Bright Cluster Manager 9.1

Developer Manual
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Preface

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.

- 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:

[Account] → 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**

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[alice@desktop ~]# python -c "import pythoncm"

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 many 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:
#!/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:

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')
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:
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:
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 node001interfaces
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.

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.

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.

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:

print(node001.get_latest_monitoring_data())

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

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
dump-monitoring-data.py entity_info.py power-parallel-status.py
add-collection.py events.py power-status.py
add-healthcheck.py execute.py print-all.py
add-metric.py free_port.py range-expander-test.py
add-node-group.py get-status.py remove-node-group.py
add-role.py health-overview.py sample-nov-checks.py
add-user.py instance_by_name.py sample-nov-parallel.py
all-nodes.py latest-counter-data.py select-devices.py
certificate-info.py latest-health-data.py service.py
clon node-group.py new-nodes.py service-status.py
clone-node.py open-close.py set-node-image.py
cm-job-analytics.py parallel-execute-async.py wait-for-image.py
create-certificate.py parallel-execute-check-status.py wait-for-up.py
create-ramdisk-task.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
INFO (25-May-2020 18:29:25) [cluster.py :207] Follow redirection to active head IP:
10.141.255.254
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
    ],
"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

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

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

**Example**

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

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
```

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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**

```bash
[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
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",
```
2.7 Prometheus Monitoring Data Producers

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

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

Example

```bash
[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.

2.8 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

```bash
[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
```
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.

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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

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

deft 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]

deft sample():
    msd_0 = {
        "metric": "lustre.free.space",
        "entity": "MSD.0",
        "value": 12345
    }
    msd_1 = {
        "metric": "lustre.free.space",
        "entity": "MSD.1",
        "value": 54321
    }
    return [msd_0, msd_1]

deft 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 567 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

```python
def settable_debug_environment:
    debug = 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 540.

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
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></td>
</tr>
</tbody>
</table>

...continues
### 3.3 CMDaemon Environment Variables

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>doQNeV1qksXr590</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>
<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>
<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_BMCOMMAND</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>&lt;name&gt;</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>&lt;name&gt;</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>&lt;name&gt;</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>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>CMD_INTERFACE_&lt;interface&gt;_BOND</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_BRIDGE</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_DHCP</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_GATEWAY</td>
<td></td>
</tr>
<tr>
<td>CMD_INTERFACE_&lt;interface&gt;_IP</td>
<td>10.141.0.5</td>
</tr>
</tbody>
</table>

where `<name>` takes these SLASH substitutions:

<table>
<thead>
<tr>
<th><code>&lt;name&gt;</code></th>
<th><code>example value</code></th>
</tr>
</thead>
<tbody>
<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>
</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_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</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...
  - ilo0, ilo1, ilo2...
  - 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

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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_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_ENDPOINT</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</td>
<td>base</td>
</tr>
<tr>
<td>CMD_PASSIVE_MASTER_IP</td>
<td>10.141.255.253</td>
</tr>
<tr>
<td>CMD_PDUS</td>
<td></td>
</tr>
<tr>
<td>CMD_PORT</td>
<td>8081</td>
</tr>
<tr>
<td>CMD_PORTS</td>
<td></td>
</tr>
<tr>
<td>CMD_POWER_CONTROL</td>
<td>custom</td>
</tr>
<tr>
<td>CMD_PROTOCOL</td>
<td>https</td>
</tr>
<tr>
<td>CMD_RACADM_PATH</td>
<td></td>
</tr>
<tr>
<td>CMD_RACK</td>
<td>rack01</td>
</tr>
<tr>
<td>CMD_RACK_HEIGHT</td>
<td>42</td>
</tr>
<tr>
<td>CMD_RACK_ROOM</td>
<td>serverroom</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_SCRIPTTIMEOUT</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_STRINGUSERID</td>
<td></td>
</tr>
</tbody>
</table>

...continues
<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>
CMDaemon REST API

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:
Figure 4.1: REST API Summary Tree

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
```
Appending /v1 to the URL gives the functionality available in the first version of the REST API.

**Example**

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

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

**Example**

```bash
[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**

```bash
[alice@bright91 ~]$ <curlauth>/rest/v1/status?indent=2
[
  {
    "hostname": "bright82",
    "status": "UP"
  },
  {
    "hostname": "node001",
    "status": "UP"
  },
  {
    "hostname": "node002",
    "status": "DOWN"
  }
]
```

The status can also be requested for a single device:

**Example**

```bash
[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"
```
4.2 Browsing The API

```
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/entity?name=node001&indent=1
{
  "entities": [
    {
      "key": 38654705666,
      "name": "node001",
      "type": "PhysicalNode"
    }
  ]
}
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/entity?type=node&indent=1
{
  "entities": [
    {
      "key": 38654705665,
      "name": "bright91",
      "type": "HeadNode"
    },
    {
      "key": 38654705666,
      "name": "node001",
      "type": "PhysicalNode"
    },
    {
      "key": 38654705667,
      "name": "node002",
      "type": "PhysicalNode"
    }
  ]
}
[alice@bright91 ~]$ <curlauth>/rest/v1/monitoring/entity?name=node001..node002&indent=1
{
  "entities": [
    {
      "key": 38654705666,
      "name": "node001",
      "type": "PhysicalNode"
    },
    {
      "key": 38654705667,
      "name": "node002",
      "type": "PhysicalNode"
    }
  ]
}
```

A regex matcher can be used to find entities based on a name match:

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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"
    },
    ...
  ]
}

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": "another measurable"
    }
  ]
}

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

**Example**

```
$ <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**

```
$ <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",
      ...
4.2 Browsing The API

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

Example

```
$ 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"
    },
    ...
typically hundreds more lines...
```

```
$ curlauth /rest/v1/monitoring/latest?entity=node001..node004&indent=1

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

```
$ curlauth /rest/v1/monitoring/latest?measurable=LoadOne&indent=1
```

```
{
  "data": [
    {
      "age": 114.099,
```

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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?entity=node001&measurable=LoadOne&indent=1"  
{  
"data": [  
{   
"age": 106.706,  
"entity": "node001",  
"measurable": "LoadOne",  
"raw": 0.0,  
"time": 1540476790390,  
"value": "0"  
}  
]  
}  
}

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

[alice@bright91 ~]$ curl http://<curlauth>/rest/v1/monitoring/dump?entity=default&measurable=CoresTotal&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": "CoresTotal",
      "raw": 1.0,
      "value": "1"
    },
    ...
typically thousands more lines...
}
Bright Cluster Manager JSON API

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/downloads/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 sync
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**:  
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**:  
hysteresisUp  
Type: unsigned integer  
Description: Delay before clock level is increased in milliseconds

**Parameter**:  
hysteresisDown  
Type: unsigned integer  
Description: Delay before clock level is decresed 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.

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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
Description: Image used to boot new nodes and keep /cm/shared up to date

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

Parameter: maxFSxInstanceCountPerUser
Type: unsigned integer
5.2 Entities

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

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

Parameter: managedDiskParameters
Type: AzureManagedDiskParameters

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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
Description: Subnet where ANF volumes will be created

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

Parameter: netAppName

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5.2 Entities

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

5.2.13 AzureProvider : CloudProvider
parent : CloudProvider
Parameter: subscriptionId
Type: string
Description: Azure Subscription ID.

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

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>clientSecret</td>
<td>string</td>
<td>Azure Client Secret.</td>
</tr>
<tr>
<td>tenantId</td>
<td>string</td>
<td>Tenant ID.</td>
</tr>
<tr>
<td>defaultLocation</td>
<td>reference to AzureLocation or None</td>
<td>Default location to start virtual machine in.</td>
</tr>
<tr>
<td>defaultVMSize</td>
<td>reference to AzureVMSize or None</td>
<td>Default cloud node VM size.</td>
</tr>
<tr>
<td>defaultDirectorVMSize</td>
<td>reference to AzureVMSize or None</td>
<td>Default cloud director VM size.</td>
</tr>
<tr>
<td>extensions</td>
<td>list of AzureExtension</td>
<td>List of extensions</td>
</tr>
<tr>
<td>defaultNodeInstallerImage</td>
<td>string</td>
<td>Default node-installer image, can be overridden in the OS disk.</td>
</tr>
<tr>
<td>marketplaceUsePolicy</td>
<td>enum</td>
<td>Preference towards using marketplace images</td>
</tr>
<tr>
<td>freeImageType</td>
<td>enum</td>
<td>What kind of image to use for cloud nodes within the license</td>
</tr>
</tbody>
</table>

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
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 the backup

5.2.17 BackupRole: Role
parent: Role
Parameter: directory
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

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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
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
5.2 Entities

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 BeeGFSCientRole: 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
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

5.2 Entities

**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

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>sessionCheckOnClose</td>
<td>Check for valid sessions on storage server when a file is closed</td>
</tr>
<tr>
<td>syncOnClose</td>
<td>Sync file content on close</td>
</tr>
<tr>
<td>targetOfflineTimeout</td>
<td>Timeout until all storage targets are considered offline when no target state updates can be fetched from management server</td>
</tr>
<tr>
<td>updateTargetStates</td>
<td>Interval for storage targets states check</td>
</tr>
<tr>
<td>enableXAttrs</td>
<td>Enable xattrs</td>
</tr>
<tr>
<td>enableACLs</td>
<td>Enable ACLs</td>
</tr>
<tr>
<td>fileCacheType</td>
<td>File read/write cache type</td>
</tr>
<tr>
<td>preferredMetaFile</td>
<td>Path to a file with preferred metadata servers</td>
</tr>
<tr>
<td>preferredStorageFile</td>
<td>Path to a file with preferred storage targets</td>
</tr>
<tr>
<td>remoteFSync</td>
<td>Should fsync be executed on server to flush cached file</td>
</tr>
<tr>
<td>useGlobalAppendLocks</td>
<td>Should files, opened in append mode, be protected by locks on local machine (false) or on servers (true)</td>
</tr>
<tr>
<td>useGlobalFileLocks</td>
<td></td>
</tr>
</tbody>
</table>
5.2 Entities

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
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

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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
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
5.2 Entities

Type: unsigned integer
Description: Quota update interval

Parameter: targetOfflineTimeout
Type: unsigned integer
Description: Timeout until targets 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

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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
5.2 Entities

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

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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
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 occurs

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
5.2 Entities

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
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
5.2 Entities

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
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
5.2 Entities

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

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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.

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 Entities

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
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

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

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

Parameter: fsexports
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

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>nodeInstallerDisk</td>
<td>boolean</td>
<td>The node has its own node installer disk</td>
</tr>
<tr>
<td>installBootRecord</td>
<td>boolean</td>
<td>Install boot record on local disk</td>
</tr>
<tr>
<td>managementNetwork</td>
<td>reference to Network or None</td>
<td>Determines what network should be used for management traffic. If not set, partition setting is used.</td>
</tr>
<tr>
<td>interactiveUser</td>
<td>enum</td>
<td>Allow user login on node</td>
</tr>
<tr>
<td>fspartAssociations</td>
<td>list of FSPartAssociation</td>
<td>None</td>
</tr>
<tr>
<td>dataNode</td>
<td>boolean</td>
<td>If enabled the node will never do a FULL install without explicit user confirmation</td>
</tr>
<tr>
<td>allowNetworkingRestart</td>
<td>boolean</td>
<td>Allow nodes to update ifcfg files and restart networking</td>
</tr>
<tr>
<td>excludeListManipulateScript</td>
<td>string</td>
<td>A user defined script that can be used to do custom last minute changes to the exclude lists used by cmdaemon to rsync</td>
</tr>
<tr>
<td>ioScheduler</td>
<td>string</td>
<td>The I/O scheduler for the disks</td>
</tr>
<tr>
<td>useExclusivelyFor</td>
<td>string</td>
<td>Use node exclusively for desired function: stop all other services</td>
</tr>
<tr>
<td>kernelVersion</td>
<td>string</td>
<td>Kernel version used</td>
</tr>
<tr>
<td>kernelParameters</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
5.2 Entities

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

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

Parameter: timeZoneSettings
Type: TimeZoneSettings or None
Description: Time zone

5.2.34 CephMDSRole : Role
parent : Role
Parameter: mdsBeaconInterval
Type: float
Description: The frequency (in seconds) of beacon messages sent to the monitor.

Parameter: mdsBeaconGrace
Type: float
Description: The interval without beacons before Ceph declares an MDS laggy (and possibly replace it).

Parameter: mdsTickInterval
Type: float
Description: How frequently the MDS performs internal periodic tasks.

Parameter: extraConfig

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Type: list of strings  
Description: Extra config parameters  

5.2.35 CephMGRRole: Role  
parent: Role  
Parameter: modulePath  
Type: string  
Description: Path to load modules from  

Parameter: dataPath  
Type: string  
Description: Path to load daemon data (such as keyring)  

Parameter: beaconPeriod  
Type: integer  
Description: How many seconds between mgr beacons to monitors  

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

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
5.2 Entities

**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

**parent**: Entity

**Parameter**: id

**Type**: unsigned integer

**Description**: Id

**Parameter**: name

**Type**: string

**Description**: Name

**Parameter**: size

**Type**: unsigned integer

**Description**: Number of replicas

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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  
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
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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
5.2 Entities

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

*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
5.2 Entities

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

Parameter: monitorPortV2
Type: unsigned integer
Description: Monitor daemon port (msg2)

Parameter: filestoreXattrUseOmap
Type: boolean
Description: filestore xattr use omap

Parameter: monAllowPoolDelete
Type: boolean
Description: mon allow pool delete

Parameter: monOsdfullRatio
Type: float
Description: mon osd full ratio

Parameter: monOsdfullRatio
Type: float
Description: mon osd nearfull ratio

Parameter: monMaxOsdf
Type: unsigned integer
Description: mon max osd

Parameter: osdPoolDefaultSize
Type: unsigned integer
Description: osd pool default size

Parameter: osdPoolDefaultMinSize
Type: unsigned integer
Description: osd pool default min size
Parameter: osdPoolDefaultPgNum
Type: unsigned integer
Description: osd pool default pg num

Parameter: osdPoolDefaultPgpNum
Type: unsigned integer
Description: osd pool default pgp num

Parameter: authClusterCephx
Type: boolean
Description: auth cluster required cephx

Parameter: authServiceCephx
Type: boolean
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
5.2 Entities

**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
**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
5.2 Entities

Parameter: locality
Type: string
Description: Locality

Parameter: organization
Type: string
Description: Organization

Parameter: organizationalUnit
Type: string
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 can not be used

Parameter: serialNumber
Type: integer
Description: Serial number

Parameter: remaining
Type: integer
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
5.2 Entities

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

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Type: boolean
Description: Group by job name

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

Parameter: groupByParentId
Type: boolean
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: pricePerGPUSecond
Type: float
Description: Price per GPU second

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

Parameter: pricePerSlotSecond
Type: float
Description: Price per slot second

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
class: 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:** 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: [|-]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
**5.2 Entities**

*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

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

Parameter: outputFiles
Type: list of strings
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
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Description: OS device path

Parameter: fsxInstanceId
Type: string
Description: none

Parameter: fsxInstanceUrl
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

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

**Parameter:** maxUploadTime  
**Type:** float  
**Description:** Time spent on jobs job results transfer and post-run activities

**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
        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

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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
5.2 Entities

Parameter: isReverse
Type: boolean
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

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Type: string
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
### 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
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

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: umountScript
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
Type: list of unsigned numbers

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

Parameter: initdead
Type: unsigned integer
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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: Entity

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

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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
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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
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

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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

Parameter: nodeInstallerDisk
Type: boolean
Description: The node has it’s 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
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

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

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

Parameter: priority
Type: integer
5.2 Entities

Description: Priority of the roles, node roles have a 750 priority, and category roles 250

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 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

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: 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

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: none
5.2 Entities

**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
**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

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<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>unassigned</td>
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</tr>
<tr>
<td>noPingMethod</td>
<td>boolean</td>
<td>none</td>
</tr>
<tr>
<td>nullIdentifier</td>
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<td>none</td>
</tr>
<tr>
<td>additionalCost</td>
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<td>none</td>
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<tr>
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</tr>
<tr>
<td>healthCheckFailed</td>
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</tr>
<tr>
<td>healthCheckUnknown</td>
<td>boolean</td>
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<tr>
<td>provisioningFailed</td>
<td>boolean</td>
<td>none</td>
</tr>
<tr>
<td>stateFlapping</td>
<td>boolean</td>
<td>none</td>
</tr>
<tr>
<td>stateFlappingCheckTime</td>
<td>unsigned integer</td>
<td>none</td>
</tr>
<tr>
<td>pingable</td>
<td>boolean</td>
<td>none</td>
</tr>
<tr>
<td>sshable</td>
<td>boolean</td>
<td>none</td>
</tr>
</tbody>
</table>
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

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

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5.2.81 Device: Entity

parent: 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: Network switches

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
Description: User defined resources used to filter monitoring data producers

5.2.82 DIGITSRole: Role
parent: Role
Parameter: version
Type: string
Description: DIGITS version

Parameter: port
Type: unsigned integer
Description: DIGITS port

Parameter: jobsDir
Type: string
Description: Location where job files are stored. Defined in DIGITS_JOBS_DIR

Parameter: logfileFilename

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Type: string
Description: File for saving log messages. Defined in DIGITS_LOGFILE_FILENAME

Parameter: logfileLevel
Type: enum
Description: Minimum log message level to be saved (DEBUG/INFO/WARNING/ERROR/Critical). Defined in DIGITS_LOGFILE_LEVEL

Parameter: serverName
Type: string
Description: The name of the server (accessible in the UI under 'Info'). Default is the system hostname. Defined in DIGITS_SERVER_NAME

Parameter: modelStoreUrl
Type: string
Description: A list of URL's, separated by comma. Default is the official NVIDIA store. Defined in DIGITS_MODEL_STORE_URL

Parameter: urlPrefix
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

Parameter: caffeRoot
Type: string
Description: Path to your local Caffe build. Should contain build/tools/caffe and python/caffe/. Defined in CAFFE_ROOT

Parameter: torchRoot
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

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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
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
5.2 Entities

**Mount options**

**Parameter:** filesystem
**Type:** string
**Description:** Filesystem

---

**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

---

**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
5.2 Entities

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

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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

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
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 ‘metadata’ 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
5.2 Entities

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
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
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
5.2 Entities

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

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 cost monitoring of cloud jobs through remote labeling

Parameter: JobIdTagName
Type: string
Description: none

Parameter: JobAccountTagName
Type: string
Description: none

Parameter: JobUserTagName
Type: string
Description: none

Parameter: JobNameTagName
Type: string
Description: none

Parameter: billingAccessKeyId
Type: string
5.2 Entities

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

5.2.105 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 cloudprovider

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**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
5.2 Entities

Type: string
Description: CPU Options in AWS shorthand syntax (e.g: CoreCount=8,ThreadsPerCore=1)

Parameter: spotPrice
Type: float
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 too 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

**Parameter**: name
**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
5.2 Entities

Type: string
Description: Routing table ID for the public subnet

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

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**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
5.2 Entities

Parameter: contact
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

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
5.2 Entities

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 hostname)

- **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
  - **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
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

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5.2 Entities

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
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

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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
Description: Options

5.2.125 FirewallRole: Role
parent: Role
Parameter: shorewall
Type: boolean
Description: Manage shorewall

Parameter: openPorts
Type: list of FirewallOpenPort
5.2 Entities

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
Description: none

Parameter: cardType
Type: string
Description: none

Parameter: flashType
Type: string
Description: none

Parameter: dsaRunningFPGA
Type: string

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Description:  none

Parameter:  dsaPackageInstalled
Type:  string
Description:  none

Parameter:  name
Type:  string
Description:  none

Parameter:  rev
Type:  string
Description:  none

Parameter:  serial
Type:  string
Description:  none

Parameter:  configMode
Type:  string
Description:  none

Parameter:  fanPresence
Type:  string
Description:  none

Parameter:  maxPowerLevel
Type:  string
Description:  none

Parameter:  mac0
Type:  MAC
Description:  none

Parameter:  mac1
Type:  MAC
Description:  none

Parameter:  mac2
Type:  MAC
Description:  none

Parameter:  mac3
Type:  MAC
Description:  none

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5.2 Entities

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
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

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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
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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

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**ArchOSInfo** or None

**Detected arch/OS**

**Parameter:** size

**Type:** unsigned integer  

**Total size**

**Parameter:** inotifyWatcherSize

**Type:** unsigned integer  

**Inotify watcher size**

**FSPartProviderAssociation:** FSPartAssociation

**parent:** FSPartAssociation

**Parameter:** onlyWhenActive

**Type:** boolean  

**Only use provider association if the node is the active head node**

**FSPartRole:** Role

**parent:** Role

**Parameter:** fsparts

**Type:** list of references to FSPart  

**FSParts**

**Parameter:** fspartSource

**Type:** boolean  

**Server as source for all these FSParts**

**FSPart:** Entity

**parent:** Entity

**Parameter:** path

**Type:** string  

**Full source path of the filesystem part**

**Parameter:** type

**Type:** enum  

**The type of filesystem part**

**Parameter:** watchDirectories

**Type:** list of strings  

**Watch directories for changes on the active head node, filesystem part will be marked dirty when changed**

**Parameter:** dirtyAutoSyncDelay

**Type:** unsigned integer  

**Time to wait before automatically syncing after the filesystem part became dirty, set 0 to disable**

**Parameter:** autoDirtyDelay
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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

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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

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
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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

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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: Filenmask directory

Parameter: userName
Type: string
Description: User ownership applied to the file

Parameter: groupName
Type: string
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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
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`

**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

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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
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

**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

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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
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)

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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
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

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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: num0sds
Type: unsigned integer
Description: Total

Parameter: numUp0sds
Type: unsigned integer
Description: Up

Parameter: numIn0sds
Type: unsigned integer
Description: In

Parameter: pgsBytesTotal

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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
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
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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
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
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**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`  
**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`  

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**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

**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 spend on other operations

**Parameter:** phaseLoad  
**Type:** float  
**Description:** Phase load accross all APCs

**Parameter:** occupationRate  
**Type:** float  
**Description:** Formula: Average[allnodes] (min(load, cores) / cores)
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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
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
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

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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

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
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
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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: 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

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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
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
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
Description: Message queue ID

Parameter: mode
5.2 Entities

**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  
**Description:** WlmCluster

**Parameter:** refJobQueueUniqueKey  
**Type:** unsigned integer  
**Description:** Queue

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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
Type: unsigned integer
Description: none

Parameter: pendingTime
Type: unsigned integer
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
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: Jobscript exit code

Parameter: state
Type: string
Description: Job status

Parameter: requestedCPUs
Type: unsigned integer
Description: Requested CPUs

Parameter: requestedCPUcores
Type: unsigned integer
Description: Requested CPU cores

Parameter: requestedGPUs
Type: unsigned integer
5.2 Entities

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
Type: string
Description: Name of queue

Parameter: wlmCluster
Type: reference to WlmCluster
Description: WlmCluster to which this node belongs

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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
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

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
Description: Comment set by workload manager

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
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
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)
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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
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.

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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
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

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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
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
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

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
5.2 Entities

**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
**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

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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: none

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
Type: string
Description: Amount of time to retain events

Parameter: kubeletTimeout
Type: string
Description: Kubelet connections timeout

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
parent: Role
Parameter: kubeCluster
Type: reference to KubeCluster
Description: The Kubernetes cluster instance (pointer)

Parameter: address
Type: IP

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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

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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
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: kubeletPort
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
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: oomScoreAdjust
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  
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: oomScoreAdj  
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

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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
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
5.2 Entities

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
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
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
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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
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

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**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`.

**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  
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
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 LSFGroupsSettings : LSFGroupsSettings
parent : LSFGroupsSettings
Parameter: resourceEnforce
Type: list of strings
Description: Controls resource enforcement through the Linux cgroup memory and cpuset subsysytem on Linux systems with cgroup support (LSB_RESOURCE_ENFORCE)

Parameter: processTracking
Type: boolean
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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 subsystem (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)

5.2.214 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
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 LSFSSubmitRole : 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: \texttt{string}  
\textbf{Description:} LSF installation directory

\textbf{Parameter:} \texttt{var}  
Type: \texttt{string}  
\textbf{Description:} Var directory location

\textbf{Parameter:} \texttt{localVar}  
Type: \texttt{string}  
\textbf{Description:} Local var directory location

\textbf{Parameter:} \texttt{logDir}  
Type: \texttt{string}  
\textbf{Description:} Logging directory location (LSF_LOGDIR in lsf.conf)

\textbf{Parameter:} \texttt{dynamicCloudNodes}  
Type: \texttt{boolean}  
\textbf{Description:} Cloud nodes are added dynamically to LSF

\textbf{Parameter:} \texttt{placeholders}  
Type: \texttt{list of JobQueuePlaceholder}  
\textbf{Description:} Job queue node placeholders mode

\textbf{Parameter:} \texttt{cgroups}  
Type: \texttt{LSFCgroupsSettings}  
\textbf{Description:} Submode containing LSF related cgroups settings

\textbf{Parameter:} \texttt{defaultQueues}  
Type: \texttt{list of references to LSFJobQueue}  
\textbf{Description:} Default queues

\textbf{Parameter:} \texttt{doBackups}  
Type: \texttt{boolean}  
\textbf{Description:} Backup configuration file before update

\textbf{Parameter:} \texttt{gpuAutoconfig}  
Type: \texttt{boolean}  
\textbf{Description:} Enable GPU autodetection (LSF_GPU_AUTOCONFIG in lsf.conf)

\textbf{Parameter:} \texttt{gpuNewSyntax}  
Type: \texttt{boolean}  
\textbf{Description:} Enable new GPU request syntax (LSB_GPU_NEW_SYNTAX in lsf.conf)

\textbf{Parameter:} \texttt{dcgmPort}  
Type: \texttt{unsigned integer}  
\textbf{Description:}
Description: Enable DCGM features and specifies the port number that LSF uses to communicate with the DCGM daemon (0 for disabled)

Parameter: unitForLimits
Type: string
Description: Enables scaling of large units in the resource usage limits (LSF_UNIT_FOR_LIMITS in lsf.conf)

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

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5.2 Entities

Parameter: gpuId
Type: unsigned integer
Description: The hardware GPU identifier

Parameter: gpuInstanceId
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
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
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
Description:  

Parameter:  
Type:  
Description:  

5.2.226  MIGProfile : Entity

parent : Entity

Parameter:  
Type:  
Description:  

Parameter:  
Type:  
Description:  

Parameter:  
Type:  
Description:  

Parameter:  
Type:  
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Parameter:  
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Description:  

Parameter:  
Type:  
Description:  

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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

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Parameter: suppressedByGoingDown
Type: boolean
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

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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

5.2.237 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 Entities

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: MonitoringDataProducer
parent: MonitoringDataProducer
Parameter: updateFreq
Type: float
Description: How often to update data

5.2.244 MonitoringDataProducerInternal: MonitoringDataProducer
parent: MonitoringDataProducer

5.2.245 MonitoringDataProducerJobMetadata: 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: 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: Minimal 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

5.2.248 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 changes, and restart

5.2.251 MonitoringDataProducerPowerDistributionUnit:
   MonitoringDataProducerInternal
   parent: MonitoringDataProducerInternal

5.2.252 MonitoringDataProducerProcMemInfo:
   MonitoringDataProducerInternal
   parent: MonitoringDataProducerInternal

5.2.253 MonitoringDataProducerProcMount:
   MonitoringDataProducerInternal
   Parameter: includeMedia
   type: boolean
   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

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

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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
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
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
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


**Parameters:**

- **fuzzyOffset**
  - **Type:** float
  - **Description:** Automatic fuzzy offset factor [0-1]. Multiplied by interval

- **introduceNaN**
  - **Type:** boolean
  - **Description:** Introduce NaN if device goes up/down/up

- **automaticReinitialize**
  - **Type:** boolean
  - **Description:** Automatic run –initialize when a new metric has been detected

- **disabled**
  - **Type:** boolean
  - **Description:** Disabled

- **disableOnHighLoad**
  - **Type:** boolean
  - **Description:** Disable when nodes are very busy

- **nodeExecutionFilters**
  - **Type:** list of `MonitoringExecutionFilter`
  - **Description:** Filter nodes which should run this data producer. If none are specified: execute on each node.

- **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.

- **consolidator**
  - **Type:** reference to `MonitoringConsolidator` or None
  - **Description:** Consolidator configuration

- **suppressedByGoingDown**
  - **Type:** boolean
  - **Description:** Suppress running action if device is going down

- **associatedUser**
  - **Type:** string
  - **Description:** User associated with this measurable
Description: Port

Parameter: localhost
Type: boolean
Description: Only listen on localhost

Parameter: secret
Type: string
Description: Secret

5.2.271 MonitoringDataProducerUserCount
parent: MonitoringDataProducerInternal
Parameter: customScript
Type: string
Description: Custom script

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
parent: MonitoringDataProducer
5.2.273 MonitoringDeviceStateSubSystemInfo
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
parent: MonitoringAction
Parameter: recipients
Type: list of strings
Description: Recipients

Parameter: allAdministrators
Type: boolean
Description: Also send e-mail to all administrators

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

5.2.277 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
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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
Type: list of strings
Description: Only these devices will be sampled if the set is not empty

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

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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
Type: unsigned integer
Description: Node

Parameter: refBestMonitoringNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: refViableMonitoringNodeUniqueKeys
Type: list of unsigned numbers

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**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
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: Minimum 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
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
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

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

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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

5.2.315 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
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Type</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>deviceState</td>
<td>list of MonitoringDeviceStateSubsystemInfo</td>
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</tr>
<tr>
<td>name</td>
<td>string</td>
<td>Name</td>
</tr>
<tr>
<td>disabled</td>
<td>boolean</td>
<td>Disable</td>
</tr>
<tr>
<td>severity</td>
<td>unsigned integer</td>
<td>Severity</td>
</tr>
<tr>
<td>markEntityAsFailed</td>
<td>boolean</td>
<td>Mark entity as failed</td>
</tr>
<tr>
<td>markEntityAsUnknown</td>
<td>boolean</td>
<td>Mark entity as unknown</td>
</tr>
<tr>
<td>stateFlappingPeriod</td>
<td>float</td>
<td>Time period to check for state flapping</td>
</tr>
<tr>
<td>stateFlappingCount</td>
<td>unsigned integer</td>
<td>Number of times states need to change in the specified period before it is considered stateflapping</td>
</tr>
<tr>
<td>expression</td>
<td>MonitoringExpression</td>
<td>Expression</td>
</tr>
<tr>
<td>enterActions</td>
<td>list of references to MonitoringAction</td>
<td>Actions to execute when the expression enters ‘true’ state</td>
</tr>
<tr>
<td>duringActions</td>
<td>list of references to MonitoringAction</td>
<td></td>
</tr>
</tbody>
</table>

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5.2 Entities

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
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

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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
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: NetworkInterface
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: NetworkInterface
parent: NetworkInterface
Parameter: stp
Type: boolean
Description: Spanning Tree Protocol enabled.
5.2 Entities

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: Entity
parent: Entity
Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: source
Type: IP
Description: The source IP address

Parameter: sourcePort
Type: unsigned integer
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

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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
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 accross 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
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
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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: Exclude from search domain in /etc/resolv.conf file

Parameter: searchDomainIndex
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
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
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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
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

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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

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Parameter: ntp
Type: boolean
Description: NTP

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
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Description: Status

Parameter: cmdaemonWebSocket
Type: boolean
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

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**Parameter:** genericDevice  
**Type:** boolean  
**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 FSExport  
**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
5.2 Entities

Type:  string
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 nodeconfiguration this role is linked with

Parameter:  httpPort
Type:  unsigned integer
Description:  HTTP port to forward as nginx stream
5.2 Entities

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
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 OSCloudEphemeralDisk : OSCloudDisk

- **parent:** OSCloudDisk
- **Parameter:** format
  - **Type:** string
  - **Description:** Filesystem to format the disk

### 5.2.357 OSCloudExtension : Entity

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

- **Parameter:** region
  - **Type:** reference to OSCloudRegion
  - **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
  - **Description:** A list of various advanced options

### 5.2.358 OSCloudFlavor : CloudType

- **parent:** CloudType
- **Parameter:** id
  - **Type:** string
  - **Description:** The ID of the flavor

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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
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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 cloudprovider

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

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

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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

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
5.2 Entities

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
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

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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
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
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
Description: Receive jobs from route queues only

Parameter: routeHeldJobs
Type: boolean
Description: Specifies whether jobs in the held state can be routed from this queue

Parameter: routeWaitingJobs
Type: boolean
Description: Specifies whether jobs whose execution_time attribute value is in the future can be routed from this queue

Parameter: routeLifetime
Type: unsigned integer
Description: The maximum time a job is allowed to reside in a routing queue

Parameter: routeRetryTime
Type: unsigned integer
Description: Route retry time in routing queue

Parameter: routes
Type: list of strings
Description: Route of queue path (route_destination parameter in qmgr)

Parameter: defaultQueue
Type: boolean
Description: Specifies the queue which is to accept jobs when no queue is requested

Parameter: minWalltime
Type: string
Description: Minimum runtime of jobs running in a queue

Parameter: maxWalltime
Type: string
Description: Maximum runtime of jobs running in a queue

Parameter: defaultWalltime
Type: string
Description: Maximum runtime of jobs running in a queue

Parameter: maxQueued
Type: unsigned integer
Description: Maximum number allowed to reside in a queue at any given time (0 is the same as infinite)

Parameter: priority
Type: integer
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
5.2 Entities

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

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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)

Parameter: startMom
Type: boolean
Description: Configure pbs_mom daemon start (PBS_START_MOM 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: spool
Type: string
Description: PBS Pro mom spool directory

Parameter: wlmCluster
Type: reference to PbsProWlmCluster
Description: PBS Pro WLM Cluster
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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 PBS Pro clusters which the role belongs to

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: Entity
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: none

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

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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

5.2.388 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
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Type: unsigned integer
Description: Total number of pings done

Parameter: pairInformation
Type: list of PingStatisticsPairInformation
Description: Ping pair information statistics

Parameter: sourceInformation
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

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Description: Configure the cluster wide SNMP settings

Parameter: firmware
Type: string
Description: Firmware revision

Parameter: controlScript
Type: string
Description: none

Parameter: controlScriptTimeout
Type: unsigned integer
Description: none

5.2.390 PowerOperationHistory: Entity
parent: 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
parent: 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

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

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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

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Type: string
Description: none

Parameter: extendedMsg
Type: string
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

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
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

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
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Description: Number of threads spawned

Parameter: nbfiledescs
Type: unsigned integer
Description: Number of held file descriptors

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

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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

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

5.2.403 ProjectManager : Entity

parent : Entity
Parameter: users
Type: list of strings

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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

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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
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
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

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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
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

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**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

**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

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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
parent: Entity
Parameter: provisioningRequestStatusList
Type: list of ProvisioningRequestStatus
Description: none

Parameter: provisioningNodeStatusList
Type: list of ProvisioningNodeStatus
Description: none

5.2.412 ProxySettings: Entity
parent: 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

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

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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
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
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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.

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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 identifier 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: dataout
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

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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
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

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 Entities

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
Type: boolean
Description: Pin workload to its queue nodes

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

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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
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
5.2 Entities

**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
**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

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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

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
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  
**Parameter:** engines  
**Type:** list of ScaleEngine  
**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  
**Parameter:** nodes  
**Type:** list of references to Node  
**Description:** List of managed nodes

**Parameter:** nodegroups  
**Type:** list of references to NodeGroup
5.2 Entities

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

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

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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
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 (slurmd) listens to for work

Parameter: storageHost
Type: string

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**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 slurmdbd 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 (slurmdbd)

**5.2.442 SlurmCgroupsSettings : 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
5.2 Entities

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
Type: float
Description: Constrain the job cgroup swap space to this percentage of the allocated memory

Parameter: maxRamPercent
Type: float
Description: Set an upper bound in percent of total RAM on the RAM constraint for a job

Parameter: maxSwapPercent
Type: float
Description: Set an upper bound (in percent of total RAM) on the amount of RAM+Swap that may be used 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)

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
5.2 Entities

Parameter: threadsPerCore
Type: unsigned integer
Description: Number of logical threads in a single physical core

Parameter: tmpDisk
Type: unsigned integer
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
parent: 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:  SelectTypeParameters
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
class: Job
5.2.449 SlurmRole: Role
class: Role
Parameter: wlmCluster
Type: reference to SlurmWlmCluster
Description: WLM cluster link to this WLM role

5.2.450 SlurmServerRole: SlurmRole
class: 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
class: 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
class: WlmCluster
Parameter: placeholders
Type: list of JobQueuePlaceholder
Description: Job queue node placeholders mode

Parameter: cgroups
Type: SlurmCgroupsSettings
Description: Submode containing Slurm related cgroups settings

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: prologSlurmd
Type: string
Description: Fully qualified pathname of a program for the slurmd 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
Type: list of strings
Description: A list of generic resources to be managed

Parameter: prefix
5.2 Entities

**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:** 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

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5.2.453 SNMPSettings : Entity

**parent:** Entity  
**Parameter:** version  
**Type:** enum  
**Description:** none

**Parameter:** timeout  
**Type:** float  
**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
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
Description:  Name

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

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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
Description: Notes

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: IP of the node

Parameter: gateway
Type: IP
Description: Gateway IP address

Parameter: netmaskBits
Type: unsigned integer
Description: Netmask bits

Parameter: network
Type: reference to Network
Description: 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

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Description:  

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  
Description: none

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

**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
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**Parameter:** maxUploadTime
**Type:** unsigned integer
**Description:** Maximum time job results 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

**Parameter:** 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 be set

**Parameter:** disableNFS2
**Type:** boolean
**Description:** Disable NFS2, NFS threads needs to be set

**Parameter:** disableNFS3
**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

5.2.471  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
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

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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
Description: none

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 rsync'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

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**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  
**Description:** Node

**Parameter:** fspart  
**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:** fspart  
**Type:** reference to FSPart  
**Description:** none

**Parameter:** target  
**Type:** string  
**Description:** none
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**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

**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
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:  

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
Description:  If true then UGE puts the job into a cpuset cgroup with the specific CPU ids assigned

Parameter:  freezer
Type:  boolean
Description:  If true than the whole job is frozen by the kernel

Parameter:  freezePeTasks
Type:  boolean
Description:  If false then slave tasks are not put in the freezer, otherwise all slave tasks are frozen (also slaves on remote hosts)

Parameter:  killing
Type:  boolean
Description:  If true then UGE signals all processes forked / started by the job until all of them are killed

Parameter:  forcedNuma
Type:  boolean
Description:  If true then on NUMA machines only local memory is allowed to be used when the job requested memory allocation with -mbind cores:strict

Parameter:  vmemLimit
Type:  boolean
Description:  Specifies if virtual memory can be limited with cgroups (h_vmem_limit)

Parameter:  memFreeHard
Type:  boolean
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Description: If true then kernel ensures that the job does not use more main memory than required (m_mem_free_hard)

Parameter: memFreeSoft
Type: boolean
Description: If true (and hard memory limit is turned off) then the requested memory with m_mem_free is a soft limit (m_mem_free_soft)

Parameter: minMemoryLimit
Type: string
Description: A host based minimum memory limit, in bytes or values like 10M, 1G (min_memory_limit)

Parameter: jobCgroupTemplate
Type: string
Description: Template for job cgroup path ($JOBID will be replaced to job id)

Parameter: options
Type: list of strings
Description: Additional UGE cgroup options

Parameter: devices
Type: list of strings
Description: Configurations for cgroup devices

5.2.481 UGEClientsRole: 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

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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
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

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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

*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*: UGEcgroupsSettings  
*Description*: Submode containing UGE related cgroups settings

*Parameter*: placeholders  
*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

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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

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
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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

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

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Type: enum
Description: Boot loader protocol for retrieving initrd and vmlinux

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: $\text{shadowMin}$
Type: unsigned integer
Description: Minimum number of days required between password changes

Parameter: $\text{shadowMax}$
Type: unsigned integer
Description: Maximum number of days for which the user password remains valid.

Parameter: $\text{shadowWarning}$
Type: unsigned integer
Description: Number of days of advance warning given to the user before the user password expires

Parameter: $\text{shadowInactive}$
Type: unsigned integer
Description: Number of days of inactivity allowed for the user

Parameter: $\text{shadowLastChange}$
Type: unsigned integer
Description: Number of days between January 1, 1970 and the day when the user password was last changed

Parameter: $\text{shadowExpire}$
Type: unsigned integer
Description: Date on which the user login will be disabled

Parameter: $\text{email}$
Type: string
Description: email

Parameter: $\text{profile}$
Type: string
Description: Profile for Authorization

Parameter: $\text{certSerialNumber}$
Type: integer
Description: Serial number of certificate assigned to user

Parameter: $\text{projectManager}$
Type: ProjectManager or None
Description: Project manager

Parameter: $\text{notes}$
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
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
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Type: integer
Description: Warning

5.2.494 VersionInfo: Entity
parent: Entity
Parameter: refNodeUniqueKey
Type: unsigned integer
Description: Node

Parameter: cmVersion
Type: string
Description: none

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: thin Provisioned
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
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
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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

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
parent: 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
parent: 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

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5.2.501 WlmCluster: Entity

- **parent**: 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
5.3 JSON Examples

Type:  string
Description:  Additional name (example: tesla)

Parameter:  amount
Type:  unsigned integer
Description:  Resource amount

Parameter:  unit
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 "======== master ==========

curl --cookie curl.cookiest.txt -i -k -X POST -d '{"service":"cmdevice","call":"getNode","arg":"master"}' $URL; echo
echo "========== logout ==========

curl --cookie curl.cookiest.txt -i -k -X POST -d '{"service":"logout"}' $URL; echo
echo "========== denied ==========

curl --cookie curl.cookiest.txt -i -k -X POST -d '{"service":"cmdevice","call":"getNode","arg":"master"}' $URL; echo

echo "========== cert ==========

curl --cert $HOME/.cm/admin.pem --key $HOME/.cm/admin.key -i -k -X POST -d '{"service":"cmdevice","call":"getNode","arg":"master"}' $URL; echo
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Bright Cluster Manager JSON API

curl.sh
#!/bin/bash
URL=https://localhost:8081/json/
if [ -z "$1" ]; then
read -p "pass: " -s $pass
else
pass=$1
fi
curl -c curl.cookiest.txt -i -k -X POST -d ’{"service":"login", "username":"root", \
"password":"’$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

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-cert\
ificate --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,",");
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 ’]’ ’ ’ | tr ’ ’ ’\n’ | cut -d: -f2 | sort -n)
echo $(echo $r | cut -d’ ’ -f 1)
}
prop=’uniqueKey’
node=master

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5.3 JSON Examples

```bash
json='wget --certificate=$HOME/.cm/admin.pem --private-key=$HOME/.cm/admin.key \
--no-check-certificate --server-response -qO- $URL --post-data='{"service":"cmdevice",\n"call":"getDevice","arg":"'$node'"}''

nkey=$(jsonval)
if [ -z $nkey ]; then
  echo $json
  exit 1
fi
echo "$node.uniqueKey = $nkey"

json='wget --certificate=$HOME/.cm/admin.pem --private-key=$HOME/.cm/admin.key \
--no-check-certificate --server-response -qO- $URL --post-data='{"service":"cmmon",\n"call":"getMonitoringMeasurable","name":"LoadOne"}''

mkey=$(jsonval)

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

wget --certificate=$HOME/.cm/admin.pem --private-key=$HOME/.cm/admin.key \
python -mjson.tool
```

**login.sh**

```bash
#!/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'", \n"password":"'$pass'"}''
echo
```

**logout.sh**

```bash
#!/bin/bash
URL=https://localhost:8081/json/
wget --load-cookies cookie.txt --no-check-certificate --server-response -qO- $URL \
--post-data='{"service":"logout"}''
rm cookie.txt
```
node001.sh
#!/bin/bash
source url

if [ -z "$1" ]; then
    node=node001
else
    node=$1
fi

wget --certificate=$HOME/.cm/admin.pem --private-key=$HOME/.cm/admin.key \
    --no-check-certificate --server-response -qO- $URL --post-data='{"service":"cmdevice",\n    "call":"getDevice","arg":"\"$node\""}' | python -m json.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 -qO- $URL --post-data='{"service":"cmpart",\n    "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"
    }
    ]
}
5.3 JSON Examples

```bash
[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:

```bash
#!/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):

```bash
#!/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"}' $URL; echo
```

After initializing, sampling can be done with:

```bash
#!/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
```

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