

# Preconfigured Key Performance Indicators Cloud Execution Environment

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## INTERWORK DESCRIPTION

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# 1 Scope

This document provides information about the factory default key performance indicators (KPIs) available at the northbound interfaces of the Cloud Execution Environment (CEE) used for performance management. The KPIs inform the operator about the actual status of the various physical and virtual resources.

Refer to the relevant Zabbix and OpenStack documentation for further information on the performance indicators.



## 2 Introduction

The performance management function in the CEE is realized by the following components:

- The **Ceilometer** component of OpenStack is used to track virtual resources, mainly for billing purposes. This component performs the telemetry functionality in OpenStack.

Telemetry is a highly automated communications process by which measurements are made and data collected at remote points are transmitted to the receiving equipment that performs accounting and billing.

Ceilometer provides a Single Point of Contact for billing systems, providing all the counters they need to establish customer billing, across all current and future OpenStack components. The delivery of counters is traceable and auditable. The counters are easily extensible to support new projects since the various agents doing data collections are independent of the overall system.

Ceilometer is disabled on single server deployment, refer to the *CEE Technical Description*.

- CEE includes **Zabbix** as a tool for monitoring the performance of the host environment. This monitoring tool extends the operations of Ceilometer by providing data for detailed performance analysis and optimization. In general, the granularity of monitoring data is about one magnitude higher than the granularity of data used for telemetry.

Zabbix has built-in interfaces for quick analysis and real-time visualization. These interfaces are wrapped and extended by standardized telecom-type and REST-based access to monitoring data. The delivery of counters is traceable and auditable. The counter settings can easily be extended, modified or reduced, based on customer needs.

Ceilometer and Zabbix also support the setting of various triggers to indicate that certain counter values are reached. A predefined set of these triggers are routed to the alarm system of CEE. The used interface is not extendable, so further triggers are only visible in their telemetry or monitoring environment.

CEE is delivered with certain KPIs of the Ceilometer and Zabbix systems preconfigured with default values for granularity, retention time, trend generation, and time-to-live. These settings ensure a stable system behavior that also generates enough information to judge system behavior and perform optimization and fine tuning analysis. Changes to the settings can influence the capacity and long-term stability of the system. System integrators are expected to adjust what measurements are enabled in order to optimize system performance, refer to [Configuration > Items](#) in the Zabbix documentation,



Reference [1]. Changes to these settings on live nodes are out of the scope of Ericsson support.

Provided IP address and TCP port for Zabbix GUI are configured in the section `bind` of the below configuration files on the CICs:

- `/etc/haproxy/conf.d/211-zabbix-ui.cfg`
- `/etc/haproxy/conf.d/212-zabbix-ui-ssl.cfg`

Example for getting the addresses and ports of Zabbix GUI:

```
grep bind /etc/haproxy/conf.d/*zabbix-ui*.cfg
```

For the full path to Zabbix GUI example, refer to `/etc/zabbix/zabbix-conf.conf`, controlled in `/etc/zabbix/apache.conf`.

**Note:** Due to security reasons, not all configured IP addresses and TCP ports are accessible from external systems.

This document only describes the factory default KPIs and settings contained by the CEE as delivered by Ericsson. The data is accessible on various northbound interfaces, as described in chapter Section 3.1 on page 4.



## 3 General

This section provides information on the terms used in the KPI descriptions in Section 4 on page 8.

### 3.1 Interfaces

Measurement data can be used for both real-time processing and offline analysis. These two main usages are supported by the following northbound interface types:

- Generated report files, mainly used for offline processing after download
- REST-based interfaces for real-time utilization

The following interfaces of these types are used:

- Generated report files
  - **PM Report File**  
Refer to the *Performance Management Northbound API* for the description of the *xml* report file.
  - **ISP Report Log File**  
Refer to the *In Service Performance Northbound API* for the description of the *xml* report file.
- REST-based interfaces
  - **Telemetry API**  
The output of this interface includes all the Telemetry data. Refer to the *OpenStack Telemetry API in CEE* for the description of the interface.
  - **Monitoring API**  
The output of this interface, beside other measurements, includes the content of the *PM Report file* and the *ISP Report Log File*. Refer to the *Performance Management Northbound API* for the description of the interface.

### 3.2 Collection Type

Collection type means the format of the source data.

The following collection types are used:





<b>Boolean</b>	A data type with only two possible values that can be text or numbers, for example, yes or no, true or false, 1 or 0
<b>Text</b>	A string of characters
<b>Delta</b>	A value integrated from a certain time
<b>Gauge</b>	The actual value of measured data

### 3.3 Retention Policy

The retention policy specifies the used retention times for a KPI.

The retention policy consists of the following retention times:

<b>History</b>	Number of days the measured data for a specific item is kept.
<b>Trend</b>	<p>Number of days the trend data for a specific item is kept. Numeric data older than specified by the <b>History</b> are consolidated to save disk space. The following trend data are stored:</p> <ul style="list-style-type: none"> <li>• Hourly average</li> <li>• Hourly minimum</li> <li>• Hourly maximum</li> </ul>

**Note:** Trend data is not stored for KPIs with **Collection Type** Text.

Table 1 describes the used *Retention Policies*.

Table 1 *Retention Policies*

Retention Policy	History (days)	Trend (days)
ISP	45	0
KPI	7	45
Metering	2	0

### 3.4 Source

The measured data are collected by Zabbix and Ceilometer from the sources listed in this section.



### 3.4.1 Zabbix

The following sources are used:

- Compute  
The name of the Compute host. Example: `compute-0-5`
- Controller  
The name of the Controller host. Example: `cic-0-3`
- Cluster  
The provided number is the calculated average of the data collected from the three Controllers.
- Switch  
The name of the switch. Example: `extreme-1`

### 3.4.2 Ceilometer

The identifier (ID) in the source names stands for the universally unique identifiers (UUIDs) of the sources used in the indicated OpenStack components.

A UUID looks similar to the following example:

`940f3b2f-bd74-45ad-bee7-eb0a7318aa84`

The following sources are used:

- Instance ID  
UUID of the virtual machine (VM) in Nova
- Image ID  
UUID of the image in Glance
- IP ID  
UUID of the Internet Protocol (IP) address in Neutron
- Subnet ID  
UUID of the subnet in Neutron
- Port ID  
UUID of the port in Neutron
- Router ID  
UUID of the virtual router in Neutron
- Volume ID  
UUID of the volume in Cinder
- Store ID  
UUID of the store in Swift
- Network ID  
UUID of the network in Neutron



- Interface ID  
UUID of the interface in Nova



## 4 Description

The following subsections describe the KPIs provided by the performance management (PM) service.

The subsection titles in this section are identical to the KPI names appearing at the used interface. The KPI names are self-explanatory in most of the cases. A short explanation is provided for some KPIs.

Each subsection contains a table with the parameters of the KPI. Rows for irrelevant parameters are not shown. The following parameters are used in the subsections:

<b>Periodic Check Interval in Seconds</b>	The refreshment period of the KPI value
<b>Retention Policy</b>	See Section 3.3 on page 5.
<b>Shown at Interface</b>	The interface or interfaces where the user can see the KPI value. See Section 3.1 on page 4. Ceilometer metrics are marked as “Telemetry API”.
<b>Collection Type</b>	The type of source data. See Section 3.2 on page 4.
<b>Output Measure</b>	Measure of the shown KPI value, if applicable
<b>Source</b>	The UUID in the OpenStack component or the name of the Cloud component providing the source data. See Section 3.4 on page 5.

### 4.1 Zabbix Agent

This section describes the KPIs for the Zabbix Agent.

#### 4.1.1 Agent ping

The agent returns 1 for this item if the agent is available. If the agent is not available, no value is returned.



<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller, Compute

#### 4.1.2 Host name of zabbix\_agentd running

<b>Periodic Check Interval in Seconds</b>	3600
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Controller, Compute

## 4.2 Zabbix Server

This section describes the KPIs for the Zabbix Server.

#### 4.2.1 Values processed by Zabbix server per second

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Number of values per second
<b>Source</b>	Controller

#### 4.2.2 Zabbix configuration cache, % free

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.



<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of cache
<b>Source</b>	Controller

#### 4.2.3 Zabbix history write cache, % free

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of cache
<b>Source</b>	Controller

#### 4.2.4 Zabbix queue

<b>Periodic Check Interval in Seconds</b>	600
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of items
<b>Source</b>	Controller

#### 4.2.5 Zabbix queue over 10m

<b>Periodic Check Interval in Seconds</b>	600
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge



<b>Output Measure</b>	Number of items
<b>Source</b>	Controller

#### 4.2.6 Zabbix text write cache, % free

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of cache
<b>Source</b>	Controller

#### 4.2.7 Zabbix trend write cache, % free

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of cache
<b>Source</b>	Controller

### 4.3 Memcache

This section describes the KPIs for Memcache.

#### 4.3.1 Bytes read by this server per second

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API



<b>Collection Type</b>	Delta
<b>Output Measure</b>	Bytes per second
<b>Source</b>	Controller

#### 4.3.2 Bytes sent by this server per second

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Bytes per second
<b>Source</b>	Controller

#### 4.3.3 Bytes this server is allowed to use for storage

<b>Periodic Check Interval in Seconds</b>	3600
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes
<b>Source</b>	Controller

#### 4.3.4 Current number of bytes used to store items

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes
<b>Source</b>	Controller

#### 4.3.5 Current number of items stored

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI





<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of items
<b>Source</b>	Controller

#### 4.3.6 Items removed to free memory per second

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Items per second
<b>Source</b>	Controller

#### 4.3.7 Items requested and not found per second

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Items per second
<b>Source</b>	Controller

#### 4.3.8 Keys requested and found present per second

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Items per second
<b>Source</b>	Controller

**4.3.9 Memcache service is running**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

**4.3.10 Memcached process is running**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

**4.3.11 Number of connection structures allocated by the server**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Connections per second
<b>Source</b>	Controller

**4.3.12 Number of connections opened per second**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Connections per second
<b>Source</b>	Controller



#### 4.3.13 Number of new items stored per second

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Connections per second
<b>Source</b>	Controller

#### 4.3.14 Number of open connections

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of connections
<b>Source</b>	Controller

#### 4.3.15 Number of retrieval requests per second

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Requests per second
<b>Source</b>	Controller

#### 4.3.16 Number of seconds since the server started

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Seconds
<b>Source</b>	Controller

**4.3.17 Number of storage requests per second**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Requests per second
<b>Source</b>	Controller

**4.3.18 Number of worker threads requested**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of threads
<b>Source</b>	Controller

**4.3.19 Process id of this server process**

<b>Periodic Check Interval in Seconds</b>	3600
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Controller

**4.3.20 System time for this process**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	s
<b>Source</b>	Controller



#### 4.3.21 Total number of retrieval and storage requests per second

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Requests per second
<b>Source</b>	Controller

#### 4.3.22 User time for this process

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	s
<b>Source</b>	Controller

### 4.4 MySQL

This section describes the KPIs for MySQL.

#### 4.4.1 MySQL aborted clients

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of clients
<b>Source</b>	Controller



#### 4.4.2 MySQL aborted connects

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of connections
<b>Source</b>	Controller

#### 4.4.3 MySQL bytes received per second

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Bytes per second
<b>Source</b>	Controller

#### 4.4.4 MySQL bytes sent per second

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Bytes per second
<b>Source</b>	Controller



#### 4.4.5 MySQL connection latency

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	s
<b>Source</b>	Controller

#### 4.4.6 MySQL database size

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes
<b>Source</b>	Controller

#### 4.4.7 MySQL number of current connections

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of connections
<b>Source</b>	Controller

#### 4.4.8 MySQL open files

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of files
<b>Source</b>	Controller



#### 4.4.9 MySQL rollback operations per second

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Queries per second
<b>Source</b>	Controller

#### 4.4.10 MySQL status

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.5 OpenStack Ceilometer

This section describes the KPIs for OpenStack Ceilometer.

In case of single server, the OpenStack Ceilometer KPIs are not available.

#### 4.5.1 Ceilometer Agent Central process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller





#### 4.5.2 Ceilometer Alarm Evaluator process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.5.3 Ceilometer Alarm Notifier process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.5.4 Ceilometer API process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.5.5 Ceilometer API Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.5.6 Ceilometer Collector process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP



<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

## 4.6 OpenStack Ceilometer Compute

This section describes the KPIs for OpenStack Ceilometer Compute.

In case of single server, the OpenStack Ceilometer Compute KPIs are not available.

### 4.6.1 Ceilometer Agent Compute process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Compute

## 4.7 OpenStack Cinder API Check

This section describes the KPIs for OpenStack Cinder API Check.

### 4.7.1 Cinder API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

## 4.8 OpenStack Cinder API

This section describes the KPIs for OpenStack Cinder API.



#### 4.8.1 Cinder API Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.8.2 Cinder API server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.9 OpenStack Cinder Scheduler

This section describes the KPIs for OpenStack Cinder Scheduler.

#### 4.9.1 Cinder Scheduler Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.10 OpenStack Cinder Volume

This section describes the KPIs for OpenStack Cinder Volume.

#### 4.10.1 Cinder Volume process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP



<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

## 4.11 OpenStack Glance API Check

This section describes the KPIs for OpenStack Glance API Check.

### 4.11.1 Glance API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

## 4.12 OpenStack Glance API

This section describes the KPIs for OpenStack Glance API.

### 4.12.1 Glance API Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.12.2 Glance API Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller



## 4.13 OpenStack Glance Registry

This section describes the KPIs for OpenStack Glance Registry.

### 4.13.1 Glance Registry Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.13.2 Glance Registry Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

## 4.14 OpenStack RabbitMQ

This section describes the KPIs for OpenStack RabbitMQ.

### 4.14.1 RabbitMQ AMQP is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.14.2 RabbitMQ EPMD is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP



<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.14.3 RabbitMQ EPMD process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.14.4 RabbitMQ missing nodes

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of nodes
<b>Source</b>	Controller

#### 4.14.5 RabbitMQ missing queues

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of queues
<b>Source</b>	Controller

#### 4.14.6 RabbitMQ queue items

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API



<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of items
<b>Source</b>	Controller

#### 4.14.7 RabbitMQ queues without consumers

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of queues
<b>Source</b>	Controller

#### 4.14.8 RabbitMQ Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.14.9 RabbitMQ Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller



#### 4.14.10 RabbitMQ unmirrored queues

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of queues
<b>Source</b>	Controller

### 4.15 OpenStack Keystone API Check

This section describes the KPIs for OpenStack Keystone API check.

#### 4.15.1 Keystone API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.15.2 Keystone Service API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.16 OpenStack Keystone

This section describes the KPIs for OpenStack Keystone.





#### 4.16.1 Keystone Admin API Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.16.2 Keystone API Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.16.3 Keystone Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.17 OpenStack Libvirt

This section describes the KPIs for OpenStack Libvirt.

#### 4.17.1 Libvirtd process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller



## 4.18 OpenStack Neutron DHCP Agent

This section describes the KPIs for OpenStack Neutron DHCP Agent.

### 4.18.1 Neutron DHCP Agent process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.18.2 Neutron DHCP Agent should run on this node

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

## 4.19 OpenStack Neutron L3 Agent

This section describes the KPIs for OpenStack Neutron L3 Agent.

### 4.19.1 Neutron L3 Agent process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

## 4.20 OpenStack Neutron Metadata Agent

This section describes the KPIs for OpenStack Neutron Metadata Agent.



#### 4.20.1 Neutron Metadata Agent process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.21 OpenStack Neutron Metadata Agent

This section describes the KPIs for OpenStack Neutron Metadata Agent.

#### 4.21.1 Neutron Metadata Agent process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.22 OpenStack Neutron OVS Agent

This section describes the KPIs for OpenStack Neutron OVS Agent.

#### 4.22.1 Neutron OVS Agent process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.23 OpenStack Neutron Server

This section describes the KPIs for OpenStack Neutron Server.



#### 4.23.1 Neutron Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.24 OpenStack Nova API EC2

This section describes the KPIs for OpenStack Nova API EC2.

#### 4.24.1 Nova API EC2 Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.25 OpenStack Nova API OSAPI Check

This section describes the KPIs for OpenStack Nova API OSAPI check.

#### 4.25.1 Nova API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.26 OpenStack Nova API OSAPI

This section describes the KPIs for OpenStack Nova API OSAPI.



#### 4.26.1 Nova API OSAPI Compute Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.27 OpenStack Nova API

This section describes the KPIs for OpenStack Nova API.

#### 4.27.1 Nova API Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.28 OpenStack Nova Cert

This section describes the KPIs for OpenStack Nova Cert.

#### 4.28.1 Nova Cert Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.29 OpenStack Nova ConsoleAuth

This section describes the KPIs for OpenStack Nova ConsoleAuth.



#### 4.29.1 Nova ConsoleAuth Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.30 OpenStack Nova Network

This section describes the KPIs for OpenStack Nova Network.

#### 4.30.1 Nova Network Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.31 OpenStack Nova Scheduler

This section describes the KPIs for OpenStack Nova Scheduler.

#### 4.31.1 Nova Scheduler Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.32 OpenStack Nova API Metadata

This section describes the KPIs for OpenStack Nova API Metadata.



#### 4.32.1 Nova API Metadata Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.33 OpenStack Open vSwitch

This section describes the KPIs for OpenStack Open vSwitch.

#### 4.33.1 Open vSwitch DB Server server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.33.2 Open vSwitch Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.34 OpenStack Swift Account

This section describes the KPIs for OpenStack Swift Account.

#### 4.34.1 Swift Account Replicator process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP



<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.34.2 Swift Account Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.34.3 Swift Account Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.35 OpenStack Swift Container

This section describes the KPIs for OpenStack Swift Container.

#### 4.35.1 Swift Container Replicator process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller





#### 4.35.2 Swift Container Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.35.3 Swift Container Server process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.36 OpenStack Swift Object

This section describes the KPIs for OpenStack Swift Object.

#### 4.36.1 Swift Object Replicator process is running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.36.2 Swift Object Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller



#### 4.36.3 Swift Object Server process is running

Periodic Check Interval in Seconds	60
Retention Policy	ISP
Shown at Interfaces	ISP Report Log File, Monitoring API
Collection Type	Boolean
Source	Controller

### 4.37 OpenStack Swift Proxy

This section describes the KPIs for OpenStack Swift Proxy.

#### 4.37.1 Swift Proxy Server is listening on port

Periodic Check Interval in Seconds	60
Retention Policy	ISP
Shown at Interfaces	ISP Report Log File, Monitoring API
Collection Type	Boolean
Source	Controller

#### 4.37.2 Swift Proxy Server process is running

Periodic Check Interval in Seconds	60
Retention Policy	ISP
Shown at Interfaces	ISP Report Log File, Monitoring API
Collection Type	Boolean
Source	Controller

### 4.38 OpenStack Cluster

This section describes the KPIs for OpenStack Cluster. The values are calculated from the data provided by the three controllers.

#### 4.38.1 Aggregated Controllers 1 minutes load

Periodic Check Interval in Seconds	60
Retention Policy	KPI



<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of units
<b>Source</b>	Cluster

#### 4.38.2 Aggregated Controllers 5 minutes load

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of units
<b>Source</b>	Cluster

#### 4.38.3 Aggregated Controllers 15 minutes load

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of units
<b>Source</b>	Cluster

#### 4.38.4 Cinder VIP API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Cluster

#### 4.38.5 Glance VIP API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP



<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Cluster

#### 4.38.6 Keystone service VIP API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Cluster

#### 4.38.7 Keystone token count

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of tokens
<b>Source</b>	Cluster

#### 4.38.8 Keystone VIP API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Cluster

#### 4.38.9 Neutron VIP API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API



<b>Collection Type</b>	Boolean
<b>Source</b>	Cluster

#### 4.38.10 Nova VIP API test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Cluster

#### 4.38.11 Number of Cinder services in offline state

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of services
<b>Source</b>	Cluster

#### 4.38.12 Number of instances

This KPI indicates the number of all VMs configured for any Compute instance in the OpenStack cluster.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of instances
<b>Source</b>	Cluster

#### 4.38.13 Number of instances in error state

This KPI indicates the number of all VMs that are in error state, configured for any Compute instance in the OpenStack cluster.



<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of instances
<b>Source</b>	Cluster

#### 4.38.14 Number of Nova services in offline state

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of services
<b>Source</b>	Cluster

#### 4.38.15 Number of used CPUs in cluster

This KPI indicates the number of all virtual Central Processing Units (VCPUs) belonging to any VMs in the OpenStack cluster. The number is queried from the Nova database.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of VCPUs
<b>Source</b>	Cluster

#### 4.38.16 Total amount of RAM in cluster

This KPI indicates the total amount of RAM (Random Access Memory) belonging to any Compute instances in the OpenStack cluster.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API



<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Megabytes
<b>Source</b>	Cluster

#### 4.38.17 Total number of CPUs in cluster

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of CPUs
<b>Source</b>	Cluster

#### 4.38.18 Used RAM in cluster

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Megabytes
<b>Source</b>	Cluster

### 4.39 Fuel OS

This section describes the KPIs for Fuel OS Linux.

#### 4.39.1 Available memory

Available memory is defined as the sum of free, cached, and buffers memory.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes
<b>Source</b>	Controller, Compute

**4.39.2 Context switches per second**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Switches per second
<b>Source</b>	Controller, Compute

**4.39.3 CPU idle time**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of time
<b>Source</b>	Controller, Compute

**4.39.4 CPU interrupt time**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of time
<b>Source</b>	Controller, Compute

**4.39.5 CPU iowait time**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of time
<b>Source</b>	Controller, Compute





#### 4.39.6 CPU nice time

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of time
<b>Source</b>	Controller, Compute

#### 4.39.7 CPU softirq time

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of time
<b>Source</b>	Controller, Compute

#### 4.39.8 CPU steal time

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of time
<b>Source</b>	Controller, Compute

#### 4.39.9 CPU system time

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of time
<b>Source</b>	Controller, Compute

**4.39.10 CPU user time**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of time
<b>Source</b>	Controller, Compute

**4.39.11 Percentage of space used on disk <filesystem\_mount\_point>**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of disk space
<b>Source</b>	Controller, Compute

**4.39.12 DNS lookup**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller, Compute

**4.39.13 Free swap space**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes
<b>Source</b>	Controller, Compute



#### 4.39.14 Free swap space in %

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of partition
<b>Source</b>	Controller, Compute

#### 4.39.15 Host name

Name of the system host.

<b>Periodic Check Interval in Seconds</b>	3600
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Controller, Compute

#### 4.39.16 Interrupts per second

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Interrupts per second
<b>Source</b>	Controller, Compute

#### 4.39.17 memu

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of memory
<b>Source</b>	Controller, Compute

**4.39.18 NTP Server is listening on port**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller, Compute

**4.39.19 NTP Server process is running**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller, Compute

**4.39.20 Number of processes**

Total number of processes in any state.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of processes
<b>Source</b>	Controller, Compute

**4.39.21 Number of running processes**

Number of processes in running state.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of processes
<b>Source</b>	Controller, Compute



#### 4.39.22 Processor load (1 min average per core)

The processor load is calculated as system CPU load divided by number of CPU cores.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of units
<b>Source</b>	Controller, Compute

#### 4.39.23 Processor load (15 min average per core)

The processor load is calculated as system CPU load divided by number of CPU cores.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of units
<b>Source</b>	Controller, Compute

#### 4.39.24 Processor load (5 min average per core)

The processor load is calculated as system CPU load divided by number of CPU cores.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of units
<b>Source</b>	Controller, Compute

**4.39.25 RsyslogD Server process is running**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller, Compute

**4.39.26 SSH Server is listening on port**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller, Compute

**4.39.27 SSH Server process is running**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller, Compute

**4.39.28 System uptime**

<b>Periodic Check Interval in Seconds</b>	600
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	s
<b>Source</b>	Controller, Compute



#### 4.39.29 Total memory

<b>Periodic Check Interval in Seconds</b>	3600
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes
<b>Source</b>	Controller, Compute

#### 4.39.30 Total swap space

<b>Periodic Check Interval in Seconds</b>	3600
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes
<b>Source</b>	Controller, Compute

### 4.40 Fuel OS Linux

This section describes the KPIs for Fuel OS Linux - Prototype.

#### 4.40.1 Disk <Linux\_device\_name> reads avg1

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Operations per second
<b>Source</b>	Controller, Compute

#### 4.40.2 Disk <Linux\_device\_name> writes avg1

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API



<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Operations per second
<b>Source</b>	Controller, Compute

#### 4.40.3 **/dev/<MD\_device\_name> device status**

<b>Periodic Check Interval in Seconds</b>	600
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Controller, Compute

#### 4.40.4 **Free disk space on <filesystem\_mount\_point>**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes
<b>Source</b>	Controller, Compute

#### 4.40.5 **Free disk space on <filesystem\_mount\_point> (percentage)**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of partition
<b>Source</b>	Controller, Compute

#### 4.40.6 **Free inodes on <filesystem\_mount\_point> (percentage)**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API





<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of inodes
<b>Source</b>	Controller, Compute

#### 4.40.7 Total disk space on <filesystem\_mount\_point>

<b>Periodic Check Interval in Seconds</b>	3600
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes
<b>Source</b>	Controller, Compute

#### 4.40.8 Incoming network dropped packets on <interface\_name>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Packets per second
<b>Source</b>	Controller, Compute

#### 4.40.9 Incoming network errors on <interface\_name>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Errors per second
<b>Source</b>	Controller, Compute

#### 4.40.10 Incoming network traffic on <interface\_name>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI



<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Bytes per second
<b>Source</b>	Controller, Compute

#### 4.40.11 Outgoing network dropped packets on <interface\_name>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Packets per second
<b>Source</b>	Controller, Compute

#### 4.40.12 Outgoing network errors on <interface\_name>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Errors per second
<b>Source</b>	Controller, Compute

#### 4.40.13 Outgoing network traffic on <interface\_name>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Bytes per second
<b>Source</b>	Controller, Compute

### 4.41 App HAProxy

This section describes the KPIs for App HAProxy – Prototype.



In case of single server, the App HAProxy KPIs are not available.

#### 4.41.1 HAProxy - <HA\_Proxy\_service> Active (Y/N)

Periodic Check Interval in Seconds	60
Retention Policy	KPI
Shown at Interface	Monitoring API
Collection Type	Text
Source	Controller

#### 4.41.2 HAProxy - <HA\_Proxy\_service> Backup (Y/N)

Periodic Check Interval in Seconds	60
Retention Policy	KPI
Shown at Interface	Monitoring API
Collection Type	Text
Source	Controller

#### 4.41.3 HAProxy - <HA\_Proxy\_service> Connection Errors

Periodic Check Interval in Seconds	60
Retention Policy	KPI
Shown at Interfaces	PM Report File, Monitoring API
Collection Type	Delta
Output Measure	Connections per second
Source	Controller

#### 4.41.4 HAProxy - <HA\_Proxy\_service> Denied Requests

Periodic Check Interval in Seconds	60
Retention Policy	KPI
Shown at Interfaces	PM Report File, Monitoring API
Collection Type	Delta
Output Measure	Requests per second
Source	Controller

**4.41.5 HAProxy - <HA\_Proxy\_service> Failed Health Check details**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Controller

**4.41.6 HAProxy - <HA\_Proxy\_service> Queued Requests**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of requests
<b>Source</b>	Controller

**4.41.7 HAProxy - <HA\_Proxy\_service> Request Errors**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Requests per second
<b>Source</b>	Controller

**4.41.8 HAProxy - <HA\_Proxy\_service> Request Rate**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Requests per second
<b>Source</b>	Controller



#### 4.41.9 HAProxy - <HA\_Proxy\_service> Response Errors

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Responses per second
<b>Source</b>	Controller

#### 4.41.10 HAProxy - <HA\_Proxy\_service> Session Rate

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Sessions per second
<b>Source</b>	Controller

#### 4.41.11 HAProxy - <HA\_Proxy\_service> Session Rate Limit

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Sessions per second
<b>Source</b>	Controller

#### 4.41.12 HAProxy - <HA\_Proxy\_service> Session Rate Max

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Sessions per second
<b>Source</b>	Controller



#### 4.41.13 HAProxy - <HA\_Proxy\_service> Total Downtime

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	s
<b>Source</b>	Controller

### 4.42 Extreme Networks

This section describes the KPIs for Extreme Networks.

#### 4.42.1 ifAdminStatus for interface <interface\_ID>

The current state of the interface set by the administrator

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Switch

#### 4.42.2 ifInDiscards for interface <interface\_ID>

Number of inbound packets discarded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of packets
<b>Source</b>	Switch

#### 4.42.3 ifInErrors for interface <interface\_ID>

Number of inbound packets that were not delivered due to errors



<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of packets
<b>Source</b>	Switch

#### 4.42.4 iflnNUcastPkts for interface <interface\_ID>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of packets
<b>Source</b>	Switch

#### 4.42.5 iflnOctets for interface <interface\_ID>

Total number of bytes received on the interface.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes
<b>Source</b>	Switch

#### 4.42.6 iflnUcastPkts for interface <interface\_ID>

Number of unicast packets delivered by the interface

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge



<b>Output Measure</b>	Number of packets
<b>Source</b>	Switch

#### 4.42.7 ifInUnknownProtos for interface <interface\_ID>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of packets
<b>Source</b>	Switch

#### 4.42.8 ifLastChange for interface <interface\_ID>

Timestamp of the last state change on the interface.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	s
<b>Source</b>	Switch

#### 4.42.9 ifOperStatus for interface <interface\_ID>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interfaces</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Switch

#### 4.42.10 ifOutDiscards for interface <interface\_ID>

Number of outbound packets discarded





<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of packets
<b>Source</b>	Switch

#### 4.42.11 **ifOutErrors for interface <interface\_ID>**

Number of inbound packets not transmitted due to errors

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of packets
<b>Source</b>	Switch

#### 4.42.12 **ifOutNUcastPkts for interface <interface\_ID>**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of packets
<b>Source</b>	Switch

#### 4.42.13 **ifOutOctets for interface <interface\_ID>**

Number of outbound packets

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge



<b>Output Measure</b>	Bytes
<b>Source</b>	Switch

#### 4.42.14 ifOutQLen for interface <interface\_ID>

Output queue length

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of packets
<b>Source</b>	Switch

#### 4.42.15 ifOutUcastPkts for interface <interface\_ID>

Number of unicast packets transmitted by the interface

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of packets
<b>Source</b>	Switch

#### 4.42.16 ifPhysAddress for interface <interface\_ID>

The media access control (MAC) address of the interface.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Switch



#### 4.42.17 ifSpecific for interface <interface\_ID>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Switch

#### 4.42.18 ifSpeed for interface <interface\_ID>

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bits per second
<b>Source</b>	Switch

#### 4.42.19 Extreme System ID of <switch\_host\_name>

<b>Periodic Check Interval in Seconds</b>	3600
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Switch

#### 4.42.20 Power Alarm of <switch\_host\_name>

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Switch



#### 4.42.21 Power Status of <switch\_host\_name>

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Switch

#### 4.42.22 Operational status of fan #<fan\_ID>

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Text
<b>Source</b>	Switch

### 4.43 Iptables

This section describes the KPIs for App Iptables Stats.

#### 4.43.1 tcp close

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge



<b>Output Measure</b>	Number of packets
<b>Source</b>	Controller, compute

#### 4.43.2 tcp established

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Number of packets
<b>Source</b>	Controller, compute

#### 4.43.3 tcp syn

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Packet
<b>Source</b>	Controller, compute

#### 4.43.4 tcp timewait

The availability of these values depends on the configuration. If the reduced footprint setting is selected (for example, single server), these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge



<b>Output Measure</b>	Packet
<b>Source</b>	Controller, compute

**4.43.5 total icmp**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Packet
<b>Source</b>	Controller, compute

**4.43.6 total other**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Packet
<b>Source</b>	Controller, compute

**4.43.7 total tcp**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Packet
<b>Source</b>	Controller, compute

**4.43.8 total udp**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API



<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Packet
<b>Source</b>	Controller, compute

## 4.44 App MongoDB

This section describes the KPIs for MongoDB.

In case of single server, the App MongoDB KPIs are not available.

### 4.44.1 MongoDB bytes received

The availability of these values depends on the configuration. If the reduced footprint setting is selected, these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Byte
<b>Source</b>	Controller

### 4.44.2 MongoDB bytes sent

The availability of these values depends on the configuration. If the reduced footprint setting is selected, these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Byte
<b>Source</b>	Controller

### 4.44.3 MongoDB database size

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI



<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Byte
<b>Source</b>	Controller

#### 4.44.4 MongoDB number of current connections

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Connection
<b>Source</b>	Controller

#### 4.44.5 MongoDB number of open cursors

The availability of these values depends on the configuration. If the reduced footprint setting is selected, these metrics are not available.

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Operation
<b>Source</b>	Controller

#### 4.44.6 MongoDB resident memory usage

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Byte
<b>Source</b>	Controller





#### 4.44.7 MongoDB virtual memory usage

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	KPI
<b>Shown at Interfaces</b>	PM Report File, Monitoring API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Byte
<b>Source</b>	Controller

### 4.45 Compute (Nova)

This section describes the KPIs for Compute (Nova).

In case single server, the Compute (Nova) KPIs are not available.

#### 4.45.1 instance

Existence of instance

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Instance
<b>Source</b>	Instance ID

#### 4.45.2 instance:<type>

Existence of instance <type> (openstack types)

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Instance
<b>Source</b>	Instance ID



#### 4.45.3 memory

Volume of RAM allocated in MB

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	MB
<b>Source</b>	Instance ID

#### 4.45.4 cpu

CPU time used

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Cumulative
<b>Output Measure</b>	ns
<b>Source</b>	Instance ID

#### 4.45.5 cpu\_util

Average CPU utilization

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	% of time
<b>Source</b>	Instance ID

#### 4.45.6 vcpus

Number of VCPUs



<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	VCPU
<b>Source</b>	Instance ID

#### 4.45.7 **disk.read.requests**

Number of read requests

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Cumulative
<b>Output Measure</b>	Request
<b>Source</b>	Instance ID

#### 4.45.8 **disk.read.requests.rate**

Average rate of read requests per second

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Requests per second
<b>Source</b>	Instance ID

#### 4.45.9 **disk.write.requests**

Number of write requests

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Cumulative



<b>Output Measure</b>	Request
<b>Source</b>	Instance ID

#### 4.45.10 **disk.write.requests.rate**

Average rate of write requests per second

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Requests per second
<b>Source</b>	Instance ID

#### 4.45.11 **disk.read.bytes**

Volume of reads in bytes

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Cumulative
<b>Output Measure</b>	Byte
<b>Source</b>	Instance ID

#### 4.45.12 **disk.read.bytes.rate**

Average rate of reads in bytes per second

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes per second
<b>Source</b>	Instance ID



#### 4.45.13 **disk.write.bytes**

Volume of writes in bytes

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Cumulative
<b>Output Measure</b>	Byte
<b>Source</b>	Instance ID

#### 4.45.14 **disk.write.bytes.rate**

Average volume of writes in bytes per second

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Bytes per second
<b>Source</b>	Instance ID

#### 4.45.15 **disk.root.size**

Size of root disk in Gigabytes

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Gigabyte
<b>Source</b>	Instance ID

#### 4.45.16 **disk.ephemeral.size**

Size of ephemeral disk in Gigabytes



<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Gigabyte
<b>Source</b>	Instance ID

## 4.46 Network (Neutron)

This section describes the KPIs for Network (Neutron).

In case of single server, the Network (Neutron) KPIs are not available.

### 4.46.1 network

Existence of network

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Network
<b>Source</b>	Network ID

### 4.46.2 router

Existence of router

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Router
<b>Source</b>	Router ID

### 4.46.3 router.create

Creation requests for this router



<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Router
<b>Source</b>	Router ID

#### 4.46.4 router.update

Update requests for this router

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Router
<b>Source</b>	Router ID

#### 4.46.5 ip.floating

Existence of floating ip

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	IP
<b>Source</b>	IP ID

#### 4.46.6 ip.floating.create

Creation requests for this floating ip

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Delta



<b>Output Measure</b>	IP
<b>Source</b>	IP ID

#### 4.46.7 **ip.floating.update**

Update requests for this floating ip

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	IP
<b>Source</b>	IP ID

### 4.47 **Image (Glance)**

This section describes the KPIs for Image (Glance).

In case of single server, the Image (Glance) KPIs are not available.

#### 4.47.1 **image**

Image polling -> it (still) exists

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Image
<b>Source</b>	Image ID

#### 4.47.2 **image.size**

Uploaded image size

<b>Periodic Check Interval in Seconds</b>	300
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API





<b>Collection Type</b>	Gauge
<b>Output Measure</b>	byte
<b>Source</b>	Image ID

#### 4.47.3 **image.update**

Number of update on the image

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Image
<b>Source</b>	Image ID

#### 4.47.4 **image.upload**

Number of upload of the image

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Image
<b>Source</b>	Image ID

#### 4.47.5 **image.delete**

Number of delete on the image

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Image
<b>Source</b>	Image ID



#### 4.47.6 image.download

Image downloaded

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	byte
<b>Source</b>	Image ID

#### 4.47.7 image.serve

Image served out

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Byte
<b>Source</b>	Image ID

### 4.48 Volume (Cinder)

This section describes the KPIs for Volume (Cinder).

In case of single server, the Volume (Cinder) KPIs are not available.

#### 4.48.1 volume

Existence of volume

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Volume
<b>Source</b>	Volume ID



#### 4.48.2 **volume.size**

Size of volume

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Gauge
<b>Output Measure</b>	Gigabyte
<b>Source</b>	Volume ID

### 4.49 Object Storage (Swift)

This section describes the KPIs for Object Storage (Swift).

In case of single server, the Object Storage (Swift) KPIs are not available.

#### 4.49.1 **storage.api.request**

Number of API requests against Swift

<b>Periodic Check Interval in Seconds</b>	N/A
<b>Retention Policy</b>	Metering
<b>Shown at Interface</b>	Telemetry API
<b>Collection Type</b>	Delta
<b>Output Measure</b>	Request
<b>Source</b>	Store ID

### 4.50 Monitoring API

This section describes the KPIs for the Monitoring API. Refer to *Performance Management Northbound API* for more information.

#### 4.50.1 **PMAPI VIP API test succeeded**

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interface</b>	ISP Report Log File, Monitoring API



<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.50.2 PMAPI Server is listening on port

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interface</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.50.3 PMAPI Server Process is Running

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interface</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

#### 4.50.4 PMAPI test succeeded

<b>Periodic Check Interval in Seconds</b>	60
<b>Retention Policy</b>	ISP
<b>Shown at Interface</b>	ISP Report Log File, Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Controller

### 4.51 Bandwidth Management

This section describes the KPIs for bandwidth management.

#### 4.51.1 Bandwidth Management Overallocation

Bandwidth overallocated due to race condition



<b>Periodic Check Interval in Seconds</b>	600
<b>Retention Policy</b>	ISP
<b>Shown at Interface</b>	Monitoring API
<b>Collection Type</b>	Boolean
<b>Source</b>	Compute



## Reference List

- [1] *Zabbix Documentation 2.4*, Items, <https://www.zabbix.com/documentation/2.4/manual/config/items>