 FSExport: Entity
parent: Entity

Parameter: name
Type: string
Description: Normally the same as the path, useful when exporting a path twice

Parameter: path
Type: string
Description: Path to export

Parameter: network
Type: reference to Network or None
Description: Network the interface is connected to

Parameter: hosts
Type: string
Description: Specify extra hosts-range allowed access to this export (space separated)

Parameter: automatic
Type: boolean
Description: The export was created automatically

Parameter: allowWrite
Type: boolean
Description: Allow writing

Parameter: async
Type: boolean
Description: Allow the NFS server to violate the NFS protocol and reply to requests before any changes made by that request have been committed to stable storage

Parameter: rootSquash
Type: boolean
Description: Map requests from uid/gid 0 to the anonymous uid/gid

Parameter: allSquash

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Type: boolean
Description: Map all uids and gids to the anonymous user

Parameter: anonUid
Type: unsigned integer
Description: Anonymous account user id number

Parameter: anonGid
Type: unsigned integer
Description: Anonymous account group id number

Parameter: extraOptions
Type: string
Description: Extra options to be added to this export

Parameter: fsid
Type: unsigned integer
Description: Identification for exports used in failover setup. Make sure these are identical

Parameter: rdma
Type: boolean
Description: Enable NFS over RDMA

Parameter: disabled
Type: boolean
Description: Disable the export

Parameter: checkTree
Type: boolean
Description: Check tree

5.2.129 FSMount: Entity
parent: Entity

Parameter: device
Type: string
Description: What to mount.

Parameter: mountpoint
Type: string
Description: Where to mount.

Parameter: filesystem
Type: string
Description: The file system type.

Parameter: mountoptions
Type: string
Description: What options to use for mounting.

Parameter: dump
Type: boolean
Description: Dump field in fstab, see man fstab.

Parameter: fsck
Type: enum
Description: Filesystem check field in fstab, see man fstab.

Parameter: rdma
Type: boolean
Description: Enable NFS over RDMA.

5.2.130 FSPartAssociation: Entity
parent: Entity

Parameter: syncPoint
Type: string
Description: Directory the FSPart should be synchronized to on the target.

Parameter: prefix
Type: string
Description: Optional prefix to the sync point.

Parameter: fspart
Type: reference to FSPart
Description: FSPart this association is associated with.

Parameter: onSharedStorage
Type: boolean
Description: FSPart associations on shared storage can be used as provisioning source, but don’t need to be kept up-to-date.

Parameter: disabled
Type: boolean
Description: Do not rsync this association

Parameter: backupDirectory
Type: string
Description: Backup directory

5.2.131 FSPartBasicAssociation: FSPartAssociation
parent: FSPartAssociation

Parameter: isRoot
Type: boolean
Description: Indicates if this association is the root file system for the target. A node can only have one association where this is set.

5.2.132 FSPartInfo: Entity
parent: Entity

Parameter: refFSPartUniqueKey
Type: unsigned integer
Description: FSPart

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: archOSInfo
Type: ArchOSInfo or None
Description: Detected arch/OS

Parameter: size
Type: unsigned integer
Description: Total size

Parameter: inotifyWatcherSize
Type: unsigned integer
Description: Inotify watcher size

5.2.133 FSPartProviderAssociation: FSPartAssociation
parent: FSPartAssociation

Parameter: onlyWhenActive
Type: boolean
Description: Only use provider association if the node is the active head node

5.2.134 FSPartRole: Role
parent: Role

Parameter: fsparts
Type: list of references to FSPart
Description: FSParts

Parameter: fspartSource
Type: boolean
Description: Server as source for all these FSParts

5.2.135 FSPart: Entity
parent: Entity

Parameter: path
Type: string
Description: Full source path of the filesystem part

Parameter: type
Type: enum
Description: The type of filesystem part

Parameter: watchDirectories
Type: list of strings
Description: Watch directories for changes on the active head node, filesystem part will be marked dirty when changed

Parameter: dirtyAutoSyncDelay
Type: unsigned integer
Description: Time to wait before automatically syncing after the filesystem part became dirty, set 0 to disable

Parameter: autoDirtyDelay
Type: unsigned integer
Description: Time to wait before automatically marking an filesystem part as dirty, set 0 to disable

Parameter: preSyncScript
Type: string
Description: Script to be executed before rsync runs

Parameter: postSyncScript
Type: string
Description: Script to be executed after rsync runs

Parameter: abortOnPreSyncScriptFailure
Type: boolean
Description: Do not rsync if the pre sync script exited with a non zero exit code

Parameter: runPostOnFailure
Type: boolean
Description: Run the post rsync script even if the pre sync or sync ended with a non zero exit code

Parameter: syncScriptTimeout
Type: unsigned integer
Description: Script timeout

Parameter: rsyncAcls
Type: boolean
Description: Rsync with –acls

Parameter: rsyncXattrs
Type: boolean
Description: Rsync with –xattrs

Parameter: rsyncHardlinks
Type: boolean
Description: Rsync with –hard-links

Parameter: rsyncSparse
Type: boolean
Description: Rsync with –sparse

Parameter: rsyncNumericIds
Type: boolean
Description: Rsync with –numeric-ids

Parameter: rsyncForce
Type: boolean
Description: Rsync with –force

Parameter: rsyncPrune
Type: boolean
Description: Rsync with –prune-empty-dirs

Parameter: rsyncDelta
Type: boolean
Description: Rsync with –inplace –no-whole-file

Parameter: rsyncBlockSize
Type: unsigned integer
Description: Rsync with –block-size=<value> Max 128KB, 0 implies rsync default

Parameter: rsyncBandWidthLimit
Type: unsigned integer
Description: Rsync with –bwlimit=<value>

Parameter: rsyncCompress
Type: enum
Description: Rsync with –compress

Parameter: rsyncCompressLevel
Type: enum
Description: Rsync compression at a specific level

Parameter: extraRsyncArguments
Type: list of strings
Description: Extra rsync arguments. These can be made condition based on type=no-new-files | normal and mode=sync | update | full | sync. For example: –max-delete=0?type=normal&mode=update | sync
Parameter: excludeListSnippets
Type: list of ExcludeListSnippet
Description: none

5.2.136 FSxInstance: Entity
parent: Entity

Parameter: fsxId
Type: string
Description: AWS assigned unique identifier

Parameter: name
Type: string
Description: Non-unique identifier

Parameter: owner
Type: string
Description: Owner of the FSx instance

Parameter: sharedWith
Type: list of strings
Description: Other cmjob users that can use this instance for jobs.

Parameter: vpcId
Type: string
Description: The VPC in which it exists

Parameter: region
Type: string
Description: The AWS region where the instance was created

Parameter: capacity
Type: unsigned integer
Description: Size in GB. Should be at least 3600

Parameter: status
Type: string
Description: AWS reported status of the instance

Parameter: hostname
Type: string
Description: Hostname of the FSx, is internal to the VPC

Parameter: management
Type: enum
Description: Instance management type

Parameter: creationTime
**Type:** string
**Description:** Creation time

5.2.137 **GenericDevice:** Device

**parent:** Device

**Parameter:** ip
**Type:** IP
**Description:** Ip address

**Parameter:** network
**Type:** reference to Network or None
**Description:** Network to which this switch is connected

**Parameter:** model
**Type:** string
**Description:** Device model name

**Parameter:** additionalHostnames
**Type:** list of strings
**Description:** List of additional hostnames that should resolve to the interfaces IP address

5.2.138 **GenericResource:** BasicResource

**parent:** BasicResource

**Parameter:** activateScript
**Type:** string
**Description:** Script to be executed when the resource is given to a node

**Parameter:** deactivateScript
**Type:** string
**Description:** Script to be executed when the resource is taken away from a node

**Parameter:** checkScript
**Type:** string
**Description:** Script to be executed periodically to verify the resource is still running

**Parameter:** arguments
**Type:** list of strings
**Description:** Arguments to pass to the script

**Parameter:** scriptTimeout
**Type:** unsigned integer
**Description:** Script timeout

5.2.139 **GenericRoleConfiguration:** Entity

**parent:** Entity

**Parameter:** name
Type: string
Description: Name

Parameter: createDirectory
Type: boolean
Description: Create directory if it doesn’t exist

Parameter: filename
Type: string
Description: Filename

Parameter: mask
Type: unsigned integer
Description: Filename mask directory

Parameter: userName
Type: string
Description: User ownership applied to the file

Parameter: groupName
Type: string
Description: Group ownership applied to the file

Parameter: disabled
Type: boolean
Description: Disabled

Parameter: serviceActionOnWrite
Type: enum
Description: Action performed on service if the file changed

Parameter: serviceStopOnFailure
Type: boolean
Description: Stop services if the file write failed

5.2.140  GenericRoleEnvironment: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: value
Type: string
Description: Value

Parameter: nodeEnvironment
Type: boolean

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Description: Update the node environment variables

5.2.141 GenericRoleGeneratedConfiguration: GenericRoleConfiguration

parent: GenericRoleConfiguration

Parameter: script
Type: string
Description: Script

Parameter: arguments
Type: list of strings
Description: Arguments

Parameter: timeout
Type: unsigned integer
Description: Timeout

Parameter: watch
Type: boolean
Description: Watch script for for changes, and rerun

5.2.142 GenericRoleStaticConfiguration: GenericRoleConfiguration

parent: GenericRoleConfiguration

Parameter: content
Type: string
Description: Content to write into file

Parameter: filemask
Type: unsigned integer
Description: Filemask

5.2.143 GenericRoleSymlinkConfiguration: GenericRoleConfiguration

parent: GenericRoleConfiguration

Parameter: sourceFilename
Type: string
Description: Source filename

Parameter: watch
Type: boolean
Description: Watch source file for for changes, and treat as file change

5.2.144 GenericRoleTemplatedConfiguration: GenericRoleConfiguration

parent: GenericRoleConfiguration

Parameter: templateContent
Type: string
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Description: Template to use for writing file

Parameter: environmentFromKeyValueStore
Type: boolean
Description: Use key value store for extra replacement rules

5.2.145 GenericRole: Role
parent: Role

Parameter: services
Type: list of strings
Description: none

Parameter: configuration
Type: list of GenericRoleConfiguration
Description: none

Parameter: extraEnvironment
Type: list of GenericRoleEnvironment
Description: none

Parameter: excludeListSnippets
Type: list of ExcludeListSnippet
Description: none

Parameter: dataNode
Type: boolean
Description: If enabled the node will never do a FULL install without explicit user confirmation

5.2.146 GPUInfo: Entity
parent: Entity

Parameter: name
Type: string
Description: none

Parameter: index
Type: unsigned integer
Description: none

Parameter: pciBusId
Type: string
Description: none

Parameter: pciDevId
Type: string
Description: none
Parameter: pciSubSysId
Type: string
Description: none

Parameter: pciMaxLinkGen
Type: string
Description: none

Parameter: pciLinkGen
Type: string
Description: none

Parameter: pciMaxLinkWidth
Type: string
Description: none

Parameter: pciLinkWidth
Type: string
Description: none

Parameter: serial
Type: string
Description: none

Parameter: uuid
Type: string
Description: none

Parameter: vBios
Type: string
Description: none

Parameter: driverModel
Type: string
Description: none

Parameter: infoRom
Type: string
Description: none

Parameter: powerMode
Type: string
Description: none

Parameter: powerLimit
Type: string
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Description: none

Parameter: displayMode
Type: string
Description: none

Parameter: eccMode
Type: string
Description: none

Parameter: computeMode
Type: string
Description: none

Parameter: operationMode
Type: string
Description: none

Parameter: persistenceMode
Type: string
Description: none

Parameter: clocksSettings
Type: list of strings
Description: none

5.2.147 GPUSettings: Entity
parent: Entity

Parameter: name
Type: string
Description: Range of GPUs for which these settings apply

Parameter: source
Type: unsigned integer
Description: none

Parameter: unitOffset
Type: unsigned integer
Description: none

5.2.148 GpuStatusEntry: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

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Parameter: index
Type: unsigned integer
Description: GPU index for this status entry

Parameter: gpu
Type: string
Description: Name of the GPU

Parameter: property
Type: string
Description: Property name

Parameter: value
Type: string
Description: Value of the property

Parameter: supported
Type: list of strings
Description: List of supported values for this property

5.2.149 GPUUnitInfo: Entity
parent: Entity

Parameter: name
Type: string
Description: Name of this unit

Parameter: id
Type: string
Description: Numeric identifier of this unit

Parameter: serial
Type: string
Description: none

Parameter: driver
Type: string
Description: none

Parameter: nvml
Type: string
Description: none

Parameter: pciSpeed
Type: string
Description: none

Parameter: firmware
Type: string
Description: none

Parameter: gpu
Type: list of GPUInfo
Description: GPU information

5.2.150 GpuUnit: Device
parent: Device

Parameter: ip
Type: IP
Description: Ip address

Parameter: network
Type: reference to Network or None
Description: Network to which this switch is connected

Parameter: serial
Type: string
Description: Serial

Parameter: indx
Type: integer
Description: Index of the pci bus

Parameter: bmcSettings
Type: BMCSettings or None
Description: Configure the baseboard management controller settings

Parameter: exclusive
Type: boolean
Description: Run in exclusive mode

Parameter: owners
Type: list of references to Node
Description: List of nodes who have access to this gpu unit

Parameter: gpuSettings
Type: list of GPUSettings
Description: Configure the GPUs

5.2.151 GridEngineJobQueueStat: JobQueueStat
parent: JobQueueStat

Parameter: load
Type: float

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Description:  Queue queue load

Parameter:  used
Type:  unsigned integer
Description:  Used queue slots

Parameter:  available
Type:  unsigned integer
Description:  Available queue slots

Parameter:  total
Type:  unsigned integer
Description:  Total queue slots

Parameter:  resv
Type:  unsigned integer
Description:  Reserved queue slots

5.2.152 GridEngineJobQueue: JobQueue

parent:  JobQueue

Parameter:  slots
Type:  string
Description:  Number of slots

Parameter:  tmpdir
Type:  string
Description:  Temporary directory for queue

Parameter:  prolog
Type:  string
Description:  Path to prolog script (e.g. root@/cm/local/apps/cmd/scripts/prolog)

Parameter:  epilog
Type:  string
Description:  Path to epilog script

Parameter:  starterMethod
Type:  string
Description:  Script to be executed instead of shell to run the job

Parameter:  suspendMethod
Type:  string
Description:  Grid Engine Suspend method

Parameter:  resumeMethod
Type:  string
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Description: Grid Engine Resume method

Parameter: terminateMethod
Type: string
Description: Grid Engine Terminate method

Parameter: minWalltime
Type: string
Description: Minimum runtime for jobs in queue

Parameter: maxWalltime
Type: string
Description: Maximum runtime for jobs in queue

5.2.153 GridEngineJob: Job
parent: Job

5.2.154 GridEngineParallelEnvironment: Entity
parent: Entity

Parameter: name
Type: string
Description: The name of the parallel environment (to be used in the qsub -pe switch)

Parameter: slots
Type: unsigned integer
Description: The number of parallel processes being allowed to run in total under the PE concurrently

Parameter: userLists
Type: list of strings
Description: A list of user access list names

Parameter: xUserLists
Type: list of strings
Description: An exclude list of user access list names

Parameter: startProcedureArguments
Type: string
Description: The invocation command line of a start-up procedure

Parameter: stopProcedureArguments
Type: string
Description: The invocation command line of a shutdown procedure

Parameter: allocationRule
Type: string
Description: The allocation rule helps the scheduler to decide how to distribute parallel processes
Parameter: controlSlaves
Type: boolean
Description: Indicates if GE is the creator of the slave tasks via sge_execd and sge_shepherd

Parameter: jobIsFirstTask
Type: boolean
Description: A value of true indicates that the GE job script already contains one of the tasks

Parameter: urgencySlots
Type: string
Description: Specifies the method to be used by GE to assess the number of slots such jobs might finally get

Parameter: accountingSummary
Type: boolean
Description: Indicates if only a single accounting record (job summary) is written to the accounting file

Parameter: extraParameters
Type: list of strings
Description: Additional parameters that will be added to PE configuration

Parameter: perPeTaskProlog
Type: string
Description: Prolog script that is started for each slave task

Parameter: perPeTaskEpilog
Type: string
Description: Epilog script that is started for each slave task

5.2.155 Group: Entity
parent: Entity

Parameter: ID
Type: string
Description: Group ID

Parameter: name
Type: string
Description: Group name

Parameter: members
Type: list of strings
Description: Users belonging to this group

5.2.156 GuiCephOsdPoolInfo: Entity
parent: Entity

Parameter: refCephOSDPoolUniqueKey
Type: unsigned integer
Description: CephOSDPool

Parameter: name
Type: string
Description: Name

Parameter: sizeBytes
Type: unsigned integer
Description: size_bytes

Parameter: numObjects
Type: unsigned integer
Description: num_objects

Parameter: numObjectClones
Type: unsigned integer
Description: num_object_clones

Parameter: numObjectCopies
Type: unsigned integer
Description: num_object_copies

Parameter: numObjectsMissingOnPrimary
Type: unsigned integer
Description: num_objects_missing_on_primary

Parameter: numObjectsDegraded
Type: unsigned integer
Description: num_objects_degraded

Parameter: numObjectsUnfound
Type: unsigned integer
Description: num_objects_unfound

Parameter: readOps
Type: unsigned integer
Description: Number of reads

Parameter: readBytes
Type: unsigned integer
Description: Total read

Parameter: writeOps
Type: unsigned integer
Description: Number of writes
Parameter: writeBytes
Type: unsigned integer
Description: Total write

5.2.157 GuiCephOverview: Entity
parent: Entity

Parameter: refCephUniqueKey
Type: unsigned integer
Description: Ceph

Parameter: status
Type: string
Description: Status

Parameter: numPgs
Type: unsigned integer
Description: Number of placement groups

Parameter: numMons
Type: unsigned integer
Description: Number of monitors

Parameter: numOsds
Type: unsigned integer
Description: Total

Parameter: numUpOsds
Type: unsigned integer
Description: Up

Parameter: numInOsds
Type: unsigned integer
Description: In

Parameter: pgsBytesTotal
Type: unsigned integer
Description: PGS Bytes Total

Parameter: pgsBytesUsed
Type: unsigned integer
Description: PGS Bytes Used

Parameter: pgsBytesAvail
Type: unsigned integer
Description: PGS Bytes Avail

Parameter: pgsDataBytes
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**Type:** unsigned integer  
**Description:** Amount of actual data in placement groups

**Parameter:** `pgsReadBytesSec`  
**Type:** unsigned integer  
**Description:** Bytes read per second for placement groups

**Parameter:** `pgsWriteBytesSec`  
**Type:** unsigned integer  
**Description:** Bytes written per second for placement groups

**Parameter:** `pgs`  
**Type:** list of `GuiCephPgsInfo`  
**Description:** PGS

**Parameter:** `osdpools`  
**Type:** list of `GuiCephOsdPoolInfo`  
**Description:** Ceph OSD Pool Information

### 5.2.158 `GuiCephPgsInfo`: Entity

**parent:** Entity

**Parameter:** `stateName`  
**Type:** string  
**Description:** State name

**Parameter:** `version`  
**Type:** string  
**Description:** Version

**Parameter:** `numPgs`  
**Type:** unsigned integer  
**Description:** Num Pgs

**Parameter:** `dataBytes`  
**Type:** unsigned integer  
**Description:** Data Bytes

**Parameter:** `usedBytes`  
**Type:** unsigned integer  
**Description:** Used Bytes

**Parameter:** `availBytes`  
**Type:** unsigned integer  
**Description:** Avail Bytes

**Parameter:** `totalBytes`  
**Type:** unsigned integer
Description: Total Bytes

5.2.159 GuiClusterOverview: Entity
parent: Entity

Parameter: refPartitionUniqueKey
Type: unsigned integer
Description: Partition

Parameter: uptime
Type: unsigned integer
Description: Uptime of the active head node

Parameter: nodesUp
Type: unsigned integer
Description: Number of nodes that are listed as up

Parameter: nodesDown
Type: unsigned integer
Description: Number of nodes that are listed as down

Parameter: nodesClosed
Type: unsigned integer
Description: Number of nodes that are listed as closed

Parameter: nodesTotal
Type: unsigned integer
Description: Number of nodes

Parameter: liteNodesUp
Type: unsigned integer
Description: Number of lite nodes that are listed as up

Parameter: liteNodesDown
Type: unsigned integer
Description: Number of lite nodes that are listed as down

Parameter: liteNodesClosed
Type: unsigned integer
Description: Number of lite nodes that are listed as closed

Parameter: liteNodesTotal
Type: unsigned integer
Description: Number of lite nodes

Parameter: unmanagedNodesUp
Type: unsigned integer

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Description: Number of unmanaged nodes that are listed as up

Parameter: unmanagedNodesDown
Type: unsigned integer
Description: Number of unmanaged nodes that are listed as down

Parameter: unmanagedNodesClosed
Type: unsigned integer
Description: Number of unmanaged nodes that are listed as closed

Parameter: unmanagedNodesTotal
Type: unsigned integer
Description: Number of unmanaged nodes

Parameter: devicesUp
Type: unsigned integer
Description: Number of non-node devices that are listed as up

Parameter: devicesDown
Type: unsigned integer
Description: Number of non-node devices that are listed as down

Parameter: devicesClosed
Type: unsigned integer
Description: Number of non-node devices that are listed as closed

Parameter: devicesTotal
Type: unsigned integer
Description: Number of non-node devices

Parameter: gpuUnitsUp
Type: unsigned integer
Description: Number of GPU units that are listed as up

Parameter: gpuUnitsDown
Type: unsigned integer
Description: Number of GPU units that are listed as down

Parameter: gpuUnitsClosed
Type: unsigned integer
Description: Number of GPU units that are listed as closed

Parameter: gpuUnitsTotal
Type: unsigned integer
Description: Number of GPU units

Parameter: coresUp

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Type: unsigned integer
Description: Sum of all cores for nodes which are up

Parameter: coresTotal
Type: unsigned integer
Description: Sum of all cores for nodes which are up at one time

Parameter: gpusUp
Type: unsigned integer
Description: Sum of all GPUs for nodes which are up

Parameter: gpusTotal
Type: unsigned integer
Description: Sum of all GPUs for nodes which are up at one time

Parameter: disks
Type: list of GuiDiskUsage
Description: Number of disks

Parameter: workload
Type: list of GuiWorkload
Description: Workload information

Parameter: usersLoggedIn
Type: unsigned integer
Description: Number of logged in users on the active head node

Parameter: usersLoggedOut
Type: unsigned integer
Description: Number of logged out users on the active head node

Parameter: usersTotal
Type: unsigned integer
Description: Number of users known to the active head node

Parameter: memoryUsed
Type: unsigned integer
Description: Sum of used memory over all nodes

Parameter: memoryUnused
Type: unsigned integer
Description: Sum of unused memory over all nodes

Parameter: memoryTotal
Type: unsigned integer
Description: Sum of total memory over all nodes
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Parameter: swapUsed
Type: unsigned integer
Description: Sum of used swap memory over all nodes

Parameter: swapUnused
Type: unsigned integer
Description: Sum of unused swap memory over all nodes

Parameter: swapTotal
Type: unsigned integer
Description: Sum of total swap over all nodes

Parameter: usageUser
Type: float
Description: Average user cpu usage over all nodes

Parameter: usageSystem
Type: float
Description: Average system cpu usage over all nodes

Parameter: usageIdle
Type: float
Description: Average idle cpu usage over all nodes

Parameter: usageOther
Type: float
Description: Percentage of cpu time spent on other operations

Parameter: phaseLoad
Type: float
Description: Phase load across all APCs

Parameter: occupationRate
Type: float
Description: Formula: Average[allnodes] (min(load, cores) / cores)

Parameter: freeRate
Type: float
Description: Formula: 1 - Average[allnodes] (min(load, cores) / cores)

5.2.160 GuiDiskUsage: Entity

parent: Entity

Parameter: refDeviceUniqueKey
Type: unsigned integer
Description: Device

Parameter: mountpoint

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Type: string
Description: Mountpoint

Parameter: used
Type: unsigned integer
Description: Bytes in use on this device

Parameter: free
Type: unsigned integer
Description: Bytes free on this device

5.2.161 GuiGPU: Entity
parent: Entity

Parameter: refDeviceUniqueKey
Type: unsigned integer
Description: Device

Parameter: name
Type: string
Description: Name

Parameter: memoryUsed
Type: unsigned integer
Description: Memory used

Parameter: memoryFree
Type: unsigned integer
Description: Memory free

Parameter: utilization
Type: float
Description: GPU Utilization

Parameter: powerUsage
Type: float
Description: Power usage

Parameter: temperature
Type: float
Description: Temperature

Parameter: smClock
Type: float
Description: Streaming multiprocessor clock speed

Parameter: memoryClock
Type: float
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Description: Memory clock speed

5.2.162 GuiJob: Entity

parent: Entity

Parameter: refWlmClusterUniqueKey
Type: unsigned integer
Description: WlmCluster

Parameter: refJobQueueUniqueKey
Type: unsigned integer
Description: Queue

Parameter: jobID
Type: string
Description: Job ID

Parameter: name
Type: string
Description: Name

Parameter: user
Type: string
Description: User

Parameter: runtime
Type: unsigned integer
Description: Runtime

5.2.163 GuiKubeClusterOverview: Entity

parent: Entity

Parameter: refKubeClusterUniqueKey
Type: unsigned integer
Description: KubeCluster

Parameter: name
Type: string
Description: Cluster Name

Parameter: version
Type: string
Description: Kubernetes Version

Parameter: notes
Type: string
Description: Notes
**Parameter:** numNodes  
**Type:** unsigned integer  
**Description:** Number of nodes

**Parameter:** numNamespaces  
**Type:** unsigned integer  
**Description:** Number of namespaces

**Parameter:** numServices  
**Type:** unsigned integer  
**Description:** Number of services

**Parameter:** numRcs  
**Type:** unsigned integer  
**Description:** Number of replication controllers

**Parameter:** numPvs  
**Type:** unsigned integer  
**Description:** Number of persistent volumes

**Parameter:** numPvcs  
**Type:** unsigned integer  
**Description:** Number of persistent volumes claims

**Parameter:** jobs  
**Type:** list of JobInfo  
**Description:** Jobs

**Parameter:** pods  
**Type:** list of KubePodInfo  
**Description:** Pods

5.2.164 GuiNetworkInterface: Entity  
**parent:** Entity

**Parameter:** name  
**Type:** string  
**Description:** Interface name

**Parameter:** rx  
**Type:** unsigned integer  
**Description:** Number of bytes received since startup

**Parameter:** tx  
**Type:** unsigned integer  
**Description:** Number of bytes transmitted since startup
5.2.165 GuiNodeOverview: Entity

**parent:** Entity

**Parameter:** refNodeUniqueKey
**Type:** unsigned integer
**Description:** Node

**Parameter:** interfaces
**Type:** list of GuiNetworkInterface
**Description:** Detailed interface information

**Parameter:** disks
**Type:** list of GuiDiskUsage
**Description:** Detailed disk information

**Parameter:** jobs
**Type:** list of GuiJob
**Description:** Detailed job information

**Parameter:** gpus
**Type:** list of GuiGPU
**Description:** Detailed GPU information

**Parameter:** load1
**Type:** float
**Description:** Average system load over the last minute

**Parameter:** load5
**Type:** float
**Description:** Average system load over the last five minutes

**Parameter:** load15
**Type:** float
**Description:** Average system load over the last fifteen minutes

**Parameter:** uptime
**Type:** unsigned integer
**Description:** Uptime

**Parameter:** memoryUsed
**Type:** unsigned integer
**Description:** Memory used

**Parameter:** memoryUnused
**Type:** unsigned integer
**Description:** Memory unused

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Parameter: memoryTotal
Type: unsigned integer
Description: Total memory

Parameter: swapUsed
Type: unsigned integer
Description: Swap memory used

Parameter: swapUnused
Type: unsigned integer
Description: Swap memory unused

Parameter: swapTotal
Type: unsigned integer
Description: Total swap memory

Parameter: wlmSlotsUsed
Type: unsigned integer
Description: WLM slots used

Parameter: wlmSlotsUnused
Type: unsigned integer
Description: WLM slots unused

Parameter: wlmSlotsTotal
Type: unsigned integer
Description: Total WLM slots

Parameter: usageUser
Type: float
Description: Percentage of cpu time spend on user processes

Parameter: usageSystem
Type: float
Description: Percentage of cpu time spend on system processes

Parameter: usageIdle
Type: float
Description: Percentage of cpu time spend in idle

Parameter: usageOther
Type: float
Description: Percentage of cpu time spend in non user/system/idle

Parameter: usageSoftIrq
Type: float

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Description: Percentage of cpu time spend in soft irq

Parameter: usageIrq
Type: float
Description: Percentage of cpu time spend in irq

Parameter: usageNice
Type: float
Description: Percentage of cpu time spend in nice

Parameter: usageSteal
Type: float
Description: Percentage of cpu time spend in steal

Parameter: usageGuest
Type: float
Description: Percentage of cpu time spend in guest

Parameter: usageWait
Type: float
Description: Percentage of cpu time spend in wait

5.2.166 GuiNodeStatus: Entity

parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: status
Type: DeviceStatus
Description: Device status

Parameter: load1
Type: float
Description: Average system load over the last minute

Parameter: load5
Type: float
Description: Average system load over the last five minutes

Parameter: load15
Type: float
Description: Average system load over the last fifteen minutes

Parameter: uptime
Type: unsigned integer

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Description: Uptime

Parameter: memoryUsed
Type: unsigned integer
Description: Memory used

Parameter: swapUsed
Type: unsigned integer
Description: Swap memory used

Parameter: wlmSlotsUsed
Type: unsigned integer
Description: WLM slots used

Parameter: usageUser
Type: float
Description: Percentage of cpu time spend on user processes

Parameter: usageSystem
Type: float
Description: Percentage of cpu time spend on system processes

Parameter: usageIdle
Type: float
Description: Percentage of cpu time spend in idle

5.2.167 GuiPDUBank: Entity
parent: Entity

Parameter: bank
Type: unsigned integer
Description: Bank

Parameter: load
Type: float
Description: Load

5.2.168 GuiPDUOutlet: Entity
parent: Entity

Parameter: outlet
Type: unsigned integer
Description: Outlet

Parameter: status
Type: enum
Description: Status
Parameter: assigned
Type: list of unsigned numbers
Description: Assigned

5.2.169 GuiPDUOverview: Entity
parent: Entity

Parameter: refPowerDistributionUnitUniqueKey
Type: unsigned integer
Description: none

Parameter: model
Type: string
Description: none

Parameter: outlets
Type: list of GuiPDUOutlet
Description: none

Parameter: banks
Type: list of GuiPDUBank
Description: none

5.2.170 GuiSwitchOverview: Entity
parent: Entity

Parameter: refSwitchUniqueKey
Type: unsigned integer
Description: Switch

Parameter: model
Type: string
Description: Model

Parameter: ports
Type: list of GuiSwitchPort
Description: Ports

5.2.171 GuiSwitchPort: Entity
parent: Entity

Parameter: prt
Type: integer
Description: Port

Parameter: name
Type: string
Description: Name

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Parameter: status
Type: string
Description: Status

Parameter: uplink
Type: boolean
Description: Uplink

Parameter: assigned
Type: unsigned integer
Description: Unique key of the device assigned to this port

Parameter: detected
Type: string
Description: List of MAC address detected on this port

Parameter: speed
Type: unsigned integer
Description: Speed

5.2.172 GuiWorkload: Entity
parent: Entity

Parameter: name
Type: string
Description: Queue name

Parameter: scheduler
Type: string
Description: Scheduler

Parameter: slots
Type: string
Description: Slots

Parameter: nodeKeys
Type: list of unsigned numbers
Description: Node keys

Parameter: nodes
Type: string
Description: Nodes

Parameter: running
Type: unsigned integer
Description: Number of running jobs in this queue

Parameter: queued
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Type:  unsigned integer
Description:  Number of pending jobs in this queue

Parameter:  error
Type:  unsigned integer
Description:  Number of jobs ended in an error state

Parameter:  completed
Type:  unsigned integer
Description:  Number of completed jobs

Parameter:  averageDuration
Type:  unsigned integer
Description:  Average duration of jobs

Parameter:  estimatedDelay
Type:  unsigned integer
Description:  Estimated delay for a new job to start

5.2.173  HeadNodeRole: Role
parent:  Role

Parameter:  failoverId
Type:  unsigned integer
Description:  none

Parameter:  disableAutomaticExports
Type:  boolean
Description:  Disable creation of automatic filesystem exports

5.2.174  HeadNode: Node
parent:  Node

5.2.175  IBSwitch: Switch
parent:  Switch

Parameter:  guid
Type:  string
Description:  The switch GUID

Parameter:  subnetManager
Type:  boolean
Description:  Indicate the subnet manager is running

5.2.176  IPCPerm: Entity
parent:  Entity

Parameter:  key
Type:  integer

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Description: Message queue ID

Parameter: mode
Type: unsigned integer
Description: Access permissions

Parameter: uid
Type: integer
Description: Owner ID

Parameter: gid
Type: integer
Description: Owner group ID

Parameter: owner
Type: string
Description: Owner

Parameter: group
Type: string
Description: Group name

5.2.177 IPResource: BasicResource
parent: BasicResource

Parameter: ip
Type: IP
Description: IP

Parameter: networkDeviceName
Type: string
Description: The network device name to start this IP on. Leave blank to automatically determine based on IP.

Parameter: alias
Type: string
Description: The network device name alias

Parameter: timeout
Type: unsigned integer
Description: Timeout

5.2.178 JobInfoStatistics: Entity
parent: Entity

Parameter: refWlmClusterUniqueKey
Type: unsigned integer
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Description: WlmCluster

Parameter: refJobQueueUniqueKey
Type: unsigned integer
Description: Queue

Parameter: user
Type: string
Description: none

Parameter: group
Type: string
Description: none

Parameter: account
Type: string
Description: none

Parameter: parentId
Type: string
Description: none

Parameter: intervalStart
Type: timestamp
Description: none

Parameter: intervalEnd
Type: timestamp
Description: none

Parameter: pending
Type: unsigned integer
Description: none

Parameter: running
Type: unsigned integer
Description: none

Parameter: finished
Type: unsigned integer
Description: none

Parameter: error
Type: unsigned integer
Description: none

Parameter: total

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Type: unsigned integer
Description: none

Parameter: pendingTime
Type: unsigned integer
Description: none

Parameter: runningTime
Type: unsigned integer
Description: none

Parameter: finishedTime
Type: unsigned integer
Description: none

Parameter: errorTime
Type: unsigned integer
Description: none

Parameter: nodes
Type: unsigned integer
Description: none

5.2.179 JobInfo: Entity
parent: Entity

Parameter: refWlmClusterUniqueKey
Type: unsigned integer
Description: WlmCluster

Parameter: refJobQueueUniqueKey
Type: unsigned integer
Description: Queue

Parameter: jobId
Type: string
Description: Job ID

Parameter: jobName
Type: string
Description: Job name

Parameter: user
Type: string
Description: User name

Parameter: group
Type: string
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Description: User group name

Parameter: account
Type: string
Description: Job account

Parameter: parentId
Type: string
Description: Parent ID

Parameter: nodes
Type: list of unsigned numbers
Description: List of job’s nodes

Parameter: cgroup
Type: string
Description: Relative cgroup path

Parameter: submitTime
Type: timestamp
Description: Job submit time

Parameter: startTime
Type: timestamp
Description: Job start time

Parameter: endTime
Type: timestamp
Description: Job end time

Parameter: persistent
Type: boolean
Description: Whether job is persistent in DB or not

Parameter: exitCode
Type: integer
Description: Jobsript exit code

Parameter: state
Type: string
Description: Job status

Parameter: requestedCPUs
Type: unsigned integer
Description: Requested CPUs

Parameter: requestedCPUCores

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Type:  unsigned integer  
Description:  Requested CPU cores

Parameter:  requestedGPUs  
Type:  unsigned integer  
Description:  Requested GPU

Parameter:  requestedMemory  
Type:  unsigned integer  
Description:  Requested memory

Parameter:  requestedSlots  
Type:  unsigned integer  
Description:  Requested slots

Parameter:  monitoring  
Type:  boolean  
Description:  Whether job still has monitoring data

5.2.180  JobQueuePlaceholder: Entity  
parent:  Entity

Parameter:  queue  
Type:  string  
Description:  Name of queue

Parameter:  baseNodeName  
Type:  string  
Description:  Placeholder node base name

Parameter:  maxNodes  
Type:  unsigned integer  
Description:  Maximum number of nodes in queue

Parameter:  templateNode  
Type:  reference to Node  
Description:  Node that will be used as a placeholder

5.2.181  JobQueueStat: Entity  
parent:  Entity

Parameter:  name  
Type:  string  
Description:  Queue name

5.2.182  JobQueue: Entity  
parent:  Entity

Parameter:  name
5.2 Entities

Type: string
Description: Name of queue

Parameter: wlmCluster
Type: reference to WlmCluster
Description: WlmCluster to which this node belongs

Parameter: options
Type: list of strings
Description: Additional parameters that will be passed to the WLM queue configuration

5.2.183 Job: Entity
parent: Entity

Parameter: refWlmClusterUniqueKey
Type: unsigned integer
Description: WlmCluster

Parameter: refJobQueueUniqueKey
Type: unsigned integer
Description: Queue name

Parameter: jobId
Type: string
Description: Job identifier

Parameter: arrayID
Type: string
Description: Job array identifier

Parameter: taskID
Type: string
Description: Job array task identifier(s)

Parameter: parentID
Type: string
Description: Job parent identifier

Parameter: jobname
Type: string
Description: Name of job

Parameter: username
Type: string
Description: Job owner name

Parameter: status
Type: string
**Description:** Current job status

**Parameter:** project  
**Type:** string  
**Description:** Project name

**Parameter:** priority  
**Type:** string  
**Description:** Job priority

**Parameter:** inqueue  
**Type:** string  
**Description:** Shows whether job has already been queued or not

**Parameter:** nodes  
**Type:** list of strings  
**Description:** Requested nodes

**Parameter:** cgroup  
**Type:** string  
**Description:** CGroup allocated for this job on all nodes

**Parameter:** rundirectory  
**Type:** string  
**Description:** Job work directory

**Parameter:** executable  
**Type:** string  
**Description:** File which is executed inside job script

**Parameter:** arguments  
**Type:** string  
**Description:** Arguments of executable file

**Parameter:** stdinfile  
**Type:** string  
**Description:** Standard input file

**Parameter:** stdoutfile  
**Type:** string  
**Description:** Standard output file

**Parameter:** stderrfile  
**Type:** string  
**Description:** Standard error file

**Parameter:** submittime
5.2 Entities

Type: string
Description: Job submission time

Parameter: starttime
Type: string
Description: Job start time (available when job is started)

Parameter: mailOptions
Type: string
Description: Mail options

Parameter: mailList
Type: string
Description: Mail addresses

Parameter: mailNotify
Type: boolean
Description: Shows whether mail notification is requested or not

Parameter: maxWallClock
Type: string
Description: Maximum available running time

Parameter: runWallClock
Type: unsigned integer
Description: Running time

Parameter: numberOfProcesses
Type: unsigned integer
Description: Number of processes

Parameter: memoryUse
Type: unsigned integer
Description: Memory usage

Parameter: scriptFile
Type: string
Description: Job script file

Parameter: numberOfNodes
Type: unsigned integer
Description: Number of nodes

Parameter: usergroup
Type: string
Description: Job user group

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Parameter: `commandLineInterpreter`
Type: `string`
Description: Command line interpreter

Parameter: `dependencies`
Type: `list of strings`
Description: Job dependencies

Parameter: `parallelEnvironment`
Type: `string`
Description: Parallel environment

Parameter: `account`
Type: `string`
Description: Account name

Parameter: `resourceList`
Type: `list of strings`
Description: List of requested resources

Parameter: `modules`
Type: `list of strings`
Description: Environment modules loaded for the script

Parameter: `environmentVariables`
Type: `list of strings`
Description: Additional environment variables

Parameter: `debug`
Type: `boolean`
Description: Debug mode (used when new job is submitted via CMDaemon API)

Parameter: `userDefined`
Type: `list of strings`
Description: User defined parameters

Parameter: `exitCode`
Type: `integer`
Description: Exit code of job

Parameter: `minMemPerNode`
Type: `unsigned integer`
Description: Minimum memory per node requested

Parameter: `comment`
Type: `string`
Parameter: placement
Type: string
Description: Jobs are placed on nodes according to their place statements (useful for PBS, see 'man pbs_resources')

Parameter: pendingReasons
Type: list of strings
Description: List of pending reasons

Parameter: requestedCPUs
Type: unsigned integer
Description: Requested CPUs

Parameter: requestedCPUCores
Type: unsigned integer
Description: Requested CPU cores

Parameter: requestedGPUs
Type: unsigned integer
Description: Requested GPUs

Parameter: requestedMemory
Type: unsigned integer
Description: Requested memory

Parameter: requestedSlots
Type: unsigned integer
Description: Requested slots

5.2.184 JupyterHubConfig: Entity
definition:
parent: Entity

Parameter: key
Type: string
Description: Configuration key

Parameter: value
Type: string
Description: The value for the given configuration key, needs to be literal (include quotes for strings)

5.2.185 JupyterHubRole: Role
definition:
parent: Role

Parameter: version
Type: string
Description: JupyterHub version

Parameter: port
Type: unsigned integer
Description: Port for proxy (JupyterHub.port)

Parameter: hubPort
Type: unsigned integer
Description: Port for hub (JupyterHub.hub_port)

Parameter: hubIp
Type: string
Description: The ip address or hostname for the Hub process to bind to (JupyterHub.hub_ip)

Parameter: proxyApiUrl
Type: string
Description: The URL which the hub uses to connect to the proxy’s API (c.ConfigurableHTTPProxy.api_url)

Parameter: dataFilesPath
Type: string
Description: The location of jupyterhub data files (JupyterHub.data_files_path)

Parameter: pamOpenSessions
Type: boolean
Description: Enable SSL communication with HTTPS (PAMAuthenticator.open_sessions)

Parameter: ca
Type: string
Description: Filename containing the PEM-encoded certificate used for the Certification authority (CA)

Parameter: cakey
Type: string
Description: Filename containing the corresponding PEM-encoded private key used for the Certification authority (CA)

Parameter: cert
Type: string
Description: Path to the ssl certificate file (JupyterHub.ssl_cert)

Parameter: key
Type: string
Description: Path to the ssl key file (JupyterHub.ssl_key)

Parameter: adminUsers
Type: list of strings
5.2 Entities

Description: User with administrator privileges (Authenticator.admin_users)

Parameter: userForService
Type: string
Description: User for running cm-jupyterhub service (defined as User in /usr/lib/systemd/system/cm-jupyterhub.service)

Parameter: trustedDomains
Type: list of strings
Description: Trusted domains to be included in JupyterHub certificates as Alt Subjects.

Parameter: configs
Type: list of JupyterHubConfig
Description: Configuration options JupyterHub

5.2.186 KernelModule: Entity
parent: Entity

Parameter: name
Type: string
Description: The name of the kernel module.

Parameter: parameters
Type: string
Description: Options to be passed to the module.

5.2.187 KeyValuePair: Entity
parent: Entity

Parameter: key
Type: string
Description: none

Parameter: value
Type: string
Description: none

Parameter: onlydaemon
Type: boolean
Description: none

Parameter: ispattern
Type: boolean
Description: none

Parameter: priority
Type: integer

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Description:  none

5.2.188  KeyValueSettings: Entity
parent: Entity

Parameter:  keyValues
Type:  list of strings
Description:  List of key=value pairs

5.2.189  KubeAppEnvironment: Entity
parent: Entity

Parameter:  name
Type:  string
Description:  Name

Parameter:  value
Type:  string
Description:  Value

Parameter:  nodesEnvironment
Type:  boolean
Description:  Add variable to the nodes environment

5.2.190  KubeAppGroup: Entity
parent: Entity

Parameter:  name
Type:  string
Description:  Object name

Parameter:  applications
Type:  list of KubeApp
Description:  Kubernetes applications managed by cmdaemon

Parameter:  enabled
Type:  boolean
Description:  Enable this application group

5.2.191  KubeApp: Entity
parent: Entity

Parameter:  name
Type:  string
Description:  Object name

Parameter:  format
Type:  string
Description: Configuration format

Parameter: enabled
Type: boolean
Description: Enable this application

Parameter: config
Type: string
Description: Yaml or json configuration for the object

Parameter: extraEnvironment
Type: list of KubeAppEnvironment
Description: none

Parameter: excludeListSnippets
Type: list of ExcludeListSnippet
Description: none

Parameter: state
Type: integer
Description: none

5.2.192 KubeCluster: Entity
parent: Entity

Parameter: name
Type: string
Description: Name of the Kubernetes cluster

Parameter: authorizationMode
Type: list of strings
Description: Selects how to do authorization on the secure port

Parameter: kubeConfig
Type: string
Description: Path to a kubeconfig file, specifying how to authenticate to API server

Parameter: kubeClientConfig
Type: string
Description: Path to a kubeconfig file, specifying how to authenticate to API server

Parameter: kubeConfigTemplate
Type: string
Description: Template for system kubeconfig file

Parameter: ca
Type: string

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Description: Filename containing the PEM-encoded certificate used for the Certification authority (CA)

Parameter: cakey
Type: string
Description: Filename containing the corresponding PEM-encoded private key used for the Certification authority (CA)

Parameter: kubernetesCertificate
Type: string
Description: File containing x509 Certificate used by the Kubelets

Parameter: kubernetesKey
Type: string
Description: File containing x509 private key used by the Kubelets

Parameter: kubernetesClientCertificate
Type: string
Description: File containing x509 Certificate used for the Kubelets

Parameter: kubernetesClientKey
Type: string
Description: File containing x509 private key used for the Kubelets

Parameter: serviceAccountCertificate
Type: string
Description: File containing x509 Certificate used Service Accounts

Parameter: serviceAccountKey
Type: string
Description: File containing x509 private key used for Service Accounts

Parameter: apiAggregatorCertificate
Type: string
Description: File containing x509 Certificate used Kube API Aggregator

Parameter: apiAggregatorKey
Type: string
Description: File containing x509 private key used for Kube API Aggregator

Parameter: domain
Type: string
Description: Domain name used by the DNS

Parameter: etcdCluster
Type: reference to EtcdCluster
5.2 Entities

Description: The Etcd cluster instance

Parameter: etcdServers
Type: list of strings
Description: List of etcd servers to watch (format: [http://host:port])

Parameter: etcdPrefix
Type: string
Description: The prefix for all resource paths in etcd

Parameter: serviceNetwork
Type: reference to Network
Description: Network where service cluster IPs will be assigned from (must not overlap with any IP ranges assigned to nodes for pods)

Parameter: podNetwork
Type: reference to Network
Description: Network where POD IPs will be assigned from

Parameter: podNetworkNodeMask
Type: string
Description: Pod Network mask size for node cidr in cluster.

Parameter: internalNetwork
Type: reference to Network
Description: Network to use to back the internal communications

Parameter: kubeDnsIp
Type: IP
Description: KubeDNS IP address

Parameter: kubernetesApiServer
Type: string
Description: Kubernetes API server address (format: [https://host:port])

Parameter: kubernetesApiServerProxyPort
Type: unsigned integer
Description: Kubernetes API server proxy port

Parameter: appGroups
Type: list of KubeAppGroup
Description: Kubernetes applications managed by cmdaemon

Parameter: labelSets
Type: list of KubeLabelSet
Description: Labels managed by cmdaemon

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Parameter: notes
Type: string
Description: Notes

Parameter: trustedDomains
Type: list of strings
Description: Trusted domains to be included in Kubernetes related certificates as Alt Subjects.

Parameter: clientTypeKube
Type: unsigned integer
Description: client type in the CLIENT_TYPE_KUBERNETES range

Parameter: clientTypeKubeUsers
Type: unsigned integer
Description: client type in the CLIENT_TYPE_KUBERNETES_USERS range

Parameter: clientTypeKubeServiceAccounts
Type: unsigned integer
Description: client type in the CLIENT_TYPE_KUBE_SERVICEACCOUNTS range

Parameter: moduleFileTemplate
Type: string
Description: Template for system module file

Parameter: InitializationState
Type: enum
Description: Kube Cluster Initialization State

Parameter: roleBindings
Type: list of KubeRoleBinding
Description: Kubernetes role bindings

5.2.193 KubeLabelSet: Entity
parent: Entity

Parameter: name
Type: string
Description: Object name

Parameter: labels
Type: list of strings
Description: Node labels

Parameter: nodes
Type: list of references to Node
Description: List of nodes belonging to this label set

Parameter: categories
5.2 Entities

**Type:** list of references to Category
**Description:** List of categories belonging to this label set

**Parameter:** overlays
**Type:** list of references to ConfigurationOverlay
**Description:** List of overlays belonging to this label set

### 5.2.194 KubeNodeLoad: Entity
**parent:** Entity

**Parameter:** refNodeUniqueKey
**Type:** unsigned integer
**Description:** Node

**Parameter:** cpu
**Type:** float
**Description:** CPU %

**Parameter:** mem
**Type:** float
**Description:** Memory % of total capacity

**Parameter:** pods
**Type:** float
**Description:** Pods % of maximum

### 5.2.195 KubePodController: Entity
**parent:** Entity

**Parameter:** name
**Type:** string
**Description:** Kubernetes pod controller name

**Parameter:** type
**Type:** string
**Description:** Kubernetes pod controller type

**Parameter:** kubeNamespace
**Type:** string
**Description:** Namespace name

**Parameter:** uid
**Type:** string
**Description:** Pod controller unique ID in Kubernetes

**Parameter:** startTime
**Type:** timestamp
Description: Pod controller start time

Parameter: creationTime
Type: timestamp
Description: Pod controller creation time

Parameter: resources
Type: list of strings
Description: List of requested (if pending) or allocated (if started) resources

Parameter: labels
Type: list of strings
Description: List of labels assigned to the controller object

Parameter: status
Type: string
Description: Current pod controller status

Parameter: reason
Type: string
Description: Pod controller status reason

Parameter: priority
Type: unsigned integer
Description: Workload priority

5.2.196 KubePodInfo: Entity
parent: Entity

Parameter: name
Type: string
Description: none

Parameter: podNamespace
Type: string
Description: none

Parameter: image
Type: string
Description: none

Parameter: nodes
Type: list of unsigned numbers
Description: none

Parameter: startTime
Type: timestamp
Description: none

Parameter: labels
Type: list of strings
Description: none

Parameter: status
Type: string
Description: none

Parameter: reason
Type: string
Description: none

Parameter: message
Type: string
Description: none

Parameter: ip
Type: IP
Description: none

Parameter: replicaSets
Type: list of strings
Description: none

Parameter: ready
Type: boolean
Description: none

Parameter: volumes
Type: list of strings
Description: none

Parameter: containers
Type: list of ContainerInfo
Description: none

Parameter: creationTime
Type: timestamp
Description: none

Parameter: controllerId
Type: string
Description: none

Parameter: resources
Type: list of strings
Description: List of requested (if pending) or allocated (if started) resources

5.2.197 KubernetesApiServerProxyRole: NginxRole
parent: NginxRole

Parameter: kubeClusters
type: list of references to KubeCluster
Description: The Kubernetes cluster instances (pointers)

5.2.198 KubernetesApiServerRole: Role
parent: Role

Parameter: kubeCluster
type: reference to KubeCluster
Description: The Kubernetes cluster instance (pointer)

Parameter: insecurePort
type: unsigned integer
Description: The port on which to serve unsecured, unauthenticated access.

Parameter: securePort
type: unsigned integer
Description: The port on which to serve HTTPS with authentication and authorization (if 0, don’t serve HTTPS at all)

Parameter: advertiseAddress
type: IP
Description: The IP address on which to advertise the apiserver to members of the cluster. When set to 0.0.0.0 the IP from the Headnode’s Management Network will be used.

Parameter: insecureBindAddress
type: IP
Description: IP address to serve on (set to 0.0.0.0 for all interfaces)

Parameter: secureBindAddress
type: IP
Description: The IP address on which to serve the read only and secure ports

Parameter: allowedPrivileged
type: boolean
Description: If true, allow privileged containers

Parameter: admissionControl
type: list of strings
Description: Ordered list of plug-ins to do admission control of resources into cluster

Parameter: eventTtl
5.2 Entities

**Parameter:** kubeletTimeout
**Type:** string
**Description:** Amount of time to retain events

**Parameter:** logLevel
**Type:** unsigned integer
**Description:** Log level

**Parameter:** logToStdErr
**Type:** boolean
**Description:** Logging to stderr means we get it in the systemd journal

**Parameter:** options
**Type:** list of strings
**Description:** Additional parameters for kube-apiserver daemon

5.2.199 KubernetesControllerRole: Role

**parent:** Role

**Parameter:** kubeCluster
**Type:** reference to KubeCluster
**Description:** The Kubernetes cluster instance (pointer)

**Parameter:** address
**Type:** IP
**Description:** IP address to serve on (set to 0.0.0.0 for all interfaces)

**Parameter:** port
**Type:** unsigned integer
**Description:** Port that the controller-manager runs on

**Parameter:** concurrentEndpointSyncs
**Type:** unsigned integer
**Description:** Number of endpoint syncing operations that will be done concurrently

**Parameter:** namespaceSyncPeriod
**Type:** string
**Description:** Period for syncing namespace life-cycle updates

**Parameter:** nodeMonitorGracePeriod
**Type:** string
**Description:** Amount of time which we allow running Node to be unresponsive before marking it unhealthy

**Parameter:** nodeMonitorPeriod
**Type:** string  
**Description:** Period for syncing NodeStatus in NodeController

**Parameter:** nodeStartupGracePeriod  
**Type:** string  
**Description:** Amount of time which we allow starting Node to be unresponsive before marking it unhealthy

**Parameter:** nodeSyncPeriod  
**Type:** string  
**Description:** Period for syncing nodes from cloudprovider

**Parameter:** podEvictionTimeout  
**Type:** string  
**Description:** Grace period for deleting pods on failed nodes

**Parameter:** pvClaimBinderSyncPeriod  
**Type:** string  
**Description:** Period for syncing persistent volumes and persistent volume claims

**Parameter:** registerRetryCount  
**Type:** string  
**Description:** Number of retries for initial node registration

**Parameter:** resourceQuotaSyncPeriod  
**Type:** string  
**Description:** Period for syncing quota usage status in the system

**Parameter:** logLevel  
**Type:** unsigned integer  
**Description:** Log level

**Parameter:** logToStdErr  
**Type:** boolean  
**Description:** Logging to stderr means we get it in the systemd journal

**Parameter:** options  
**Type:** list of strings  
**Description:** Additional parameters for kube-controller-manager daemon

**Parameter:** clusterSigningCertFile  
**Type:** string  
**Description:** Filename containing a PEM-encoded X509 CA certificate used to issue cluster-scoped certificates. (leave empty to use the value of CA)

**Parameter:** clusterSigningKeyFile  
**Type:** string
**Description:**  Filename containing a PEM-encoded RSA or ECDSA private key used to sign cluster-scoped certificates. (leave empty to use the value of CA Key)

**Parameter:**  useServiceAccountCredentials
**Type:**  boolean
**Description:**  Flag to enable or disable use of Service Account Credentials

**Parameter:**  allocateNodeCidrs
**Type:**  boolean
**Description:**  Allocate node cidr in cluster using Pod Network and Node Mask size defined in Kubernetes Cluster Object

**Parameter:**  kubeConfig
**Type:**  string
**Description:**  Path to a kubeconfig file, specifying how to authenticate to API server.

**Parameter:**  kubernetesCertificate
**Type:**  string
**Description:**  File containing x509 Certificate used by Kubernetes Controller Manager

**Parameter:**  kubernetesKey
**Type:**  string
**Description:**  File containing x509 private key used by Kubernetes Controller Manager

**5.2.200 KubernetesNodeRole: Role**

**parent:**  Role

**Parameter:**  kubeCluster
**Type:**  reference to KubeCluster
**Description:**  The Kubernetes cluster instance (pointer)

**Parameter:**  address
**Type:**  IP
**Description:**  IP address to serve on (set to 0.0.0.0 for all interfaces)

**Parameter:**  kubelLetPort
**Type:**  unsigned integer
**Description:**  Port that the Node’s http service runs on

**Parameter:**  spool
**Type:**  string
**Description:**  Directory path for managing kubelet files

**Parameter:**  manifestsPath
**Type:**  string
**Description:**  Path to the config file or directory of files

**Parameter:**  enableServer

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Type: boolean
Description: Enable Kubelet's server

Parameter: networkPlugin
Type: string
Description: The name of the network plugin to be invoked for various events in kubelet/pod lifecycle

Parameter: cniPluginBinariesPath
Type: string
Description: The full path of the directory in which to search for CNI plugin binaries.

Parameter: hostnameOverride
Type: string
Description: If non-empty, will use this string as identification instead of the actual hostname

Parameter: cgroupRoot
Type: string
Description: Optional root cgroup to use for pods

Parameter: containerRuntime
Type: string
Description: The container runtime to use

Parameter: containerRuntimeEndpoint
Type: string
Description: The endpoint of remote runtime service

Parameter: containerRuntimeService
Type: string
Description: The container runtime systemd service

Parameter: resourceContainer
Type: string
Description: Absolute name of the resource-only container to create and run the Kubelet in

Parameter: allowedPrivileged
Type: boolean
Description: If true, allow privileged containers

Parameter: registerOnStart
Type: boolean
Description: Register the node with the apiserver

Parameter: maxPods
Type: unsigned integer
Description: Number of Pods that can run on this node
Parameter: evictionSoft
Type: list of strings
Description: Soft eviction constraints

Parameter: evictionSoftGrace
Type: list of strings
Description: Soft eviction grace period

Parameter: evictionMaxPodGrace
Type: unsigned integer
Description: Maximum allowed grace period (in sec) allowed to terminated pods

Parameter: evictionHard
Type: list of strings
Description: Hard eviction constraints

Parameter: evictionMinReclaim
Type: list of strings
Description: Minimum amount of resources reclaimed in an eviction

Parameter: runOnce
Type: boolean
Description: If true, exit after spawning pods from local manifests or remote urls

Parameter: fileCheckFrequency
Type: string
Description: Duration between checking config files for new data

Parameter: httpCheckFrequency
Type: string
Description: Duration between checking http for new data

Parameter: nodeStatusUpdateFrequency
Type: string
Description: Duration between kubelet posts of node status to master

Parameter: syncFrequency
Type: string
Description: Max period between synchronizing running containers and config

Parameter: streamingConnectionIdleTimeout
Type: string
Description: Maximum time a streaming connection can be idle before the connection is automatically closed

Parameter: imageGcHighThreshold
Type: unsigned integer
Description: The percent of disk usage after which image garbage collection is always run

Parameter: imageGcLowThreshold
Type: unsigned integer
Description: The percent of disk usage before which image garbage collection is never run

Parameter: lowDiskSpaceThreshold
Type: unsigned integer
Description: The absolute free disk space, in MB, to maintain

Parameter: oomScoreAdj
Type: integer
Description: The oom_score_adj value for kubelet process

Parameter: logLevel
Type: unsigned integer
Description: Log level

Parameter: logToStdErr
Type: boolean
Description: Logging to stderr means we get it in the systemd journal

Parameter: options
Type: list of strings
Description: Additional parameters for kubelet daemon

Parameter: kubeConfig
Type: string
Description: Path to a kubeconfig file, specifying how to authenticate to API server

5.2.201 KubernetesProxyRole: Role

parent: Role

Parameter: kubeCluster
Type: reference to KubeCluster
Description: The Kubernetes cluster instance (pointer)

Parameter: address
Type: IP
Description: IP address to serve on (set to 0.0.0.0 for all interfaces)

Parameter: proxyPortRangeStart
Type: unsigned integer
Description: Range of host ports (format: 'beginPort-endPort', inclusive) that may be consumed in order to proxy service traffic

Parameter: proxyPortRangeEnd
Type: unsigned integer
5.2 Entities

**Description:** Range of host ports (format: ‘beginPort-endPort’, inclusive) that may be consumed in order to proxy service traffic

**Parameter:** masqueradeAll
**Type:** boolean
**Description:** If using the pure iptables proxy, SNAT everything

**Parameter:** healthCheckAddress
**Type:** IP
**Description:** The IP address for the health check server to serve on

**Parameter:** healthCheckPort
**Type:** unsigned integer
**Description:** The port to bind the health check server (use 0 to disable)

**Parameter:** oomScoreAdjust
**Type:** integer
**Description:** The oom_score_adj value for kube-proxy process

**Parameter:** logLevel
**Type:** unsigned integer
**Description:** Log level

**Parameter:** logToStdErr
**Type:** boolean
**Description:** Logging to stderr means we get it in the systemd journal

**Parameter:** options
**Type:** list of strings
**Description:** Additional parameters for kube-proxy daemon

**Parameter:** kubeConfig
**Type:** string
**Description:** Path to a kubeconfig file, specifying how to authenticate to API server.

**Parameter:** kubernetesCertificate
**Type:** string
**Description:** File containing x509 Certificate used by kube-proxy

**Parameter:** kubernetesKey
**Type:** string
**Description:** File containing x509 private key used by Kubernetes API server

**5.2.202 KubernetesSchedulerRole**

**Role parent:** Role

**Parameter:** kubeCluster
**Type:** reference to KubeCluster

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**Description:** The Kubernetes cluster instance (pointer)

**Parameter:** `address`
**Type:** IP
**Description:** IP address to serve on (set to 0.0.0.0 for all interfaces)

**Parameter:** `port`
**Type:** unsigned integer
**Description:** Port that the scheduler’s http service runs on

**Parameter:** `algorithmProvider`
**Type:** string
**Description:** The scheduling algorithm provider to use

**Parameter:** `policyConfig`
**Type:** string
**Description:** File with scheduler policy configuration

**Parameter:** `logLevel`
**Type:** unsigned integer
**Description:** Log level

**Parameter:** `logToStdErr`
**Type:** boolean
**Description:** Logging to stderr means we get it in the systemd journal

**Parameter:** `options`
**Type:** list of strings
**Description:** Additional parameters for kube-scheduler daemon

**Parameter:** `kubeConfig`
**Type:** string
**Description:** Path to a kubeconfig file, specifying how to authenticate to API server.

**Parameter:** `kubernetesCertificate`
**Type:** string
**Description:** File containing x509 Certificate used by Kubernetes Scheduler

**Parameter:** `kubernetesKey`
**Type:** string
**Description:** File containing x509 private key used by Kubernetes Scheduler

5.2.203  **KubeRoleBinding**: Entity
**parent:** Entity

**Parameter:** `user`
**Type:** string
5.2 Entities

Description: User name (not user ID)

Parameter: config
Type: string
Description: The RBAC config to apply for the user for the Kubernetes cluster.

Parameter: enabled
Type: boolean
Description: Enable this cluster binding

5.2.204 LabeledEntity: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: introductionTime
Type: timestamp
Description: Introduction time

Parameter: lastUsedTime
Type: timestamp
Description: Time entity was last used

Parameter: permanent
Type: boolean
Description: Do not allow automatic deletion

5.2.205 LdapServerRole: Role
parent: Role

Parameter: nodegroups
Type: list of references to NodeGroup
Description: List of node groups which can boot from this node

Parameter: categories
Type: list of references to Category
Description: List of categories which can boot from this node

Parameter: racks
Type: list of references to Rack
Description: List of racks which can boot from this node

5.2.206 LicenseInfo: Entity
parent: Entity

Parameter: refPartitionUniqueKey
Type: unsigned integer

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**Description:** Partition

**Parameter:** `macAddress`  
**Type:** string  
**Description:** MAC address linked to the license

**Parameter:** `licensedNodes`  
**Type:** unsigned integer  
**Description:** Number of pre-paid nodes

**Parameter:** `licensedAcceleratorNodes`  
**Type:** integer  
**Description:** Number of licensed nodes with accelerators

**Parameter:** `licensedBurstNodes`  
**Type:** integer  
**Description:** Number of ondemand nodes

**Parameter:** `version`  
**Type:** string  
**Description:** Version

**Parameter:** `edition`  
**Type:** string  
**Description:** Edition

**Parameter:** `startTime`  
**Type:** timestamp  
**Description:** Time from which the license is active

**Parameter:** `endTime`  
**Type:** timestamp  
**Description:** Time at which the license stops being valid

**Parameter:** `serial`  
**Type:** integer  
**Description:** Serial

**Parameter:** `licensee`  
**Type:** string  
**Description:** Licensee

**Parameter:** `nodeCount`  
**Type:** unsigned integer  
**Description:** Nodes count with a MAC / cloud-identifier set

**Parameter:** `burstNodeCount`
5.2 Entities

Type: unsigned integer
Description: Bursted nodes count

Parameter: acceleratorNodeCount
Type: unsigned integer
Description: Nodes with one or more accelerators

Parameter: accountingAndReporting
Type: boolean
Description: Accounting and reporting enabled/disabled

Parameter: edgeSites
Type: boolean
Description: Edge sites enabled/disabled

Parameter: message
Type: string
Description: License count message

Parameter: licenseType
Type: string
Description: License type

5.2.207 LiteMonitoredEntity: Entity
parent: Entity

Parameter: name
Type: string
Description: none

Parameter: types
Type: list of strings
Description: none

Parameter: resources
Type: list of strings
Description: none

Parameter: disabled
Type: boolean
Description: none

5.2.208 LiteMonitoringMeasurable: Entity
parent: Entity

Parameter: producer
Type: unsigned integer
Description: none

Parameter: name
Type: string
Description: none

Parameter: parameter
Type: string
Description: none

Parameter: kind
Type: string
Description: none

Parameter: disabled
Type: boolean
Description: none

Parameter: cumulative
Type: boolean
Description: none

5.2.209 LiteNode: Device
parent: Device

Parameter: ip
Type: IP
Description: Ip address

Parameter: network
Type: reference to Network or None
Description: Network to which this switch is connected

Parameter: additionalHostnames
Type: list of strings
Description: List of additional hostnames that should resolve to the interfaces IP address

5.2.210 LSFBaseJobQueueStat: JobQueueStat
parent: JobQueueStat

Parameter: status
Type: string
Description: Queue status

Parameter: priority
Type: unsigned integer
Description: Queue priority
Parameter: njobs
Type: unsigned integer
Description: Number of all jobs in queue

Parameter: pending
Type: unsigned integer
Description: Number of pending jobs in queue

Parameter: running
Type: unsigned integer
Description: Number of running jobs in queue

Parameter: suspended
Type: unsigned integer
Description: Number of suspended jobs in queue

5.2.211 LSFBaseJobQueue: JobQueue

parent: JobQueue

Parameter: administrators
Type: string
Description: List of queue administrators.

Parameter: corelimit
Type: unsigned integer
Description: The per-process core file size limit (in KB) for all of the processes belonging to a job from this queue.

Parameter: cpulimit
Type: string
Description: Maximum normalized CPU time and optionally, the default normalized CPU time allowed for all processes of a job running in this queue; value format: [default_limit] maximum_limit.

Parameter: chkPnt
Type: string
Description: Enables automatic checkpointing; value format: dir [period], where dir is the directory where the checkpoint files are created (do not use environment variables); period is the checkpoint period in minutes.

Parameter: datalimit
Type: unsigned integer
Description: The per-process data segment size limit (in KB) for all of the processes belonging to a job from this queue.

Parameter: description
Type: string
Description: Description of the queue that will be displayed by 'bqueues -l'

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Parameter: default_host_spec
Type: string
Description: The default CPU time normalization host for the queue.

Parameter: dispatch_window
Type: string
Description: The time windows in which jobs from this queue are dispatched.

Parameter: exclusive
Type: string
Description: If Y, specifies an exclusive queue. Jobs submitted to an exclusive queue with 'bsub -x' will only be despatched to a host that has no other LSF jobs running.

Parameter: filelimit
Type: unsigned integer
Description: The per-process file size limit (in KB) for all of the processes belonging to a job from this queue.

Parameter: hjob_limit
Type: unsigned integer
Description: Maximum number of job slots that this queue can use on any host.

Parameter: hosts
Type: string
Description: A space-separated list of hosts, host groups, and host partitions on which jobs from this queue can be run.

Parameter: ignore_deadline
Type: string
Description: If Y, disables deadline constraint scheduling (starts all jobs regardless of deadline constraints).

Parameter: interactive
Type: string
Description: Causes the queue to reject interactive batch jobs (NO) or accept nothing but interactive batch jobs (ONLY). Interactive batch jobs are submitted via 'bsub -I'.

Parameter: job_accept_interval
Type: unsigned integer
Description: The number of dispatch turns to wait after dispatching a job to a host, before dispatching a second job to the same host.

Parameter: job_controls
Type: string
Description: Changes the behaviour of the SUSPEND, RESUME, and TERMINATE actions.

Parameter: pre_post_exec_user
5.2 Entities

Type: string
Description: Username for prolog and epilog execution.

Parameter: prolog
Type: string
Description: Path to prolog script (pre_exec).

Parameter: epilog
Type: string
Description: Path to epilog script (post_exec).

Parameter: job_starter
Type: string
Description: Creates a specific environment for submitted jobs prior to execution.

Parameter: load_index
Type: string
Description: Scheduling and suspending thresholds for the specified dynamic load index.

Parameter: memlimit
Type: string
Description: The per-process memory resident set size limit (in KB) for all of the processes belonging to a job from this queue. Format is '[default_limit] maximum_limit'.

Parameter: mig
Type: unsigned integer
Description: Enables automatic job migration and specifies the migration threshold, in minutes.

Parameter: new_job_sched_delay
Type: unsigned integer
Description: The maximum or minimum length of time that a new job waits before being dispatched; the behavior depends on whether the delay period specified is longer or shorter than a regular dispatch interval (MBD_SLEEP_TIME in lsb.params, 60 seconds by default).

Parameter: nice
Type: unsigned integer
Description: Adjusts the Unix scheduling priority at which jobs from this queue execute.

Parameter: pjob_limit
Type: unsigned integer
Description: The per-processor job slot limit for the queue.

Parameter: processlimit
Type: string
Description: Limits the number of concurrent processes that can be part of a job.

Parameter: proclimit

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Type: string
Description: Limits the number of processors that can be allocated to the job.

Parameter: priority
Type: unsigned integer
Description: Queue priority.

Parameter: qjob_limit
Type: unsigned integer
Description: Job slot limit for the queue. Total number of job slots this queue can use.

Parameter: rerunnable
Type: string
Description: If yes, enables automatic job rerun (restart).

Parameter: require_exit_values
Type: string
Description: The exit codes that will cause the job to be requeued.

Parameter: res_req
Type: string
Description: Resource requirements used to determine eligible hosts.

Parameter: resume_cond
Type: string
Description: Use the select section of the resource requirement string to specify load thresholds. All other sections are ignored.

Parameter: run_window
Type: string
Description: Time period during which jobs in the queue are allowed to run.

Parameter: runlimit
Type: string
Description: The maximum run limit and optionally the default run limit. Value format: [default_limit] maximum_limit.

Parameter: slot_reserve
Type: unsigned integer
Description: Enables processor reservation and specifies the number of dispatch turns over which a parallel job can reserve job slots.

Parameter: stacklimit
Type: unsigned integer
Description: The per-process stack segment size limit (in KB) for all of the processes belonging to a job from this queue.
Parameter: stop_cond
Type: string
Description: Use the select section of the resource requirement string to specify load thresholds. All other sections are ignored.

Parameter: swaplimit
Type: unsigned integer
Description: The amount of total virtual memory limit (in KB) for a job from this queue.

Parameter: terminate_when
Type: string
Description: Configures the queue to invoke the TERMINATE action instead of the SUSPEND action in the specified circumstance.

Parameter: ujob_limit
Type: unsigned integer
Description: The per-user job slot limit for the queue. Maximum number of slots that each user can use in this queue.

Parameter: users
Type: string
Description: A list of users or user groups that can submit jobs to this queue. Use the reserved word all to specify all users.

Parameter: r15s
Type: string
Description: Built-in load index: run queue length (15 sec average).

Parameter: r1m
Type: string
Description: Built-in load index: run queue length (1 min average).

Parameter: r15m
Type: string
Description: Built-in load index: run queue length (15 min average).

Parameter: it
Type: string
Description: Built-in load index: idle time.

Parameter: io
Type: string
Description: Built-in load index: disk I/O.

Parameter: ut
Type: string
Description: Built-in load index: CPU utilization.

Parameter: **mem**  
Type: string  
Description: Built-in load index: available memory (in MB).

Parameter: **pg**  
Type: string  
Description: Built-in load index: pages in + pages out.

Parameter: **tmp**  
Type: string  
Description: Built-in load index: available space in temporary file system (MB).

Parameter: **swp**  
Type: string  
Description: Built-in load index: available swap space (in MB).

Parameter: **ls**  
Type: string  
Description: Built-in load index.

### 5.2.212 LSFBaseJob: Job

**parent**: Job

### 5.2.213 LSF_CgroupsSettings: WlmCgroupsSettings

**parent**: WlmCgroupsSettings

Parameter: **resourceEnforce**  
Type: list of strings  
Description: Controls resource enforcement through the Linux cgroup memory and cpuset subsytem on Linux systems with cgroup support (LSB_RESOURCE_ENFORCE)

Parameter: **processTracking**  
Type: boolean  
Description: Enable this parameter to track processes based on job control functions such as termination, suspension, resume and other signaling, on Linux systems which support cgroups freezer subsys- tem (LSF_PROCESS_TRACKING)

Parameter: **linuxCgroupAccounting**  
Type: boolean  
Description: Enable this parameter to track processes based on CPU and memory accounting for Linux systems that support cgroup’s memory and cpuacct subsystems (LSF_LINUX_CGROUP_ACCT)

Parameter: **jobCgroupTemplate**  
Type: string  
Description: Template for job cgroup path ($CLUSTER will be replaced to LSF cluster name, $JOBID will be replaced to job id)
5.2 Entities

5.2.214 LSFClientRole: LSFRole

**parent:** LSFRole

**Parameter:** slots
**Type:** string
**Description:** Number of slots available on this node/category

**Parameter:** queues
**Type:** list of references to LSFJobQueue
**Description:** Queues this node/nodes in this category belongs to

**Parameter:** allQueues
**Type:** boolean
**Description:** When set, the role will provide all available queues (the queues property will then be ignored)

**Parameter:** gpus
**Type:** unsigned integer
**Description:** Number of gpus

**Parameter:** gpuDevices
**Type:** list of strings
**Description:** /dev/* available to workload management

**Parameter:** server
**Type:** boolean
**Description:** Is LSF server (can run jobs)

**Parameter:** hostModel
**Type:** string
**Description:** Host model (possible values are defined in lsf.shared)

**Parameter:** hostType
**Type:** string
**Description:** Host type (possible values are defined in lsf.shared)

**Parameter:** nodeCustomizations
**Type:** list of WlmNodeCustomizationEntry
**Description:** LSF node custom properties

5.2.215 LSFJobQueueStat: LSFBaseJobQueueStat

**parent:** LSFBaseJobQueueStat

5.2.216 LSFJobQueue: LSFBaseJobQueue

**parent:** LSFBaseJobQueue

**Parameter:** fairshare
**Type:** string

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Description: Fairshare scheduling

Parameter: backfill
Type: string
Description: Backfill scheduling

Parameter: preemption
Type: string
Description: Preemption scheduling

5.2.217 LSFJob: LSFBaseJob
parent: LSFBaseJob

5.2.218 LSFRole: Role
parent: Role

Parameter: wlmCluster
Type: reference to LSFWlmCluster
Description: WLM cluster link to this WLM role

5.2.219 LSFServerRole: LSFRole
parent: LSFRole

Parameter: externalServer
Type: boolean
Description: LSF server daemons are running on some external machine

5.2.220 LSFSubmitRole: WlmSubmitRole
parent: WlmSubmitRole

Parameter: lsfWlmClusters
Type: list of references to LSFWlmCluster
Description: List of LSF clusters which the role belongs to

5.2.221 LSFWlmCluster: WlmCluster
parent: WlmCluster

Parameter: version
Type: string
Description: Major LSF version

Parameter: prefix
Type: string
Description: LSF installation directory

Parameter: var
Type: string
Description: Var directory location

Parameter: localVar
5.2 Entities

- **Type:** string
  **Description:** Local var directory location

  **Parameter:** logDir
  **Type:** string
  **Description:** Logging directory location (LSF_LOGDIR in lsf.conf)

- **Type:** boolean
  **Description:** Cloud nodes are added dynamically to LSF

  **Parameter:** dynamicCloudNodes
  **Type:** boolean
  **Description:** Cloud nodes are added dynamically to LSF

- **Type:** list of JobQueuePlaceholder
  **Description:** Job queue node placeholders mode

  **Parameter:** placeholders
  **Type:** list of JobQueuePlaceholder
  **Description:** Job queue node placeholders mode

- **Type:** LSFGroupsSettings
  **Description:** Submode containing LSF related cgroups settings

  **Parameter:** cgroups
  **Type:** LSFGroupsSettings
  **Description:** Submode containing LSF related cgroups settings

- **Type:** list of references to LSFJobQueue
  **Description:** Default queues

  **Parameter:** defaultQueues
  **Type:** list of references to LSFJobQueue
  **Description:** Default queues

- **Type:** boolean
  **Description:** Backup configuration file before update

  **Parameter:** doBackups
  **Type:** boolean
  **Description:** Backup configuration file before update

- **Type:** boolean
  **Description:** Enable GPU autodetection (LSF_GPU_AUTOCONFIG in lsf.conf)

  **Parameter:** gpuAutoconfig
  **Type:** boolean
  **Description:** Enable GPU autodetection (LSF_GPU_AUTOCONFIG in lsf.conf)

- **Type:** boolean
  **Description:** Enable new GPU request syntax (LSB_GPU_NEW_SYNTAX in lsf.conf)

  **Parameter:** gpuNewSyntax
  **Type:** boolean
  **Description:** Enable new GPU request syntax (LSB_GPU_NEW_SYNTAX in lsf.conf)

- **Type:** unsigned integer
  **Description:** Enable DCGM features and specifies the port number that LSF uses to communicate with the DCGM daemon (0 for disabled)

  **Parameter:** dcgmPort
  **Type:** unsigned integer
  **Description:** Enable DCGM features and specifies the port number that LSF uses to communicate with the DCGM daemon (0 for disabled)

- **Type:** string
  **Description:** Enables scaling of large units in the resource usage limits (LSF_UNIT_FOR_LIMITS in lsf.conf)

  **Parameter:** unitForLimits
  **Type:** string
  **Description:** Enables scaling of large units in the resource usage limits (LSF_UNIT_FOR_LIMITS in lsf.conf)

- **Type:** string
  **Description:**

  **Parameter:** noQueueHostsString
  **Type:** string
Description: String that is used to replace empty nodes list for a queue

Parameter: enableEgo
Type: boolean
Description: Enable EGO functionality (LSF_ENABLE_EGO in lsf.conf)

Parameter: dynamicHostWaitTime
Type: unsigned integer
Description: Defines the length of time in seconds that a dynamic host waits communicating with the master host LIM to either add the host to the cluster or to shut down any running daemons if the host is not added successfully (LSF_DYNAMIC_HOST_WAIT_TIME in lsf.conf)

Parameter: hostAddressRange
Type: string
Description: Identifies the range of IP addresses that are allowed to be LSF hosts that can be dynamically added to or removed from the cluster (LSF_HOST_ADDR_RANGE in lsf.conf)

5.2.222 MemoryInfo: Entity
parent: Entity

Parameter: location
Type: list of strings
Description: Location

Parameter: speed
Type: string
Description: Speed

Parameter: size
Type: string
Description: Size

Parameter: type
Type: string
Description: Type

5.2.223 MIGComputeInstanceInformation: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: gpuId
Type: unsigned integer
Description: The hardware GPU identifier

Parameter: gpuInstanceId
5.2 Entities

Type: unsigned integer
Description: The GPU MIG instance identifier

Parameter: name
Type: string
Description: none

Parameter: profileId
Type: unsigned integer
Description: none

Parameter: instanceId
Type: unsigned integer
Description: none

Parameter: placementStart
Type: unsigned integer
Description: none

Parameter: placementSize
Type: unsigned integer
Description: none

5.2.224 MIGComputeInstanceProfile: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: gpuId
Type: unsigned integer
Description: The hardware GPU identifier

Parameter: gpuInstanceId
Type: unsigned integer
Description: The GPU instance identifier

Parameter: name
Type: string
Description: none

Parameter: profileId
Type: unsigned integer
Description: none

Parameter: freeInstances
Type: unsigned integer

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Description: none

Parameter: totalInstances
Type: unsigned integer
Description: none

Parameter: SM
Type: unsigned integer
Description: none

Parameter: CE
Type: unsigned integer
Description: none

Parameter: DEC
Type: unsigned integer
Description: none

Parameter: JPEG
Type: unsigned integer
Description: none

Parameter: ENC
Type: unsigned integer
Description: none

Parameter: OFA
Type: unsigned integer
Description: none

5.2.225 MIGInformation: Entity

parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: gpuId
Type: unsigned integer
Description: The hardware GPU identifier

Parameter: name
Type: string
Description: none

Parameter: profileId
Type: unsigned integer
5.2 Entities

Description: none

Parameter: instanceId
Type: unsigned integer
Description: none

Parameter: placementStart
Type: unsigned integer
Description: none

Parameter: placementSize
Type: unsigned integer
Description: none

Parameter: memory
Type: unsigned integer
Description: none

Parameter: P2P
Type: boolean
Description: none

Parameter: SM
Type: unsigned integer
Description: none

Parameter: CE
Type: unsigned integer
Description: none

Parameter: DEC
Type: unsigned integer
Description: none

Parameter: JPEG
Type: unsigned integer
Description: none

Parameter: ENC
Type: unsigned integer
Description: none

Parameter: OFA
Type: unsigned integer
Description: none

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5.2.226  MIGProfile: Entity

parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: gpuId
Type: unsigned integer
Description: The hardware GPU identifier

Parameter: name
Type: string
Description: none

Parameter: profileId
Type: unsigned integer
Description: none

Parameter: freeInstances
Type: unsigned integer
Description: none

Parameter: totalInstances
Type: unsigned integer
Description: none

Parameter: memory
Type: unsigned integer
Description: none

Parameter: P2P
Type: boolean
Description: none

Parameter: SM
Type: unsigned integer
Description: none

Parameter: CE
Type: unsigned integer
Description: none

Parameter: DEC
Type: unsigned integer
Description: none
Parameter: JPEG  
Type: unsigned integer  
Description: none

Parameter: ENC  
Type: unsigned integer  
Description: none

Parameter: OFA  
Type: unsigned integer  
Description: none

5.2.227 MonitoringActionRunData: Entity  
parent: Entity

Parameter: target  
Type: unsigned integer  
Description: Target node

Parameter: info  
Type: string  
Description: Extra information

Parameter: env  
Type: list of strings  
Description: Environment

5.2.228 MonitoringAction: Entity  
parent: Entity

Parameter: name  
Type: string  
Description: Name

Parameter: runOn  
Type: enum  
Description: Run the action on

Parameter: allowedTime  
Type: string  
Description: Sets time interval during which action is allowed to be executed

Parameter: disable  
Type: boolean  
Description: Disable

Parameter: suppressedByGoingDown  
Type: boolean  

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Description: Suppress running action if device is going down

5.2.229 MonitoringCacheSubSystemInfo: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: queued
Type: unsigned integer
Description: Number of samples ready for delivery

Parameter: pickup
Type: unsigned integer
Description: Number of times data has been picked up

Parameter: delivered
Type: unsigned integer
Description: Number of samples delivered the last pick up

Parameter: handled
Type: unsigned integer
Description: Total number of samples handled

5.2.230 MonitoringCategoryListExecutionFilter: MonitoringExecutionFilter
parent: MonitoringExecutionFilter

Parameter: categories
Type: list of references to Category
Description: List of categories belonging to this group

5.2.231 MonitoringCategoryListExecutionMultiplexer: MonitoringExecutionMultiplexer
parent: MonitoringExecutionMultiplexer

Parameter: categories
Type: list of references to Category
Description: List of categories belonging to this group

5.2.232 MonitoringCompareExpression: MonitoringExpression
parent: MonitoringExpression

Parameter: entities
Type: string
Description: Entities matching the regex, leave empty for all

Parameter: measurables
Type: string
Description: Measurables matching the regex, leave empty for all

Parameter: parameters
Type: string
Description: Parameters matching the regex, leave empty for all

Parameter: op
Type: enum
Description: Operator

Parameter: grouping
Type: enum
Description: Method to group all matching entity measurable parameter

Parameter: value
Type: string
Description: Value

Parameter: useRaw
Type: boolean
Description: Use raw data instead of rate for cumulative metrics

Parameter: code
Type: string
Description: Lua code

5.2.233 MonitoringConsolidator: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: disabled
Type: boolean
Description: Disable, consolidator for all entities. Do not throw away existing data.

Parameter: consolidators
Type: list of Consolidator
Description: Consolidators

5.2.234 MonitoringDataCacheSubSystemInfo: Entity

parent: Entity

Parameter: name
Type: string
Description: Name
Parameter: size
Type: unsigned integer
Description: First plot request

Parameter: updates
Type: unsigned integer
Description: Last plot request

Parameter: requests
Type: unsigned integer
Description: Number of plot requests

5.2.235 MonitoringDataProducerAggregateNode: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

Parameter: maxSampleAge
Type: float
Description: Maximal age of node sample to contribute

Parameter: excludeNodes
Type: list of references to Node
Description: List of nodes to exclude from the total

Parameter: excludeCategories
Type: list of references to Category
Description: List of node groups to exclude from the total

Parameter: excludeNodeGroups
Type: list of references to NodeGroup
Description: List of node groups to exclude from the total

5.2.236 MonitoringDataProducerAggregatePDU: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

Parameter: maxSampleAge
Type: float
Description: Maximal age of node sample to contribute

Parameter: excludePDUs
Type: list of references to PowerDistributionUnit
Description: List of PDUs to exclude from the total
5.2 Entities

5.2.237 MonitoringDataProducerAlertLevel: MonitoringDataProducerInternal
    parent: MonitoringDataProducerInternal

5.2.238 MonitoringDataProducerClusterTotal: MonitoringDataProducerInternal
    parent: MonitoringDataProducerInternal

5.2.239 MonitoringDataProducerCMDaemonState: MonitoringDataProducerInternal
    parent: MonitoringDataProducerInternal

Parameter: subsystems
Type: list of strings
Description: Subsystems

5.2.240 MonitoringDataProducerDeviceState: MonitoringDataProducerInternal
    parent: MonitoringDataProducerInternal

5.2.241 MonitoringDataProducerEC2SpotPrices: MonitoringDataProducerInternal
    parent: MonitoringDataProducerInternal

Parameter: regions
Type: enum
Description: Regions to collect data for

Parameter: customRegions
Type: list of references to EC2Region
Description: Custom list of regions to collect data from

Parameter: types
Type: enum
Description: Types to collect data for

Parameter: customTypes
Type: list of references to EC2Type
Description: Custom list of types to collect data from

5.2.242 MonitoringDataProducerEthernetSwitch: MonitoringDataProducerInternal
    parent: MonitoringDataProducerInternal

5.2.243 MonitoringDataProducerGPU: MonitoringDataProducerInternal
    parent: MonitoringDataProducer

Parameter: updateFreq
Type: float
Description: How often to update data

5.2.244 MonitoringDataProducerInternal: MonitoringDataProducerInternal
    parent: MonitoringDataProducer

5.2.245 MonitoringDataProducerJobMetadata: MonitoringDataProducer
    parent: MonitoringDataProducer

Parameter: allowPreAllocate

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**Type:** boolean  
**Description:** Allow pre-allocate of monitoring structures, speeds up for large number of jobs. Disable if measurables per node differ a lot

**Parameter:** excludeMetrics  
**Type:** list of strings  
**Description:** Exclude metrics by name from collection

**Parameter:** includeMetrics  
**Type:** list of strings  
**Description:** Only these metrics will be samples if the set is not empty

**Parameter:** excludeUsers  
**Type:** list of strings  
**Description:** Exclude usage data for the specified users

**Parameter:** includeUsers  
**Type:** list of strings  
**Description:** Only include usage data for the specified users

**Parameter:** minimalUserId  
**Type:** unsigned integer  
**Description:** Minumal user ID

**Parameter:** userCode  
**Type:** string  
**Description:** Lua code for calculation of extra metric per user

5.2.246 MonitoringDataProducerJobQueue: MonitoringDataProducer  
**parent:** MonitoringDataProducer

**Parameter:** wlmClusters  
**Type:** list of references to WlmCluster  
**Description:** List of wlm clusters for which to sample, empty for all

5.2.247 MonitoringDataProducerJob: MonitoringDataProducer  
**parent:** MonitoringDataProducer

**Parameter:** allowPreAllocate  
**Type:** boolean  
**Description:** Allow pre-allocate of monitoring structures, speeds up for large number of jobs. Disable if measurables per node differ a lot

**Parameter:** metricSettings  
**Type:** MonitoringJobMetricSettings  
**Description:** Submode containing job metric settings
5.2 Entities

5.2.248 MonitoringDataProducerLua: MonitoringDataProducer
parent: MonitoringDataProducer

Parameter: code
Type: string
Description: Lua code

Parameter: timeout
Type: unsigned integer
Description: Lua timeout

5.2.249 MonitoringDataProducerMonitoringSystem: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

5.2.250 MonitoringDataProducerPerpetual: MonitoringDataProducer
parent: MonitoringDataProducer

Parameter: script
Type: string
Description: Script

Parameter: runInBash
Type: boolean
Description: Run the script in a bash session

Parameter: arguments
Type: list of strings
Description: Additional arguments to pass to the script

Parameter: format
Type: enum
Description: Expected output format

Parameter: watch
Type: boolean
Description: Watch script for for changes, and restart

5.2.251 MonitoringDataProducerPowerDistributionUnit: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

5.2.252 MonitoringDataProducerProcMemInfo: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

5.2.253 MonitoringDataProducerProcMount: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

Parameter: includeMedia
Type: boolean

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Description: Include media mount points

Parameter: includeRemote
Type: boolean
Description: Include remote mount points

Parameter: includeDocker
Type: boolean
Description: Include docker mount points

Parameter: excludeMountPoints
Type: list of strings
Description: Exclude mount points

5.2.254 MonitoringDataProducerProcNetDev: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

Parameter: excludeIf
Type: list of strings
Description: Exclude interfaces

5.2.255 MonitoringDataProducerProcNetSnmp: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

5.2.256 MonitoringDataProducerProcPidStat: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

Parameter: pid
Type: unsigned integer
Description: PID to sample

Parameter: process
Type: string
Description: Process

5.2.257 MonitoringDataProducerProcStat: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

Parameter: individualCPU
Type: boolean
Description: Measure individual CPUs

5.2.258 MonitoringDataProducerProcVMStat: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

5.2.259 MonitoringDataProducerPrometheus: MonitoringDataProducer
parent: MonitoringDataProducer

Parameter: urls
Type: list of strings
Description: One or more URLs to try connect to

Parameter: timeout
Type: unsigned integer
Description: Http get timeout

Parameter: passEnvironment
Type: boolean
Description: Pass the entity environment to the script

Parameter: username
Type: string
Description: Username used in http call

Parameter: password
Type: string
Description: Password used in http call

Parameter: https
Type: boolean
Description: https

Parameter: caPath
Type: string
Description: CA certificate path

Parameter: privateKeyPath
Type: string
Description: Certificate path

Parameter: certificatePath
Type: string
Description: Private key path

Parameter: staleTracking
Type: boolean
Description: Enable automatic tracking of stale metrics

Parameter: includeProducerJobName
Type: boolean
Description: Automatically include producer job name in Prometheus label

Parameter: includeEntityName
Type: boolean
Description: Automatically include entity name in Prometheus label

Parameter: rules
Type: list of PrometheusRecordingRule
Description: Recording rules

5.2.260 MonitoringDataProducerRackSensor: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

5.2.261 MonitoringDataProducerRecorder: MonitoringDataProducer
parent: MonitoringDataProducer

Parameter: query
Type: reference to PrometheusQuery or None
Description: Query to execute

Parameter: freeQuery
Type: string
Description: Free string query to execute

Parameter: parameters
Type: list of strings
Description: Parameters

Parameter: evaluationTime
Type: string
Description: Evaluation time

Parameter: stalenessDelay
Type: float
Description: Staleness delay

Parameter: excludeBright
Type: boolean
Description: Exclude Bright data

Parameter: excludePrometheus
Type: boolean
Description: Exclude Prometheus data

Parameter: inputRules
Type: list of PrometheusRecordingRule
Description: Input recording rules

Parameter: rules
Type: list of PrometheusRecordingRule
Description: Recording rules

5.2.262 MonitoringDataProducerScript: MonitoringDataProducer
parent: MonitoringDataProducer

Parameter: script
5.2 Entities

Type: string
Description: Script

Parameter: timeout
Type: unsigned integer
Description: Script timeout

Parameter: arguments
Type: list of strings
Description: Additional arguments to pass to the script

Parameter: format
Type: enum
Description: Expected output format

5.2.263 MonitoringDataProducerSingleLineHealthCheckScript: MonitoringDataProducerSingleLineScript
parent: MonitoringDataProducerSingleLineScript

5.2.264 MonitoringDataProducerSingleLineMetricScript: MonitoringDataProducerSingleLineScript
parent: MonitoringDataProducerSingleLineScript

Parameter: minimum
Type: float
Description: Minimum

Parameter: maximum
Type: float
Description: Maximum

Parameter: cumulative
Type: boolean
Description: Cumulative

Parameter: unit
Type: string
Description: Unit

5.2.265 MonitoringDataProducerSingleLineScript: MonitoringDataProducer
parent: MonitoringDataProducer

Parameter: script
Type: string
Description: Script

Parameter: typeClass
Type: string

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Description: Type class, slash(\/) separated for levels

Parameter: timeout
Type: unsigned integer
Description: Script timeout

Parameter: arguments
Type: list of strings
Description: Additional arguments to pass to the script

Parameter: runInBash
Type: boolean
Description: Run the script in a bash session

5.2.266 MonitoringDataProducerSysBlockStat: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

Parameter: excludeVirtualDisks
Type: boolean
Description: Exclude virtual disks

Parameter: excludeDisks
Type: list of strings
Description: Exclude disks

5.2.267 MonitoringDataProducerSysInfo: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

5.2.268 MonitoringDataProducerTest: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

Parameter: instances
Type: unsigned integer
Description: Number of instances per test

5.2.269 MonitoringDataProducer: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: description
Type: string
Description: Description

Parameter: notes
Type: string

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Description: Administrator notes

Parameter: when
Type: enum
Description: When the producer should run

Parameter: maxAge
Type: float
Description: Maximal age of historic data, 0 for infinite

Parameter: maxSamples
Type: unsigned integer
Description: Maximal samples of historic data, 0 for infinite

Parameter: interval
Type: float
Description: Sampling interval

Parameter: offset
Type: float
Description: Time offset for sampling interval

Parameter: startupDelay
Type: float
Description: Delay the first sampling the specified time after cmd starts

Parameter: intervals
Type: list of floating point numbers
Description: Out of band sampling interval

Parameter: gap
Type: unsigned integer
Description: Number of missed samples before we add a NaN

Parameter: fuzzyOffset
Type: float
Description: Automatic fuzzy offset factor [0-1]. Multiplied by interval

Parameter: introduceNaN
Type: boolean
Description: Introduce NaN if device goes up/down/up

Parameter: automaticReinitialize
Type: boolean
Description: Automatic run –initialize when a new metric has been detected

Parameter: disabled
Type: boolean
Description: Disabled

Parameter: disableOnHighLoad
Type: boolean
Description: Disable when nodes are very busy

Parameter: nodeExecutionFilters
Type: list of MonitoringExecutionFilter
Description: Filter nodes which should run this data producer. If none are specified: execute on each node.

Parameter: executionMultiplexers
Type: list of MonitoringExecutionMultiplexer
Description: Execute the producer once for each entity which matches one of the criteria. If none are specified: only execute it for the node itself.

Parameter: consolidator
Type: reference to MonitoringConsolidator or None
Description: Consolidator configuration

Parameter: suppressedByGoingDown
Type: boolean
Description: Suppress running action if device is going down

Parameter: associatedUser
Type: string
Description: User associated with this measurable

5.2.270 MonitoringDataProducerTrustedTool: MonitoringDataProducer
parent: MonitoringDataProducer

Parameter: port
Type: unsigned integer
Description: Port

Parameter: localhost
Type: boolean
Description: Only listen on localhost

Parameter: secret
Type: string
Description: Secret

5.2.271 MonitoringDataProducerUserCount: MonitoringDataProducerInternal
parent: MonitoringDataProducerInternal

Parameter: customScript
5.2 Entities

**Parameter:** customScriptTimeout
**Type:** unsigned integer
**Description:** Custom script timeout

**Parameter:** minimalUserId
**Type:** unsigned integer
**Description:** Minimal user ID

**Parameter:** namesInInfoMessage
**Type:** boolean
**Description:** Names in info message, could lead to lots of data

5.2.272 MonitoringDataProducerWlmSlot: MonitoringDataProducer
**parent:** MonitoringDataProducer

5.2.273 MonitoringDeviceStateSubSystemInfo: Entity
**parent:** Entity

**Parameter:** name
**Type:** string
**Description:** Name

**Parameter:** up
**Type:** unsigned integer
**Description:** Number of up devices

**Parameter:** down
**Type:** unsigned integer
**Description:** Number of down devices

**Parameter:** closed
**Type:** unsigned integer
**Description:** Number of closed devices

**Parameter:** muted
**Type:** unsigned integer
**Description:** Number of muted devices

5.2.274 MonitoringDrainAction: MonitoringAction
**parent:** MonitoringAction

5.2.275 MonitoringDynamicExecutionMultiplexer: MonitoringExecutionMultiplexer
**parent:** MonitoringExecutionMultiplexer

**Parameter:** local
**Type:** boolean
Description: Run on the local node

Parameter: offload
Type: boolean
Description: Run on the nodes offloaded onto this node

5.2.276 MonitoringEmailAction: MonitoringAction

Parameter: recipients
Type: list of strings
Description: Recipients

Parameter: allAdministrators
Type: boolean
Description: Also send e-mail to all administrator

Parameter: server
Type: string
Description: The SNMP server

Parameter: sender
Type: string
Description: The sender of the e-mail

Parameter: info
Type: string
Description: Extra information passed in the e-mail

Parameter: timeout
Type: unsigned integer
Description: Timeout

Parameter: mergeDelay
Type: float
Description: Maximal action delay in order to merge with others

Parameter: mergeTrigger
Type: boolean
Description: Merge action from multiple triggers into one

Parameter: mergeMeasurable
Type: boolean
Description: Merge action from multiple measurables into one
5.2 Entities

5.2.277 MonitoringEventAction: MonitoringAction
parent: MonitoringAction

Parameter: profiles
Type: list of strings
Description: Inform all sessions with the specified profile, none is all

Parameter: userNames
Type: list of strings
Description: Inform all sessions with the specified user names, none is all

Parameter: mergeDelay
Type: float
Description: Maximal action delay in order to merge with others

5.2.278 MonitoringExecutionFilter: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: filterOperation
Type: enum
Description: The filter operation to be performed

5.2.279 MonitoringExecutionMultiplexer: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: filterOperation
Type: enum
Description: The filter operation to be performed

5.2.280 MonitoringExpression: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

5.2.281 MonitoringGroupedExpression: MonitoringExpression
parent: MonitoringExpression

Parameter: op
Type: enum
Description: Operator

Parameter: allowMissing
Type: boolean
Description: Allow missing sub expressions

Parameter: expressions
Type: list of MonitoringCompareExpression
Description: Expressions

5.2.282 MonitoringHealthOverview: Entity
parent: Entity

Parameter: refEntityUniqueKey
Type: unsigned integer
Description: Entity

Parameter: alertLevelMaximum
Type: unsigned integer
Description: Maximal severity of all failed triggers

Parameter: alertLevelSum
Type: unsigned integer
Description: Total severity of all failed triggers

Parameter: alertLevelCount
Type: unsigned integer
Description: Total count of all failed triggers

Parameter: timestamp
Type: unsigned integer
Description: Timestamp of data

Parameter: info
Type: string
Description: Info

5.2.283 MonitoringImageUpdateAction: MonitoringAction
parent: MonitoringAction

5.2.284 MonitoringJobMetricSettings: Entity
parent: Entity

Parameter: excludeDevices
Type: list of strings
Description: Exclude block devices from metric collection (by default all the devices are sampled)

Parameter: includeDevices
5.2 Entities

Parameter: enableAdvancedMetrics
Type: boolean
Description: Sample advanced metrics as well as basic metrics

Parameter: mapJobsToGpus
Type: boolean
Description: Associate job with GPUs where the job processes run when possible

Parameter: excludeMetrics
Type: list of strings
Description: Exclude metrics by name from collection

Parameter: includeMetrics
Type: list of strings
Description: Only these metrics will be sampled if the set is not empty

Parameter: cgroupBaseDirectory
Type: string
Description: CGroup base directory

Parameter: cgroupSearch
Type: string
Description: Search field for finding the WLM CGroup

Parameter: keepAliveSleep
Type: float
Description: Time the cgroup keepalive process sleeps

Parameter: samplingType
Type: enum
Description: Type of metrics sampling

Parameter: pickupInterval
Type: float
Description: High initial pickup interval

Parameter: pickupTimes
Type: unsigned integer
Description: Number of times to apply the high initial pickup interval

Parameter: pickupPriority
Type: unsigned integer
Description: Priority of the pickup interval change
5.2.285 MonitoringLuaExecutionFilter: MonitoringExecutionFilter
parent: MonitoringExecutionFilter

Parameter: code
Type: string
Description: Lua code

Parameter: notes
Type: string
Description: Notes

5.2.286 MonitoringLuaExecutionMultiplexer: MonitoringExecutionMultiplexer
parent: MonitoringExecutionMultiplexer

Parameter: code
Type: string
Description: Lua code

Parameter: notes
Type: string
Description: Notes

5.2.287 MonitoringMeasurableEnum: MonitoringMeasurable
parent: MonitoringMeasurable

5.2.288 MonitoringMeasurableHealthCheck: MonitoringMeasurable
parent: MonitoringMeasurable

5.2.289 MonitoringMeasurableMetric: MonitoringMeasurable
parent: MonitoringMeasurable

Parameter: minimum
Type: float
Description: Minimum

Parameter: maximum
Type: float
Description: Maximum

Parameter: cumulative
Type: boolean
Description: Cumulative

Parameter: unit
Type: string
Description: Unit
5.2.290 MonitoringMeasurable: Entity

**parent**: Entity

**Parameter**: producer
**Type**: reference to MonitoringDataProducer
**Description**: Monitoring data producer

**Parameter**: name
**Type**: string
**Description**: Name

**Parameter**: parameter
**Type**: string
**Description**: Parameter

**Parameter**: maxAge
**Type**: float
**Description**: Maximal age of historic data, 0 for infinite

**Parameter**: maxSamples
**Type**: unsigned integer
**Description**: Maximal samples of historic data, 0 for infinite

**Parameter**: disabled
**Type**: boolean
**Description**: Disable: do not process or save to disk

**Parameter**: gap
**Type**: unsigned integer
**Description**: Number of missed samples before we add a NaN

**Parameter**: introduceNaN
**Type**: boolean
**Description**: Introduce NaN if device goes up/down/up

**Parameter**: description
**Type**: string
**Description**: Description

**Parameter**: typeClass
**Type**: string
**Description**: Type class, slash(/) separated for levels

**Parameter**: sourceType
**Type**: enum
**Description**: Source of the measurable
Parameter: consolidator
Type: reference to MonitoringConsolidator or None
Description: Consolidator configuration

Parameter: suppressedByGoingDown
Type: boolean
Description: Suppress running action if device is going down

Parameter: access
Type: enum
Description: User access control

Parameter: associatedUser
Type: string
Description: User associated with this measurable

5.2.291 MonitoringNodeListExecutionFilter: MonitoringExecutionFilter
parent: MonitoringExecutionFilter

Parameter: nodes
Type: list of references to Node
Description: List of nodes belonging to this group

5.2.292 MonitoringNodeListExecutionMultiplexer: MonitoringExecutionMultiplexer
parent: MonitoringExecutionMultiplexer

Parameter: nodes
Type: list of references to Node
Description: List of nodes belonging to this group

5.2.293 MonitoringOffloadBackupInformation: Entity
parent: Entity

Parameter: refMonitoringNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: refBackupNodeUniqueKeys
Type: list of unsigned numbers
Description: Node

5.2.294 MonitoringOffloadInformation: Entity
parent: Entity

Parameter: refMonitoringNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: refNodeUniqueKey
5.2 Entities

Type: unsigned integer
Description: Node

Parameter: refBestMonitoringNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: refViableMonitoringNodeUniqueKeys
Type: list of unsigned numbers
Description: Node

5.2.295 MonitoringOverlayListExecutionFilter: MonitoringExecutionFilter
parent: MonitoringExecutionFilter

Parameter: overlays
Type: list of references to ConfigurationOverlay
Description: List of overlays belonging to this group

5.2.296 MonitoringOverlayListExecutionMultiplexer: MonitoringExecutionMultiplexer
parent: MonitoringExecutionMultiplexer

Parameter: overlays
Type: list of references to ConfigurationOverlay
Description: List of overlays belonging to this group

5.2.297 MonitoringPickupInterval: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: interval
Type: float
Description: Interval on which the RPC will be done

Parameter: times
Type: unsigned integer
Description: Number of times the RPC will be done with the interval

Parameter: priority
Type: unsigned integer
Description: Priority of the current pickup interval

5.2.298 MonitoringPlotterSubSystemInfo: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: first
Type: unsigned integer
Description: First plot request

Parameter: last
Type: unsigned integer
Description: Last plot request

Parameter: count
Type: unsigned integer
Description: Number of plot requests

Parameter: samples
Type: unsigned integer
Description: Number of data samples

Parameter: sources
Type: unsigned integer
Description: Number of sources

5.2.299 MonitoringPowerAction: MonitoringAction
parent: MonitoringAction

5.2.300 MonitoringPowerOffAction: MonitoringPowerAction
parent: MonitoringPowerAction

5.2.301 MonitoringPowerOnAction: MonitoringPowerAction
parent: MonitoringPowerAction

5.2.302 MonitoringPowerResetAction: MonitoringPowerAction
parent: MonitoringPowerAction

5.2.303 MonitoringRebootAction: MonitoringAction
parent: MonitoringAction

Parameter: runPreHaltOperations
Type: boolean
Description: Run pre-halt operations

Parameter: preHaltOperationTimeout
Type: unsigned integer
Description: Run pre-halt operation timeout

5.2.304 MonitoringResourceExecutionFilter: MonitoringExecutionFilter
parent: MonitoringExecutionFilter

Parameter: resources
5.2 Entities

Type: list of strings
Description: Resources

Parameter: op
Type: enum
Description: Operator

5.2.305 MonitoringResourceExecutionMultiplexer: MonitoringExecutionMultiplexer
parent: MonitoringExecutionMultiplexer

Parameter: resources
Type: list of strings
Description: Resources

Parameter: op
Type: enum
Description: Operator

5.2.306 MonitoringRole: Role
parent: Role

Parameter: numberOfBackups
Type: unsigned integer
Description: Minimum number of backups of the monitoring data

Parameter: backupRing
Type: unsigned integer
Description: Only backup to nodes within the same ring

Parameter: maximumNumberOfNodes
Type: unsigned integer
Description: Maximum number of nodes the monitoring can handle, set to 0 for no limit

Parameter: delayAfterUp
Type: unsigned integer
Description: Delay after node becomes up before it can take over from other nodes

Parameter: delayAfterDown
Type: unsigned integer
Description: Delay after node goes down before the workload will be offloaded to other nodes

Parameter: backupOnShutdown
Type: boolean
Description: Take a backup when the node is shutdown via RPC

Parameter: backupOnReboot
Type: boolean

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Description: Take a backup when the node is reboot via RPC

Parameter: backupOnPowerOff
Type: boolean
Description: Take a backup when the node is power reset via RPC

Parameter: backupOnPowerReset
Type: boolean
Description: Take a backup when the node is powered off via RPC

Parameter: backupOnTerminate
Type: boolean
Description: Take a backup when the node is terminated via RPC

Parameter: nodeFilters
Type: list of MonitoringExecutionFilter
Description: Filter nodes that can be monitored by this node, clear this list for automatic

5.2.307 MonitoringScriptAction: MonitoringAction
parent: MonitoringAction

Parameter: script
Type: string
Description: Script

Parameter: arguments
Type: list of strings
Description: Arguments

Parameter: timeout
Type: unsigned integer
Description: Timeout

Parameter: nodeEnvironment
Type: boolean
Description: Pass the node environment to the script

Parameter: runInShell
Type: boolean
Description: Run in shell

Parameter: mergeDelay
Type: float
Description: Maximal action delay in order to merge with others

Parameter: mergeTrigger
Type: boolean
5.2 Entities

Description: Merge action from multiple triggers into one

Parameter: mergeMeasurable
Type: boolean
Description: Merge action from multiple measurables into one

5.2.308 MonitoringServiceAction: MonitoringAction
parent: MonitoringAction

Parameter: service
Type: string
Description: Service

Parameter: arguments
Type: list of strings
Description: Arguments

5.2.309 MonitoringServiceRestartAction: MonitoringServiceAction
parent: MonitoringServiceAction

5.2.310 MonitoringServiceStartAction: MonitoringServiceAction
parent: MonitoringServiceAction

5.2.311 MonitoringServiceStopAction: MonitoringServiceAction
parent: MonitoringServiceAction

5.2.312 MonitoringServiceSubSystemInfo: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: stopped
Type: boolean
Description: Stopped

Parameter: suspended
Type: boolean
Description: Suspended

Parameter: last
Type: unsigned integer
Description: Last sample time

Parameter: queued
Type: unsigned integer
Description: Queued items

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Parameter: handled
Type: unsigned integer
Description: Handled items

Parameter: cacheMiss
Type: unsigned integer
Description: Miss cached count

### 5.2.313 MonitoringShutdownAction: MonitoringAction

parent: MonitoringAction

Parameter: runPreHaltOperations
Type: boolean
Description: Run pre-halt operations

Parameter: preHaltOperationTimeout
Type: unsigned integer
Description: Run pre-halt operation timeout

### 5.2.314 MonitoringStorageSubSystemInfo: Entity

parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: name
Type: string
Description: Name

Parameter: elements
Type: unsigned integer
Description: Elements

Parameter: disksize
Type: unsigned integer
Description: Disk size

Parameter: freespace
Type: unsigned integer
Description: Free disk space

Parameter: usage
Type: float
Description: Usage
5.2 Entities

### 5.2.315 MonitoringSubSystemInfo: SubSystemInfo

**parent**: SubSystemInfo

- **Parameter**: storage
  - **Type**: list of MonitoringStorageSubSystemInfo
  - **Description**: Storage

- **Parameter**: service
  - **Type**: list of MonitoringServiceSubSystemInfo
  - **Description**: Service

- **Parameter**: plotter
  - **Type**: list of MonitoringPlotterSubSystemInfo
  - **Description**: Plotter

- **Parameter**: dataCache
  - **Type**: list of MonitoringDataCacheSubSystemInfo
  - **Description**: DataCache

- **Parameter**: cache
  - **Type**: list of MonitoringCacheSubSystemInfo
  - **Description**: Cache

- **Parameter**: deviceState
  - **Type**: list of MonitoringDeviceStateSubSystemInfo
  - **Description**: DeviceState

### 5.2.316 MonitoringTrigger: Entity

**parent**: Entity

- **Parameter**: name
  - **Type**: string
  - **Description**: Name

- **Parameter**: disabled
  - **Type**: boolean
  - **Description**: Disable

- **Parameter**: severity
  - **Type**: unsigned integer
  - **Description**: Severity

- **Parameter**: markEntityAsFailed
  - **Type**: boolean
  - **Description**: Mark entity as failed

- **Parameter**: markEntityAsUnknown
  - **Type**: boolean
Description:  Mark entity as unknown

Parameter:  stateFlappingPeriod
Type:  float
Description:  Time period to check for state flapping

Parameter:  stateFlappingCount
Type:  unsigned integer
Description:  Number of times states need to change in the specified period before it is considered state flapping

Parameter:  expression
Type:  MonitoringExpression
Description:  Expression

Parameter:  enterActions
Type:  list of references to MonitoringAction
Description:  Actions to execute when the expression enters ‘true’ state

Parameter:  duringActions
Type:  list of references to MonitoringAction
Description:  Actions to execute when the expression is and has been ‘true’

Parameter:  leaveActions
Type:  list of references to MonitoringAction
Description:  Actions to execute when the expression is was ‘true’ and no longer is

Parameter:  stateFlappingActions
Type:  list of references to MonitoringAction
Description:  Actions to execute when the expression is state flapping

5.2.317  MonitoringTypeExecutionFilter: MonitoringExecutionFilter

parent: MonitoringExecutionFilter

Parameter:  headNode
Type:  boolean
Description:  Head node

Parameter:  physicalNode
Type:  boolean
Description:  Physical node

Parameter:  cloudNode
Type:  boolean
Description:  Cloud node

Parameter:  liteNode
Type:  boolean
5.2 Entities

Description: Lite node

5.2.318 MonitoringTypeExecutionMultiplexer: MonitoringExecutionMultiplexer
parent: MonitoringExecutionMultiplexer

Parameter: types
Type: list of strings
Description: Types

5.2.319 MonitoringUndrainAction: MonitoringAction
parent: MonitoringAction

5.2.320 MsgQueue: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: msqid
Type: integer
Description: Message queue ID

Parameter: ipcperm
Type: IPCPerm
Description: IPC permissions

Parameter: size
Type: unsigned integer
Description: Size in bytes

Parameter: qnum
Type: unsigned integer
Description: Number of messages in the queue

5.2.321 MyrinetSwitch: Switch
parent: Switch

5.2.322 NetworkAliasInterface: NetworkInterface
parent: NetworkInterface

5.2.323 NetworkBmcInterface: NetworkInterface
parent: NetworkInterface

Parameter: gateway
Type: IP
Description: Gateway IP address, usually the head node’s IP on the BMC network.

Parameter: vlanid
Type: unsigned integer

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Description: VLAN ID setting for the BMC card. When set to 0, VLAN capabilities are disabled.

**Parameter:** lanchannel  
**Type:** unsigned integer  
**Description:** LAN channel for BMC interface

**5.2.324 NetworkBondInterface:**  
**parent:** NetworkInterface

**Parameter:** mode  
**Type:** integer  
**Description:** Bonding mode, see bonding.txt in the kernel documentation.

**Parameter:** options  
**Type:** string  
**Description:** Options to pass to the bonding driver, see kernel documentation.

**Parameter:** interfaces  
**Type:** list of strings  
**Description:** List of interfaces which should be channel-bonded.

**5.2.325 NetworkBridgeInterface:**  
**parent:** NetworkInterface

**Parameter:** stp  
**Type:** boolean  
**Description:** Spanning Tree Protocol enabled.

**Parameter:** forward_delay  
**Type:** unsigned integer  
**Description:** Frame forward delay (in seconds)

**Parameter:** interfaces  
**Type:** list of strings  
**Description:** List of interfaces which should be bridged.

**5.2.326 NetworkConnection:**  
**parent:** Entity

**Parameter:** refNodeUniqueKey  
**Type:** unsigned integer  
**Description:** Node

**Parameter:** source  
**Type:** IP  
**Description:** The source IP address

**Parameter:** sourcePort  
**Type:** unsigned integer
5.2 Entities

**Description:** The source port

**Parameter:** destination
**Type:** IP
**Description:** The destination IP address

**Parameter:** destinationPort
**Type:** unsigned integer
**Description:** The destination port

**Parameter:** type
**Type:** enum
**Description:** The connection type

**Parameter:** state
**Type:** enum
**Description:** The connection state

5.2.327 **NetworkInterface:** Entity

**parent:** Entity

**Parameter:** name
**Type:** string
**Description:** The network interface device name

**Parameter:** ip
**Type:** IP
**Description:** The interfaces IP address

**Parameter:** ipv6Ip
**Type:** IP
**Description:** The interfaces IPv6 IP address

**Parameter:** dhcp
**Type:** boolean
**Description:** Get the ip via DHCP, leave ip blank

**Parameter:** ipv6Dhcp
**Type:** boolean
**Description:** Get the IPv6IP via DHCP, leave IPv6IP blank

**Parameter:** bringupduringinstall
**Type:** enum
**Description:** Brings up interface during install if on

**Parameter:** network
**Type:** reference to Network or None

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Description: Network the interface is connected to

Parameter: alternativeHostname
Type: string
Description: An alternative hostname to use if this is second (startIf != always) IP address on the same network

Parameter: additionalHostnames
Type: list of strings
Description: List of additional hostnames that should resolve to the interfaces IP address

Parameter: startIf
Type: enum
Description: Only run this service in the specified state

Parameter: onNetworkPriority
Type: unsigned integer
Description: Priority of DNS resolution queries for the interface on its network

Parameter: connectedMode
Type: boolean
Description: IB connected mode

5.2.328 NetworkNetMapInterface: NetworkInterface
parent: NetworkInterface

5.2.329 NetworkPhysicalInterface: NetworkInterface
parent: NetworkInterface

Parameter: mac
Type: MAC
Description: The interfaces MAC address

Parameter: speed
Type: string
Description: The interfaces network speed.

Parameter: cardtype
Type: string
Description: The type of network interface.

5.2.330 Network: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: IPv6
Type: boolean
Description: IPv6 enabled

Parameter: ipv6NetmaskBits
Type: unsigned integer
Description: Netmask or Classless Inter-Domain Routing for IPv6

Parameter: netmaskBits
Type: unsigned integer
Description: Netmask or Classless Inter-Domain Routing

Parameter: ipv6BaseAddress
Type: IP
Description: Base IP address for IPv6

Parameter: baseAddress
Type: IP
Description: Base IP address

Parameter: broadcastAddress
Type: IP
Description: Broadcast IP address

Parameter: domainName
Type: string
Description: Domain name

Parameter: type
Type: enum
Description: Type of network, internal: local cluster network, external: connection to outside world, global: unique network across the cloud, tunnel: cloud network, netmap: virtual network user by cloud nodes to connect to nodes inside the cluster

Parameter: mtu
Type: unsigned integer
Description: The maximum transmission unit.

Parameter: bootable
Type: boolean
Description: If set compute nodes can boot using this network

Parameter: dynamicRangeStart
Type: IP
Description: First IP address in the networks dynamic range

Parameter: dynamicRangeEnd
Type: IP

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Description:  Last IP address in the networks dynamic range

Parameter:  lockDownDhcpd
Type:  boolean
Description:  Don’t respond to dhcp request of new nodes via this network

Parameter:  management
Type:  boolean
Description:  If set, the network can be used as a management network

Parameter:  gateway
Type:  IP
Description:  Gateway

Parameter:  ipv6Gateway
Type:  IP
Description:  IPv6 Gateway

Parameter:  notes
Type:  string
Description:  Administrator notes

Parameter:  cloudSubnetID
Type:  string
Description:  The Cloud ID of the subnet

Parameter:  EC2AvailabilityZone
Type:  string
Description:  The AWS availability zone inside which the subnet exists

Parameter:  EC2String
Type:  string
Description:  none

Parameter:  allowAutosign
Type:  enum
Description:  Specify if certificate request from node installers can be signed automatically

Parameter:  generateDNSZone
Type:  enum
Description:  Specify which DNS zones should be written

Parameter:  excludeFromSearchDomain
Type:  boolean
Description:  Exlude from search domain in /etc/resolv.conf file

Parameter:  searchDomainIndex
5.2 Entities

Type: unsigned integer
Description: Search domain index in /etc/resolv.conf file, set to 0 for automatic

Parameter: disableAutomaticExports
Type: boolean
Description: Disable creation of automatic filesystem exports

5.2.331 NetworkTunnelInterface: NetworkInterface
parent: NetworkInterface

5.2.332 NetworkVLANInterface: NetworkInterface
parent: NetworkInterface

Parameter: reorder_hdr
Type: boolean
Description: When set to true the VLAN device will move the ethernet header around to make it look exactly like a real ethernet device.

5.2.333 NewNode: Entity
parent: Entity

Parameter: switchPort
Type: SwitchPort or None
Description: Switch port the new node is connected to.

Parameter: mac
Type: MAC
Description: MAC address of the new node.

Parameter: firstSeen
Type: integer
Description: Uptime when the new node was first seen.

Parameter: lastSeen
Type: integer
Description: Uptime when the new node was last seen.

Parameter: appeared
Type: string
Description: Timestamp when the new node first appeared.

5.2.334 NginxRole: Role
parent: Role

Parameter: workerConnections
Type: unsigned integer
Description: Number of worker connections

Parameter: sendFile

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Type: boolean
Description: Allow files to be send

Parameter: tcpNoPush
Type: boolean
Description: none

Parameter: tcpNoDelay
Type: boolean
Description: TCP no delay

Parameter: keepAliveTimeout
Type: unsigned integer
Description: Keep alive timeout

Parameter: typesHashMaxSize
Type: unsigned integer
Description: Types hash max size

5.2.335  NodeGroup: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: nodes
Type: list of references to Node
Description: List of nodes belonging to this group

Parameter: type
Type: enum
Description: Node group type

5.2.336  NodeHierarchyResult: Entity
parent: Entity

Parameter: responsibility
Type: enum
Description: Responsibility

Parameter: nodes
Type: list of unsigned numbers
Description: Node

Parameter: rules
Type: list of unsigned numbers

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5.2 Entities

Description: Rules from which nodes were derived

Parameter: responsible
Type: list of unsigned numbers
Description: List of nodes that are responsible for the node

5.2.337 NodeHierarchyRuleCategorySelection: NodeHierarchyRuleSelection
parent: NodeHierarchyRuleSelection

Parameter: categories
Type: list of references to Category
Description: List of categories

5.2.338 NodeHierarchyRuleCloudRegionSelection: NodeHierarchyRuleSelection
parent: NodeHierarchyRuleSelection

Parameter: regions
Type: list of references to CloudRegion
Description: List of regions

5.2.339 NodeHierarchyRuleDeviceSelection: NodeHierarchyRuleSelection
parent: NodeHierarchyRuleSelection

Parameter: devices
Type: list of references to Device
Description: List of devices

5.2.340 NodeHierarchyRuleEdgeSiteSelection: NodeHierarchyRuleSelection
parent: NodeHierarchyRuleSelection

Parameter: edgesites
Type: list of references to EdgeSite
Description: List of edgesites

5.2.341 NodeHierarchyRuleNodeGroupSelection: NodeHierarchyRuleSelection
parent: NodeHierarchyRuleSelection

Parameter: nodegroups
Type: list of references to NodeGroup
Description: List of nodegroups

5.2.342 NodeHierarchyRuleNodeSelection: NodeHierarchyRuleSelection
parent: NodeHierarchyRuleSelection

Parameter: nodes
Type: list of references to Node
Description: List of nodes
5.2.343  NodeHierarchyRuleRackSelection: NodeHierarchyRuleSelection

parent: NodeHierarchyRuleSelection

Parameter: racks
Type: list of references to Rack
Description: List of racks

5.2.344  NodeHierarchyRuleRoleSelection: NodeHierarchyRuleSelection

parent: NodeHierarchyRuleSelection

Parameter: director
Type: boolean
Description: Director

Parameter: boot
Type: boolean
Description: Boot

Parameter: provisioning
Type: boolean
Description: Provisioning

Parameter: dns
Type: boolean
Description: DNS

Parameter: ldap
Type: boolean
Description: LDAP

Parameter: monitoring
Type: boolean
Description: Monitoring

5.2.345  NodeHierarchyRuleSelection: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: operation
Type: enum
Description: Operation

5.2.346  NodeHierarchyRule: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: description
Type: string
Description: description

Parameter: disabled
Type: boolean
Description: Disabled

Parameter: priority
Type: unsigned integer
Description: Priority

Parameter: allowSelf
Type: boolean
Description: Allow node to serve itself

Parameter: locationMatch
Type: boolean
Description: Source and target node locations need to match

Parameter: sources
Type: list of NodeHierarchyRuleSelection
Description: Source selection

Parameter: targets
Type: list of NodeHierarchyRuleSelection
Description: Target selection

Parameter: director
Type: boolean
Description: Director

Parameter: dhcp
Type: boolean
Description: DHCP

Parameter: dns
Type: boolean
Description: DNS

Parameter: ntp
Type: boolean
Description: NTP

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Parameter: vpn
Type: boolean
Description: VPN

Parameter: rsyslog
Type: boolean
Description: rsyslog

Parameter: ldap
Type: boolean
Description: LDAP

Parameter: bios
Type: boolean
Description: BIOS

Parameter: provisioning
Type: boolean
Description: Provisioning

Parameter: mount
Type: boolean
Description: Mount

Parameter: sshProxy
Type: boolean
Description: SSH proxy

Parameter: cmdaemonConfiguration
Type: boolean
Description: Configuration

Parameter: cmdaemonRpcForward
Type: boolean
Description: RPC forward

Parameter: cmdaemonEvents
Type: boolean
Description: Events

Parameter: cmdaemonStatus
Type: boolean
Description: Status

Parameter: cmdaemonWebSocket
Type: boolean
5.2 Entities

Description:  Web socket for lite nodes

Parameter:  monitoringOffload
Type:  boolean
Description:  Monitoring offload

Parameter:  distribution
Type:  enum
Description:  Distribution

5.2.347  NodeHierarchyRuleTypeSelection: NodeHierarchyRuleSelection
parent:  NodeHierarchyRuleSelection

Parameter:  headNode
Type:  boolean
Description:  Head node

Parameter:  physicalNode
Type:  boolean
Description:  Physical node

Parameter:  cloudNode
Type:  boolean
Description:  Cloud node

Parameter:  liteNode
Type:  boolean
Description:  Lite node

Parameter:  ethernetSwitch
Type:  boolean
Description:  Ethernet switch

Parameter:  ibSwitch
Type:  boolean
Description:  IB switch

Parameter:  rackSensor
Type:  boolean
Description:  Rack sensor

Parameter:  powerDistributionUnit
Type:  boolean
Description:  Power distribution unit

Parameter:  genericDevice
Type:  boolean

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Description:  Generic device

Parameter:  unmanagedNode
Type:  boolean
Description:  Unmanaged node

Parameter:  chassis
Type:  boolean
Description:  Chassis

5.2.348  Node: Device
parent:  Device

Parameter:  cmdaemonUrl
Type:  string
Description:  none

Parameter:  interfaces
Type:  list of NetworkInterface
Description:  Ip on the management network

Parameter:  provisioningInterface
Type:  element of interfaces
Description:  Network interface on which the node will receive software image updates

Parameter:  fsmounts
Type:  list of FSMount
Description:  Configure the entries placed in /etc/fstab

Parameter:  fsexports
Type:  list of FSEncrypt
Description:  Configure the entries placed in /etc/exports

Parameter:  staticRoutes
Type:  list of StaticRoute
Description:  Configure static routes for the interfaces

Parameter:  roles
Type:  list of Role
Description:  Assign the roles the node should play

Parameter:  services
Type:  list of OSServiceConfig
Description:  Manage operating system services

Parameter:  pxelabel
Type:  string
5.2 Entities

Description: PXE Label to be displayed when this node boots

Parameter: customRemoteConsoleScript
Type: string
Description: Script that will be used to remote console a device

Parameter: customRemoteConsoleScriptArgument
Type: string
Description: Argument for the custom remote console script

Parameter: provisioningTransport
Type: enum
Description: Defines what transport protocol should be used for provisioning. Options are RSYNC-SSH or RSYNCDAEMON. The latter is the default, is a bit less secure but faster.

Parameter: cpuspeedGovernor
Type: string
Description: Current governor for frequency scaling

Parameter: gpuSettings
Type: list of GPUSettings
Description: Configure the GPUs

Parameter: excludeListManipulateScript
Type: string
Description: A user defined script that can be used to do custom last minute changes to the exclude lists used by cmdaemon to rsync

Parameter: ioScheduler
Type: string
Description: The I/O scheduler for the disks

Parameter: useExclusivelyFor
Type: string
Description: Use node exclusively for desired function: stop all other services

Parameter: bmcSettings
Type: BMCSettings or None
Description: Configure the baseboard management controller settings

Parameter: proxySettings
Type: ProxySettings or None
Description: Configure the proxy server settings

Parameter: versionConfigFiles
Type: boolean

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Description: Keep old versions of all config files for this node

Parameter: forceFullEnvironment
Type: boolean
Description: Force this node to create the environment for all nodes

Parameter: biosSetup
Type: string
Description: BIOS setup

Parameter: timeZoneSettings
Type: TimeZoneSettings or None
Description: Time zone

5.2.349 NvidiaGPUSettings: GPUSettings
parent: GPUSettings

Parameter: powerLimit
Type: string
Description: An upper limit on how much power a GPU can use

Parameter: eccMode
Type: string
Description: Set the ECC mode in which the GPU runs

Parameter: computeMode
Type: string
Description: Set the compute mode in which the GPU runs

Parameter: clockSyncBoostMode
Type: string
Description: Set the clock sync boost among the GPUs in group

Parameter: clockSpeeds
Type: string
Description: Set the streaming multiprocessor/memory clock speed of the GPU

5.2.350 OpenShiftClientRole: OpenShiftRole
parent: OpenShiftRole

5.2.351 OpenShiftProxyRole: NginxRole
parent: NginxRole

Parameter: unmanagedNodeConfiguration
Type: reference to UnmanagedNodeConfiguration
Description: The unmanaged node configuration this role is linked with

Parameter: httpPort
5.2 Entities

Type: unsigned integer
Description: HTTP port to forward as nginx stream

Parameter: httpsPort
Type: unsigned integer
Description: HTTPS port to forward as nginx stream

5.2.352 OpenShiftRole: Role
parent: Role

Parameter: unmanagedNodeConfiguration
Type: reference to UnmanagedNodeConfiguration
Description: The unmanaged nodeconfiguration this role is linked with

5.2.353 OpenShiftWorkerRole: OpenShiftRole
parent: OpenShiftRole

Parameter: containerStoragePath
Type: string
Description: Container storage path

5.2.354 OpenStackIntermediateStorage: CMJobIntermediateStorage
parent: CMJobIntermediateStorage

Parameter: container
Type: string
Description: Container name to place data into

5.2.355 OSCloudDisk: Entity
parent: Entity

Parameter: name
Type: string
Description: Name of the disk

Parameter: bootIndex
Type: integer
Description: Defines the order in which a hypervisor will try devices when attempting to boot the guest from storage. Setting a negative value indicates that the device should not be used for booting

Parameter: size
Type: unsigned integer
Description: Size of the disk

Parameter: diskBus
Type: string
Description: Hypervisor-specific details about disk bus type

Parameter: deviceType

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Type: string
Description: Hypervisor-specific details about disk device type

Parameter: removeOnTermination
Type: boolean
Description: If true, the drive will be removed when the instance it is attached to gets terminated

5.2.356 OSEphemeralDisk: OSEmailDisk
parent: OSEmailDisk

Parameter: format
Type: string
Description: Filesystem to format the disk

5.2.357 OSEmailExtension: Entity
parent: Entity

Parameter: name
Type: string
Description: User-defined name of the private cloud

Parameter: region
Type: reference to OSEmailRegion
Description: Region of the cluster extension

Parameter: network
Type: reference to Network
Description: Network associated with the extension

Parameter: floatingIpNetworkId
Type: string
Description: Floating IP Network UUID or name

Parameter: stackId
Type: string
Description: Heat stack ID

Parameter: defaultDirectorSecGroupId
Type: string
Description: Default security group ID/name for the cloud director

Parameter: defaultCnodeSecGroupId
Type: string
Description: Default security group ID/name for the cloud nodes

Parameter: extraField
Type: list of strings
5.2 Entities

Description: A list of various advanced options

5.2.358 OSCloudFlavor: CloudType
parent: CloudType

Parameter: id
Type: string
Description: The ID of the flavor

5.2.359 OSCloudProvider: CloudProvider
parent: CloudProvider

Parameter: cloudApiType
Type: string
Description: Cloud provider type

Parameter: authUrl
Type: string
Description: Keystone URL

Parameter: username
Type: string
Description: Username

Parameter: password
Type: string
Description: Password

Parameter: projectId
Type: string
Description: Project ID

Parameter: projectName
Type: string
Description: Project Name

Parameter: projectDomainId
Type: string
Description: Project Domain Id

Parameter: userDomainId
Type: string
Description: User Domain Id

Parameter: keyPairName
Type: string
Description: SSH Key Pair Name
Parameter: openStackVersion
Type: string
Description: OpenStack release version (e.g. 2015.1.3)

Parameter: openStackVersionName
Type: string
Description: OpenStack release codename (e.g. Kilo)

Parameter: extensions
Type: list of OSCloudExtension
Description: List of extensions

Parameter: defaultRegion
Type: reference to OSCloudRegion or None
Description: Default region to start instances

Parameter: defaultFlavor
Type: reference to OSCloudFlavor or None
Description: Default cloud node flavor

Parameter: defaultDirectorFlavor
Type: reference to OSCloudFlavor or None
Description: Default cloud director Flavor

Parameter: defaultImage
Type: string
Description: Default node-installer image, can be overridden in the OS disk

5.2.360  OSCloudRegion: CloudRegion
parent: CloudRegion

Parameter: id
Type: string
Description: The ID of the region

5.2.361  OSCloudSettings: CloudSettings
parent: CloudSettings

Parameter: instanceId
Type: string
Description: Unique ID of the instance in OpenStack (the UUID).

Parameter: secGroupId
Type: string
Description: Security group name/ID

Parameter: region
Type: reference to OSCloudRegion
Description: The region of the cloud the VM is located in.

Parameter: flavor
Type: reference to OSCloudFlavor
Description: Instance Flavor (the type of the VM).

Parameter: image
Type: string
Description: The name of the cloud image used for creating the VM.

Parameter: disks
Type: list of OSCloudDisk
Description: Definitions of storage devices of the VM.

Parameter: availabilityZone
Type: string
Description: Availability zone the VM is supposed to be created in. If left empty, the availability zone will be automatically assigned by the cloud.

Parameter: externalIP
Type: IP
Description: The external IP address as set by the cloud provider

Parameter: useKernelAndInitrdFromTheSoftwareImage
Type: boolean
Description: Make the cloud node’s node-installer download the kernel and the initrd from the software image configured for this cloud node and then reboot the cloud node to use those, instead of using the kernel and initrd already present on the node-installer’s cloud image.

5.2.362 OSCloudSwapDisk: OSCloudDisk
parent: OSCloudDisk

5.2.363 OSCloudVolumeDisk: OSCloudDisk
parent: OSCloudDisk

Parameter: imageId
Type: string
Description: Image ID to use as source for this disk

Parameter: snapshotId
Type: string
Description: Snapshot ID to use as source for this disk

Parameter: volumeId
Type: string
Description: Volume ID to use as source for this disk

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5.2.364 OSServiceConfig: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: monitored
Type: boolean
Description: CMDaemon will periodically check if the service is running

Parameter: autostart
Type: boolean
Description: CMDaemon will restart a failed service

Parameter: runIf
Type: enum
Description: Only run this service in the specified state

Parameter: belongsToRole
Type: boolean
Description: Service is initialized as part of an assigned role

Parameter: addFromRole
Type: boolean
Description: none

Parameter: fromGenericRole
Type: boolean
Description: none

Parameter: roleKey
Type: unsigned integer
Description: none

Parameter: extraKey
Type: unsigned integer
Description: none

Parameter: internal
Type: boolean
Description: none

Parameter: serviceType
Type: unsigned integer
Description: none
5.2 Entities

**Parameter:** sicknessCheckScript
**Type:** string
**Description:** Script for sickness checking (no script means no sickness checks)

**Parameter:** sicknessCheckScriptTimeout
**Type:** unsigned integer
**Description:** Timeout after which the script is killed

**Parameter:** sicknessCheckInterval
**Type:** unsigned integer
**Description:** Sickness checks interval (rounded up to 30s monitoring interval)

**Parameter:** scriptTimeout
**Type:** integer
**Description:** Service operation timeout

### 5.2.365 OSService: Entity

**parent:** Entity

**Parameter:** refOSServiceConfigUniqueKey
**Type:** unsigned integer
**Description:** OSServiceConfig

**Parameter:** name
**Type:** string
**Description:** none

**Parameter:** status
**Type:** enum
**Description:** none

**Parameter:** refNodeUniqueKey
**Type:** unsigned integer
**Description:** Node

**Parameter:** isRealService
**Type:** boolean
**Description:** none

**Parameter:** sicknessMessage
**Type:** string
**Description:** none

### 5.2.366 Package: Entity

**parent:** Entity

**Parameter:** refNodeUniqueKey
**Type:** unsigned integer

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Description: Node

Parameter: type
Type: enum
Description: Type of package manager

Parameter: name
Type: string
Description: Name

Parameter: version
Type: string
Description: Version

Parameter: release
Type: string
Description: Release

Parameter: arch
Type: string
Description: Version

Parameter: buildDate
Type: timestamp
Description: Build date

Parameter: installDate
Type: timestamp
Description: Install date

Parameter: size
Type: unsigned integer
Description: Size

Parameter: installed
Type: boolean
Description: Installed

5.2.367 Partition: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: clusterName
Type: string
5.2 Entities

Description: Cluster name

Parameter: primaryHeadNode
Type: reference to HeadNode
Description: Primary head node

Parameter: failover
Type: CMDaemonFailover
Description: Manage failover setup for this cluster

Parameter: timeZoneSettings
Type: TimeZoneSettings or None
Description: Time zone

Parameter: adminEmail
Type: list of strings
Description: Administrator’s email

Parameter: slaveName
Type: string
Description: Default prefix to identify nodes. eg node003 (basename = node)

Parameter: slaveDigits
Type: unsigned integer
Description: Number of digits used to identify nodes. eg node003 (digits = 3)

Parameter: nameServers
Type: list of strings
Description: Name servers

Parameter: nameServersFromDhcp
Type: list of strings
Description: Name servers provided by DHCP, edit the name servers property instead

Parameter: timeServers
Type: list of strings
Description: NTP time servers

Parameter: searchDomains
Type: list of strings
Description: DNS search domains

Parameter: externallyVisibleIp
Type: IP
Description: IP that external sites see when headnode connects

Parameter: externalNetwork

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Type: reference to Network
Description: External network

Parameter: defaultCategory
Type: reference to Category
Description: Default category for new nodes

Parameter: archOS
Type: list of ArchOS
Description: Architecture operating system

Parameter: burnConfigs
Type: list of BurnConfig
Description: Burn configurations

Parameter: failoverGroups
Type: list of CMDaemonFailoverGroup
Description: Failover group configurations

Parameter: resourcePools
Type: list of ResourcePool
Description: Resource pools

Parameter: defaultBurnConfig
Type: element of burnConfigs
Description: Default burn configuration

Parameter: bmcSettings
Type: BMCSettings or None
Description: Configure the baseboard management controller settings

Parameter: snmpSettings
Type: SNMPSettings or None
Description: Configure the cluster wide SNMP settings

Parameter: managementNetwork
Type: reference to Network
Description: Determines what network should be used for management traffic.

Parameter: notes
Type: string
Description: Administrator notes

Parameter: provisioningNodeAutoUpdateTimeout
Type: unsigned integer
Description: Time, in seconds, when an image on a provisioning node is considered out of date and automatically updated when needed (0 to disable automatic updates)

Parameter: relayHost
Type: string
Description: SMTP mail relay host

Parameter: noZeroConf
Type: boolean
Description: Add nozeroconf to network configuration

Parameter: proxySettings
Type: ProxySettings or None
Description: Configure the proxy server settings

Parameter: autosign
Type: enum
Description: Sign certificates for node installer request according to network settings.

5.2.368 PBSJobQueueStat: JobQueueStat
parent: JobQueueStat

Parameter: running
Type: unsigned integer
Description: Running jobs

Parameter: queued
Type: unsigned integer
Description: Queued jobs

Parameter: held
Type: unsigned integer
Description: Held jobs

Parameter: waiting
Type: unsigned integer
Description: Waiting jobs

5.2.369 PBSJobQueue: JobQueue
parent: JobQueue

Parameter: queueType
Type: enum
Description: Pbs Pro queue type

Parameter: fromRouteOnly
Type: boolean
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>routeHeldJobs</td>
<td>boolean</td>
<td>Specifies whether jobs in the held state can be routed from this queue</td>
</tr>
<tr>
<td>routeWaitingJobs</td>
<td>boolean</td>
<td>Specifies whether jobs whose execution_time attribute value is in the future can be routed from this queue</td>
</tr>
<tr>
<td>routeLifetime</td>
<td>unsigned integer</td>
<td>The maximum time a job is allowed to reside in a routing queue</td>
</tr>
<tr>
<td>routeRetryTime</td>
<td>unsigned integer</td>
<td>Route retry time in routing queue</td>
</tr>
<tr>
<td>routes</td>
<td>list of strings</td>
<td>Route of queue path (route_destination parameter in qmgr)</td>
</tr>
<tr>
<td>defaultQueue</td>
<td>boolean</td>
<td>Specifies the queue which is to accept jobs when no queue is requested</td>
</tr>
<tr>
<td>minWalltime</td>
<td>string</td>
<td>Minimum runtime of jobs running in a queue</td>
</tr>
<tr>
<td>maxWalltime</td>
<td>string</td>
<td>Maximum runtime of jobs running in a queue</td>
</tr>
<tr>
<td>defaultWalltime</td>
<td>string</td>
<td>Maximum runtime of jobs running in a queue</td>
</tr>
<tr>
<td>maxQueued</td>
<td>unsigned integer</td>
<td>Maximum number allowed to reside in a queue at any given time (0 is the same as infinite)</td>
</tr>
<tr>
<td>priority</td>
<td>integer</td>
<td></td>
</tr>
</tbody>
</table>
Description: Priority of a queue against other queues of the same type [-1024; 1024]

Parameter: enabled
Type: boolean
Description: When true, a queue will accept new jobs; when false, a queue is disabled and will not accept jobs

Parameter: started
Type: boolean
Description: Jobs may be scheduled for execution from this queue; when false, a queue is considered stopped

Parameter: aclHostEnable
Type: boolean
Description: When true directs the server to use the acl_hosts access list for the named queue

5.2.370 PBSJob: Job
parent: Job

5.2.371 PbsProCgroupsSettings: WlmCgroupsSettings
parent: WlmCgroupsSettings

Parameter: jobCgroupTemplate
Type: string
Description: Template for job cgroup path ($JOBID will be replaced by job id, while $ESCAPE_JOBID will be replaced by systemd-escape of job id)

5.2.372 PbsProClientRole: PbsProRole
parent: PbsProRole

Parameter: slots
Type: unsigned integer
Description: Number of slots available on this node/category

Parameter: queues
Type: list of references to PbsProJobQueue
Description: Queues this node/nodes in this category belongs to

Parameter: allQueues
Type: boolean
Description: When set, the role will provide all available queues. (The queues property will then be ignored.)

Parameter: gpus
Type: unsigned integer
Description: Number of gpus

Parameter: gpuDevices
Type: list of strings
Description: /dev/* available to workload management

Parameter: properties
Type: list of strings
Description: Node properties (a ‘pnames’ node attribute)

Parameter: momSettings
Type: PbsProMomSettings
Description: Submode containing pbs_mom daemon settings

Parameter: commSettings
Type: PbsProCommSettings
Description: Submode containing pbs_comm settings

Parameter: nodeCustomizations
Type: list of WlmNodeCustomizationEntry
Description: PBS Pro node custom properties

5.2.373 PbsProCommSettings: Entity
parent: Entity

Parameter: commRouters
Type: list of strings
Description: Tells a pbs_comm where to find its fellow communication daemons (PBS_COMM_ROUTERS parameter in pbs.conf)

Parameter: commThreads
Type: unsigned integer
Description: Tells pbs_comm how many threads to start (PBS_COMM_THREADS parameter in pbs.conf)

Parameter: startComm
Type: boolean
Description: Configure pbs_com daemon start (PBS_START_COMM parameter in pbs.conf)

5.2.374 PbsProJobQueueStat: PBSJobQueueStat
parent: PBSJobQueueStat

5.2.375 PbsProJobQueue: PBSJobQueue
parent: PBSJobQueue

5.2.376 PbsProJob: PBSJob
parent: PBSJob

5.2.377 PbsProMomSettings: Entity
parent: Entity

Parameter: outputHostname
Type: string
5.2 Entities

Description: Host to which all job standard output and standard error are delivered (PBS_OUTPUT_HOST_NAME parameter in pbs.conf)

Parameter: leafRouters
Type: list of strings
Description: Location of endpoint's pbs_comm daemon (PBS_LEAF_ROUTERS parameter in pbs.conf)

Parameter: leafName
Type: string
Description: Leaf name (PBS_LEAF_NAME parameter in pbs.conf)

Parameter: leafManagementFqdn
Type: boolean
Description: Leaf name in pbs.conf is appended with FQDN from management network

Parameter: startMom
Type: boolean
Description: Configure pbs_mom daemon start (PBS_START_MOM parameter in pbs.conf)

Parameter: spool
Type: string
Description: PBS Pro mom spool directory

5.2.378 PbsProRole: Role
parent: Role

Parameter: wlmCluster
Type: reference to PbsProWlmCluster
Description: WLM cluster link to this WLM role

5.2.379 PbsProServerRole: PbsProRole
parent: PbsProRole

Parameter: externalServer
Type: boolean
Description: PBS Pro server daemons are running on some external machine

Parameter: commSettings
Type: PbsProCommSettings
Description: Submode containing pbs_comm settings

5.2.380 PbsProSubmitRole: WlmSubmitRole
parent: WlmSubmitRole

Parameter: pbsProWlmClusters
Type: list of references to PbsProWlmCluster
Description: List of PbsPro clusters which the role belongs to

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5.2.381  PbsProWlmCluster: WlmCluster

parent: WlmCluster

Parameter: version
Type: string
Description: Major PBS Pro version

Parameter: placeholders
Type: list of JobQueuePlaceholder
Description: Job queue node placeholders mode

Parameter: cgroups
Type: PbsProCgroupsSettings
Description: Submode containing PBS Pro related cgroups settings

Parameter: enableJobHistory
Type: boolean
Description: Keep all job attribute information in PBS Pro

Parameter: jobHistoryDuration
Type: string
Description: Specifies the length of time that PBS will keep each job’s history

Parameter: prefix
Type: string
Description: PBS Pro installation directory

Parameter: spool
Type: string
Description: PBS Pro server spool directory

Parameter: subType
Type: enum
Description: PBS Pro subtype

5.2.382  PDUPort: Entity

parent: Entity

Parameter: pdu
Type: reference to PowerDistributionUnit
Description: Pointer to a power distribution unit

Parameter: prt
Type: unsigned integer
Description: Port number on the power distribution unit
5.2.383 PhysicalNode: ComputeNode

parent: ComputeNode

5.2.384 PingResult: Entity

parent: Entity

Parameter: source
Type: unsigned integer
Description: Source

Parameter: destination
Type: unsigned integer
Description: Destination

Parameter: result
Type: enum
Description: Result of the ping operation

Parameter: latency
Type: float
Description: Round trip latency

Parameter: sequenceId
Type: unsigned integer
Description: Sequence ID

5.2.385 PingStatisticsGlobalInformation: Entity

parent: Entity

Parameter: count
Type: unsigned integer
Description: none

Parameter: average
Type: float
Description: none

Parameter: minimum
Type: float
Description: none

Parameter: maximum
Type: float
Description: none

Parameter: uniformity
Type: float
Description:  

5.2.386 PingStatisticsPairInformation:  Entity
parent: Entity

Parameter:  source
Type: unsigned integer
Description: none

Parameter:  destination
Type: unsigned integer
Description: none

Parameter:  count
Type: unsigned integer
Description: none

Parameter:  average
Type: float
Description: none

Parameter:  minimum
Type: float
Description: none

Parameter:  maximum
Type: float
Description: none

Parameter:  uniformity
Type: float
Description: none

5.2.387 PingStatisticsSourceInformation:  Entity
parent: Entity

Parameter:  source
Type: unsigned integer
Description: none

Parameter:  count
Type: unsigned integer
Description: none

Parameter:  average
Type: float
Description: none

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5.2 Entities

Parameter: minimum
Type: float
Description: none

Parameter: maximum
Type: float
Description: none

Parameter: uniformity
Type: float
Description: none

5.2.388 PingStatistics: Entity

parent: Entity

Parameter: totalOk
Type: unsigned integer
Description: Total number of pings that returned OK

Parameter: totalError
Type: unsigned integer
Description: Total number of pings that returned error

Parameter: totalFailed
Type: unsigned integer
Description: Total number of pings that returned failed

Parameter: totalTimeout
Type: unsigned integer
Description: Total number of pings that returned timeout

Parameter: totalNoAddress
Type: unsigned integer
Description: Total number of pings had no address

Parameter: totalUnreachable
Type: unsigned integer
Description: Total number of pings that returned unreachable

Parameter: total
Type: unsigned integer
Description: Total number of pings done

Parameter: pairInformation
Type: list of PingStatisticsPairInformation
Description: Ping pair information statistics

Parameter: sourceInformation

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Type: list of PingStatisticsSourceInformation
Description: Ping source information statistics

Parameter: globalInformation
Type: PingStatisticsGlobalInformation
Description: Ping global information statistics

Parameter: results
Type: list of PingResult
Description: Raw ping results

5.2.389 PowerDistributionUnit: Device
parent: Device

Parameter: ip
Type: IP
Description: IP address

Parameter: network
Type: reference to Network or None
Description: Network to which this unit is connected

Parameter: model
Type: string
Description: PowerDistributionUnit model name

Parameter: ports
Type: integer
Description: Number of outlets

Parameter: banks
Type: integer
Description: Number of banks

Parameter: phases
Type: integer
Description: Number of phases

Parameter: snmpSettings
Type: SNMPSettings or None
Description: Configure the cluster wide SNMP settings

Parameter: firmware
Type: string
Description: Firmware revision

Parameter: controlScript
Type: string
5.2 Entities

Parameter: controlScriptTimeout
Type: unsigned integer
Description: none

5.2.390 PowerOperationHistory: Entity

Parameter: refDeviceUniqueKey
Type: unsigned integer
Description: Device

Parameter: executionTime
Type: unsigned integer
Description: Execution time in milliseconds after epoch

Parameter: operation
Type: enum
Description: Operation

Parameter: success
Type: boolean
Description: Success

5.2.391 PowerOperationStatus: Entity

Parameter: state
Type: enum
Description: State of the operation

Parameter: operation
Type: enum
Description: Operation to be performed

Parameter: executionTime
Type: timestamp
Description: Execution time

Parameter: info
Type: string
Description: Extra information about the power operation

Parameter: retries
Type: unsigned integer
Description: Number of retries

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Parameter: devices
Type: list of unsigned numbers
Description: Devices

Parameter: index
Type: list of unsigned numbers
Description: Indexes of power operation

Parameter: gpus
Type: list of unsigned numbers
Description: GPUs

5.2.392 PowerOperation: Entity
parent: Entity

Parameter: devices
Type: list of unsigned numbers
Description: Devices

Parameter: pduPorts
Type: list of unsigned numbers
Description: A list of (PDU, port) pairs

Parameter: sessionId
Type: unsigned integer
Description: Session id

Parameter: force
Type: boolean
Description: Set to true to also do power operation on closed devices

Parameter: delay
Type: unsigned integer
Description: Delay between sequencial operations in milliseconds

Parameter: deviceDelay
Type: list of unsigned numbers
Description: Individual device delay in milliseconds

Parameter: headIndex
Type: unsigned integer
Description: Should be 0

Parameter: operation
Type: enum
Description: Operation to be performed

Parameter: gpus
Type: list of unsigned numbers
Description: GPUs

Parameter: retryCount
Type: unsigned integer
Description: Number of times to retry on failure

Parameter: retryDelay
Type: unsigned integer
Description: Delay between consecutive tries in milliseconds

### 5.2.393 PowerStatus: Entity

parent: Entity

Parameter: device
Type: unsigned integer
Description: Device

Parameter: host
Type: unsigned integer
Description: none

Parameter: powerDistributionUnit
Type: unsigned integer
Description: none

Parameter: gpu
Type: integer
Description: none

Parameter: prt
Type: unsigned integer
Description: none

Parameter: name
Type: string
Description: none

Parameter: state
Type: enum
Description: none

Parameter: msg
Type: string
Description: none

Parameter: extendedMsg
Type: string

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Description: none

Parameter: indexes
Type: list of unsigned numbers
Description: none

Parameter: tracker
Type: unsigned integer
Description: none

Parameter: retries
Type: unsigned integer
Description: none

5.2.394 PreJobOutput: Entity
parent: Entity

Parameter: measurable
Type: unsigned integer
Description: none

Parameter: value
Type: float
Description: none

Parameter: output
Type: string
Description: none

Parameter: failed
Type: boolean
Description: none

Parameter: reschedule
Type: boolean
Description: none

5.2.395 PreJobResult: Entity
parent: Entity

Parameter: hostname
Type: string
Description: none

Parameter: nodeKey
Type: unsigned integer
Description: none
5.2 Entities

Parameter: output
Type: list of PreJobOutput
Description: none

5.2.396 Processor: Entity
parent: Entity

Parameter: ID
Type: list of unsigned numbers
Description: ID

Parameter: physicalID
Type: list of unsigned numbers
Description: Physical ID

Parameter: coreID
Type: list of unsigned numbers
Description: Core ID

Parameter: vendor
Type: string
Description: Vendor

Parameter: family
Type: string
Description: Family

Parameter: model
Type: string
Description: Model

Parameter: modelName
Type: string
Description: Model name

Parameter: cores
Type: unsigned integer
Description: Cores

Parameter: IDLevel
Type: string
Description: ID level

Parameter: stepping
Type: unsigned integer
Description: Stepping

Parameter: speed

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Type: string
Description: Speed

Parameter: cacheSize
Type: string
Description: Cache size

Parameter: cacheAlignment
Type: string
Description: Cache alignment

Parameter: flags
Type: string
Description: Flags

Parameter: bogomips
Type: string
Description: Bogomips

Parameter: TLBSize
Type: string
Description: TLB size

Parameter: addressSizes
Type: string
Description: Address sizes

Parameter: powerManagement
Type: string
Description: Power management

Parameter: FPU
Type: boolean
Description: FPU

Parameter: FPUException
Type: boolean
Description: FPU exception

Parameter: wp
Type: boolean
Description: WP

Parameter: availableGovernors
Type: list of strings
Description: Available governors
5.2 Entities

Parameter: currentGovernor
Type: string
Description: Current governor

5.2.397 Process: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: pid
Type: integer
Description: Process ID

Parameter: ppid
Type: integer
Description: Parent PID

Parameter: uid
Type: integer
Description: Owner UID

Parameter: gid
Type: integer
Description: Process’ group ID

Parameter: state
Type: string
Description: Process’ state

Parameter: cmd
Type: string
Description: The command name

Parameter: size
Type: unsigned integer
Description: Virtual memory size

Parameter: rss
Type: unsigned integer
Description: Resident memory size

Parameter: nbthreads
Type: unsigned integer
Description: Number of threads spawned

Parameter: nbfiledescs

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**Parameter:** cputime
Type: unsigned integer
Description: CPU time

**Parameter:** cpuuse
Type: float
Description: CPU usage

**Parameter:** username
Type: string
Description: Owner name

**Parameter:** groupname
Type: string
Description: Group name

### 5.2.398 Profile: Entity
parent: Entity

**Parameter:** name
Type: string
Description: Name

**Parameter:** tokens
Type: list of strings
Description: Tokens

**Parameter:** accessServices
Type: list of strings
Description: Services

**Parameter:** nonuser
Type: boolean
Description: True if profile not assignable to users.

### 5.2.399 ProgramRunnerInput: Entity
parent: Entity

**Parameter:** user
Type: string
Description: none

**Parameter:** startInShell
Type: boolean
Description: none

Parameter: cmd
Type: string
Description: none

Parameter: info
Type: string
Description: none

Parameter: args
Type: list of strings
Description: none

Parameter: env
Type: list of strings
Description: none

Parameter: datacin
Type: string
Description: none

Parameter: mergeCoutCerr
Type: boolean
Description: none

Parameter: maxruntime
Type: unsigned integer
Description: none

Parameter: updateinterval
Type: unsigned integer
Description: none

Parameter: priority
Type: integer
Description: none

Parameter: tracker
Type: unsigned integer
Description: none

Parameter: logger
Type: enum
Description: none
5.2.400  **ProgramRunnerKill**: Entity

**parent**: Entity

**Parameter**: `node`
*Type*: unsigned integer
*Description*: Node key

**Parameter**: `running`
*Type*: integer
*Description*: Running

**Parameter**: `trackers`
*Type*: list of unsigned numbers
*Description*: Tackers

**Parameter**: `results`
*Type*: list of signed numbers
*Description*: results

5.2.401  **ProgramRunnerOutput**: Entity

**parent**: Entity

**Parameter**: `node`
*Type*: unsigned integer
*Description*: none

**Parameter**: `datacout`
*Type*: string
*Description*: none

**Parameter**: `datacerr`
*Type*: string
*Description*: none

**Parameter**: `exitcode`
*Type*: integer
*Description*: none

**Parameter**: `signal`
*Type*: integer
*Description*: none

**Parameter**: `pid`
*Type*: integer
*Description*: none

**Parameter**: `runtime`
*Type*: unsigned integer
*Description*: none
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Description: none

Parameter: state
Type: unsigned integer
Description: none

5.2.402 ProgramRunnerStatus: Entity
parent: Entity

Parameter: startTime
Type: timestamp
Description: none

Parameter: runtime
Type: unsigned integer
Description: none

Parameter: sid
Type: unsigned integer
Description: none

Parameter: running
Type: integer
Description: none

Parameter: unknown
Type: integer
Description: none

Parameter: internal
Type: boolean
Description: none

Parameter: nodes
Type: list of unsigned numbers
Description: none

Parameter: state
Type: list of unsigned numbers
Description: none

Parameter: input
Type: ProgramRunnerInput
Description: none

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5.2.403 ProjectManager: Entity

parent: Entity

Parameter: users
Type: list of strings
Description: List of users managed

Parameter: accounts
Type: list of strings
Description: List of accounts managed

Parameter: op
Type: enum
Description: Job needs to belong to one of the users and/or accounts

5.2.404 PrometheusQueryDrilldown: Entity

parent: Entity

Parameter: name
Type: string
Description: The name of the drill down

Parameter: parameters
Type: list of strings
Description: Parameters to be passed to the drill down query

Parameter: query
Type: reference to PrometheusQuery or None
Description: Query to execute

5.2.405 PrometheusQuery: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: alias
Type: string
Description: Alternative name

Parameter: query
Type: string
Description: PromQL Query

Parameter: typeClass
Type: string
Description:    Type class, slash(\/) separated for levels

Parameter:    description
Type:    string
Description:    Description

Parameter:    notes
Type:    string
Description:    Notes

Parameter:    startTime
Type:    string
Description:    Default query start time

Parameter:    endTime
Type:    string
Description:    Default end start time

Parameter:    interval
Type:    float
Description:    Interval

Parameter:    stalenessDelay
Type:    float
Description:    Staleness delay

Parameter:    access
Type:    enum
Description:    User access control

Parameter:    unit
Type:    string
Description:    Unit of measure for the query results

Parameter:    price
Type:    float
Description:    Optional price associated with the query results per unit

Parameter:    currency
Type:    string
Description:    Currency

Parameter:    preference
Type:    unsigned integer
Description:    The query with the highest preference be shown by default

Parameter:    drilldown

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Type: list of PrometheusQueryDrilldown
Description: Manage the drilldown queries

5.2.406 PrometheusRecordingRule: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: sourceLabels
Type: list of strings
Description: Source labels to be translated into target

Parameter: targetLabel
Type: string
Description: Target label

Parameter: valueRegex
Type: string
Description: Regex the value must match for this rule to be applied

Parameter: valueReplace
Type: string
Description: Replace value with regex replace (use $1 for matchers)

Parameter: disabled
Type: boolean
Description: Disable this rule

Parameter: keepOriginalLabels
Type: boolean
Description: Keep original labels

5.2.407 ProvisioningNodeStatus: Entity
parent: Entity

Parameter: slotsCapacity
Type: unsigned integer
Description: Number of provisioning requests this node can handle in parallel.

Parameter: slotsUsed
Type: unsigned integer
Description: Number of provisioning requests currently being handled by this node.

Parameter: nodeKey
Type: unsigned integer
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Description: The provisioning node.

Parameter: drained
Type: boolean
Description: Drained and not available for future request

Parameter: imageKeys
Type: list of unsigned numbers
Description: none

Parameter: upToDate
Type: list of booleans
Description: none

Parameter: nodeGroupKeys
Type: list of unsigned numbers
Description: Node groups this provisioning node will provide images for.

Parameter: categoryKeys
Type: list of unsigned numbers
Description: Categories this provisioning node will provide images for.

Parameter: rackKeys
Type: list of unsigned numbers
Description: Racks this provisioning node will provide images for.

5.2.408 ProvisioningProcessorJob: Entity

parent: Entity

Parameter: jobID
Type: unsigned integer
Description: Internal provisioning system job ID.

Parameter: requestID
Type: unsigned integer
Description: Provisioning request ID.

Parameter: source
Type: reference to Node
Description: Source node.

Parameter: sourcePath
Type: string
Description: Path on the source node.

Parameter: destination
Type: reference to Node

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Description: Destination node.

Parameter: destinationPath
Type: string
Description: Path on the destination node.

Parameter: isFromNodeInstaller
Type: boolean
Description: Set if the request came from the node-installer.

Parameter: isBackupFromBackup
Type: boolean
Description: Set if the request came a backup of a backup.

Parameter: userName
Type: string
Description: Rsync username.

Parameter: password
Type: string
Description: Rsync password.

Parameter: rsyncdPort
Type: unsigned integer
Description: Rsync port.

Parameter: includelist
Type: string
Description: Rsync include list.

Parameter: excludelist
Type: string
Description: Rsync exclude list.

Parameter: dryrun
Type: boolean
Description: If set, a dry run will be performed, no data is written.

Parameter: syncMode
Type: unsigned integer
Description: Sync mode.

Parameter: state
Type: unsigned integer
Description: Job state.

Parameter: errorMessage
Type: string
Description: Error message.

Parameter: errorDetails
Type: string
Description: Error details.

Parameter: fspart
Type: reference to FSPart
Description: FSPart

Parameter: index
Type: unsigned integer
Description: Index

5.2.409 ProvisioningRequestStatus: Entity
parent: Entity

Parameter: requestIDs
Type: list of unsigned numbers
Description: Provisioning request IDs.

Parameter: sourceNodeKey
Type: unsigned integer
Description: Source node handling the provisioning request.

Parameter: sourcePath
Type: string
Description: Path on the source node.

Parameter: destinationNodeKey
Type: unsigned integer
Description: Destination node for the provisioning request.

Parameter: destinationPath
Type: string
Description: Path on the destination node.

Parameter: dryRun
Type: boolean
Description: In dry-run mode no data is actually written. See provisioning log for results.

Parameter: syncMode
Type: unsigned integer
Description: Sync mode used for the provisioning request.

Parameter: state
Type: unsigned integer

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Description: State of the provisioning request.

Parameter: errorMessage
Type: string
Description: Error message.

Parameter: errorDetails
Type: string
Description: Detailed error message.

Parameter: jobFailureCounter
Type: unsigned integer
Description: Number of times the provisioning job has failed.

Parameter: isFromNodeInstaller
Type: boolean
Description: Set if the request came from the node-installer.

Parameter: requesterSessions
Type: list of unsigned numbers
Description: none

Parameter: schedulerInfo
Type: list of strings
Description: Details on how the provisioning request was scheduled.

5.2.410 ProvisioningRole: Role

parent: Role

Parameter: maxProvisioningNodes
Type: unsigned integer
Description: Maximum number of nodes that can be provisioned in parallel

Parameter: localImages
Type: list of references to SoftwareImage
Description: List of software images provided from local disk

Parameter: includeRevisionsOfLocalImages
Type: boolean
Description: Include revisions of local images

Parameter: sharedImages
Type: list of references to SoftwareImage
Description: List of software images provided from shared storage

Parameter: allImages
Type: enum
Description:  When set, the role will provide all available images. (The images property will then be ignored.)

Parameter:  nodegroups
Type:  list of references to NodeGroup
Description:  List of node groups for which to provide images

Parameter:  categories
Type:  list of references to Category
Description:  List of categories for which to provide images

Parameter:  racks
Type:  list of references to Rack
Description:  List of racks for which to provide images

Parameter:  localProvisioning
Type:  boolean
Description:  Speeds up initial provisioning of cloud directors and cloud provisioning nodes. When enabled, if a software image is used as the rootfs of the provisioning node and is also to be used by that node to provision other cloud nodes, during the initial FULL install that image will be transferred only once to the provisioning node, instead of twice.

5.2.411 ProvisioningStatus: Entity

Parameter:  provisioningRequestStatusList
Type:  list of ProvisioningRequestStatus
Description:  none

Parameter:  provisioningNodeStatusList
Type:  list of ProvisioningNodeStatus
Description:  none

5.2.412 ProxySettings: Entity

Parameter:  proxyHttp
Type:  string
Description:  HTTP proxy address which will be used for the node connections to HTTP resources

Parameter:  proxyHttpUser
Type:  string
Description:  HTTP proxy username for authentication

Parameter:  proxyHttpPass
Type:  string
Description:  HTTP proxy password for authentication

Parameter:  proxyHttps
Type: string
Description: HTTPS proxy address which will be used for the node connections to HTTPS resources

Parameter: proxyHttpsUser
Type: string
Description: HTTPS proxy username for authentication

Parameter: proxyHttpsPass
Type: string
Description: HTTPS proxy password for authentication

Parameter: proxyFtp
Type: string
Description: FTP proxy address which will be used for the node connections to FTP resources

Parameter: proxyFtpUser
Type: string
Description: FTP proxy username for authentication

Parameter: proxyFtpPass
Type: string
Description: FTP proxy password for authentication

Parameter: noProxy
Type: list of strings
Description: Hosts to be accessed without proxy

5.2.413 RackPosition: Entity
parent: Entity

Parameter: rack
Type: reference to Rack
Description: Name of the rack in which the device resides

Parameter: position
Type: unsigned integer
Description: Position of the node in the rack, top is 1

Parameter: height
Type: unsigned integer
Description: Height of the node

5.2.414 RackSensor: Device
parent: Device

Parameter: ip
Type: IP

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Description:  Ip address

Parameter:  network
Type:  reference to Network or None
Description:  Network to which this switch is connected

Parameter:  model
Type:  string
Description:  RackSensor model name

Parameter:  sensors
Type:  list of Sensor
Description:  Sensors in the rackmon kit

Parameter:  snmpSettings
Type:  SNMPSettings or None
Description:  Configure the cluster wide SNMP settings

5.2.415  Rack: Entity
parent:  Entity

Parameter:  name
Type:  string
Description:  Name

Parameter:  room
Type:  string
Description:  Name of the room

Parameter:  xCoordinate
Type:  unsigned integer
Description:  Position in the room

Parameter:  yCoordinate
Type:  unsigned integer
Description:  Position in the room

Parameter:  height
Type:  unsigned integer
Description:  Height

Parameter:  width
Type:  unsigned integer
Description:  Width

Parameter:  depth
Type:  unsigned integer

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Description: Depth

Parameter: angle
Type: unsigned integer
Description: Angle of the rack, 90 face right, 180 face backwards, 270 face left

Parameter: inverted
Type: boolean
Description: Inverted racks have position 1 at the bottom

Parameter: notes
Type: string
Description: Administrator notes

5.2.416 RadosGatewayRole: Role
parent: Role

Parameter: serverRoot
Type: string
Description: Fast CGI server root path

Parameter: serverSocket
Type: string
Description: Fast CGI server socket

Parameter: serverPort
Type: unsigned integer
Description: Gateway port

Parameter: serverScript
Type: string
Description: Fast CGI server script content

Parameter: module
Type: string
Description: Apache fastcgi module file name

Parameter: nssDbPath
Type: string
Description: Path to NSS database directory

5.2.417 RemoteNodeInstallerInteraction: Entity
parent: Entity

Parameter: node
Type: reference to ComputeNode
Description: The node requesting interaction.
Parameter: description
Type: string
Description: The description of the interaction.

Parameter: firstSeen
Type: integer
Description: The first time this interaction was requested.

Parameter: lastSeen
Type: integer
Description: The last time this interaction was requested.

Parameter: appeared
Type: string
Description: The first time this interaction was requested.

Parameter: wasConfirmed
Type: boolean
Description: Whether the interaction has been confirmed.

Parameter: wasDenied
Type: boolean
Description: Whether the interaction has been denied (rejected).

Parameter: invalid
Type: boolean
Description: Whether the interaction was found to be invalid.

5.2.418 RemoteSetupExecution: Entity
parent: Entity

Parameter: id
Type: integer
Description: A unique identified of the remote cm-*-setup execution.

Parameter: inputConfig
Type: string
Description: cm-*-setup yaml input configuration file (used with ‘-c’ flag).

Parameter: exitCode
Type: integer
Description: The return exit code from cm-setup (once the execution has been completed).

Parameter: signal
Type: integer
Description: Number identifying the signal which interrupted the execution.

Parameter: datacout

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Type: list of strings
Description: Data which was emitted on stdout from cm-*-setup.

5.2.419 ResourcePoolStatus: Entity
parent: Entity

Parameter: nodes
Type: list of unsigned numbers
Description: Nodes

Parameter: nodeStatus
Type: list of unsigned numbers
Description: Node status

Parameter: resourceKeys
Type: list of unsigned numbers
Description: Resource key

Parameter: resourceStatus
Type: list of unsigned numbers
Description: Resource status

Parameter: resourceMessages
Type: list of strings
Description: Resource message

5.2.420 ResourcePool: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: nodes
Type: list of references to Node
Description: List of nodes who share the resources

Parameter: configurationOverlay
Type: reference to ConfigurationOverlay
Description: Configuration overlay which defines the nodes that share the resources

Parameter: priority
Type: list of floating point numbers
Description: Distribution priorities for the nodes

Parameter: hostname
Type: string
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Description: Hostname all IP resources will point to

Parameter: resources
Type: list of BasicResource
Description: Resources to be divided among the given nodes

Parameter: waitTime
Type: unsigned integer
Description: How long to wait after a node goes down before migrating it’s resources

Parameter: disabled
Type: boolean
Description: Disabled the entire resource pool

Parameter: generateDNSZone
Type: enum
Description: Specify which DNS zones should be written

5.2.421 Role: Entity

parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: addServices
Type: boolean
Description: Add services to nodes which belong to this node. Be careful setting this to false.

Parameter: fspartAssociations
Type: list of FSPartAssociation
Description: Provisioning associations linked to this role

5.2.422 Route: Entity

parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: destination
Type: IP
Description: The destination network or destination host.

Parameter: gateway
Type: IP
Description: Gateway

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Parameter: netmask
Type: IP
Description: The netmask for the destination

Parameter: flags
Type: string
Description: Flags

Parameter: metric
Type: unsigned integer
Description: The ‘distance’ to the target (usually counted in hops)

Parameter: ref
Type: unsigned integer
Description: Number of references to this route

Parameter: use
Type: unsigned integer
Description: Number of lookups for the route

Parameter: interface
Type: string
Description: none

5.2.423  ScaleAdvancedSettings: Entity
parent: Entity

Parameter: debug2
Type: boolean
Description: Print very low level debug messages to the log

Parameter: maxThreads
Type: unsigned integer
Description: Maximum number of threads for sequential operations

Parameter: powerOperationTimeout
Type: unsigned integer
Description: Power Operation Timeout (in seconds)

Parameter: connectionRetryInterval
Type: unsigned integer
Description: Connection to CMDaemon retry interval (in seconds)

Parameter: logFile
Type: string
Description: Path to cm-scale logs file

Parameter: pinQueues
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Parameter: mixLocations
Type: boolean
Description: Allow to map workload to different locations (for example, cloud and local)

Parameter: failedNodeIsHealthy
Type: boolean
Description: Do not start a new node instead of a failed one

Parameter: azureDiskAccountNodes
Type: unsigned integer
Description: Number of nodes that can share the same Azure disk account

Parameter: azureDiskImageName
Type: string
Description: Image name for Azure disks

Parameter: azureDiskContainerName
Type: string
Description: Container name for Azure disks

Parameter: azureDiskAccountPrefix
Type: string
Description: Prefix for randomly generated Azure disk account names

Parameter: options
Type: list of strings
Description: Additional parameters that will be passed to cm-scale daemon

5.2.424 ScaleDynamicNodesProvider: ScaleResourceProvider
parent: ScaleResourceProvider

Parameter: templateNode
Type: reference to Node
Description: Template node

Parameter: nodeRange
Type: string
Description: Node range

Parameter: networkInterface
Type: string
Description: Which node network interface will be changed on cloning (incremented)

Parameter: startTemplateNode
Type: boolean

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Description: Should template node be started automatically

Parameter: stopTemplateNode
Type: boolean
Description: Should template node be stopped automatically

Parameter: removeNodes
Type: boolean
Description: Should nodes be removed from Bright Cluster Manager configuration upon the node termination

Parameter: leaveFailedNodes
Type: boolean
Description: Failed nodes will not be touched in order to allow administrator to investigate why they were failed

Parameter: neverTerminate
Type: unsigned integer
Description: Number of nodes that cm-scale powers off and allows to remain, instead of terminating

5.2.425 ScaleEngine: Entity

parent: Entity

Parameter: name
Type: string
Description: HPC workload engine name

Parameter: trackers
Type: list of ScaleTracker
Description: Workload trackers

Parameter: workloadsPerNode
Type: unsigned integer
Description: Number of workloads that can be scheduled to the same node at the same time

Parameter: priority
Type: unsigned integer
Description: Workload engine priority

Parameter: ageFactor
Type: float
Description: Fairsharing coefficient for workload age significance

Parameter: engineFactor
Type: float
Description: Fairsharing coefficient for engine priority significance

Parameter: externalPriorityFactor
5.2 Entities

Type: float
Description: Fairsharing coefficient for external priority significance

Parameter: maxNodes
Type: unsigned integer
Description: Allowed running nodes limit

Parameter: notes
Type: string
Description: Engine related notes

Parameter: options
Type: list of strings
Description: Additional engine related parameters that will be passed to cm-scale daemon

5.2.426 ScaleGenericEngine: ScaleEngine
parent: ScaleEngine

5.2.427 ScaleGenericTracker: ScaleTracker
parent: ScaleTracker

Parameter: handler
Type: string
Description: Full path to python module that produces workload entities for cm-scale

5.2.428 ScaleHpcEngine: ScaleEngine
parent: ScaleEngine

Parameter: wlmCluster
Type: reference to WlmCluster
Description: WLM cluster that will be used by cm-scale

5.2.429 ScaleHpcQueueTracker: ScaleTracker
parent: ScaleTracker

Parameter: queue
Type: string
Description: Tracking job queue

5.2.430 ScaleKubeEngine: ScaleEngine
parent: ScaleEngine

Parameter: cluster
Type: reference to KubeCluster
Description: Kubernetes cluster which pods will be tracked

Parameter: cpuBusyThreshold
Type: float
Description: CPU load % that defines if node is too busy for new pods

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Parameter: memoryBusyThreshold
Type: float
Description: Memory load % that defines if node is too busy for new pods

5.2.431 ScaleKubeNamespaceTracker: ScaleTracker
parent: ScaleTracker

Parameter: controllerNamespace
Type: string
Description: Tracking Kubernetes namespace name

Parameter: object
Type: enum
Description: Type of Kubernetes objects to track

5.2.432 ScalePendingWorkload: Entity
parent: Entity

Parameter: workloadId
Type: string
Description: Workload that waits for nodes

Parameter: nodes
Type: list of references to Node
Description: List of managed nodes

5.2.433 ScaleResourceProvider: Entity
parent: Entity

Parameter: name
Type: string
Description: Resource provider name

Parameter: enabled
Type: boolean
Description: Resource provider is currently enabled

Parameter: priority
Type: unsigned integer
Description: Node provider priority

Parameter: wholeTime
Type: unsigned integer
Description: A compute node running time (in minutes) before it is stopped if no workload requires it

Parameter: stoppingAllowancePeriod
Type: unsigned integer
5.2 Entities

**Description:** A time (in minutes) just before the end of the wholeTime period prior to which all power off (or terminate) operations must be started

**Parameter:** keepRunning
**Type:** string
**Description:** Nodes that should not be stopped or terminated even if they are unused (range format)

**Parameter:** extraNodes
**Type:** list of strings
**Description:** Nodes that should be started before regular nodes

**Parameter:** extraNodeIdleTime
**Type:** unsigned integer
**Description:** Time, in seconds, that extra nodes can remain unused (after this time they are stopped)

**Parameter:** extraNodeStart
**Type:** boolean
**Description:** Automatically start extra node before the first compute node is started

**Parameter:** extraNodeStop
**Type:** boolean
**Description:** Automatically stop extra node after the last compute node stops

**Parameter:** allocationProlog
**Type:** string
**Description:** Script that is executed when a node is allocated to a workload

**Parameter:** allocationEpilog
**Type:** string
**Description:** Script that is executed when a node is deallocated

**Parameter:** allocationScriptsTimeout
**Type:** unsigned integer
**Description:** Allocation scripts timeout in seconds

**Parameter:** defaultResources
**Type:** list of strings
**Description:** List of default resources in format [name=value]

**Parameter:** options
**Type:** list of strings
**Description:** Additional resource provider related parameters that will be passed to cm-scale daemon

---

5.2.434 ScaleServerRole: Role

**parent:** Role

**Parameter:** engines
**Type:** list of ScaleEngine

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Description: Submode containing workload engines settings

Parameter: resourceProviders
Type: list of ScaleResourceProvider
Description: List of resource providers

Parameter: dryRun
Type: boolean
Description: Run in dry run mode

Parameter: debug
Type: boolean
Description: Print debug messages to the log

Parameter: runInterval
Type: unsigned integer
Description: Frequency of cm-scale decision making (in seconds)

Parameter: advancedSettings
Type: ScaleAdvancedSettings
Description: Submode containing advanced settings

5.2.435 ScaleStaticNodesProvider: ScaleResourceProvider
parent: ScaleResourceProvider

Parameter: nodes
Type: list of references to Node
Description: List of managed nodes

Parameter: nodegroups
Type: list of references to NodeGroup
Description: List of managed nodegroups

5.2.436 ScaleTracker: Entity
parent: Entity

Parameter: name
Type: string
Description: Tracker name

Parameter: enabled
Type: boolean
Description: Tracker is currently enabled or disabled

Parameter: assignCategory
Type: reference to Category
Description: Category that should be assigned to managed nodes
5.2 Entities

**Parameter:** primaryOverlays  
**Type:** list of references to ConfigurationOverlay  
**Description:** Configuration overlays that managed nodes are added to when they are required by workload

**Parameter:** allowedResourceProviders  
**Type:** list of strings  
**Description:** Only the specified resource providers will be used for a workload of this tracker (if empty than all allowed)

**Parameter:** queueLengthThreshold  
**Type:** unsigned integer  
**Description:** Number of pending workloads/jobs that triggers the nodes bursting

**Parameter:** ageThreshold  
**Type:** unsigned integer  
**Description:** Workload/job pending time threshold that triggers the nodes bursting for this workload (in seconds)

**Parameter:** workloadsPerNode  
**Type:** unsigned integer  
**Description:** Number of workloads that can be scheduled to the same node at the same time (0 means no limit)

**Parameter:** options  
**Type:** list of strings  
**Description:** Additional tracker related parameters

5.2.437 Semaphore: Entity  
**parent:** Entity

**Parameter:** refNodeUniqueKey  
**Type:** unsigned integer  
**Description:** Node

**Parameter:** semid  
**Type:** integer  
**Description:** Semaphore Set ID

**Parameter:** ipcperm  
**Type:** IPCPerm  
**Description:** IPC permissions

**Parameter:** nsems  
**Type:** unsigned integer  
**Description:** Number of semaphores in the set
5.2.438 Sensor: Entity

parent: Entity

Parameter: type
Type: enum
Description: Sensor type

Parameter: name
Type: string
Description: Sensor name

Parameter: prt
Type: unsigned integer
Description: Sensor port

5.2.439 Session: Entity

parent: Entity

Parameter: eventCounter
Type: unsigned integer
Description: none

Parameter: queuedEventSize
Type: unsigned integer
Description: none

Parameter: clientType
Type: unsigned integer
Description: none

Parameter: acknowledgedKeepAlive
Type: integer
Description: none

Parameter: nodeKey
Type: unsigned integer
Description: none

Parameter: remoteAddress
Type: IP
Description: none

Parameter: username
Type: string
Description: none

Parameter: group
Type: string
Description: none

5.2.440 SharedMemory: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: shmid
Type: integer
Description: Shared memory ID

Parameter: ipcperm
Type: IPCPerm
Description: IPC permissions

Parameter: size
Type: unsigned integer
Description: Size in bytes

Parameter: cpid
Type: integer
Description: Creator PID

Parameter: nattch
Type: integer
Description: Number of attaches

5.2.441 SlurmAccountingRole: Role
parent: Role

Parameter: dbdPort
Type: unsigned integer
Description: The port number that the Slurm Database Daemon (slurmdbd) listens to for work

Parameter: storageHost
Type: string
Description: Defines the name of the host the MySQL database is running where slurmdbd is going to store the data

Parameter: storagePort
Type: unsigned integer
Description: The port number that the Slurm Database Daemon (slurmdbd) communicates with the database

Parameter: storageLoc
Type: string
Description: The name of the database as the location where slurmd accounting records are written

Parameter: storageUser
Type: string
Description: Defines the name of the user to connect to the MySQL database with to store the job accounting data

Parameter: slurmWlmClusters
Type: list of references to SlurmWlmCluster
Description: List of Slurm clusters which can make use of this SlurmAccountingRole (slurmd)

5.2.442 SlurmCgroupsSettings: WlmCgroupsSettings
parent: WlmCgroupsSettings

Parameter: allowedDevicesFile
Type: string
Description: If ConstrainDevices is true then this file has to be used to declare the devices that need to be allowed by default for all the jobs

Parameter: taskAffinity
Type: boolean
Description: If true then set a default task affinity to bind each step task to a subset of the allocated cores using sched_setaffinity

Parameter: constrainCores
Type: boolean
Description: If true then constrain allowed cores to the subset of allocated resources

Parameter: constrainRAMSpace
Type: boolean
Description: If true then constrain the job’s RAM usage

Parameter: constrainSwapSpace
Type: boolean
Description: If true then constrain the job’s swap space usage

Parameter: constrainDevices
Type: boolean
Description: If true constrain the job’s allowed devices based on GRES allocated resources

Parameter: allowedRamSpace
Type: float
Description: Constrain the job cgroup RAM to this percentage of the allocated memory. The percentage supplied may be expressed as floating point number, e.g. 98.5. If the AllowedRAMSpace limit is exceeded, the job steps will be killed and a warning message will be written to standard error. Also see ConstrainRAMSpace. The default value is 100.

Parameter: allowedSwapSpace
5.2 Entities

**Parameter:** maxRAMPercent
**Type:** float
**Description:** Constrain the job cgroup swap space to this percentage of the allocated memory

**Parameter:** maxSwapPercent
**Type:** float
**Description:** Set an upper bound in percent of total RAM on the RAM constraint for a job

**Parameter:** minRAMSpace
**Type:** unsigned integer
**Description:** Set a lower bound (in MB) on the memory limits defined by AllowedRAMSpace and AllowedSwapSpace

**Parameter:** jobCgroupTemplate
**Type:** string
**Description:** Template for job cgroup path ($UID will be replaced to user ID, $JOBID will be replaced to job id)

**Parameter:** allowedKmemSpace
**Type:** unsigned integer
**Description:** Constrain the job cgroup kernel memory to this amount of the allocated memory (in bytes)

**Parameter:** constrainKmemSpace
**Type:** boolean
**Description:** Specifies if Slurm will constrain the job’s Kmem RAM usage

**Parameter:** minKmemSpace
**Type:** unsigned integer
**Description:** Set a lower bound (in MB) on the memory limits defined by AllowedKmemSpace

**Parameter:** maxKmemPercent
**Type:** float
**Description:** Set an upper bound in percent of total Kmem for a job

**Parameter:** memorySwappiness
**Type:** float
**Description:** Configure the kernel’s priority for swapping out anonymous pages (such as program data) verses file cache pages for the job cgroup (either ConstrainRAMSpace or ConstrainSwapSpace must be enabled in order for this parameter to be applied)

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5.2.443  SlurmClientRole: SlurmRole

parent: SlurmRole

Parameter: slots
Type: unsigned integer
Description: Number of slots available on this node/category (set 0 for default)

Parameter: queues
Type: list of references to SlurmJobQueue
Description: Queues this node/nodes in this category belongs to

Parameter: allQueues
Type: boolean
Description: When set, the role will provide all available queues (the queues property will then be ignored)

Parameter: nodeAddr
Type: string
Description: Name that a node should be referred to in establishing a communications path

Parameter: coresPerSocket
Type: unsigned integer
Description: Number of cores in a single physical processor socket

Parameter: features
Type: list of strings
Description: A list of arbitrary strings indicative of some characteristic associated with the node

Parameter: tcpPort
Type: unsigned integer
Description: The port number that the Slurm compute node daemon, slurmd, listens to for work on this particular node

Parameter: realMemory
Type: unsigned integer
Description: Size of real memory on the node in MegaBytes

Parameter: sockets
Type: unsigned integer
Description: Number of physical processor sockets/chips on the node

Parameter: threadsPerCore
Type: unsigned integer
Description: Number of logical threads in a single physical core

Parameter: tmpDisk
Type: unsigned integer
5.2 Entities

**Description:** Total size of temporary disk storage in TmpFS in MegaBytes

**Parameter:** weight
**Type:** integer
**Description:** The priority of the node for scheduling purposes

**Parameter:** boards
**Type:** unsigned integer
**Description:** Number of baseboards in nodes with a baseboard controller

**Parameter:** socketsPerBoard
**Type:** unsigned integer
**Description:** Number of physical processor sockets/chips on a baseboard

**Parameter:** powerSavingAllowed
**Type:** boolean
**Description:** Enable Slurm power saving for particular nodes, categories or configuration overlays

**Parameter:** reason
**Type:** string
**Description:** Identifies the reason for a node being in a particular state

**Parameter:** cpuSpecList
**Type:** list of strings
**Description:** A comma delimited list of Slurm abstract CPU IDs on which Slurm compute node daemons (slurmd, slurmstepd) will be confined

**Parameter:** coreSpecCount
**Type:** unsigned integer
**Description:** Number of cores in a single physical processor socket

**Parameter:** memSpecLimit
**Type:** unsigned integer
**Description:** Limit on combined real memory allocation for compute node daemons (slurmd, slurmstepd), in megabytes

**Parameter:** nodeCustomizations
**Type:** list of WlmNodeCustomizationEntry
**Description:** Slurm node custom properties

**Parameter:** genericResources
**Type:** list of SlurmGenericResource
**Description:** Slurm generic resources settings

5.2.444 SlurmGenericResource: Entity

**parent:** Entity

**Parameter:** alias
Type: string
Description: Unique alias name of the generic resource

Parameter: name
Type: string
Description: Name of the generic resource in Slurm

Parameter: count
Type: string
Description: Number of resources of this type available on this node (a suffix K, M, G, T or P may be used to multiply the number by 1024, 1048576, etc. respectively)

Parameter: cores
Type: string
Description: Specify the first thread CPU index numbers for the specific cores which can use this resource (e.g. ‘0,1,2,3’ or ‘0-3’)

Parameter: type
Type: string
Description: An arbitrary string identifying the type of device

Parameter: file
Type: string
Description: Fully qualified pathname of the device files associated with a resource (simple regular expressions are supported)

Parameter: consumable
Type: boolean
Description: Multiple jobs can use the same generic resource

Parameter: addToGresConfig
Type: boolean
Description: Add the generic resource entity to gres.conf

5.2.445 SlurmJobQueueAccessList: Entity

Parameter: wlmCluster
Type: reference to WlmCluster
Description: WLM cluster link to this job queue access list

Parameter: slurmJobQueue
Type: list of references to SlurmJobQueue
Description: List of queues that can be submitted to. If none is specified, this access list will submit to all job queues in the specified WlmCluster.
5.2.446  SlurmJobQueueStat: JobQueueStat
parent: JobQueueStat

Parameter: memory
Type: string
Description: Memory

Parameter: cpus
Type: unsigned integer
Description: CPUs

Parameter: total
Type: unsigned integer
Description: Total nodes

Parameter: usable
Type: unsigned integer
Description: Usable nodes

Parameter: free
Type: unsigned integer
Description: Free nodes

Parameter: limit
Type: unsigned integer
Description: Node limit

Parameter: timeLimit
Type: string
Description: Time limit

Parameter: other
Type: string
Description: Other traits

5.2.447  SlurmJobQueue: JobQueue
parent: JobQueue

Parameter: allocNodes
Type: string
Description: Comma separated list of nodes from which users can submit jobs in the partition

Parameter: defaultQueue
Type: boolean
Description: Set this as the default queue

Parameter: minNodes
Type: string
**Description**: Minimal nodes one job has to use

**Parameter**: maxNodes
**Type**: string
**Description**: Maximal nodes one job can use

**Parameter**: defaultTime
**Type**: string
**Description**: Default job runtime

**Parameter**: maxTime
**Type**: string
**Description**: Maximal job runtime

**Parameter**: priorityJobFactor
**Type**: integer
**Description**: Partition factor used by priority/multifactor plugin in calculating job priority

**Parameter**: priorityTier
**Type**: integer
**Description**: Jobs submitted to a partition with a higher priority tier value will be dispatched before pending jobs in partition with lower priority tier value

**Parameter**: hidden
**Type**: boolean
**Description**: Hide from all

**Parameter**: disableRoot
**Type**: boolean
**Description**: Do not allow root to run jobs

**Parameter**: rootOnly
**Type**: boolean
**Description**: Only allow root to run jobs

**Parameter**: allowGroups
**Type**: string
**Description**: Specify user groups which are allowed to run jobs

**Parameter**: overSubscribe
**Type**: string
**Description**: Controls the ability of the partition to execute more than one job at a time on each resource

**Parameter**: status
**Type**: string

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Description: Queue status

Parameter: totalNodes
Type: unsigned integer
Description: Total number of nodes part of this queue

Parameter: totalCPUs
Type: unsigned integer
Description: Total number of CPUs available to this queue

Parameter: alternate
Type: string
Description: Partition name of alternate partition to be used if the state of this partition is DRAIN or INACTIVE

Parameter: graceTime
Type: unsigned integer
Description: Specifies, in units of seconds, the preemption grace time to be extended to a job which has been selected for preemption

Parameter: defMemPerCPU
Type: string
Description: Default real memory size available per allocated CPU in MegaBytes

Parameter: maxMemPerCPU
Type: string
Description: Maximum real memory size available per allocated CPU in MegaBytes

Parameter: defMemPerNode
Type: string
Description: Default real memory size available per allocated node in MegaBytes

Parameter: maxMemPerNode
Type: string
Description: Maximum real memory size available per allocated node in MegaBytes

Parameter: preemptMode
Type: string
Description: Mechanism used to preempt jobs from this partition

Parameter: reqResv
Type: string
Description: Specifies users of this partition are required to designate a reservation when submitting a job

Parameter: SelectListTypeParameters
Type: string

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Description: Partition-specific resource allocation type

Parameter: allowAccounts
Type: string
Description: Specify accounts which are allowed to run jobs

Parameter: allowQos
Type: string
Description: Specify qos which are allowed to run jobs

Parameter: denyGroups
Type: string
Description: Specify groups which are denied to run jobs

Parameter: denyAccounts
Type: string
Description: Specify accounts which are denied to run jobs

Parameter: denyQos
Type: string
Description: Specify qos which are denied to run jobs

Parameter: lln
Type: boolean
Description: Schedule resources to jobs on the least loaded nodes

Parameter: maxCPUsPerNode
Type: string
Description: Maximum number of CPUs on any node available to all jobs from this partition

Parameter: tresBillingWeights
Type: list of strings
Description: Billing weights of each TRES type that will be used in calculating the usage of a job

Parameter: defMemPerGPU
Type: string
Description: Default real memory size available per allocated GPU in megabytes

Parameter: defCpuPerGPU
Type: string
Description: Default count of CPUs allocated per allocated GPU

Parameter: cpuBind
Type: string
Description: How tasks are bound to allocated CPUs

Parameter: qos
5.2 Entities

Type: string
Description: Used to extend the limits available to a QOS on a partition

Parameter: exclusiveUser
Type: boolean
Description: If set to YES then nodes will be exclusively allocated to users

Parameter: ordering
Type: integer
Description: Positioning of the jobqueue. Smaller values go first in the configuration file.

5.2.448 SlurmJob: Job
parent: Job

5.2.449 SlurmRole: Role
parent: Role

Parameter: wlmCluster
Type: reference to SlurmWlmCluster
Description: WLM cluster link to this WLM role

5.2.450 SlurmServerRole: SlurmRole
parent: SlurmRole

Parameter: scheduler
Type: string
Description: Scheduler to use in combination with slurm

Parameter: externalServer
Type: boolean
Description: Slurm server daemons are running on some external machine

5.2.451 SlurmSubmitRole: WlmSubmitRole
parent: WlmSubmitRole

Parameter: slurmJobQueueAccessList
Type: list of SlurmJobQueueAccessList
Description: List of slurm clusters and their associated queues that can be submitted to

5.2.452 SlurmWlmCluster: WlmCluster
parent: WlmCluster

Parameter: placeholders
Type: list of JobQueuePlaceholder
Description: Job queue node placeholders mode

Parameter: cgroups
Type: SlurmCgroupsSettings
Description: Submode containing Slurm related cgroups settings

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Parameter: powerSavingEnabled
Type: boolean
Description: Enable power saving options into slurm.conf

Parameter: suspendTime
Type: integer
Description: Nodes which remain idle for this number of seconds will be placed into power save mode by SuspendProgram

Parameter: suspendTimeout
Type: unsigned integer
Description: Maximum time permitted (in second) between when a node suspend request is issued and when the node shutdown

Parameter: resumeTimeout
Type: unsigned integer
Description: Maximum time permitted (in second) between when a node is resume request is issued and when the node is actually available for use

Parameter: suspendProgram
Type: string
Description: Program that will be executed when a node remains idle for an extended period of time

Parameter: resumeProgram
Type: string
Description: Program that will be executed when a suspended node is needed by a submitted jobs

Parameter: prologSlurmctld
Type: string
Description: Fully qualified pathname of a program for the slurmctld daemon to execute before granting a new job allocation (e.g. /usr/local/slurm/prolog_controller)

Parameter: prolog
Type: string
Description: Fully qualified pathname of a program for the slurmd to execute whenever it is asked to run a job step from a new job allocation (e.g. /usr/local/slurm/prolog)

Parameter: epilog
Type: string
Description: Fully qualified pathname of a script to execute as user root on every node when a user’s job completes (e.g. /usr/local/slurm/epilog)

Parameter: fastSchedule
Type: unsigned integer
Description: Controls how a node’s configuration specifications in slurm.conf are used

Parameter: gresTypes
5.2 Entities

**Type:** list of strings  
**Description:** A list of generic resources to be managed

**Parameter:** prefix  
**Type:** string  
**Description:** Slurm root installation directory

**Parameter:** etc  
**Type:** string  
**Description:** Slurm configuration files directory

**Parameter:** stateSave  
**Type:** string  
**Description:** Directory into which the Slurm controller saves its state

**Parameter:** version  
**Type:** string  
**Description:** Major Slurm version

**Parameter:** slurmConfFileTemplate  
**Type:** string  
**Description:** Template for slurm.conf file

**Parameter:** gresConfFileTemplate  
**Type:** string  
**Description:** Template for gres.conf file

**Parameter:** autoDetect  
**Type:** enum  
**Description:** Detect NVidia (nvml) or AMD (rsmi) GPUs automatically

**Parameter:** slurmdParameters  
**Type:** list of strings  
**Description:** Parameters specific to the Slurmd

**Parameter:** schedulerParameters  
**Type:** list of strings  
**Description:** Parameters specific to the scheduler. The interpretation of them varies by SchedulerType

5.2.453 SNMPSettings: Entity  
**parent:** Entity

**Parameter:** version  
**Type:** enum  
**Description:** Version of SNMP that should be use to read information from the device

**Parameter:** timeout  
**Type:** float

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Description: SNMP timeout, set to 0 for default

Parameter: `vlanTimeout`
Type: `float`
Description: SNMP timeout for VLAN calls, set to 0 for default

Parameter: `retries`
Type: `integer`
Description: SNMP retries, set to -1 for default

Parameter: `readString`
Type: `string`
Description: SNMP read-only community string

Parameter: `writeString`
Type: `string`
Description: SNMP read-write community string

Parameter: `securityName`
Type: `string`
Description: Security name

Parameter: `context`
Type: `string`
Description: `none`

Parameter: `authProtocol`
Type: `enum`
Description: Authentication protocol

Parameter: `privProtocol`
Type: `enum`
Description: Privacy protocol

Parameter: `authKey`
Type: `string`
Description: Authentication key

Parameter: `privKey`
Type: `string`
Description: Privacy key

Parameter: `securityLevel`
Type: `enum`
Description: Security level

Parameter: `filename`
5.2 Entities

**Type:** string
**Description:** Filename for SNMP testing

### 5.2.454 SnmpTrapRole: Role
**parent:** Role

**Parameter:** event
**Type:** boolean
**Description:** Enable events

**Parameter:** mail
**Type:** boolean
**Description:** Enable mail

**Parameter:** recipients
**Type:** list of strings
**Description:** Recipients

**Parameter:** allAdministrators
**Type:** boolean
**Description:** Also send e-mail to all administrators as defined in partition

**Parameter:** access
**Type:** string
**Description:** Access string

**Parameter:** server
**Type:** string
**Description:** The SNMP server

**Parameter:** sender
**Type:** string
**Description:** The sender of the e-mail

**Parameter:** arguments
**Type:** list of strings
**Description:** Additional script arguments

**Parameter:** alternativeScript
**Type:** string
**Description:** Alternative script

### 5.2.455 SoftwareImageFileSelection: Entity
**parent:** Entity

**Parameter:** name
**Type:** string
Description: Name

Parameter: patterns
Type: list of strings
Description: Patterns to be included

Parameter: watch
Type: boolean
Description: Watch files with inotify

5.2.456 SoftwareImageProxy: Entity
parent: Entity

Parameter: parentSoftwareImage
Type: reference to SoftwareImage
Description: Parent software image

Parameter: revisionID
Type: integer
Description: Revision ID

5.2.457 SoftwareImageRevisionInfo: Entity
parent: Entity

Parameter: image
Type: reference to SoftwareImage or None
Description: none

Parameter: revisionID
Type: integer
Description: Revision ID

Parameter: creationTime
Type: timestamp
Description: Revision creation time

Parameter: removalTime
Type: timestamp
Description: Revision removal time

Parameter: description
Type: string
Description: Revision Description

5.2.458 SoftwareImage: Entity
parent: Entity

Parameter: name
Type: string
5.2 Entities

Parameter: path
Type: string
Description: Base directory of the image

Parameter: originalImage
Type: unsigned integer
Description: Image from which this one will be cloned

Parameter: fileOperationInProgress
Type: boolean
Description: none

Parameter: kernelVersion
Type: string
Description: Kernel version used

Parameter: kernelParameters
Type: string
Description: Kernel parameters passed to the kernel at boot time

Parameter: kernelOutputConsole
Type: string
Description: Kernel output console used at boot time

Parameter: creationTime
Type: timestamp
Description: Creation time

Parameter: modules
Type: list of KernelModule
Description: Manage kernel modules loaded in this image

Parameter: enableSOL
Type: boolean
Description: Enable Serial console Over LAN

Parameter: SOLPort
Type: string
Description: Serial port to use for SOL, usually ttyS0 or ttyS1

Parameter: SOLSpeed
Type: string
Description: Baud rate to use for SOL

Parameter: SOLFlowControl
Type: boolean
Description: Enable to use hardware flow control for SOL

Parameter: notes
Type: string
Description: Administrator notes

Parameter: fspart
Type: reference to FSPart or None
Description: Internal pointer to the FSPart associated with this image

Parameter: bootfspart
Type: reference to FSPart or None
Description: Internal pointer to the FSPart associated with the boot directory of this image

Parameter: revisionDescription
Type: string
Description: none

Parameter: revisionID
Type: integer
Description: none

Parameter: parentSoftwareImage
Type: reference to SoftwareImage or None
Description: none

Parameter: revisionHistory
Type: list of SoftwareImageRevisionInfo
Description: none

5.2.459 StandaloneMonitoredEntity: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: type
Type: string
Description: Optional type in case name matches an other entity

Parameter: data
Type: string
Description: Data that will be passed to the script environment

Parameter: notes
Type: string
5.2.460 StaticRoute: Entity

parent: Entity

Parameter: name
Type: string
Description: Generally a unique combination of gateway ip and netmaskbits

Parameter: ip
Type: IP
Description: Destination IP

Parameter: gateway
Type: IP
Description: Gateway IP address

Parameter: netmaskBits
Type: unsigned integer
Description: Destination netmask bits

Parameter: network
Type: reference to Network
Description: Destination network the interface is connected to

Parameter: networkDeviceName
Type: string
Description: Name of network device

Parameter: notes
Type: string
Description: Administrator notes

5.2.461 StatusCollectorSubSystemInfo: StatusSubSystemInfo

parent: StatusSubSystemInfo

Parameter: nodes
Type: unsigned integer
Description: none

Parameter: updates
Type: unsigned integer
Description: none

Parameter: merges
Type: unsigned integer
Description: none
5.2.462 StatusControllerSubSystemInfo: StatusSubSystemInfo

parent: StatusSubSystemInfo

Parameter: updates
Type: unsigned integer
Description: none

Parameter: reports
Type: unsigned integer
Description: none

Parameter: nodes
Type: unsigned integer
Description: none

Parameter: icmpPingCount
Type: unsigned integer
Description: none

Parameter: checkUrlCount
Type: unsigned integer
Description: none

Parameter: customScriptCount
Type: unsigned integer
Description: none

Parameter: customFunctionCount
Type: unsigned integer
Description: none

5.2.463 StatusManagerSubSystemInfo: StatusSubSystemInfo

parent: StatusSubSystemInfo

Parameter: nodes
Type: unsigned integer
Description: none

Parameter: events
Type: unsigned integer
Description: none

5.2.464 StatusRuleSubSystemInfo: StatusSubSystemInfo

parent: StatusSubSystemInfo

Parameter: rules
Type: unsigned integer
5.2 Entities

Parameter: updates
Type: unsigned integer
Description: none

Parameter: checks
Type: unsigned integer
Description: none

5.2.465 StatusSubSystemInfo: SubSystemInfo
parent: SubSystemInfo

Parameter: stopped
Type: boolean
Description: Stopped

Parameter: suspended
Type: boolean
Description: Suspended

5.2.466 StatusTimeoutSubSystemInfo: StatusSubSystemInfo
parent: StatusSubSystemInfo

Parameter: active
Type: unsigned integer
Description: none

Parameter: registered
Type: unsigned integer
Description: none

Parameter: handled
Type: unsigned integer
Description: none

5.2.467 StatusTransitionSubSystemInfo: StatusSubSystemInfo
parent: StatusSubSystemInfo

Parameter: handled
Type: unsigned integer
Description: none

Parameter: transitions
Type: list of unsigned numbers
Description: Transition matrices: from -> to
**5.2.468 StorageNodePolicy: Entity**

**parent:** Entity

**Parameter:** name  
*Type: string*  
*Description: Name*

**Parameter:** exportedDirectories  
*Type: list of strings*  
*Description: Exported directories*

**Parameter:** minStorageVolumeSize  
*Type: unsigned integer*  
*Description: Minimal size of storage volume*

**Parameter:** defaultJobOutputSize  
*Type: unsigned integer*  
*Description: Default size of job output data*

**Parameter:** storageVolumeFilesystem  
*Type: string*  
*Description: Filesystem type of storage volume*

**Parameter:** shareStorageVolumeBetweenJobs  
*Type: boolean*  
*Description: Share storage volumes between jobs*

**Parameter:** scalingUpFactor  
*Type: float*  
*Description: Scaling up factor*

**Parameter:** storageNodeNamePrefix  
*Type: string*  
*Description: Storage node name prefix*

**Parameter:** storagePrototype  
*Type: reference to CloudNode*  
*Description: Template node used for instantiating cloud storage nodes*

**Parameter:** maxStorageNodeCount  
*Type: unsigned integer*  
*Description: Maximum number of storage nodes*

**Parameter:** maxJobsPerNode  
*Type: unsigned integer*  
*Description: Maximum number of jobs that can be run on a single storage node simultaneously*
5.2 Entities

**Parameter:** storageNodeIdleTimeLimit
**Type:** unsigned integer
**Description:** After that timeout storage node will be shut down

**Parameter:** terminateStorageNodes
**Type:** boolean
**Description:** Terminate storage nodes instead of powering them off

**Parameter:** cloudOperationTimeout
**Type:** unsigned integer
**Description:** Timeout for various cloud job operations

**Parameter:** maxDownloadTime
**Type:** unsigned integer
**Description:** Maximum time job results data transfer can take

**Parameter:** maxUploadTime
**Type:** unsigned integer
**Description:** Maximum time job input data transfer can take

**Parameter:** intermediateStorage
**Type:** CMJobIntermediateStorage
**Description:** Place to store data to be accessible from storage node

**Parameter:** restartNFSServer
**Type:** boolean
**Description:** Restarts the NFS server on the storage node before umounting.

**Parameter:** extraOptions
**Type:** list of strings
**Description:** Extra options for jobs

5.2.469 **StorageRole: Role**
parent: Role

**Parameter:** nfsThreads
**Type:** unsigned integer
**Description:** Number of nfs threads (0 for don’t touch the current config file value)

**Parameter:** disableNFS1
**Type:** boolean
**Description:** Disable NFS1, NFS threads needs to bet set

**Parameter:** disableNFS2
**Type:** boolean
**Description:** Disable NFS2, NFS threads needs to bet set

**Parameter:** disableNFS3

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Type: boolean
Description: Disable NFS3, NFS threads needs to be set

Parameter: disableNFS4
Type: boolean
Description: Disable NFS4, NFS threads needs to be set

Parameter: nfs4grace
Type: unsigned integer
Description: NFS4 grace period (0 for don’t touch the current config file value)

Parameter: statdPort
Type: unsigned integer
Description: Stat daemon port (0 for don’t touch the current config file value)

Parameter: statdOutgoingPort
Type: unsigned integer
Description: Stat daemon outgoing port (0 for don’t touch the current config file value)

Parameter: mountdPort
Type: unsigned integer
Description: Mount daemon port (0 for don’t touch the current config file value)

Parameter: rquotadPort
Type: unsigned integer
Description: Rquota daemon port (0 for don’t touch the current config file value)

Parameter: lockdTcpPort
Type: unsigned integer
Description: Lock daemon TCP port (0 for don’t touch the current config file value)

Parameter: lockdUdpPort
Type: unsigned integer
Description: Lock daemon UDP port (0 for don’t touch the current config file value)

Parameter: rdmaPort
Type: unsigned integer
Description: RDMA port (0 for don’t touch the current config file value)

5.2.470 StringListObject: Entity
parent: Entity

Parameter: list
Type: list of strings
Description: List
5.2 Entities

5.2.471 SubnetManagerRole: Role
parent: Role

Parameter: interconnect
Type: enum
Description: Type of interconnect

Parameter: ibl2mtu
Type: enum
Description: IB L2 MTU Value

5.2.472 SubSystemInfo: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: name
Type: string
Description: Name

Parameter: timestamp
Type: timestamp
Description: Time

5.2.473 SwitchPort: Entity
parent: Entity

Parameter: networkSwitch
Type: reference to Switch
Description: Switch

Parameter: prt
Type: unsigned integer
Description: Port number on the switch

5.2.474 Switch: Device
parent: Device

Parameter: ip
Type: IP
Description: IP address

Parameter: network
Type: reference to Network or None
Description: Network to which this switch is connected

Parameter: ports

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Type: integer
Description: Number of ports

Parameter: model
Type: string
Description: The switch model

Parameter: snmpSettings
Type: SNMPSettings or None
Description: Configure the cluster wide SNMP settings

Parameter: members
Type: list of references to Switch
Description: List of switches belonging to this stack

Parameter: controlScript
Type: string
Description: Custom control script that provides switch functionality

Parameter: controlScriptTimeout
Type: unsigned integer
Description: Control script timeout

Parameter: priority
Type: unsigned integer
Description: Devices on multiple switches will be listed under the switch with the largest priority

5.2.475 SyncInfo: Entity
parent: Entity

Parameter: node
Type: reference to Node
Description: none

Parameter: provisioningNode
Type: reference to Node
Description: none

Parameter: fspart
Type: reference to FSPart
Description: none

Parameter: mode
Type: enum
Description: none

Parameter: type
Type: enum
Parameter: dryRun
Type: boolean
Description: none

Parameter: startTime
Type: timestamp
Description: none

Parameter: endTime
Type: timestamp
Description: none

Parameter: exitCode
Type: integer
Description: none

Parameter: signal
Type: integer
Description: none

Parameter: numberOfFiles
Type: unsigned integer
Description: The count of all 'files' (in the generic sense), which includes directories, symlinks, etc.

Parameter: numberOfTransferredFiles
Type: unsigned integer
Description: The count of normal files that were updated via rsyncâ€™s delta-transfer algorithm, which does not include created dirs, symlinks, etc.

Parameter: numberOfCreatedFiles
Type: unsigned integer
Description: The count of normal files that were created.

Parameter: numberOfDeletedFiles
Type: unsigned integer
Description: The count of normal files that were deleted.

Parameter: totalFileSize
Type: unsigned integer
Description: The total sum of all file sizes in the transfer. This does not count any size for directories or special files, but does include the size of symlinks.

Parameter: totalTransferredFileSize
Type: unsigned integer
Description: The total sum of all files sizes for just the transferred files.

Parameter: literalData
Type: unsigned integer
Description: How much unmatched file-update data we had to send to the receiver for it to recreate the updated files.

Parameter: matchedData
Type: unsigned integer
Description: How much data the receiver got locally when recreating the updated files.

Parameter: fileListSize
Type: unsigned integer
Description: How big the file-list data was when the sender sent it to the receiver. This is smaller than the in-memory size for the file list due to some compressing of duplicated data when rsync sends the list.

Parameter: fileListGenerationTime
Type: float
Description: The number of seconds that the sender spent creating the file list. This requires a modern rsync on the sending side for this to be present.

Parameter: fileListTransferTime
Type: float
Description: The number of seconds that the sender spent sending the file list to the receiver.

Parameter: totalSent
Type: unsigned integer
Description: The count of all the bytes that rsync sent from the client side to the server side.

Parameter: totalReceived
Type: unsigned integer
Description: The count of all non-message bytes that rsync received by the client side from the server side. 'Non-message' bytes means that we don’t count the bytes for a verbose message that the server sent to us, which makes the stats more consistent.

Parameter: transferSpeed
Type: float
Description: Transfer speed

Parameter: speedup
Type: float
Description: Speedup

5.2.476 SyncSource: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
5.2 Entities

Description: Node

Parameter: fs/part
Type: reference to FSPart
Description: none

Parameter: priority
Type: unsigned integer
Description: none

5.2.477 SyncTarget: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: fs/part
Type: reference to FSPart
Description: none

Parameter: target
Type: string
Description: none

Parameter: prefix
Type: string
Description: none

Parameter: excludeList
Type: string
Description: none

Parameter: root
Type: boolean
Description: none

Parameter: priority
Type: unsigned integer
Description: none

5.2.478 SysInfoCollector: Entity
parent: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Device

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Parameter: processors
Type: list of Processor
Description: none

Parameter: disks
Type: list of DiskInfo
Description: none

Parameter: gpus
Type: list of GPUInfo
Description: none

Parameter: fpgas
Type: list of FPGAInfo
Description: none

Parameter: memory
Type: list of MemoryInfo
Description: none

Parameter: biosVersion
Type: string
Description: none

Parameter: biosVendor
Type: string
Description: none

Parameter: biosDate
Type: string
Description: none

Parameter: motherboardManufacturer
Type: string
Description: none

Parameter: motherboardName
Type: string
Description: none

Parameter: memoryTotal
Type: unsigned integer
Description: none

Parameter: memorySwap
Type: unsigned integer
Description: none

Parameter: diskCount
Type: unsigned integer
Description: none

Parameter: diskTotalSpace
Type: unsigned integer
Description: none

Parameter: osName
Type: string
Description: none

Parameter: osVersion
Type: string
Description: none

Parameter: osFlavor
Type: string
Description: none

Parameter: vendorTag
Type: string
Description: none

Parameter: systemName
Type: string
Description: none

Parameter: systemManufacturer
Type: string
Description: none

Parameter: mountPoints
Type: list of FSMount
Description: none

Parameter: nics
Type: list of strings
Description: none

Parameter: ibGUIDs
Type: list of strings
Description: none

Parameter: bootIf

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Type: string
Description: none

Parameter: partitions
Type: list of strings
Description: none

Parameter: interconnects
Type: list of strings
Description: none

Parameter: raidControllers
Type: list of strings
Description: none

Parameter: virtualCluster
Type: boolean
Description: none

Parameter: clusterRandomNumber
Type: unsigned integer
Description: none

Parameter: updateCount
Type: unsigned integer
Description: none

5.2.479 TimeZoneSettings: Entity
parent: Entity

Parameter: timeZone
Type: string
Description: Time zone

Parameter: biosUTC
Type: boolean
Description: Store BIOS time in UTC

5.2.480 UGECgroupsSettings: WlmCgroupsSettings
parent: WlmCgroupsSettings

Parameter: enabled
Type: boolean
Description: If true then settings are configured

Parameter: cpuset
Type: boolean
### 5.2 Entities

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>freezer</td>
<td>boolean</td>
<td>If true then the whole job is frozen by the kernel</td>
</tr>
<tr>
<td>freezePeTasks</td>
<td>boolean</td>
<td>If false then slave tasks are not put in the freezer, otherwise all slave tasks are frozen</td>
</tr>
<tr>
<td>killing</td>
<td>boolean</td>
<td>If true then UGE signals all processes forked/stared by the job until all of them are killed</td>
</tr>
<tr>
<td>forcedNuma</td>
<td>boolean</td>
<td>If true then on NUMA machines only local memory is allowed to be used when the job requested</td>
</tr>
<tr>
<td>vmemLimit</td>
<td>boolean</td>
<td>Specifies if virtual memory can be limited with cgroups (h_vmem_limit)</td>
</tr>
<tr>
<td>memFreeHard</td>
<td>boolean</td>
<td>If true then the job does not use more main memory than required</td>
</tr>
<tr>
<td>memFreeSoft</td>
<td>boolean</td>
<td>If true (and hard memory limit is turned off) then the requested memory with m_mem_free soft</td>
</tr>
<tr>
<td>minMemoryLimit</td>
<td>string</td>
<td>A host based minimum memory limit, in bytes or values like 10M, 1G (min_memory_limit)</td>
</tr>
<tr>
<td>jobCgroupTemplate</td>
<td>string</td>
<td>Template for job cgroup path ($JOBID will be replaced to job id, $TASKID to array task id)</td>
</tr>
<tr>
<td>options</td>
<td>list of strings</td>
<td>Additional UGE cgroup options</td>
</tr>
<tr>
<td>devices</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Type: list of strings
Description: Configurations for cgroup devices

5.2.481 UGEClientRole: UGERole
parent: UGERole

Parameter: execHost
Type: boolean
Description: Specifies if host is allowed to run Grid Engine jobs

Parameter: adminHost
Type: boolean
Description: Specifies if host is administrative one

Parameter: slots
Type: string
Description: Number of slots available on this node/category

Parameter: queues
Type: list of references to UGEJobQueue
Description: Queues this node/nodes in this category belongs to

Parameter: allQueues
Type: boolean
Description: When set, the role will provide all available queues. (The queues property will then be ignored.)

Parameter: gpus
Type: unsigned integer
Description: Number of gpus

Parameter: gpuDevices
Type: list of strings
Description: Custom gpu RSMAP

Parameter: micDevices
Type: list of strings
Description: Custom phi RSMAP

Parameter: cgroups
Type: UGEcgroupsSettings
Description: Submode containing UGE related cgroups settings

Parameter: nodeCustomizations
Type: list of WlmNodeCustomizationEntry
Description: Grid Engine node custom properties

Parameter: prolog
5.2 Entities

Type: string
Description: Path to prolog script that is configured at local level (e.g. root@/cm/local/apps/cmd/scripts/prolog)

Parameter: epilog
Type: string
Description: Path to epilog script that is configured at global level

5.2.482 UGEJobQueueStat: GridEngineJobQueueStat
parent: GridEngineJobQueueStat

5.2.483 UGEJobQueue: GridEngineJobQueue
parent: GridEngineJobQueue

Parameter: pelist
Type: list of strings
Description: Parallel environments associated with queue

5.2.484 UGEJob: GridEngineJob
parent: GridEngineJob

5.2.485 UGEParallelEnvironment: GridEngineParallelEnvironment
parent: GridEngineParallelEnvironment

Parameter: daemonForksSlaves
Type: boolean
Description: Defines if every task of a tightly integrated parallel job gets started individually

Parameter: masterForksSlaves
Type: boolean
Description: Indicates if limits set for the master task are multiplied by the number of slots granted on the host

5.2.486 UGERole: Role
parent: Role

Parameter: wlmCluster
Type: reference to UGEWlmCluster
Description: WLM cluster link to this WLM role

5.2.487 UGEServerRole: UGERole
parent: UGERole

Parameter: externalServer
Type: boolean
Description: Grid Engine server daemon is running on some external machine

Parameter: prolog
Type: string
Description: Path to prolog script that is configured at global level

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Parameter: epilog
Type: string
Description: Path to epilog script that is configured at global level

5.2.488 UGESubmitRole: WlmSubmitRole
parent: WlmSubmitRole

Parameter: ugeWlmClusters
Type: list of references to UGEWlmCluster
Description: List of UGE clusters which the role belongs to

5.2.489 UGEWlmCluster: WlmCluster
parent: WlmCluster

Parameter: parallelEnvironments
Type: list of UGEParallelEnvironment
Description: UGE Parallel Environments

Parameter: cgroups
Type: UGEGroupsSettings
Description: Submode containing UGE related cgroups settings

Parameter: placebos
Type: list of JobQueuePlaceholder
Description: Job queue node placeholders mode

Parameter: prefix
Type: string
Description: UGE installation directory

Parameter: cell
Type: string
Description: UGE cell directory location

Parameter: version
Type: string
Description: Major UGE version

5.2.490 UnmanagedNodeConfiguration: Entity
parent: Entity

Parameter: name
Type: string
Description: Name

Parameter: description
Type: string
Description: description
5.2 Entities

Parameter: pxeConfigurationTemplate
Type: string
Description: PXE configuration template used to write out pxelinux.cfg

Parameter: grubConfigurationTemplate
Type: string
Description: Grub configuration template used to write out grub.cfg

Parameter: image
Type: reference to FSPart or None
Description: Image filesystem part used to boot nodes from

Parameter: pxelabel
Type: string
Description: PXE menu label to be used when this node boots

Parameter: keyValueSettings
Type: KeyValueSettings or None
Description: Key value settings used for all unmanaged nodes in this configuration unless otherwise specified

Parameter: bmcSettings
Type: BMCSettings or None
Description: Configure the baseboard management controller settings

Parameter: bootLoader
Type: enum
Description: Boot loader

Parameter: bootLoaderProtocol
Type: enum
Description: Boot loader protocol for retrieving initrd and vmlinuz

Parameter: bootLoaderFile
Type: string
Description: Alternative boot loader file

5.2.491 UnmanagedNode: Device
parent: Device

Parameter: unmanagedNodeConfiguration
Type: reference to UnmanagedNodeConfiguration
Description: The unmanaged node configuration used for this node

Parameter: ip
Type: IP
Description: Ip address

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Parameter:  network
Type:  reference to Network or None
Description:  Network to which this switch is connected

Parameter:  additionalHostnames
Type:  list of strings
Description:  List of additional hostnames that should resolve to the interfaces IP address

Parameter:  pxelabel
Type:  string
Description:  PXE menu label to be used when this node boots

Parameter:  bmcIp
Type:  IP
Description:  BMC ip address

Parameter:  bmcType
Type:  enum
Description:  The type of BMC interface available

Parameter:  bmcSettings
Type:  BMCSettings or None
Description:  Configure the baseboard management controller settings

Parameter:  biosSetup
Type:  string
Description:  BIOS setup

Parameter:  bootLoader
Type:  enum
Description:  Boot loader

Parameter:  bootLoaderProtocol
Type:  enum
Description:  Boot loader protocol for retrieving initrd and vmlinuz

Parameter:  bootLoaderFile
Type:  string
Description:  Alternative boot loader file

Parameter:  keyValueSettings
Type:  KeyValueSettings or None
Description:  Key value settings unique to this node

**5.2.492**  User: Entity
parent: Entity

Parameter:  name
Type: string
Description: User login (e.g. donald)

Parameter: ID
Type: string
Description: User ID number

Parameter: commonName
Type: string
Description: Full name (e.g. Donald Duck)

Parameter: surname
Type: string
Description: Surname (e.g. Duck)

Parameter: groupID
Type: string
Description: Base group of this user

Parameter: loginShell
Type: string
Description: Login shell

Parameter: homeDirectory
Type: string
Description: Home directory

Parameter: password
Type: string
Description: Password

Parameter: homeDirOperation
Type: boolean
Description: Set to true: to create or move home directory if needed

Parameter: shadowMin
Type: unsigned integer
Description: Minimum number of days required between password changes

Parameter: shadowMax
Type: unsigned integer
Description: Maximum number of days for which the user password remains valid.

Parameter: shadowWarning
Type: unsigned integer
Description: Number of days of advance warning given to the user before the user password expires

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Parameter: shadowInactive
Type: unsigned integer
Description: Number of days of inactivity allowed for the user

Parameter: shadowLastChange
Type: unsigned integer
Description: Number of days between January 1, 1970 and the day when the user password was last changed

Parameter: shadowExpire
Type: unsigned integer
Description: Date on which the user login will be disabled

Parameter: email
Type: string
Description: email

Parameter: profile
Type: string
Description: Profile for Authorization

Parameter: certSerialNumber
Type: integer
Description: Serial numer of certificate assigned to user

Parameter: projectManager
Type: ProjectManager or None
Description: Project manager

Parameter: notes
Type: string
Description: Administrator notes

Parameter: homePage
Type: string
Description: Home page

Parameter: information
Type: string
Description: Information added by CMDaemon

Parameter: writeSshProxyConfig
Type: boolean
Description: Write ssh proxy config

Parameter: extraFields
Type: list of strings
5.2 Entities

Description:  
none

Parameter:  extraValues
Type:  list of strings
Description:  
none

Parameter:  extraReadable
Type:  list of strings
Description:  
none

Parameter:  extraDescriptions
Type:  list of strings
Description:  
none

Parameter:  extraDefaults
Type:  list of strings
Description:  
none

5.2.493  Validation: Entity

parent:  Entity

Parameter:  code
Type:  unsigned integer
Description:  Code

Parameter:  field
Type:  string
Description:  Field

Parameter:  msg
Type:  string
Description:  Message

Parameter:  warning
Type:  integer
Description:  Warning

5.2.494  VersionInfo: Entity

parent:  Entity

Parameter:  refNodeUniqueKey
Type:  unsigned integer
Description:  Node

Parameter:  cmVersion
Type:  string
Description:  
none

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Parameter: cmdaemonVersion
Type: string
Description: none

Parameter: cmdaemonBuildIndex
Type: unsigned integer
Description: none

Parameter: cmdaemonBuildHash
Type: string
Description: none

Parameter: databaseVersion
Type: unsigned integer
Description: none

5.2.495 VMWareDisk: Entity
parent: Entity

Parameter: name
Type: string
Description: Name of the disk

Parameter: size
Type: unsigned integer
Description: Size of the drive

Parameter: thinProvisioned
Type: boolean
Description: If true, the disk will be created with thin provisioning

5.2.496 VMWareProvider: CloudProvider
parent: CloudProvider

Parameter: apiHost
Type: string
Description: Hostname or address of the vAPI server.

Parameter: apiUserName
Type: string
Description: Username for the vAPI server.

Parameter: apiPassword
Type: string
Description: Password for the vAPI server.

Parameter: apiCertificateVerificationEnabled
Type: boolean
5.2 Entities

Description: Verify server certificate

Parameter: vmwareResourcePool
Type: string
Description: Name of the VMWare resource pool in which to spawn VMs.

Parameter: internalNetId
Type: string
Description: ID of the cluster internal network.

Parameter: defaultOVFName
Type: string
Description: Name of the default OVF template to instantiate VMs from.

Parameter: marketplaceUsePolicy
Type: enum
Description: none

5.2.497 VMWareSettings: CloudSettings
parent: CloudSettings

Parameter: instanceId
Type: string
Description: Instance id in VMWare.

Parameter: ovfName
Type: string
Description: Name of the OVF template to instantiate the VM from.

Parameter: numCpus
Type: unsigned integer
Description: none

Parameter: memorySize
Type: unsigned integer
Description: Size of the nodes main memory

Parameter: disks
Type: list of VMWareDisk
Description: Definitions of storage devices of the VM.

5.2.498 WillChange: Entity
parent: Entity

Parameter: changeBaseType
Type: string
Description: Base type

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Parameter: key
Type: unsigned integer
Description: Key

Parameter: parameter
Type: string
Description: Parameter

Parameter: autoChange
Type: integer
Description: Auto change

### 5.2.499 WireguardInfo: Entity
default: Entity

Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: interface
Type: string
Description: Interface name

Parameter: publicKey
Type: string
Description: Public key

### 5.2.500 WlmCgroupsSettings: Entity
default: Entity

Parameter: mountPoint
Type: string
Description: Where cgroups is mounted

Parameter: autoMount
Type: boolean
Description: If true then workload manager tries to mount a subsystem if it is not mounted yet

### 5.2.501 WlmCluster: Entity

default: Entity

Parameter: name
Type: string
Description: Name

Parameter: moduleFileTemplate
Type: string
Description: Template content for system module file
Parameter: primaryServer
Type: reference to Node or None
Description: The WLM primary server (where the active WLM daemon will be running). This parameter has no effect in HA setup controlled by Bright.

Parameter: topologySwitches
Type: list of references to Switch
Description: List of switches that should be used to write the topology file

Parameter: network
Type: reference to Network or None
Description: Network that will be used to form FQDN node names

5.2.502 WlmNodeCustomizationEntry: Entity
parent: Entity

Parameter: key
Type: string
Description: Name of the key

Parameter: value
Type: string
Description: Value for the key

Parameter: enabled
Type: boolean
Description: Add the key/value to workload management node configuration or not

Parameter: notes
Type: string
Description: Administrator notes

5.2.503 WlmNodeResource: Entity
parent: Entity

Parameter: name
Type: string
Description: Resource name (Example: gpu)

Parameter: extraName
Type: string
Description: Additional name (example: tesla)

Parameter: amount
Type: unsigned integer
Description: Resource amount

Parameter: unit

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Type: boolean
Description: The unit the amount is expressed in

Parameter: nodeKeys
Type: list of unsigned numbers
Description: Node keys

Parameter: refWlmClusterUniqueKey
Type: unsigned integer
Description: WlmCluster

5.2.504 WlmSubmitRole: Role
parent: Role

5.3 JSON Examples

complete.sh
#!/bin/bash

URL=https://localhost:8081/json/
user=root
pass=secretrootpassword

echo "========== login ==========="
curl -c curl.cookiest.txt -i -k -X POST -d '{"service":"login", "username":"root", "password":"$pass"}' $URL; echo

echo "========== logout ==========

curl.sh
#!/bin/bash

URL=https://localhost:8081/json/

if [ -z "$1" ]; then
  read -p "pass: " -s $pass
else
  pass=$1
fi
5.3 JSON Examples

```
curl -c curl.cookiest.txt -i -k -X POST -d '{"service":"login", "username":"root", "password":"\$pass"}' $URL

# curl --cookie curl.cookiest.txt -i -k -X POST -d '{"service":"

cmsession","call":"getLastEvents","args":[0,256]}' $URL

curl --cookie curl.cookiest.txt -i -k -X POST -d '{"service":"cmmain","call":"getProfile"}' $URL

curl --cookie curl.cookiest.txt -i -k -X POST -d '{"service":"cmmain","call":"getSubjectName"}' $URL

```

```bash
devices.sh
#!/bin/bash
URL=https://localhost:8081/json/
if [ "$1" == "gzip" ]; then
    wget --certificate=$HOME/.cm/admin.pem --private-key=$HOME/.cm/admin.key --header='Accept-Encoding: gzip' --no-check-certificate --server-response -qO- $URL --post-data='{"service":"cmdevice","call":getDevices"}'
else
    wget --certificate=$HOME/.cm/admin.pem --private-key=$HOME/.cm/admin.key --no-check-certificate --server-response -qO- $URL --post-data='{"service":"cmdevice","call":getDevices"}'
fi
Tip: run as ./devices.sh | python -mjson.tool
```

```
loadone.sh
#!/bin/bash
URL=https://localhost:8081/json/
# not perfect but gets the job done
function jsonval {
    temp=`echo $json | sed 's/\\\\/\\/g' | sed 's/[{}]/g' | awk -v k="text" '{n=split($0,a,".");$a[1]="\"\"$k\"\"";
    for (i=1; i<=n; i++) print a[i];}' | sed 's/\"\="/\|/g' | sed 's/\[,\]/ /g' | sed 's/\"//g'
    grep -w $prop
    r=$(echo ${temp##*|} | tr -d: | tr -d
    | cut -d: -f2 | sort -n)
    echo $(echo $r | cut -d' '-'f1)
}
prop='uniqueKey'
node=master
json=`wget --certificate=$HOME/.cm/admin.pem --private-key=$HOME/.cm/admin.key 
--no-check-certificate --server-response -qO- $URL --post-data='{"service":"cmdevice",
"call":"getDevice","arg":"

node=$jsonval
if [ -z $nkey ]; then
    echo $json
    exit 1
fi
    echo "$node.uniqueKey = $nkey"
```

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Bright Cluster Manager JSON API

--no-check-certificate --server-response -qO- $URL --post-data='{"service":"cmmon","call":"getMonitoringMeasurable","name":"LoadOne"}"

mkey=$(jsonval)
echo "loadone.uniqueKey = $mkey"

now=$(date +%s)
day=$((now-86400))
echo "now is $now"
echo "day is $day"

cat <<EOF > /tmp/plot.json
{
  "service" : "cmmon",
  "call" : "plot",
  "request" : {
    "entities" : [$nkey],
    "measurables" : [$mkey],
    "intervals" : 25,
    "rangeStart" : $((day*1000)),
    "rangeEnd" : $((now*1000))
  }
}
EOF

EOF

wget --certificate=$HOME/.cm/admin.pem --private-key=$HOME/.cm/admin.key --no-check-certificate -qO- https://master:8081/json --post-file=/tmp/plot.json | python -mjson.tool

login.sh
#!/bin/bash
URL=https://localhost:8081/json/
user=$USER
pass=secretpassword

wget --keep-session-cookies --save-cookies cookie.txt --no-check-certificate --server-response -qO- $URL --post-data='{"service":"login","username":"$USER","password":"$pass"}';

rm cookie.txt

logout.sh
#!/bin/bash
URL=https://localhost:8081/json/

wget --load-cookies cookie.txt --no-check-certificate --server-response -qO- $URL --post-data='{"service":"logout"}';

node001.sh
#!/bin/bash
source url

if [ -z "$1" ]; then
    node=node001
else
    node=$1

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wget --certificate=$HOME/.cm/admin.pem --private-key=$HOME/.cm/admin.key \\ --no-check-certificate --server-response -q- URL --post-data='{"service":"cmdevice","call":"getDevice","arg":"$node"} | python -mjson.tool

basic_information.sh
#!/bin/bash
URL=https://localhost:8081/json/
wget --certificate=$HOME/.cm/admin.pem --private-key=$HOME/.cm/admin.key \\ --no-check-certificate --server-response -q- URL --post-data='{"service":"cmpart","call":"getBasicEntityInformation"'}

push_to_CMDaemon.sh
In the following example, the health check ManagedServicesOK, is pushed to CMDaemon with a FAIL value.

Example
[root@bright90 ~]# cat push_to_CMDaemon.sh
#!/bin/bash
URL='https://master:8081/monitoring/push/ManagedServicesOk?info=brol&class=Push/Single&healthcheck=yes'
value='FAIL'
curl --cert $HOME/.cm/admin.pem --key $HOME/.cm/admin.key -i -k -X POST -d "$value" $URL; echo

Its behavior can be verified by checking the latest value for ManagedServicesOK before and after the push_to_CMDaemon.sh script is run:

Example
[root@bright90 ~]# curl --cert ~/.cm/admin.pem --key ~/.cm/admin.key -k "https://master:8081/rest/v1/monitoring/latest?measurable=ManagedServicesOk&entity=bright90&indent=1" 
{
    "data": [
    {
        "age": 89.735,
        "entity": "bright90",
        "measurable": "ManagedServicesOk",
        "raw": 0.0,
        "time": 1586450030968,
        "value": "PASS"
    }
    ]
}
[root@bright90 ~]# ./push_to_CMDaemon.sh
HTTP/1.1 200 OK
Content-Length: 55
Content-Type: application/json

{  
    "values": {  
        "added": 1,  
}
"provided": 1
}

[root@bright90 ~]# curl --cert ~/.cm/admin.pem --key ~/.cm/admin.key -k "https://master:8081/rest/v1/monitoring/latest?measurable=ManagedServicesOK&entity=bright90&indent=1"
{
  "data": [
    {
      "age": 3.357,
      "entity": "bright90",
      "info": "brol",
      "measurable": "ManagedServicesOk",
      "raw": 2.0,
      "time": 1586450124437,
      "value": "FAIL"
    }
  ]
}

A metric version of the push, using the measurable push-test-02 might look like:

```
#!/bin/bash
value=$(date +%s)
curl --cert $HOME/.cm/admin.pem --key $HOME/.cm/admin.key -i -k -X POST -d "$value" $URL; echo
```

A collection can be pushed as follows: To initialize (once):

```
#!/bin/bash
URL='https://localhost:8081/monitoring/initialize'
curl --cert $HOME/.cm/admin.pem --key $HOME/.cm/admin.key -i -k -X POST -d '[{"metric":"push-collection-01","class":"Push/Collection"},{"metric":"push-collection-02","class":"Push/Collection"}]' $URL; echo
```

After initializing, sampling can be done with:

```
#!/bin/bash
URL='https://localhost:8081/monitoring/push'
curl --cert $HOME/.cm/admin.pem --key $HOME/.cm/admin.key -i -k -X POST -d '[{"metric":"push-collection-01","value":31},{"metric":"push-collection-02","value":32,"info":"Some message"}]' $URL; echo
```