



Intel® Rack Scale Design PSME

User Guide

Software Release 1.2

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Revision 005



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Revision History

Revision	Description	Date
0.1	Initial version.	April 4, 2016

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1 Introduction

1.1 Scope

This document contains information about the installation and management of Intel® Rack Scale Design Scale Architecture Pooled System Management Engine (PSME) Software Release 1.2.

1.2 Intended audience

The intended audiences for this document include:

- Software Vendors (ISVs) of POD Management software, that make use of Intel® Rack Scale Design Scale Architecture PSME API to discover, compose, and manage Intel® Rack Scale Design Scale Architecture drawers, regardless of the hardware vendor and/or manage Intel® Rack Scale Design Scale Architecture drawers in a multivendor environment.
- Hardware Vendors (OxMs) of PSME firmware for different hardware platforms other than Bulldog Creek SDV that would like to provide Intel® Rack Scale Design Scale Architecture PSME API on top of their systems.

1.3 Introduction

The PSME Software is a bundle of applications working and communicating together to manage and control different assets in the Drawer.

The PSME Software consists of:

- **PSME REST server** – HTTP server with REST API and JSON data container responsible for gathering and presenting information about assets and available operations on these assets. This application communicates with agents through *JSON-RPC* as a transport and the *Generic Asset Management Interface (GAMI)* as a payload protocol.

The PSME REST server connects with the following agents:

- **PSME Compute agent** – responsible for gathering detailed information about compute modules and for controlling hosts. It participates in Assemble Procedure.
- **PSME Network agent** – responsible for configuration and gathering of detailed information about the network topology. It also manages the Drawer's switch.
- **PSME Chassis agent** – responsible for gathering detailed information about CPP. Communicates with the Rack Management Module (RMM).
- **PSME Storage service** – Is similar to the PSME REST server. Provides HTTP server JSON REST API for storage pool support.

The PSME Storage service connects with the following agent:

- **PSME Storage agent** – responsible for preparing, configuring, gathering, and connection of storage LVM and tgt. This agent connects to the PSME Storage Service.
- **PSME Compute agent simulator** – This is used to imitate the PSME Compute agent with data read from an XML file. The XML file describes hardware (assets layout and details), validates with an XML schema, and sends the information to the PSME REST server.

Please be aware that parts of the PSME, such as the PSME's agents, can be distributed in a few different binaries which are tailored to various customer requirements, supported technologies, and hardware.

Additional supported binaries:

- **PSME Stubs agents** – Each agent (*Compute, Network, Chassis*) is also implemented as a stub. It provides only hardcoded information, which is presented as an example of the full agent's API.



1.4 Supported system environments

Table 1 Supported System

Component	Source compile on	
	Ubuntu* 14.04	Fedora* 23
psme_rest_app	+	+
psme_compute_intel	+	+
psme_compute_stubs	+	+
psme_network_stubs	+	+
psme_storage_tgt_lvm	+	-
psme_chassis_stubs	-	+

The PSME Software is designed and developed to support generic hardware and various operating system solutions. Some steps in the development, configuration, or deployment process can vary for different system environments.

The PSME Software should compile and run on any Linux* system if the required libraries are available and at the proper version for the specific operating system.

1.5 Terminology

Table 2 Terminology

Term	Definition
Blade	Server Board that equates to the SPMF:ComputerSystem
BMC	Baseboard Management Controller
CM	Control Module
CPP	Control Plane Processor*
IPMB	Intelligent Platform Management Bus
LUI	Linux Utility Image
LVM	Logical volume management
Module	Physical component housing a blade or switch
POD	A physical collection of multiple racks
PODM	POD Manager
PSME	Pooled System Management Engine
REST	Representational state transfer
RMM	Rack Management Module
SDV	Software Development Vehicle
TGT	iSCSI target
TOR	Top of Rack network switch
UUID	Universally unique identifier
VLAN	Virtual Lan
XML	Extensible Markup Language



1.6 References

Table 3 Reference documents

Doc ID	Title	Location
332868	Intel® Rack Scale Design GAMI API Specification	http://intel.com/intelRSD
332869	Intel® Rack Scale Design Pod Manager REST API Specification	http://intel.com/intelRSD
332870	Intel® Rack Scale Design Pod Manager Release Notes	http://intel.com/intelRSD
332871	Intel® Rack Scale Design Pod Manager User Guide	http://intel.com/intelRSD
332873	Intel® Rack Scale Design PSME REST API Specification	http://intel.com/intelRSD
332872	Intel® Rack Scale Design PSME Release Notes	http://intel.com/intelRSD
332874	Intel® Rack Scale Design PSME User Guide	http://intel.com/intelRSD
332877	Intel® Rack Scale Design RMM REST API Specification	http://intel.com/intelRSD
332876	Intel® Rack Scale Design RMM Release Notes	http://intel.com/intelRSD
332875	Intel® Rack Scale Design RMM User Guide	http://intel.com/intelRSD
332878	Intel® Rack Scale Design Storage Services API Specification	http://intel.com/intelRSD
332936	Intel® Rack Scale Design BIOS/BMC Tech Guide	http://intel.com/intelRSD
332937	Intel® Rack Scale Design Architectural Requirements Specification	http://intel.com/intelRSD
334611	Intel® Rack Scale Design Getting Started Guide	http://intel.com/intelRSD
n/a	Scalable Platforms Management API	http://dmtf.org/standards/redfish

1.7 Typographical conventions

Symbol and note convention are similar to typographical conventions used in CIMI specification.

Notation used in JSON serialization description:

- Values in italics indicate data types instead of literal values.
- Characters are appended to items to indicate cardinality:
 - "?" (0 or 1)
 - "*" (0 or more)
 - "+" (1 or more)
- Vertical bars, "|", denote choice. For example, "a|b" means a choice between "a" and "b".
- Parentheses, "(" and ")", are used to indicate the scope of the operators "?", "*", "+" and "|".
- Ellipses (i.e., "...") indicate points of extensibility. Note that the lack of an ellipses does not mean no extensibility point exists, rather it is just not explicitly called out.

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2 Key Features

This section explains some of the key features of the Intel® Rack Scale Design PSME software.

2.1 Deep discovery

2.1.1 Description

The Deep Discovery feature has been introduced to address instances of insufficient blade data from the BMC. The Deep Discovery feature can be used to gather hardware details which are unavailable while the platform is offline such as data from PCI/USB installed devices. This feature exposes the host details on the PSME REST API through a dedicated VLAN to the POD Manager. Note that the PSME is not involved in the Deep Discovery data propagation.

The following steps take place during the Deep Discovery:

- Basic discovery of the PSME provides resources (Blades) to be deep discovered.
- The POD Manager selects resources (Blades) to run the deep discovery on.
- Those selected resources (Blades) are booted with a Linux Utility Image (LUI)
- The LUI exposes data to the POD Manager via a REST API
- The POD Manager merges the data obtained from both the PSME and the LUI
- A full set of data is made available via the POD Manager REST API

For more information on implementing Deep Discovery, refer to the [Building Linux Utility Image \(LUI\)](#) section in this document and the Intel® Rack Scale Design Pod Manager User Guide.

2.2 Remote iSCSI target blade boot

The Intel® Rack Scale Design Pod Manager (PODM) utilizes network boot which loads iPXE open source firmware for booting from remote iSCSI targets. Since iPXE does not fully support UEFI, the server BIOS must be set to Legacy mode.

2.3 Security

2.3.1 Overview

1. The PSME Rest Server service generates a self-signed TLS cert (server.key, server.cert) on the initial startup and stores it in `/etc/psme/certs` directory.
2. The Certificate Authority (CA) public key, which is used to validate the POD Manager certificate, must be manually installed on the RMM (via USB stick or root scp).
3. The RMM installs the CA public key to all Drawers within the rack over either i2c* or an IPMB call.
4. If no RMM is present, then every PSME must be provisioned manually by uploading the CA public key which is used for POD Manager TLS certificate certification. The `ca.crt` file (PEM format) must be placed in the `/etc/psme/certs` directory.

The same must be done for PSME Storage (which does not communicate with the RMM). If no RMM is present, then the `psme-rest-server-configuration.json` file must be modified as follows:

```
"rmm-present" : false
```

5. For correct POD Manager certificate validation, the system on which the PSME runs requires a correctly configured NTP client:
 - a. Edit the `/etc/ntp.conf` file



In the servers section, add the following:

```
server 0.rhel.pool/ntp.org iburst
server 1.rhel.pool/ntp.org iburst
```

Add the local ntp server:

```
server IP_OF_YOUR_LOCAL_NTP_SERVER prefer
```

prefer: Specifies that this server is preferred over other servers. A response from the preferred server will be discarded if it differs significantly from the other servers' responses:

- b. Start the NTP Daemon

```
/etc/init.d/ntp start
```

- c. Set initial local date and time

```
ntpdate u IP_OF_YOUR_LOCAL_NTP_SERVER
```

This command is used to manually synchronize your time with the ntp server time. After the initial sync, the NTP client will automatically perform periodic syncs with the NTP Server.

There is a limitation on setting BootSourceOverrideEnabled and BootSourceOverrideTarget options of a System. Since the IMPI command used for setting these attributes requires both values, the user must provide both values in a PATCH request.

2.3.2 Certificate configuration

2.3.2.1 Using RMM

To perform certificate deployment automatically, the PSME Chassis agent must be installed on each drawer in the rack.

To enable the PSME Rest Server to work with the PSME Chassis agent and RMM, the following must be added to the psme-rest-server-configuration.json file:

```
"rmm-present" : true
```

When the RMM is present, the certificate (/etc/rmm/podm.cert) must be placed on the RMM. The RMM will then automatically connect to the PSME Chassis and send the certificates which will be available for the PSME REST Server.

2.3.2.2 Without RMM

Certificates usually are populated by the RMM and PSME Chassis. In the event that none of the components are installed, certificates can be manually deployed on the PSME REST Server:

```
cp ca.crt /etc/psme/certs/ca.crt
```

And the PSME REST Server must have the rmm-present flag disabled:

```
"rmm-present" : false
```

To disable certificate validation, perform the following steps:

1. Change the ssl connector in the psme-rest-server-configuration.json file:

```
"client-cert-required": false
```

2. The Drawer ID must be set manually in PSME Chassis by setting
"chassis": "locationOffset": DRAWER_ID.



2.4 Hot swap

Hardware asset removal is automatically reflected on the REST API. In the event of a sled or drawer removal, only a single event is triggered but all resources will disappear on the API. Once the user removes the hard drive from the JBOD, the following events are triggered:

- Remove physical drive representing the drive (remove event)
- Set physical volume health to critical (update event)
- Set volume group health to critical (update event)
- Set logical volume health to critical (update event for every logical volume placed on the removed drive)
- Set targets' (that point to the logical volume) health to critical (update event for every target)

The re-insertion of the hard drive does not cause the asset critical state to revert back to the previous state.

2.4.1 Hot Swap Limitations

There is a hardware/BIOS limitation regarding the discovery of CPU and DIMM information. Since enumeration of resources happens at boot time, no changes will be detected after a hardware change (e.g. re-insertion of a DIMM into a different slot) without reboot.

To work around this, the sled must be rebooted, removed, and inserted back (or a psme restart may be performed), so that full basic discovery succeeds.

2.5 Link Aggregation Group (LAG)

The Link Aggregation Group (LAG) functionality allows the ability to aggregate a number of physical ports together to make a single high bandwidth data path. It mostly makes sense to configure LAG on interfaces between switches. In addition to increased total bandwidth of the link between switches, LAG ensures redundancy between them.

2.6 Virtual LAN

The VLAN functionality allows the ability to manage VLANs dynamically using the PSME REST API.

2.7 Mesh Topology

The network agent receives neighbor information from an LLDP agent (Open-LLDP daemon). The agents always communicate between each other (talk using LLDPDU packets) thru mesh links. Thus, the neighbor port information can be retrieved only on this port type. If communication between LLDP agents is lost from some reason (mesh port went down, wrong speed is set on the port etc.), the neighbor information will not be provided thru the network agent interface. Aging time for neighbor information is about 2 min 20 sec. This feature requires relevant ONP Switch Software with LLDP support.

2.8 Access Control List (ACL)

To configure ACL on an RRC switch, the user should be aware of the following:

1. Before binding/unbinding ACL to/from a port, at least one rule needs to be created. Therefore, an empty list of ports should be passed when creating ACL on a switch.
2. When creating an ACL rule, at least one condition needs to be specified in the request.
3. There is no HW support to change an already created ACL rule. Therefore, the user is requested to delete the existing rule and create a new one with new attributes.
4. ACLs are not supported on LAG ports.



5. The number of ACLs that can be created is limited by switch resources, the number of rules created and by the number and type of conditions that are defined in the rules.

Please refer to the ONPSS2 API Guide for information about rule priorities and limitations on the number of ACLs that can be created. This feature requires relevant ONP Switch Software with ACL support.

2.9 Static MAC

To configure Static MAC on an RRC switch, the user should be aware of following:

1. There is no HW support to change an already created Static MAC entry. Therefore, the user is requested to delete the existing entry and create a new one with new attributes.
2. It is not possible to have the same Static MAC entry defined on two or more ports at the same time. Adding a static MAC to a port that already exists on another port will automatically remove the old one. This feature requires relevant ONP Switch Software with Static MAC support.

2.10 MultiRack

This functionality allows for managing multiple racks with one POD Manager. The PSME Chassis Agent is responsible for providing Parent ID (Rack ID) and Location Offset (Drawer ID). These values can be hardcoded in the PSME Chassis configuration file or can be overwritten by RMM via IPMB protocol.

2.10.1 MultiRack configuration

In order to modify the default Parent ID and Location Offset, make the following changes to the `/etc/psme/psme-chassis-configuration.json` file and restart `psme-chassis` agent:

```
[...]
"managers": [
{
  "slot" : 1,
  "chassis" : {
    "size": 4,
    "locationOffset": INSERT_LOCATION_OFFSET,
    "networkInterface": "enp0s20f0.4094",
    "parentId" : INSERT_PARENT_ID,
    "platform" : "BDCR",
    "type": "Drawer"
  },
[...]
```

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3 PSME Software Installation Prerequisites

This section explains how to prepare the system for installation of the Intel® Rack Scale Design PSME software.

3.1 Acquire the PSME software

The PSME software is distributed in a source code package for customers wishing to build and compile the software for their particular platform. Refer to the Software Package Contents section of the Intel® Rack Scale Design PSME Release Notes for the latest posted version of the PSME source code.

3.2 Source code

The PSME source code can be downloaded from the Intel® Rack Scale Design Github Site located at <https://github.com/01org/intelRSD>.

This site contains source code for the following components:

- REST Server
- Compute Agent
- Network Agent
- Storage Agent
- Agent Stubs
 - Chassis
 - Compute
 - Network
- Agent Simulator

Please refer to the Intel® Rack Scale Design Package Content section of the Intel® Rack Scale Design Customer Release Notes for the Reference Number of the latest posted version of the PSME source code packages.

3.3 Configure server internet access

Much of the PSME software installation requires access to public software repositories on the Internet. Confirm that the server network, firewall, and proxy configurations allow the appropriate server access.





4 Building and Compiling from Source Code

4.1 Dependencies

Certain OS packages must be present when initiating the build process. Other packages will be installed as part of the build.

4.1.1 Fedora* dependencies

4.1.1.1 Fedora 23 OS package requirements

The following Fedora* 23 Linux OS packages must be manually downloaded and installed. They are required for PSME software compilation and full functionality. Additional modules will be downloaded and installed as part of the CMake compilation step.

Table 4 Fedora package requirements

Package	Description
argtable	Cross platform C library for parsing GNU style command line arguments
argtable-devel	Development package that includes the argtable header files
clang	LLVM clang C/C++ frontend compiler
cmake	Cmake Build tool
cpp	GNU C Preprocessor
doxygen	Documentation system
emacs-filesystem	GNU Emacs Filesystem Layout
gcc	GCC compiler
gcc-c++	GCC C++ compiler
glibc-devel	Object files for development using standard C libraries
glibc-headers	Header files for development using standard C libraries
gmock-devel	Google C++ Mocking Framework development files
gnutls-devel	Development files for the gnutls package
gtest-devel	Google C++ testing framework development files
jsoncpp	JSON library implemented in C++
jsoncpp-devel	Development headers and library for jsoncpp
kernel-headers	Header files for the Linux kernel for use by glibc
libarchive	A library for handling streaming archive formats
libcurl-devel	Files needed for building applications with libcurl
libgcc	GCC version 5 shared support library
libcrypt-devel	Cryptographic Language library
libgomp	CC OpenMP v3.0 shared support library
libmicrohttpd	Lightweight library for embedding a webserver in applications
libmicrohttpd-devel	Development files for libmicrohttpd
libmpc	C library for multiple precision complex arithmetic
libmpc-devel	Header and shared development libraries for MPC
libnl3-devel	Netlink Protocol Development Library (1)
libstdc++	GNU Standard C++ Library
libstdc++-devel	Header files and libraries for C++ development
libusb-devel	Libudev Development Library (1)
libxml++-devel	Development files for C++ wrapper for the libxml2 XML parser library
lvm2-devel	Logical Volume Management development libraries and headers



Package	Description
lzo	Data compression library with very fast (de)compression
mpfr-devel	Dev tools for multiple-precision floating-point computations C Library
ncurses-devel	Ncurses support utilities development files
OpenIPMI	IPMI library and tools
OpenIPMI-devel	Development environment for the OpenIPMI project
patch	Utility for modifying/upgrading files
perl-Digest	Modules that calculate message digests
perl-Digest-MD5	Perl interface to the MD5 algorithm
perl-GD	Perl interface to the GD graphics library
scsi-target-utils	SCSI target daemon and utility programs (2) (3)
systemd-devel	Development headers for systemd System and Service Manager
texlive-base	TeX Live filesystem, metadata and licenses shipped in text form
texlive-epstopdf	Convert EPS to 'encapsulated' PDF using Ghostscript
texlive-epstopdf-bin	Binaries for epstopdf
texlive-kpathsea	Path searching library for TeX-related files
texlive-kpathsea-bin	Binaries for kpathsea
texlive-kpathsea-lib	Library for kpathsea
uuid-c++-devel	C++ development support for UUID
valgrind	Tool for finding memory management bugs in programs

(1) Required for Network Module.

(2) Required for Storage Module.

(3) Not required for compilation. But must be installed before managing iscsi targets.

4.1.1.2 Fedora 23 package installation

Enter the following command to install all Fedora Packages:

```
dnf install argtable argtable-devel clang cmake cpp doxygen emacs-filesystem
gcc gcc-c++ glibc-devel glibc-headers gmock-devel gnutls-devel gtest-devel
jsoncpp jsoncpp-devel kernel-headers libarchive libcurl-devel libgcc
libgcrypt-devel libgomp libmicrohttpd libmicrohttpd-devel libmpc libmpc-devel
libn13-devel libstdc++ libstdc++-devel libxml++-devel lvm2-devel lzo mpfr-
devel ncurses-devel OpenIPMI OpenIPMI-devel patch perl-Digest perl-Digest-MD5
perl-GD scsi-target-utils systemd-devel texlive-base texlive-epstopdf
texlive-epstopdf-bin texlive-kpathsea texlive-kpathsea-bin texlive-kpathsea-
lib uuid-c++-devel valgrind
```

4.1.2 Ubuntu* dependencies

4.1.2.1 Ubuntu OS package requirements

The following Ubuntu* Linux OS packages must be manually downloaded and installed. They are required for PSME software compilation and full functionality. Additional modules will be downloaded and installed as part of the CMake compilation step.

Table 5 Ubuntu package dependencies

Package	Description
bison	YACC-compatible parser generator
build-essential	Build-essential Package



Package	Description
ccache	Compiler cache for fast recompilation of C/C++ code
clang	C, C++ and Objective-C compiler (LLVM based)
cmake	Cmake Build tool
cpp	GNU C Preprocessor
doxygen	Documentation system
flex	A fast lexical analyzer generator
g++	GCC C++ compiler
g++-5	GNU C++ compiler
gcc	GCC compiler
gcc-5	GNU C Compiler
lcov	Summarise Code coverage information from GCOV
libcurl3-dev	Packages providing libcurl3-dev
libgcc-4.9-dev	GCC support library
libgcrypt-dev	Cryptographic Language library
libgnutls-dev	GNU TLS library
libjsoncpp-dev	Library for reading and writing JSON for C++
libmicrohttpd-dev	Library embedding HTTP server functionality
libmpc-dev	Multiple precision complex floating-point library
libnl-3-dev	Netlink Protocol Development Library (1)
libnl-genl-3-dev	Generic netlink development library
libnl-route-3-200	Netlink Route Interface Package (1)
libnl-route-3-dev	Netlink Route Interface development library
libopenipmi-dev	Intelligent Platform Management Interface
libosp-uuid-dev	C++ development support for UUID
libpopt-dev	Lib for parsing cmdline parameters
libstdc++6	GNU Standard C++ Library v3
libsysfs-dev	Interface library to sysfs
libudev-dev	Libudev Development Library (1)
libusb-dev	Userspace USB programming library
libxml++2.6-dev	C++ interface to the GNOME XML library
linux-libc-dev	Linux Kernel Headers for development
ncurses-dev	New Curses development library
patch	Package to apply a diff file to an original
tgt	Linux* Target Framework (TGT) (2)
valgrind	Tool for finding memory management bugs in programs

(1) Required for Network module

(2) Required for Storage module



4.1.2.2 Ubuntu package installation

Add the Required Repositories

The following lines must be appended to `/etc/apt/sources.list` file:

```
deb http://ppa.launchpad.net/ubuntu-toolchain-r/test/ubuntu trusty main
deb-src http://ppa.launchpad.net/ubuntu-toolchain-r/test/ubuntu trusty main
```

The apt-get database must be updated:

```
apt-get update
```

Export the Required Environment Variables

Environment variables must be set to ensure that the correct GCC version is used. Perform the following steps to export the required environment variables before building and compiling the PSME modules.

```
export CC=/usr/bin/gcc-5
export CXX=/usr/bin/g++-5
```

Enter the following command to install all Ubuntu Packages:

```
apt-get install bison build-essential ccache clang cmake cpp doxygen flex g++
g++-5 gcc gcc-5 lcov libcurl3-dev libgcc-4.9-dev libgcrypt-dev libgnutls-dev
libjsoncpp-dev libmicrohttpd-dev libmpc-dev libnl-3-dev libnl-genl-3-dev
libnl-route-3-200 libnl-route-3-dev libopenipmi-dev libossp-uuid-dev libopt-
dev libstdc++6 libsysfs-dev libudev-dev libusb-dev libxml++2.6-dev linux-
libc-dev ncurses-dev patch tgt valgrind
```

4.2 Building and compiling

4.2.1 Create a Linux user account

Create and use a non-root account to build and compile the PSME modules.

4.2.2 Prepare the build directory

All PSME Modules must be built from a main build directory. Perform the following steps to prepare the build directory:

```
cd <PSME root>
mkdir build
cd build
cmake ..
```

Note: During the “cmake ..” step, several third-party libraries are downloaded from the Internet. In the event that some of libraries do not download completely, ie. due to connectivity problems, then remove the broken library from `<PSME_root>/third_party` directory, delete the old `<PSME_root>/build` directory, and perform the steps again to prepare the build directory.



Note: The PSME Network Agent will not be automatically compiled on Ubuntu. Cmake excludes the agent/network directory if a header from the fm10kd-devel package is not found in the system. This package is only available on Fedora 23.

4.2.3 Building the modules

All PSME modules must be built from the previously prepared build directory. Perform the following steps to build the PSME Rest Server, all associated agents, stubs, and simulators:

```
cd <PSME_root>/build
make all
```

The resulting executables are located in the <PSME_root>/build/bin directory.

The location of the PSME project source and executable locations are in Table 6:

Table 6 PSME projects and locations

Name	Project location	Executable location
PSME Rest Server	<PSME_root>/application-ref	<PSME_root>/build/bin/psme-rest-server
PSME Compute Agent	<PSME_root>/agent-intel/compute	<PSME_root>/build/bin/psme-compute-intel
PSME Network Agent	<PSME_root>/agent/network	<PSME_root>/build/bin/psme-network-fm10000
PSME Storage Agent	<PSME_root>/agent/storage	<PSME_root>/build/bin/psme-storage
PSME Chassis Agent Stubs	<PSME_root>/agent-stubs/chassis	<PSME_root>/build/bin/psme-chassis-stubs
PSME Compute Agent Stubs	<PSME_root>/agent-stubs/compute	<PSME_root>/build/bin/psme-compute-stubs
PSME Network Agent Stubs	<PSME_root>/agent-stubs/network	<PSME_root>/build/bin/psme-network-stubs
PSME Compute Agent Simulator	<PSME_root>/agent-simulator/compute	<PSME_root>/build/bin/psme-compute-simulator

4.2.4 cyMUX utility build procedure (optional)

The cyMUX utility is required if running the PSME Chassis Agent. Perform the following steps to prepare, build , and install the cyMUX utility.

1. Acquire the cyMUX source files

The cyMUX utility source code is available in the /tools/CyMUX directory on <https://github.com/01org/intelRSD>.

2. Build the cyMUX utility

Enter the following commands to build the libcyusbserial libraries and cyMUX binaries:

```
cd <cyMUX_root>
make
```

3. Install the libcyusbserial libraries

To install the library on a Fedora target, enter the following commands:

```
cd <cyMUX_root>/cyMUX
install -m 755 libcyusbserial.so.1 /usr/lib64
ln -sf libcyusbserial.so.1 /usr/lib64/libcyusbserial.so
```

To install the library on an Ubuntu target, enter the following commands:

```
cd <cyMUX_root>/cyMUX
install -m 755 libcyusbserial.so.1 /usr/lib
ln -sf libcyusbserial.so.1 /usr/lib/libcyusbserial.so
```



4. Install the cyMUX binaries

```
cd <cyMUX_root>/cyMUX  
install -m 755 cyMUX cytool /usr/bin
```

5. Running the cyMUX Utility

The cyMUX Utility must be run as a service and started before starting the PSME Chassis.

Enter the following command for cyMUX Utility options:

```
/usr/bin/cyMUX -?
```





5 Running the PSME Components

Each PSME component can be executed by **root** from any local directory, or optionally run from a non-root account if not binding to a privileged port.

The component can be executed with default values, or an optional configuration file can be passed as a command line argument.

The executables are located in the <PSME_root>/build/bin directory as shown in Table 7.

Table 7 PSME executables in <PSME_root>/build/bin

Name	Executable name
PSME Rest Server	psme-rest-server
PSME Compute Agent	psme-compute-intel
PSME Network Agent	psme-network-fm10000
PSME Storage Agent	psme-storage
PSME Chassis Agent Stubs	psme-chassis-stubs
PSME Compute Agent Stubs	psme-compute-stubs
PSME Network Agent Stubs	psme-network-stubs
PSME Compute Agent Simulator	psme-compute-simulator

Due to limitations of the jsoncpp library, using locale identifier other than a "C" is unsafe for the LC_NUMERIC environment variable and may prevent PSME components from communicating. In such case an error log would appear containing the following line:

Exception -32700 : JSON_PARSE_ERROR: The JSON-Object is not JSON-VALID

To ensure proper settings follow these steps:

1. Check locale setting with locale command:

```
# locale
LANG="pl_PL"
LANGUAGE=
LC_CTYPE="pl_PL"
LC_NUMERIC="pl_PL"
LC_TIME="pl_PL"
LC_COLLATE="pl_PL"
LC_MONETARY="pl_PL"
LC_MESSAGES="pl_PL"
LC_PAPER="pl_PL"
LC_NAME="pl_PL"
LC_ADDRESS="pl_PL"
LC_TELEPHONE="pl_PL"
LC_MEASUREMENT="pl_PL"
LC_IDENT
```

2. Change LC_NUMERIC variable to "C":

```
# export LC_NUMERIC="C"
```

3. If locale settings were altered while PSME agents were running, they must be restarted for the changes to take effect:

```
# service psme-rest-server restart
# service psme-compute restart
# service psme-network restart
# service psme-chassis restart
```



5.1 PSME configuration file

The configuration file details and properties can be found in the [PSME Configuration Guide](#) section of this document.

Table 8 shows the location of the PSME module configuration files.

Table 8 PSME software configuration files

Modules	Configuration files
PSME Rest Server	<PSME_root>/application-ref/configuration.json
PSME Compute Agent	<PSME_root>/agent-intel/compute/configuration.json
PSME Network Agent	<PSME_root>/agent/network/configuration.json
PSME Storage Agent	<PSME_root>/agent/storage/configuration.json
PSME Chassis Agent Stubs	<PSME_root>/agent-stubs/chassis/configuration.json
PSME Compute Agent Stubs	<PSME_root>/agent-stubs/compute/configuration.json
PSME Network Agent Stubs	<PSME_root>/agent-stubs/network/configuration.json

5.1.1 PSME REST server default configuration

The PSME REST Server will assume the following default values if no optional configuration file is specified during execution:

```
{
  "server": {
    "network-interface-name" : "enp0s20f0.4094",
    "connectors" : [
      {
        "use-ssl" : true,
        "certs-directory" : "/etc/psme/certs",
        "port": 8443,
        "thread-mode" : "select",
        "thread-pool-size" : 10,
        "client-cert-required" : true
      },
      {
        "use-ssl" : false,
        "port": 8888,
        "redirect-port" : 8443,
        "thread-mode" : "select"
      }
    ]
  },
  "event-service" : {
    "delivery-retry-attempts" : 3,
    "delivery-retry-interval-seconds" : 60
  },
  "rmm-present" : true,
  "registration": {
    "port": 8383,
    "minDelay": 3
  },
  "commands": {
    "generic": "Registration"
  },
  "eventing" : {
```



```
"address": "localhost",
"port" : 5567,
"poll-interval-sec" : 20
},
"rest-server" : {
  "storage-service-mode" : false
},
"service-uuid-file" : "/etc/psme/service_uuid.json",
"subscription-config-file" : "/tmp/subscriptions",
"logger" : {
  "app" : {
    "level" : "INFO",
    "timeformat" : "DATE_NS",
    "color" : true,
    "output" : true,
    "tagging" : true,
    "moredebug" : false,
    "streams" : [
      {
        "type" : "STDOUT"
      }
    ]
  }
}
}
```

If using the PSME REST Server with the Storage Services Module, then set the following value:

```
"storage-service-mode" : true
```

5.1.2 PSME compute module default configuration

The PSME Compute Module will assume the following default values if no optional configuration file is specified during execution:

```
{
  "agent": {
    "vendor" : "Intel Corporation",
    "capabilities" : [ "Compute" ]
  },
  "server": {
    "port": 7777
  },
  "registration": {
    "ipv4": "localhost",
    "port": 8383,
    "interval": 3
  },
  "managers": [
    {
      "slot" : 1,
      "switchPortIdentifier" : "sw0p37",
      "ipv4": "1.1.2.1",

```



```

        "username": "put_username_hash_here",
        "password": "put_password_hash_here",
        "port": 623,
        "serialConsoleEnabled": true
    },
    {
        "slot" : 2,
        "switchPortIdentifier" : "sw0p41",
        "ipv4": "1.1.2.2",
        "username": "put_username_hash_here",
        "password": "put_password_hash_here",
        "port": 623,
        "serialConsoleEnabled": true
    },
    {
        "slot" : 3,
        "switchPortIdentifier" : "sw0p39",
        "ipv4": "1.1.2.3",
        "username": "put_username_hash_here",
        "password": "put_password_hash_here",
        "port": 623,
        "serialConsoleEnabled": true
    },
    {
        "slot" : 4,
        "switchPortIdentifier" : "sw0p43",
        "ipv4": "1.1.2.4",
        "username": "put_username_hash_here",
        "password": "put_password_hash_here",
        "port": 623,
        "serialConsoleEnabled": true
    }
],
"logger" : {
    "agent" : {
        "level" : "WARNING",
        "timeformat" : "DATE_NS",
        "color" : true,
        "output" : true,
        "tagging" : true,
        "moredebug" : false,
        "streams" : [
            {
                "type" : "STDOUT"
            }
        ]
    }
}
}

```

5.1.3 PSME network module default configuration

The PSME Network Module will assume the following default values if no optional configuration file is specified during execution:

```
{
```



```
"agent": {
  "vendor" : "Intel Corporation",
  "capabilities" : [ "Network" ]
},
"server": {
  "port": 7779
},
"registration": {
  "ipv4": "localhost",
  "port": 8383,
  "interval": 3
},
"managers": [
  {
    "ipv4": "127.0.0.1",
    "serialConsoleEnabled": true,
    "switches": [
      {
        "mgmt_port": "p1p1",
        "ports" : [
          { "id": "sw0p1", "portType": "Downstream" },
          { "id": "sw0p2", "portType": "Downstream" },
          { "id": "sw0p3", "portType": "Downstream" },
          { "id": "sw0p4", "portType": "Downstream" },
          { "id": "sw0p5", "portType": "Downstream" },
          { "id": "sw0p6", "portType": "Downstream" },
          { "id": "sw0p7", "portType": "Downstream" },
          { "id": "sw0p8", "portType": "Downstream" },
          { "id": "sw0p9", "portType": "Downstream" },
          { "id": "sw0p10", "portType": "Downstream" },
          { "id": "sw0p11", "portType": "Downstream" },
          { "id": "sw0p12", "portType": "Downstream" },
          { "id": "sw0p13", "portType": "Downstream" },
          { "id": "sw0p14", "portType": "Downstream" },
          { "id": "sw0p15", "portType": "Downstream" },
          { "id": "sw0p16", "portType": "Downstream" },
          { "id": "sw0p17", "portType": "Downstream" },
          { "id": "sw0p18", "portType": "Downstream" },
          { "id": "sw0p19", "portType": "Downstream" },
          { "id": "sw0p20", "portType": "Downstream" },
          { "id": "sw0p21", "portType": "Downstream" },
          { "id": "sw0p22", "portType": "Downstream" },
          { "id": "sw0p23", "portType": "Downstream" },
          { "id": "sw0p24", "portType": "Downstream" },
          { "id": "sw0p37", "linkTechnology": "PCIe",
"portType": "Downstream" },
          { "id": "sw0p38", "linkTechnology": "PCIe",
"portType": "Downstream" },
          { "id": "sw0p39", "linkTechnology": "PCIe",
"portType": "Downstream" },
          { "id": "sw0p40", "linkTechnology": "PCIe",
"portType": "Downstream" },
          { "id": "sw0p41", "linkTechnology": "PCIe",
"portType": "Downstream" },
```




```

        { "id": "sw0p42", "linkTechnology": "PCIe",
"portType": "Downstream" },
        { "id": "sw0p43", "linkTechnology": "PCIe",
"portType": "Downstream" },
        { "id": "sw0p44", "linkTechnology": "PCIe",
"portType": "Downstream" }
    ]
    }
    ]
    },
    "logger" : {
        "agent" : {
            "level" : "WARNING",
            "timeformat" : "DATE_NS",
            "color" : true,
            "output" : true,
            "tagging" : true,
            "moredebug" : false,
            "streams" : [
                {
                    "type" : "STDOUT"
                }
            ]
        }
    }
}

```

5.1.4 PSME storage module default configuration

The PSME Storage Module will assume the following default values if no optional configuration file is specified during execution:

```

{
  "agent":{
    "type":"Storage",
    "capabilities" : [
      {
        "name" : "Storage",
        "version" : ""
      }
    ]
  },
  "commands":{
    "*": {
      "implementation": "ConfigurationBased"
    }
  },
  "server":{
    "ipv4":"localhost",
    "port":7777
  },
  "registration":{
    "ipv4":"localhost",
    "port":8383,
    "interval":3
  }
}

```



```
},
"modules": [
  {
    "ipv4" : "127.0.0.1",
    "username": "put_username_hash_here",
    "password": "put_password_hash_here",
    "port" : 623,
    "submodules": [
      {
        "type": "StorageServices",
        "port": 623,
        "iscsi" : {
          "config-path" : "/etc/tgt/conf.d",
          "portal-interface" : "eth0",
          "port" : 3260,
          "username" : "",
          "password" : "",
          "initiator" : "psme-storage"
        },
        "networkInterfaces": [],
        "storageControllers": [
          {
            "status": {
              "state": "Enabled",
              "health": "OK"
            },
            "interface": "SATA",
            "fruInfo": {
              "serialNumber": "123fed3029c-12",
              "manufacturer": "Intel Corporation",
              "modelName": "Wellsburg 6-Port SATA
Controller",
              "partNumber": "rev2"
            },
            "driveCount": 1,
            "drives": [],
            "oem": {
            }
          }
        ]
      }
    ]
  }
],
"logger": {
  "agent": {
    "level": "WARNING",
    "timeformat": "DATE_NS",
    "color": true,
    "output": true,
    "tagging": true,
    "moredebug": false,
    "streams": [
      {

```



```
    "type": "STDOUT"
  }
]
}
}
```

The Storage Agent will not be functional until the interface specified in the "portal-interface" field has an IP address assigned. The Storage Agent communicates with the tgt daemon to manage iSCSI targets. Therefore, the tgt daemon must be running when the Storage Agent is utilized.

It is recommended that OS on which the Storage Agent runs, has an LVM filesystem only on hard drives which will be managed by the agent. One LVM Physical Volume should be created on each managed hard disk. All Physical Volumes should be added to one LVM Volume Group on top of which the LVM Logical Volumes are created. The Storage Agent creates new Logical Volumes only by making snapshots/clones of already existing ones.

5.2 Logging

The default PSME logging outputs to STDOUT.

5.2.1 Fedora logging

Logging on Fedora 22 is managed by **systemd**. It can be viewed with the Fedora **journalctl** command.

5.2.2 Ubuntu logging

Logging on Ubuntu 14.04 is managed by upstart. The Ubuntu log files are written to **/var/log/upstart/psme-*.log**.





6 Building Linux Utility Image (LUI)

The LUI building procedure consists of two steps:

1. Compile & copy the psme-rest-server and psme-compute-simulator application to the rootfs overlay directory that is available under PSME source packages.
2. Prepare the PXE bootable bzImage. This is done using a buildroot environment. Sample buildroot and kernel configuration files (for BDC platform) are available on github. The buildroot tool can be downloaded from <http://buildroot.uclibc.org/downloads/buildroot-2016.02.tar.gz>

Buildroot depends on the following utilities:

Name	Version
which	NA
sed	NA
make	3.81 or later
binutils	NA
build-essential (required only for Debian based systems)	NA
gcc	2.95 or later
g++	2.95 or later
bash	NA
patch	NA
gzip	NA
bzip2	NA
Perl	5.8.7 or later
tar	NA
cpio	NA
python	2.6 or later
unzip	NA
rsync	NA
wget	NA
ncurses5	NA

It is recommended to perform both steps on the same machine running Fedora 23 with at least 7 GB of free disk space. The installation requires access to public software repositories on the Internet. Confirm that the server network, firewall, and proxy configurations allow the appropriate server access. Installation of the following dependencies on a standard Fedora 23 distribution is sufficient to compile all the necessary components.

```
dnf install bison flex libxslt-devel binutils-devel gcc cmake gcc-c++ cpp
ccache glibc-devel glibc-headers kernel-headers libmpc libstdc++-devel perl
Digest perl-Digest-MD5 perl-GD libcurl-devel libmicrohttpd-devel
libmicrohttpd jsoncpp-devel jsoncpp argtable-devel argtable libstdc++-devel
libgcc libgomp libstdc++ emacs-filesystem lzo libarchive texlive-epstopdf
texlive-base texlive-epstopdf-bin texlive-kpathsea texlive-kpathsea-bin
texlive-kpathsea-lib ncurses-devel uuid-c++-devel patch libgcrypt-devel
gnutls-devel libxml++-devel perl perl-Thread-Queue perl-Data-Dumper
```

6.1 Preparing the rootfs directory

To avoid end line formatting of LUI scripts, it is recommended to copy original PSME source tar ball directly on build machine where LUI image will be compiled.



1. Copy the PSME source directory to a local directory and export its location path to the \$RACKSCALE variable:

```
export RACKSCALE="/path/to/source/directory/"
```

2. Export rootfs overlay directory path to the \$ROOTFS variable:

```
export ROOTFS="$RACKSCALE/loi/OS/rootfs"
```

3. Compile the psme-rest-server and copy to the \$ROOTFS/usr/bin directory:

```
cd $RACKSCALE
mkdir -p build
cd build/
export CC=$(which gcc)
export CXX=$(which g++)
cmake ..
make psme-rest-server psme-compute-simulator
cp bin/psme-rest-server $ROOTFS/usr/bin
cp bin/psme-compute-simulator $ROOTFS/usr/bin
```

4. Copy the psme-rest-server shared library dependencies to \$ROOTFS/usr/lib:

```
cp `ldd $ROOTFS/usr/bin/psme-rest-server | cut -d " " -f 3`
$ROOTFS/usr/local/lib
```

5. Copy psme-compute-simulator shared library dependencies to \$ROOTFS/usr/lib (duplicates from earlier step and can be overwritten).

- a. Copy the shared library dependencies:

```
cp `ldd $ROOTFS/usr/bin/psme-compute-simulator | cut -d " " -f 3`
$ROOTFS/usr/local/lib $ROOTFS/usr/local/lib
```

- b. Remove libraries which were provided with Buildroot:

```
rm $ROOTFS/usr/local/lib/libc.so.*
rm $ROOTFS/usr/local/lib/libpthread.so.*
rm $ROOTFS/usr/local/lib/libresolv.so.*
```

6. Copy configuration files:

```
cp $RACKSCALE/agent-simulator/compute/configuration.json
$ROOTFS/etc/psme/psme-computesimulator-configuration.json

cp $RACKSCALE/agent-simulator/compute/deep_discovery.xsd
$ROOTFS/etc/psme/deep_discovery.xsd

cp $RACKSCALE/application-ref/configuration.json $ROOTFS/etc/psme/psme
rest-serverconfiguration.json
```

7. Edit \$ROOTFS/etc/psme/psme-compute-simulator-configuration.json file to:

- a. Set "input" variable to "/usr/bin/deep_discovery.xml" and "schema" variable to "/etc/psme/deep_discovery.xsd"

```
sed -i 's/\\"input\"[ \t]*: .*/\\"input\" :
\\"/usr/bin/deep_discovery.xml\"/,/' $ROOTFS/etc/psme/psme-compute-
simulator-configuration.json

sed -i 's/\\"schema\"[ \t]*: .*/\\"schema\" :
\\"/etc/psme/deep_discovery.xsd\"/,/' $ROOTFS/etc/psme/psme-compute-
simulator-configuration.json
```

- b. Set cert-required to FALSE:



```
sed -i 's/\\"client-cert-required\"[ \t]*:[ \t]*true/\\"client-cert-required\" : false/' $ROOTFS/etc/psme/psme-rest-server-configuration.json
```

8. Set executable attribute to \$ROOTFS files:

```
chmod +x $ROOTFS/usr/bin/*  
chmod +x $ROOTFS/etc/init.d/*
```

6.2 Building the LUI

1. Download and unpack Buildroot to your local directory:

```
wget http://buildroot.uclibc.org/downloads/buildroot-2016.02.tar.gz  
tar -xf buildroot-2016.02.tar.gz  
cd buildroot-2016.02
```

2. Create Buildroot initial configuration:

```
make menuconfig  
Choose <Exit>  
Do you wish to save your new configuration?  
Choose <Yes>
```

3. Copy (overwrite) LUI Buildroot configuration:

```
cp $RACKSCALE/lui/config/buildroot.config .config
```

4. Create Kernel default configuration:

```
make linux-menuconfig  
Choose <Exit>
```

5. Copy (overwrite) LUI Kernel configuration:

```
cp $RACKSCALE/lui/config/kernel.config ./output/build/linux-4.4.3/.config
```

6. Build image passing ROOTFS overlay path.

(Note: The first build may take 1-2 hours depending on Internet connection speed and computing power)

```
make BR2_ROOTFS_OVERLAY=$ROOTFS
```

7. Copy generated image to POD manager:

```
scp output/images/bzImage rsd@PODM:/opt/pod-manager/wildfly/discovery/
```

§



7 PSME Configuration Guide

7.1 PSME REST server configuration

7.1.1 Prerequisites

The PSME Rest Server configuration file can be found at:

```
/etc/psme/psme-rest-server-configuration.json
```

7.1.2 Properties

Table 9 PSME REST server properties

Name	Type	Description	Default value	Required
/:commands	object	Configuration which implementation of the commands use to communicate with server.	-	True
/:commands:generic	string	Generic command. Implementation based only on POSIX sockets.	Registration	True
/:eventing	object	An explanation about the purpose of this instance.	-	True
/:eventing:address	string	Address used for eventing.	localhost	True
/:eventing:poll-interval-sec	integer	Delay between polling tries. Busy waiting interval.	20	True
/:eventing:port	integer	Port used for eventing.	5567	True
/:event-service	object	Configuration of EventService.	-	True
/:event-service:delivery-retry-attempts	integer	Number of attempts an event posting is retried before the subscription is terminated.	3	True
/:event-service:delivery-retry-interval-seconds	integer	Number of seconds between retry attempts for sending any given Event.	60	True
/:logger	object	Logger configuration.	-	True
/:logger:app	object	Application logging configuration.	-	True
/:logger:app:color	boolean	Enable / disable colors in log file.	True	False
/:logger:app:level	string	Severity level compatible with syslog.	WARNING	False
/:logger:app:moredebug	boolean	Additional debug info in log file.	False	False
/:logger:app:output	boolean	Enable / disable output.	True	False
/:logger:app:streams	array	Logger output streams configuration.	-	False
/:logger:app:streams:file	string	Path to the file, if stream type is set to FILE.	-	False
/:logger:app:streams:type	string	Stream type. FILE or STDOUT.	STDOUT	False
/:logger:app:tagging	boolean	Enable / disable tagging.	True	False
/:logger:app:timeformat	string	Timestamp format.	DATE_NS	False
/:registration	object	Registration to server configuration container.	-	True
/:registration:minDelay	integer	Minimum delay between heart-beat checks.	3	True
/:registration:port	integer	PSME REST server registration port number.	8383	True
/:rest-server	object	General PSME REST server configuration.	-	True
/:rest-server:storage-service-mode	boolean	Enabling Storage Service Mode. This is needed when REST is running on Storage Module.	False	True
/:rmm-present	boolean	Indicates RMM presence.	True	True



/:server	object	Information about REST server communication.	-	True
/:server:connectors	array	Connectors server listens on.	-	True
/:server:connectors:port	integer	Port on which connector listens on.	8888	True
/:server:connectors:redirect-port	integer	In case of http connector traffic may be redirected to secured connection when accessing secured resources.	8443	True
/:server:connectors:use-ssl	boolean	Indicates if connection should be over SSL.	False	True
/:server:network-interface-name	string	Name of the network interface used for communication.	enp0s20f0.4094	True
/:service-uuid-file	string	Path to service uuid file.	/etc/psme/service_uuid.json	True
/:subscription-config-file	string	Path to subscription config file.	/tmp/subscriptions	True

7.1.3 Example

Configuration Example:

```
{
  "server": {
    "network-interface-name" : "enp0s20f0.4094",
    "connectors" : [
      {
        "use-ssl" : true,
        "certs-directory" : "/etc/psme/certs",
        "port": 8443,
        "thread-mode" : "select",
        "thread-pool-size" : 10,
        "client-cert-required" : true
      },
      {
        "use-ssl" : false,
        "port": 8888,
        "redirect-port" : 8443,
        "thread-mode" : "select"
      }
    ]
  },
  "event-service" : {
    "delivery-retry-attempts" : 3,
    "delivery-retry-interval-seconds" : 60
  },
  "rmm-present" : true,
  "registration": {
    "port": 8383,
    "minDelay": 3
  },
  "commands": {
    "generic": "Registration"
  },
  "eventing" : {
    "address": "localhost",
    "port" : 5567,
    "poll-interval-sec" : 20
  },
}
```




```

"rest-server" : {
  "storage-service-mode" : false
},
"service-uuid-file" : "/etc/psme/service_uuid.json",
"subscription-config-file" : "/tmp/subscriptions",
"logger" : {
  "app" : {
    "level" : "INFO",
    "timeformat" : "DATE_NS",
    "color" : true,
    "output" : true,
    "tagging" : true,
    "moredebug" : false,
    "streams" : [
      {
        "type" : "STDOUT"
      }
    ]
  }
}
}

```

7.1.4 Schema

Configuration schema:

```

{
  "type": "object",
  "title": "PSME Rest Server Configuration Schema",
  "description": "Detailed description of the PSME Rest Server configuration file.",
  "properties": {
    "server": {
      "type": "object",
      "title": "Server schema.",
      "description": "Information about REST server communication.",
      "properties": {
        "network-interface-name": {
          "type": "string",
          "title": "Network-interface-name schema.",
          "description": "Name of the network interface used for communication.",
          "default": "enp0s20f0.4094"
        },
        "connectors": {
          "type": "array",
          "title": "Connectors schema.",
          "description": "Connectors server listens on.",
          "items": {
            "type": "object",
            "properties": {
              "use-ssl": {
                "type": "boolean",
                "title": "Use-ssl schema.",
                "description": "Indicates if connection should be over SSL.",
                "default": false
              }
            }
          }
        }
      }
    }
  }
}

```



```
    },
    "port": {
      "type": "integer",
      "title": "Port schema.",
      "description": "Port on which connector listens on.",
      "default": 8888
    },
    "redirect-port": {
      "type": "integer",
      "title": "Redirect-port schema.",
      "description": "In case of http connector traffic may be
redirected to secured connection when accessing secured resources.",
      "default": 8443
    },
    "thread-mode": {
      "enum": ["select", "thread-per-connection"],
      "title": "Thread-mode schema.",
      "description": "Enumeration of available threading modes of
connector.",
      "default": "select"
    }
  },
  "required": [
    "use-ssl",
    "port",
    "redirect-port",
    "thread-mode"
  ]
}
},
"required": [
  "network-interface-name",
  "connectors"
]
},
"event-service": {
  "type": "object",
  "title": "Event-service schema.",
  "description": "Configuration of EventService.",
  "properties": {
    "delivery-retry-attempts": {
      "type": "integer",
      "title": "Delivery-retry-attempts schema.",
      "description": "Number of attempts an event posting is retried
before the subscription is terminated.",
      "default": 3
    },
    "delivery-retry-interval-seconds": {
      "type": "integer",
      "title": "Delivery-retry-interval-seconds schema.",
      "description": "Number of seconds between retry attempts for
sending any given Event.",
      "default": 60
    }
  }
}
```



```

    },
    "required": [
        "delivery-retry-attempts",
        "delivery-retry-interval-seconds"
    ]
},
"rmm-present": {
    "type": "boolean",
    "title": "Rmm-present schema.",
    "description": "Indicates RMM presence.",
    "default": true
},
"registration": {
    "type": "object",
    "title": "Registration schema.",
    "description": "Registration to server configuration container.",
    "properties": {
        "port": {
            "type": "integer",
            "title": "Port schema.",
            "description": "PSME REST server registration port number.",
            "default": 8383
        },
        "minDelay": {
            "type": "integer",
            "title": "MinDelay schema.",
            "description": "Minimum delay between heart-beat checks.",
            "default": 3
        }
    },
    "required": [
        "port",
        "minDelay"
    ]
},
"commands": {
    "type": "object",
    "title": "Commands schema.",
    "description": "Configuration which implementation of the commands use
to communicate with server.",
    "properties": {
        "generic": {
            "type": "string",
            "title": "Generic schema.",
            "description": "Generic command. Implementation based only on POSIX
sockets.",
            "default": "Registration"
        }
    },
    "required": [
        "generic"
    ]
},
"eventing": {
    "type": "object",

```



```
"title": "Eventing schema.",
"description": "An explanation about the purpose of this instance.",
"properties": {
  "address": {
    "type": "string",
    "title": "Address schema.",
    "description": "Address used for eventing.",
    "default": "localhost"
  },
  "port": {
    "type": "integer",
    "title": "Port schema.",
    "description": "Port used for eventing.",
    "default": 5567
  },
  "poll-interval-sec": {
    "type": "integer",
    "title": "Poll-interval-sec schema.",
    "description": "Delay between polling tries. Busy waiting
interval.",
    "default": 20
  }
},
"required": [
  "address",
  "port",
  "poll-interval-sec"
]
},
"rest-server": {
  "type": "object",
  "title": "Rest-server schema.",
  "description": "General PSME REST server configuration.",
  "properties": {
    "storage-service-mode": {
      "type": "boolean",
      "title": "Storage-service-mode schema.",
      "description": "Enabling Storage Service Mode. This is needed when
REST is running on Storage Module.",
      "default": false
    }
  },
  "required": [
    "storage-service-mode"
  ]
},
"service-uuid-file": {
  "type": "string",
  "title": "Service-uuid-file schema.",
  "description": "Path to service uuid file.",
  "default": "/etc/psme/service_uuid.json"
},
"subscription-config-file": {
  "type": "string",
  "title": "Subscription-config-file schema.",
```



```

    "description": "Path to subscription config file.",
    "default": "/tmp/subscriptions"
  },
  "logger": {
    "type": "object",
    "title": "Logger schema.",
    "description": "Logger configuration.",
    "properties": {
      "app": {
        "type": "object",
        "title": "Application schema.",
        "description": "Application logging configuration.",
        "properties": {
          "level": {
            "type": "string",
            "title": "Level schema.",
            "description": "Severity level compatible with syslog.",
            "default": "WARNING"
          },
          "timeformat": {
            "type": "string",
            "title": "Timeformat schema.",
            "description": "Timestamp format.",
            "default": "DATE_NS"
          },
          "color": {
            "type": "boolean",
            "title": "Color schema.",
            "description": "Enable / disable colors in log file.",
            "default": true
          },
          "output": {
            "type": "boolean",
            "title": "Output schema.",
            "description": "Enable / disable output.",
            "default": true
          },
          "tagging": {
            "type": "boolean",
            "title": "Tagging schema.",
            "description": "Enable / disable tagging.",
            "default": true
          },
          "moredebug": {
            "type": "boolean",
            "title": "Moredebug schema.",
            "description": "Additional debug info in log file.",
            "default": false
          },
          "streams": {
            "type": "array",
            "title": "Streams schema.",
            "description": "Logger output streams configuration.",
            "items": {
              "type": "object",

```

```

        "properties": {
          "type": {
            "type": "string",
            "title": "Type schema.",
            "description": "Stream type. FILE or STDOUT.",
            "default": "STDOUT"
          },
          "file": {
            "type": "string",
            "title": "File schema.",
            "description": "Path to the file, if stream type is set
to FILE.",
            "default": ""
          }
        },
        "required": [
          "type"
        ]
      }
    },
    "required": [
      "app"
    ]
  },
  "required": [
    "server",
    "event-service",
    "rmm-present",
    "registration",
    "commands",
    "eventing",
    "rest-server",
    "service-uuid-file",
    "subscription-config-file",
    "logger"
  ]
}

```

7.2 PSME compute agent configuration

7.2.1 Prerequisites

The PSME Compute configuration file can be found at:

```
/etc/psme/psme-compute-configuration.json
```



7.2.2 Properties

Table 10 PSME compute agent properties

Name	Type	Description	Default value	Required
/:agent	object	Container for agent specific information.	-	True
/:agent:capabilities	array	Capabilities of the agent (compute, network, chassis, storage or multiple).	-	True
/:agent:vendor	string	Information about agent vendor.	Intel Corporation	True
/:logger	object	Logger configuration.	-	True
/:logger:agent	object	Agent logging configuration.	-	True
/:logger:agent:color	boolean	Enable / disable colors in log file.	True	False
/:logger:agent:level	string	Severity level compatible with syslog.	WARNING	False
/:logger:agent:moredebug	boolean	Additional debug info in log file.	False	False
/:logger:agent:output	boolean	Enable / disable output.	True	False
/:logger:agent:streams	array	Logger output streams configuration.	-	False
/:logger:agent:streams:file	string	Path to the file, if stream type is set to FILE.	-	False
/:logger:agent:streams:type	string	Stream type. FILE or STDOUT.	STDOUT	False
/:logger:agent:tagging	boolean	Enable / disable tagging.	True	False
/:logger:agent:timeformat	string	Timestamp format.	DATE_NS	False
/:managers	array	List of all managers. Each entry represents single manager.	-	True
/:managers:ipv4	string	Internal IP address of the module.	1.1.2.1	True
/:managers:password	string	Module's BMC password.	put_password_hash_here	True
/:managers:port	integer	Module's BMC port number.	623	True
/:managers:serialConsoleEnabled	boolean	Enable / disable module's serial console.	True	True
/:managers:slot	integer	Slot number in drawer.	1	True
/:managers:switchPortIdentifier	string	Module's switch port name.	sw0p37	True
/:managers:username	string	Module's BMC username.	put_username_hash_here	True
/:registration	object	Registration to server configuration container.	-	True
/:registration:interval	integer	Delay between next registration try in seconds.	3	True
/:registration:ipv4	string	PSME REST server IP address or hostname.	localhost	True
/:registration:port	integer	PSME REST server registration port number.	8383	True
/:server	object	Information for agent about communication with REST server	-	True
/:server:port	integer	Port number to register to REST server. Must be the same as configured in PSME REST Server.	7777	True

7.2.3 Example

```
{
```



```
"agent": {
  "vendor" : "Intel Corporation",
  "capabilities" : [ "Compute" ]
},
"server": {
  "port": 7777
},
"registration": {
  "ipv4": "localhost",
  "port": 8383,
  "interval": 3
},
"managers": [
  {
    "slot" : 1,
    "switchPortIdentifier" : "sw0p37",
    "ipv4": "1.1.2.1",
    "username": "put_username_hash_here",
    "password": "put_password_hash_here",
    "port": 623,
    "serialConsoleEnabled": true
  },
  {
    "slot" : 2,
    "switchPortIdentifier" : "sw0p41",
    "ipv4": "1.1.2.2",
    "username": "put_username_hash_here",
    "password": "put_password_hash_here",
    "port": 623,
    "serialConsoleEnabled": true
  },
  {
    "slot" : 3,
    "switchPortIdentifier" : "sw0p39",
    "ipv4": "1.1.2.3",
    "username": "put_username_hash_here",
    "password": "put_password_hash_here",
    "port": 623,
    "serialConsoleEnabled": true
  },
  {
    "slot" : 4,
    "switchPortIdentifier" : "sw0p43",
    "ipv4": "1.1.2.4",
    "username": "put_username_hash_here",
    "password": "put_password_hash_here",
    "port": 623,
    "serialConsoleEnabled": true
  }
],
"logger" : {
  "agent" : {
    "level" : "WARNING",
    "timeformat" : "DATE_NS",
    "color" : true,
```




```

        "output" : true,
        "tagging" : true,
        "moredebug" : false,
        "streams" : [
            {
                "type" : "STDOUT"
            }
        ]
    }
}

```

7.2.4 Schema

```

{
  "type": "object",
  "title": "PSME Compute Agent Configuration Schema",
  "description": "Detailed description of the PSME Compute Agent configuration file.",
  "properties": {
    "agent": {
      "type": "object",
      "title": "Agent schema.",
      "description": "Container for agent specific information.",
      "properties": {
        "vendor": {
          "type": "string",
          "title": "Vendor schema.",
          "description": "Information about agent vendor.",
          "default": "Intel Corporation"
        },
        "capabilities": {
          "type": "array",
          "title": "Capabilities schema.",
          "description": "Capabilities of the agent (compute, network, chassis, storage or multiple).",
          "items": {
            "type": "string",
            "default": "Compute"
          }
        }
      },
      "required": [
        "vendor",
        "capabilities"
      ]
    },
    "server": {
      "type": "object",
      "title": "Server schema.",
      "description": "Information for agent about communication with REST server",
      "properties": {
        "port": {
          "type": "integer",
          "title": "Port schema.",

```



```
        "description": "Port number to register to REST server. Must be the
same as configured in PSME REST Server.",
        "default": 7777
    },
    "required": [
        "port"
    ]
},
"registration": {
    "type": "object",
    "title": "Registration schema.",
    "description": "Registration to server configuration container.",
    "properties": {
        "ipv4": {
            "type": "string",
            "title": "Ipv4 schema.",
            "description": "PSME REST server IP address or
hostname.",
            "default": "localhost"
        },
        "port": {
            "type": "integer",
            "title": "Port schema.",
            "description": "PSME REST server registration port number.",
            "default": 8383
        },
        "interval": {
            "type": "integer",
            "title": "Interval schema.",
            "description": "Delay between next registration try in seconds.",
            "default": 3
        }
    },
    "required": [
        "ipv4",
        "port",
        "interval"
    ]
},
"managers": {
    "type": "array",
    "title": "Managers schema.",
    "description": "List of all managers. Each entry represents single
manager.",
    "items": {
        "type": "object",
        "properties": {
            "slot": {
                "type": "integer",
                "title": "Slot schema.",
                "description": "Slot number in drawer.",
                "default": 1
            },
            "switchPortIdentifier": {
```



```

        "type": "string",
        "title": "SwitchPortIdentifier schema.",
        "description": "Module's switch port name.",
        "default": "sw0p37"
    },
    "ipv4": {
        "type": "string",
        "title": "Ipv4 schema.",
        "description": "Internal IP address of the module.",
        "default": "1.1.2.1"
    },
    "username": {
        "type": "string",
        "title": "Module's BMC username.",
        "description": "Module's BMC username.",
        "default": "put_username_hash_here"
    },
    "password": {
        "type": "string",
        "title": "Password schema.",
        "description": "Module's BMC password.",
        "default": "put_password_hash_here"
    },
    "port": {
        "type": "integer",
        "title": "Port schema.",
        "description": "Module's BMC port number.",
        "default": 623
    },
    "serialConsoleEnabled": {
        "type": "boolean",
        "title": "SerialConsoleEnabled schema.",
        "description": "Enable / disable module's serial console.",
        "default": true
    }
},
"required": [
    "slot",
    "switchPortIdentifier",
    "ipv4",
    "username",
    "password",
    "port",
    "serialConsoleEnabled"
]
}
},
"logger": {
    "type": "object",
    "title": "Logger schema.",
    "description": "Logger configuration.",
    "properties": {
        "agent": {
            "type": "object",
            "title": "Agent schema.",

```



```
"description": "Agent logging configuration.",
"properties": {
  "level": {
    "type": "string",
    "title": "Level schema.",
    "description": "Severity level compatible with syslog.",
    "default": "WARNING"
  },
  "timeformat": {
    "type": "string",
    "title": "Timeformat schema.",
    "description": "Timestamp format.",
    "default": "DATE_NS"
  },
  "color": {
    "type": "boolean",
    "title": "Color schema.",
    "description": "Enable / disable colors in log file.",
    "default": true
  },
  "output": {
    "type": "boolean",
    "title": "Output schema.",
    "description": "Enable / disable output.",
    "default": true
  },
  "tagging": {
    "type": "boolean",
    "title": "Tagging schema.",
    "description": "Enable / disable tagging.",
    "default": true
  },
  "moredebug": {
    "type": "boolean",
    "title": "Moredebug schema.",
    "description": "Additional debug info in log file.",
    "default": false
  },
  "streams": {
    "type": "array",
    "title": "Streams schema.",
    "description": "Logger output streams configuration.",
    "items": {
      "type": "object",
      "properties": {
        "type": {
          "type": "string",
          "title": "Type schema.",
          "description": "Stream type. FILE or STDOUT.",
          "default": "STDOUT"
        },
        "file": {
          "type": "string",
          "title": "File schema.",
```



```

        "description": "Path to the file, if stream type is set
to FILE.",
        "default": ""
    },
    },
    "required": [
        "type"
    ]
}
}
}
}
},
"required": [
    "agent"
]
}
},
"required": [
    "agent",
    "server",
    "registration",
    "managers",
    "logger"
]
}
}

```

7.2.5 BMC password encryption

To encrypt the BMC password or username, use the encrypt tool:

```
$ /usr/bin/encrypt <password> [key_file]
```

Then copy the output to the Compute Agent configuration file:

```
$ /etc/psme/psme-compute-configuration.json
```

Note the following:

- If key file does not exist, tool will generate a new one.
- Default key file path is /etc/psme/psme-key
- Tool can be found inside psme-compute package.
- Key must be 8 characters long.

7.3 PSME storage agent configuration

7.3.1 Prerequisites

The PSME Storage configuration file can be found at:

```
/etc/psme/psme-storage-configuration.json
```



7.3.2 Properties

Table 11 PSME storage agent properties

Name	Type	Description	Default value	Required
/:agent	object	Container for agent specific information.	-	True
/:agent:capabilities	array	Capabilities of the agent (compute, network, chassis, storage or multiple).	-	True
/:agent:capabilities:version	string	Version of Storage Agent.		True
/:agent:type	string	Information about agent vendor.	Storage	True
/:commands	object	Container for agent commands configuration.	-	True
/:commands:*	object	* covers all commands.	-	True
/:commands:*.implementation	string	Type of implementation.	ConfigurationBased	True
/:logger	object	Logger configuration.	-	True
/:logger:agent	object	Agent logging configuration.	-	True
/:logger:agent:color	boolean	Enable / disable colors in log file.	True	False
/:logger:agent:level	string	Severity level compatible with syslog.	WARNING	False
/:logger:agent:moredebug	boolean	Additional debug info in log file.	False	False
/:logger:agent:output	boolean	Enable / disable output.	True	False
/:logger:agent:streams	array	Logger output streams configuration.	-	False
/:logger:agent:streams:file	string	Path to the file, if stream type is set to FILE.	-	False
/:logger:agent:streams:type	string	Stream type. FILE or STDOUT.	STDOUT	False
/:logger:agent:tagging	boolean	Enable / disable tagging.	True	False
/:logger:agent:timeformat	string	Timestamp format.	DATE_NS	False
/:modules	array	List of modules. For Storage Agent there should be only one entry in this array.	-	True
/:modules:ipv4	string	Internal IP address of the module.	127.0.0.1	True
/:modules:password	string	Module's BMC password. Not used in PSME Storage Agent.	put_password_hash_here	False
/:modules:port	integer	Module's BMC port number. Not used in PSME Storage Agent.	623	True
/:modules:submodules	array	Configuration for each submodule. For Storage Agent there should be only one entry in this array.	-	True
/:modules:submodules:iscsi	object	iSCSI configuration container.	-	True
/:modules:submodules:iscsi:config-path	string	Path within filesystem where tgt configuration files are located.	/etc/tgt/conf.d	True
/:modules:submodules:iscsi:initiator	string	iSCSI initiator name: psme-storage	psme-storage	True
/:modules:submodules:iscsi:password	string	Password used to authentication to iSCSI.		True
/:modules:submodules:iscsi:port	integer	Port on which iSCSI portal is listening.	3260	True
/:modules:submodules:iscsi:portal-interface	string	Network interface of iSCSI portal.	eth0	True
/:modules:submodules:iscsi:username	string	Username used to authentication to iSCSI.		True
/:modules:submodules:networkInterfaces	array	List of network interfaces. Should be empty array.	-	True
/:modules:submodules:port	integer	Submodule port number. Not used in PSME Storage Agent.	623	True



Name	Type	Description	Default value	Required
/:modules:submodules:storageControllers	array	List of storage controllers. For Storage Agent there should be only one entry.	-	True
/:modules:submodules:storageControllers:driveCount	integer	Number of drives. Will be override on runtime.	1	True
/:modules:submodules:storageControllers:drives	array	List of drives. Should be empty array, will be override on runtime.	-	True
/:modules:submodules:storageControllers:fruInfo	object	FRU information.	-	True
/:modules:submodules:storageControllers:fruInfo:manufacturer	string	Manufacturer name.	Intel Corporation	True
/:modules:submodules:storageControllers:fruInfo:modelNumber	string	Model number.	Wellsburg 6-Port SATA Controller	True
/:modules:submodules:storageControllers:fruInfo:partNumber	string	Part number.	rev2	True
/:modules:submodules:storageControllers:fruInfo:serialNumber	string	Serial number.	123fed3029c-12	True
/:modules:submodules:storageControllers:interface	string	Storage controller interface: SATA, SAS, etc.	SATA	True
/:modules:submodules:storageControllers:oem	object	OEM specific data.	-	True
/:modules:submodules:storageControllers:status	object	Storage controller status.	-	True
/:modules:submodules:storageControllers:status:health	string	Storage controller health: OK	OK	True
/:modules:submodules:storageControllers:status:state	string	Storage controller state: Enabled	Enabled	True
/:modules:submodules:type	string	Submodule type. For Storage Agent there should be: StorageServices.	StorageServices	True
/:modules:username	string	Module's BMC username. Not used in PSME Storage Agent.	put_username_hash_here	False
/:registration	object	Registration to server configuration container.	-	True
/:registration:interval	integer	Delay between next registration try in seconds.	3	True
/:registration:ipv4	string	PSME REST server IP address or hostname.	localhost	True
/:registration:port	integer	PSME REST server registration port number.	8383	True
/:server	object	Information for agent about communication with REST server	-	True
/:server:ipv4	string	PSME REST server IP address or hostname.	localhost	True
/:server:port	integer	Port number to register to REST server. Must be the same as configured in PSME REST Server.	7777	True

7.3.3 Example

```
{
  "agent":{
    "type":"Storage",
    "capabilities" : [
      {
        "name" : "Storage",
        "version" : ""
      }
    ]
  }
}
```



```
    }
  ],
  },
  "commands":{
    "*": {
      "implementation": "ConfigurationBased"
    }
  },
  "server":{
    "ipv4":"localhost",
    "port":7777
  },
  "registration":{
    "ipv4":"localhost",
    "port":8383,
    "interval":3
  },
  "modules":[
    {
      "ipv4" : "127.0.0.1",
      "username": "put_username_hash_here",
      "password": "put_password_hash_here",
      "port" : 623,
      "submodules":[
        {
          "type": "StorageServices",
          "port": 623,
          "iscsi" : {
            "config-path" : "/etc/tgt/conf.d",
            "portal-interface" : "eth0",
            "port" : 3260,
            "username" : "",
            "password" : "",
            "initiator" : "psme-storage"
          },
          "networkInterfaces": [],
          "storageControllers":[
            {
              "status":{
                "state":"Enabled",
                "health":"OK"
              },
              "interface":"SATA",
              "fruInfo":{
                "serialNumber":"123fed3029c-12",
                "manufacturer":"Intel Corporation",
                "modelName":"Wellsburg 6-Port SATA
Controller",
                "partNumber":"rev2"
              },
              "driveCount": 1,
              "drives": [],
              "oem":{
            }
          ]
        }
      ]
    }
  ]
}
```




```

    }
  ]
}
],
"logger":{
  "agent":{
    "level": "WARNING",
    "timeformat":"DATE_NS",
    "color":true,
    "output":true,
    "tagging":true,
    "moredebug":false,
    "streams":[
      {
        "type": "STDOUT"
      }
    ]
  }
}
}
}

```

7.3.4 Schema

```

{
  "type": "object",
  "title": "PSME Storage Agent Configuration Schema",
  "description": "Detailed description of the PSME Storage Agent
configuration file.",
  "properties": {
    "agent": {
      "type": "object",
      "title": "Agent schema.",
      "description": "Container for agent specific information.",
      "properties": {
        "type": {
          "type": "string",
          "title": "Type schema.",
          "description": "Information about agent vendor.",
          "default": "Storage"
        },
        "capabilities": {
          "type": "array",
          "title": "Capabilities schema.",
          "description": "Capabilities of the agent (compute, network,
chassis, storage or multiple).",
          "items": {
            "type": "object",
            "properties": {
              "name": {
                "type": "string",
                "default": "Storage"
              },
              "version": {

```



```
        "type": "string",
        "title": "Version schema.",
        "description": "Version of Storage Agent.",
        "default": ""
    },
    },
    "required": [
        "name",
        "version"
    ]
}
},
"required": [
    "type",
    "capabilities"
]
},
"commands": {
    "type": "object",
    "title": "Commands schema.",
    "description": "Container for agent commands configuration.",
    "properties": {
        "*": {
            "type": "object",
            "description": "* covers all commands.",
            "properties": {
                "implementation": {
                    "type": "string",
                    "title": "Implementation schema.",
                    "description": "Type of implementation.",
                    "default": "ConfigurationBased"
                }
            },
            "required": [
                "implementation"
            ]
        }
    },
    "required": [
        "*"
    ]
},
"server": {
    "type": "object",
    "title": "Server schema.",
    "description": "Information for agent about communication with REST
server",
    "properties": {
        "ipv4": {
            "type": "string",
            "title": "Ipv4 schema.",
            "description": "PSME REST server IP address or hostname.",
            "default": "localhost"
        }
    },
    },
```



```

    "port": {
      "type": "integer",
      "title": "Port schema.",
      "description": "Port number to register to REST server. Must be the
same as configured in PSME REST Server.",
      "default": 7777
    }
  },
  "required": [
    "ipv4",
    "port"
  ]
},
"registration": {
  "type": "object",
  "title": "Registration schema.",
  "description": "Registration to server configuration container.",
  "properties": {
    "ipv4": {
      "type": "string",
      "title": "Ipv4 schema.",
      "description": "PSME REST server IP address or hostname.",
      "default": "localhost"
    },
    "port": {
      "type": "integer",
      "title": "Port schema.",
      "description": "PSME REST server registration port number.",
      "default": 8383
    },
    "interval": {
      "type": "integer",
      "title": "Interval schema.",
      "description": "Delay between next registration try in seconds.",
      "default": 3
    }
  },
  "required": [
    "ipv4",
    "port",
    "interval"
  ]
},
"modules": {
  "type": "array",
  "title": "Modules schema.",
  "description": "List of modules. For Storage Agent there should be only
one entry in this array.",
  "items": {
    "type": "object",
    "properties": {
      "ipv4": {
        "type": "string",
        "title": "Ipv4 schema.",
        "description": "Internal IP address of the module.",

```



```
        "default": "127.0.0.1"
    },
    "username": {
        "type": "string",
        "title": "Username schema.",
        "description": "Module's BMC username. Not used in PSME Storage
Agent.",
        "default": "put_username_hash_here"
    },
    "password": {
        "type": "string",
        "title": "Password schema.",
        "description": "Module's BMC password. Not used in PSME Storage
Agent.",
        "default": "put_password_hash_here"
    },
    "port": {
        "type": "integer",
        "title": "Port schema.",
        "description": "Module's BMC port number. Not used in PSME
Storage Agent.",
        "default": 623
    },
    "submodules": {
        "type": "array",
        "title": "Submodules schema.",
        "description": "Configuration for each submodule. For Storage
Agent there should be only one entry in this array.",
        "items": {
            "type": "object",
            "properties": {
                "type": {
                    "type": "string",
                    "title": "Type schema.",
                    "description": "Submodule type. For Storage Agent there
should be: StorageServices.",
                    "default": "StorageServices"
                },
                "port": {
                    "type": "integer",
                    "title": "Port schema.",
                    "description": "Submodule port number. Not used in PSME
Storage Agent.",
                    "default": 623
                }
            }
        },
        "iscsi": {
            "type": "object",
            "title": "Iscsi schema.",
            "description": "iSCSI configuration container.",
            "properties": {
                "config-path": {
                    "type": "string",
                    "title": "Config-path schema.",
                    "description": "Path within filesystem where tgt
configuration files are located.",
```



```

        "default": "/etc/tgt/conf.d"
    },
    "portal-interface": {
        "type": "string",
        "title": "Portal-interface schema.",
        "description": "Network interface of iSCSI portal.",
        "default": "eth0"
    },
    "port": {
        "type": "integer",
        "title": "Port schema.",
        "description": "Port on which iSCSI portal is
listening.",
        "default": 3260
    },
    "username": {
        "type": "string",
        "title": "Username schema.",
        "description": "Username used to authentication to
iSCSI.",
        "default": ""
    },
    "password": {
        "type": "string",
        "title": "Password schema.",
        "description": "Password used to authentication to
iSCSI.",
        "default": ""
    },
    "initiator": {
        "type": "string",
        "title": "Initiator schema.",
        "description": "iSCSI initiator name: psme-storage",
        "default": "psme-storage"
    }
},
"required": [
    "config-path",
    "portal-interface",
    "port",
    "username",
    "password",
    "initiator"
]
},
"networkInterfaces": {
    "type": "array",
    "title": "NetworkInterfaces schema.",
    "description": "List of network interfaces. Should be empty
array.",
    "items": {}
},
"storageControllers": {
    "type": "array",
    "title": "StorageControllers schema.",

```



```
    "description": "List of storage controllers. For Storage
Agent there should be only one entry.",
    "items": {
      "type": "object",
      "properties": {
        "status": {
          "type": "object",
          "title": "Status schema.",
          "description": "Storage controller status.",
          "properties": {
            "state": {
              "type": "string",
              "title": "State schema.",
              "description": "Storage controller state:
Enabled",
              "default": "Enabled"
            },
            "health": {
              "type": "string",
              "title": "Health schema.",
              "description": "Storage controller health: OK",
              "default": "OK"
            }
          },
          "required": [
            "state",
            "health"
          ]
        },
        "interface": {
          "type": "string",
          "title": "Interface schema.",
          "description": "Storage controller interface: SATA,
SAS, etc.",
          "default": "SATA"
        },
        "fruInfo": {
          "type": "object",
          "title": "FruInfo schema.",
          "description": "FRU information.",
          "properties": {
            "serialNumber": {
              "type": "string",
              "title": "SerialNumber schema.",
              "description": "Serial number.",
              "default": "123fed3029c-12"
            },
            "manufacturer": {
              "type": "string",
              "title": "Manufacturer schema.",
              "description": "Manufacturer name.",
              "default": "Intel Corporation"
            },
            "modelName": {
              "type": "string",
```



```

        "title": "ModelNumber schema.",
        "description": "Model number.",
        "default": "Wellsburg 6-Port SATA Controller"
    },
    "partNumber": {
        "type": "string",
        "title": "PartNumber schema.",
        "description": "Part number.",
        "default": "rev2"
    }
},
"required": [
    "serialNumber",
    "manufacturer",
    "modelNumber",
    "partNumber"
]
},
"driveCount": {
    "type": "integer",
    "title": "DriveCount schema.",
    "description": "Number of drives. Will be override on
runtime.",
    "default": 1
},
"drives": {
    "type": "array",
    "title": "Drives schema.",
    "description": "List of drives. Should be empty
array, will be override on runtime.",
    "items": {
        "type": "string"
    }
},
"oem": {
    "type": "object",
    "title": "Oem schema.",
    "description": "OEM specific data.",
    "properties": {
        "type": "string"
    }
}
},
"required": [
    "status",
    "interface",
    "fruInfo",
    "driveCount",
    "drives",
    "oem"
]
}
},
"required": [

```



```
        "type",
        "port",
        "iscsi",
        "networkInterfaces",
        "storageControllers"
    ]
}
},
"required": [
    "ipv4",
    "username",
    "password",
    "port",
    "submodules"
]
}
},
"logger": {
    "type": "object",
    "title": "Logger schema.",
    "description": "Logger configuration.",
    "properties": {
        "agent": {
            "type": "object",
            "title": "Agent schema.",
            "description": "Agent logging configuration.",
            "properties": {
                "level": {
                    "type": "string",
                    "title": "Level schema.",
                    "description": "Severity level compatible with syslog.",
                    "default": "WARNING"
                },
                "timeformat": {
                    "type": "string",
                    "title": "Timeformat schema.",
                    "description": "Timestamp format.",
                    "default": "DATE_NS"
                },
                "color": {
                    "type": "boolean",
                    "title": "Color schema.",
                    "description": "Enable / disable colors in log file.",
                    "default": true
                },
                "output": {
                    "type": "boolean",
                    "title": "Output schema.",
                    "description": "Enable / disable output.",
                    "default": true
                },
                "tagging": {
                    "type": "boolean",
                    "title": "Tagging schema.",
```




```

        "description": "Enable / disable tagging.",
        "default": true
    },
    "moredebug": {
        "type": "boolean",
        "title": "Moredebug schema.",
        "description": "Additional debug info in log file.",
        "default": false
    },
    "streams": {
        "type": "array",
        "title": "Streams schema.",
        "description": "Logger output streams configuration.",
        "items": {
            "type": "object",
            "properties": {
                "type": {
                    "type": "string",
                    "title": "Type schema.",
                    "description": "Stream type. FILE or STDOUT.",
                    "default": "STDOUT"
                },
                "file": {
                    "type": "string",
                    "title": "File schema.",
                    "description": "Path to the file, if stream type is set
to FILE.",
                    "default": ""
                }
            },
            "required": [
                "type"
            ]
        }
    },
    "required": [
        "agent"
    ]
},
"required": [
    "agent",
    "commands",
    "server",
    "registration",
    "modules",
    "logger"
]
}

```



7.4 PSME network agent configuration

7.4.1 Prerequisites

The PSME Network configuration file can be found at:

```
/etc/psme/psme-network-configuration.json
```

7.4.2 Properties

Table 12 PSME network agent properties

Name	Type	Description	Default value	Required
/:agent	object	Container for agent specific information.	-	True
/:agent:capabilities	array	Capabilities of the agent (compute, network, chassis, storage or multiple).	-	True
/:agent:vendor	string	Information about agent vendor.	Intel Corporation	True
/:logger	object	Logger configuration.	-	True
/:logger:agent	object	Agent logging configuration.	-	True
/:logger:agent:color	boolean	Enable / disable colors in log file.	True	False
/:logger:agent:level	string	Severity level compatible with syslog.	WARNING	False
/:logger:agent:moredebug	boolean	Additional debug info in log file.	False	False
/:logger:agent:output	boolean	Enable / disable output.	True	False
/:logger:agent:streams	array	Logger output streams configuration.	-	False
/:logger:agent:streams:file	string	Path to the file, if stream type is set to FILE.	-	False
/:logger:agent:streams:type	string	Stream type. FILE or STDOUT.	STDOUT	False
/:logger:agent:tagging	boolean	Enable / disable tagging.	True	False
/:logger:agent:timeformat	string	Timestamp format.	DATE_NS	False
/:managers	array	List of all managers. Each entry represents single manager.	-	True
/:managers:ipv4	string	Internal IP address of the module.	127.0.0.1	True
/:managers:serialConsoleEnabled	boolean	Enable / disable module's serial console.	True	True
/:managers:switches	array	Configuration for Switches during discovery.	-	True
/:managers:switches:mgmt_port	string	Management port interface name.	p1p1	True
/:managers:switches:ports	array	List of all ports.	-	True
/:managers:switches:ports:id	string	Port's ID name.	sw0p37	True
/:managers:switches:ports:linkTechnology	string	Port's link technology.	PCIe	False
/:managers:switches:ports:portType	string	Port's type.	Downstream	True
/:registration	object	Registration to server configuration container.	-	True
/:registration:interval	integer	Delay between next registration try in seconds.	3	True
/:registration:ipv4	string	PSME REST server IP address or hostname.	localhost	True
/:registration:port	integer	PSME REST server registration port number.	8383	True
/:server	object	Information for agent about communication with REST server	-	True
/:server:port	integer	Port number to register to REST server. Must be the same as configured in PSME REST Server.	7779	True



7.4.3 Example

```
{
  "agent": {
    "vendor" : "Intel Corporation",
    "capabilities" : [ "Network" ]
  },
  "server": {
    "port": 7779
  },
  "registration": {
    "ipv4": "localhost",
    "port": 8383,
    "interval": 3
  },
  "managers": [
    {
      "ipv4": "127.0.0.1",
      "serialConsoleEnabled": true,
      "switches": [
        {
          "mgmt_port": "plp1",
          "ports" : [
            { "id": "sw0p1", "portType": "Downstream" },
            { "id": "sw0p2", "portType": "Downstream" },
            { "id": "sw0p3", "portType": "Downstream" },
            { "id": "sw0p4", "portType": "Downstream" },
            { "id": "sw0p5", "portType": "Downstream" },
            { "id": "sw0p6", "portType": "Downstream" },
            { "id": "sw0p7", "portType": "Downstream" },
            { "id": "sw0p8", "portType": "Downstream" },
            { "id": "sw0p9", "portType": "Downstream" },
            { "id": "sw0p10", "portType": "Downstream" },
            { "id": "sw0p11", "portType": "Downstream" },
            { "id": "sw0p12", "portType": "Downstream" },
            { "id": "sw0p13", "portType": "Downstream" },
            { "id": "sw0p14", "portType": "Downstream" },
            { "id": "sw0p15", "portType": "Downstream" },
            { "id": "sw0p16", "portType": "Downstream" },
            { "id": "sw0p17", "portType": "Downstream" },
            { "id": "sw0p18", "portType": "Downstream" },
            { "id": "sw0p19", "portType": "Downstream" },
            { "id": "sw0p20", "portType": "Downstream" },
            { "id": "sw0p21", "portType": "Downstream" },
            { "id": "sw0p22", "portType": "Downstream" },
            { "id": "sw0p23", "portType": "Downstream" },
            { "id": "sw0p24", "portType": "Downstream" },
            { "id": "sw0p37", "linkTechnology": "PCIe",
"portType": "Downstream" },
            { "id": "sw0p38", "linkTechnology": "PCIe",
"portType": "Downstream" },
            { "id": "sw0p39", "linkTechnology": "PCIe",
"portType": "Downstream" },
```



```
        { "id": "sw0p40", "linkTechnology": "PCIe",
"portType": "Downstream" },
        { "id": "sw0p41", "linkTechnology": "PCIe",
"portType": "Downstream" },
        { "id": "sw0p42", "linkTechnology": "PCIe",
"portType": "Downstream" },
        { "id": "sw0p43", "linkTechnology": "PCIe",
"portType": "Downstream" },
        { "id": "sw0p44", "linkTechnology": "PCIe",
"portType": "Downstream" }
    ]
  }
]
},
"logger" : {
  "agent" : {
    "level" : "WARNING",
    "timeformat" : "DATE_NS",
    "color" : true,
    "output" : true,
    "tagging" : true,
    "moredebug" : false,
    "streams" : [
      {
        "type" : "STDOUT"
      }
    ]
  }
}
}
```

7.4.4 Schema

```
{
  "type": "object",
  "title": "PSME Network Agent Configuration Schema",
  "description": "Detailed description of the PSME Network Agent
configuration file.",
  "properties": {
    "agent": {
      "type": "object",
      "title": "Agent schema.",
      "description": "Container for agent specific information.",
      "properties": {
        "vendor": {
          "type": "string",
          "title": "Vendor schema.",
          "description": "Information about agent vendor.",
          "default": "Intel Corporation"
        },
        "capabilities": {
          "type": "array",
          "title": "Capabilities schema.",
          "description": "Capabilities of the agent (compute, network,
chassis, storage or multiple).",
```



```

        "items": {
            "type": "string",
            "default": "Network"
        }
    },
    "required": [
        "vendor",
        "capabilities"
    ]
},
"server": {
    "type": "object",
    "title": "Server schema.",
    "description": "Information for agent about communication with REST
server",
    "properties": {
        "port": {
            "type": "integer",
            "title": "Port schema.",
            "description": "Port number to register to REST server. Must be the
same as configured in PSME REST Server.",
            "default": 7779
        }
    },
    "required": [
        "port"
    ]
},
"registration": {
    "type": "object",
    "title": "Registration schema.",
    "description": "Registration to server configuration container.",
    "properties": {
        "ipv4": {
            "type": "string",
            "title": "Ipv4 schema.",
            "description": "PSME REST server IP address or hostname.",
            "default": "localhost"
        },
        "port": {
            "type": "integer",
            "title": "Port schema.",
            "description": "PSME REST server registration port number.",
            "default": 8383
        },
        "interval": {
            "type": "integer",
            "title": "Interval schema.",
            "description": "Delay between next registration try in seconds.",
            "default": 3
        }
    },
    "required": [
        "ipv4",

```



```
        "port",
        "interval"
    ]
},
"managers": {
    "type": "array",
    "title": "Managers schema.",
    "description": "List of all managers. Each entry represents single
manager.",
    "items": {
        "type": "object",
        "properties": {
            "ipv4": {
                "type": "string",
                "title": "Ipv4 schema.",
                "description": "Internal IP address of the module.",
                "default": "127.0.0.1"
            },
            "serialConsoleEnabled": {
                "type": "boolean",
                "title": "SerialConsoleEnabled schema.",
                "description": "Enable / disable module's serial console.",
                "default": true
            },
            "switches": {
                "type": "array",
                "title": "Switches schema.",
                "description": "Configuration for Switches during discovery.",
                "items": {
                    "type": "object",
                    "properties": {
                        "mgmt_port": {
                            "type": "string",
                            "title": "Mgmt_port schema.",
                            "description": "Management port interface name.",
                            "default": "plp1"
                        },
                        "ports": {
                            "type": "array",
                            "title": "Ports schema.",
                            "description": "List of all ports.",
                            "items": {
                                "type": "object",
                                "properties": {
                                    "id": {
                                        "type": "string",
                                        "title": "Id schema.",
                                        "description": "Port's ID name.",
                                        "default": "sw0p37"
                                    },
                                    "linkTechnology": {
                                        "type": "string",
                                        "title": "LinkTechnology schema.",
                                        "description": "Port's link technology.",
                                        "default": "PCIe"
                                    }
                                }
                            }
                        }
                    }
                }
            }
        }
    }
}
```



```

        },
        "portType": {
            "type": "string",
            "title": "PortType schema.",
            "description": "Port's type.",
            "default": "Downstream"
        }
    },
    "required": [
        "id",
        "portType"
    ]
}

},
"required": [
    "mgmt_port",
    "ports"
]
}

},
"required": [
    "ipv4",
    "serialConsoleEnabled",
    "switches"
]
}

},
"logger": {
    "type": "object",
    "title": "Logger schema.",
    "description": "Logger configuration.",
    "properties": {
        "agent": {
            "type": "object",
            "title": "Agent schema.",
            "description": "Agent logging configuration.",
            "properties": {
                "level": {
                    "type": "string",
                    "title": "Level schema.",
                    "description": "Severity level compatible with syslog.",
                    "default": "WARNING"
                },
                "timeformat": {
                    "type": "string",
                    "title": "Timeformat schema.",
                    "description": "Timestamp format.",
                    "default": "DATE_NS"
                },
                "color": {
                    "type": "boolean",
                    "title": "Color schema.",
                    "description": "Enable / disable colors in log file.",

```



```
        "default": true
    },
    "output": {
        "type": "boolean",
        "title": "Output schema.",
        "description": "Enable / disable output.",
        "default": true
    },
    "tagging": {
        "type": "boolean",
        "title": "Tagging schema.",
        "description": "Enable / disable tagging.",
        "default": true
    },
    "moredebug": {
        "type": "boolean",
        "title": "Moredebug schema.",
        "description": "Additional debug info in log file.",
        "default": false
    },
    "streams": {
        "type": "array",
        "title": "Streams schema.",
        "description": "Logger output streams configuration.",
        "items": {
            "type": "object",
            "properties": {
                "type": {
                    "type": "string",
                    "title": "Type schema.",
                    "description": "Stream type. FILE or STDOUT.",
                    "default": "STDOUT"
                },
                "file": {
                    "type": "string",
                    "title": "File schema.",
                    "description": "Path to the file, if stream type is set
to FILE.",
                    "default": ""
                }
            },
            "required": [
                "type"
            ]
        }
    },
    "required": [
        "agent"
    ]
},
"required": [
```




```

    "agent",
    "server",
    "registration",
    "managers",
    "logger"
  ]
}

```

7.5 PSME chassis configuration

7.5.1 Prerequisites

The PSME chassis configuration file can be found at:

```
/etc/psme/psme-chassis-configuration.json
```

7.5.2 Properties

Table 13 PSME chassis properties

Name	Type	Description	Default value	Required
/:agent	object	Container for agent specific information.	-	True
/:agent:capabilities	array	Capabilities of the agent (compute, network, chassis, storage or multiple).	-	True
/:agent:vendor	string	Information about agent vendor.	Intel Corporation	True
/:cyMux	object	Information about CyMux module.	-	True
/:cyMux:port	integer	Port used for CyMux communication.	5623	True
/:logger	object	Logger configuration.	-	True
/:logger:agent	object	Agent logging configuration.	-	True
/:logger:agent:color	boolean	Enable / disable colors in log file.	True	False
/:logger:agent:level	string	Severity level compatible with syslog.	WARNING	False
/:logger:agent:moredebug	boolean	Additional debug info in log file.	False	False
/:logger:agent:output	boolean	Enable / disable output.	True	False
/:logger:agent:streams	array	Logger output streams configuration.	-	False
/:logger:agent:streams:file	string	Path to the file, if stream type is set to FILE.	-	False
/:logger:agent:streams:type	string	Stream type. FILE or STDOUT.	STDOUT	False
/:logger:agent:tagging	boolean	Enable / disable tagging.	True	False
/:logger:agent:timeformat	string	Timestamp format.	DATE_NS	False
/:managers	array	List of all managers. Each entry represents single manager.	-	True
/:managers:chassis	object	Configuration for general Chassis during discovery.	-	True
/:managers:chassis:locationOffset	integer	Location identifier offset.	1	True
/:managers:chassis:networkInterface	string	Network interface name the agent uses for communication.	enp0s20f0.4094	True
/:managers:chassis:parentId	integer	Parent ID (Rack ID) of the platform the agent is running on.	1	True
/:managers:chassis:platform	string	Name of the platform the agent is running on.	BDCR	True
/:managers:chassis:size	integer	Size of the chassis in units [U].	4	True



Name	Type	Description	Default value	Required
/:managers:chassis:type	string	Type of the platform the agent is running on.	Drawer	True
/:managers:managers	array	An explanation about the purpose of this instance.	-	True
/:managers:managers:ipv4	string	Internal IP address of the module.	1.1.2.1	True
/:managers:managers:password	string	Module's BMC password.	put_password_hash_here	True
/:managers:managers:port	integer	Module's BMC port number.	623	True
/:managers:managers:serialConsoleEnabled	boolean	Enable / disable module's serial console.	True	True
/:managers:managers:slot	integer	Slot number in drawer.	1	True
/:managers:managers:username	string	Module's BMC username.	put_username_hash_here	True
/:managers:serialConsoleEnabled	boolean	Enable / disable module's serial console.	True	True
/:managers:slot	integer	Slot number in the drawer.	1	True
/:registration	object	Registration to server configuration container.	-	True
/:registration:interval	integer	Delay between next registration try in seconds.	3	True
/:registration:ipv4	string	PSME REST server IP address or hostname.	localhost	True
/:registration:port	integer	PSME REST server registration port number.	8383	True
/:server	object	Information for agent about communication with REST server	-	True
/:server:port	integer	Port number to register to REST server. Must be the same as configured in PSME REST Server.	7780	True

7.5.3 Example

```
{
  "agent": {
    "vendor": "Intel Corporation",
    "capabilities" : ["Chassis"]
  },
  "server": {
    "port": 7780
  },
  "registration": {
    "ipv4": "localhost",
    "port": 8383,
    "interval": 3
  },
  "cyMux": {
    "port": 5623
  },
  "managers": [
    {
      "slot" : 1,
      "chassis" : {
        "size": 4,
        "locationOffset": 1,
        "networkInterface": "enp0s20f0.4094",
        "parentId" : 1,
        "platform" : "BDCR",
        "type": "Drawer"
      }
    }
  ]
}
```



```

    },
    "serialConsoleEnabled": true,
    "managers" : [
        {
            "ipv4" : "1.1.2.1",
            "username" : "put_username_hash_here",
            "password" : "put_password_hash_here",
            "port" : 623,
            "slot" : 1,
            "serialConsoleEnabled": true
        },
        {
            "ipv4" : "1.1.2.2",
            "username" : "put_username_hash_here",
            "password" : "put_password_hash_here",
            "port" : 623,
            "slot" : 2,
            "serialConsoleEnabled": true
        },
        {
            "ipv4" : "1.1.2.3",
            "username" : "put_username_hash_here",
            "password" : "put_password_hash_here",
            "port" : 623,
            "slot" : 3,
            "serialConsoleEnabled": true
        },
        {
            "ipv4" : "1.1.2.4",
            "username" : "put_username_hash_here",
            "password" : "put_password_hash_here",
            "port" : 623,
            "slot" : 4,
            "serialConsoleEnabled": true
        }
    ]
},
"logger" : {
    "agent" : {
        "level" : "INFO",
        "timeformat" : "DATE_NS",
        "color" : true,
        "output" : true,
        "tagging" : true,
        "moredebug" : false,
        "streams" : [
            {
                "type" : "STDOUT"
            }
        ]
    }
}
}

```



7.5.4 Schema

```
{
  "type": "object",
  "title": "PSME Chassis Agent Configuration Schema",
  "description": "Detailed description of the PSME Chassis Agent
configuration file.",
  "properties": {
    "agent": {
      "type": "object",
      "title": "Agent schema.",
      "description": "Container for agent specific information.",
      "properties": {
        "vendor": {
          "type": "string",
          "title": "Vendor schema.",
          "description": "Information about agent vendor.",
          "default": "Intel Corporation"
        },
        "capabilities": {
          "type": "array",
          "title": "Capabilities schema.",
          "description": "Capabilities of the agent (compute, network,
chassis, storage or multiple).",
          "items": {
            "type": "string",
            "default": "Chassis"
          }
        }
      }
    },
    "required": [
      "vendor",
      "capabilities"
    ]
  },
  "server": {
    "type": "object",
    "title": "Server schema.",
    "description": "Information for agent about communication with REST
server",
    "properties": {
      "port": {
        "type": "integer",
        "title": "Port schema.",
        "description": "Port number to register to REST server. Must be the
same as configured in PSME REST Server.",
        "default": 7780
      }
    },
    "required": [
      "port"
    ]
  },
  "registration": {
    "type": "object",
    "title": "Registration schema.",
```



```

"description": "Registration to server configuration container.",
"properties": {
  "ipv4": {
    "type": "string",
    "title": "Ipv4 schema.",
    "description": "PSME REST server IP address or hostname.",
    "default": "localhost"
  },
  "port": {
    "type": "integer",
    "title": "Port schema.",
    "description": "PSME REST server registration port number.",
    "default": 8383
  },
  "interval": {
    "type": "integer",
    "title": "Interval schema.",
    "description": "Delay between next registration try in seconds.",
    "default": 3
  }
},
"required": [
  "ipv4",
  "port",
  "interval"
]
},
"cyMux": {
  "type": "object",
  "title": "CyMux schema.",
  "description": "Information about CyMuX module.",
  "properties": {
    "port": {
      "type": "integer",
      "title": "Port schema.",
      "description": "Port used for CyMuX communication.",
      "default": 5623
    }
  },
  "required": [
    "port"
  ]
},
"managers": {
  "type": "array",
  "title": "Managers schema.",
  "description": "List of all managers. Each entry represents single
manager.",
  "items": {
    "type": "object",
    "properties": {
      "slot": {
        "type": "integer",
        "title": "Slot schema.",
        "description": "Slot number in the drawer.",

```



```
        "default": 1
    },
    "chassis": {
        "type": "object",
        "title": "Chassis schema.",
        "description": "Configuration for general Chassis during
discovery.",
        "properties": {
            "size": {
                "type": "integer",
                "title": "Size schema.",
                "description": "Size of the chassis in units [U].",
                "default": 4
            },
            "locationOffset": {
                "type": "integer",
                "title": "LocationOffset schema.",
                "description": "Location identifier offset.",
                "default": 1
            },
            "networkInterface": {
                "type": "string",
                "title": "NetworkInterface schema.",
                "description": "Network interface name the agent uses for
communication.",
                "default": "enp0s20f0.4094"
            },
            "parentId": {
                "type": "integer",
                "title": "ParentId schema.",
                "description": "Parent ID (Rack ID) of the platform the agent
is running on.",
                "default": 1
            },
            "platform": {
                "type": "string",
                "title": "Platform schema.",
                "description": "Name of the platform the agent is running
on.",
                "default": "BDCR"
            },
            "type": {
                "type": "string",
                "title": "Type schema.",
                "description": "Type of the platform the agent is running
on.",
                "default": "Drawer"
            }
        },
        "required": [
            "size",
            "locationOffset",
            "networkInterface",
            "parentId",
            "platform",
```



```

        "type"
    ]
},
"serialConsoleEnabled": {
    "type": "boolean",
    "title": "SerialConsoleEnabled schema.",
    "description": "Enable / disable module's serial console.",
    "default": true
},
"managers": {
    "type": "array",
    "title": "Managers schema.",
    "description": "An explanation about the purpose of this
instance.",
    "items": {
        "type": "object",
        "properties": {
            "ipv4": {
                "type": "string",
                "title": "Ipv4 schema.",
                "description": "Internal IP address of the module.",
                "default": "1.1.2.1"
            },
            "username": {
                "type": "string",
                "title": "Module's BMC username.",
                "description": "Module's BMC username.",
                "default": "put_username_hash_here"
            },
            "password": {
                "type": "string",
                "title": "Password schema.",
                "description": "Module's BMC password.",
                "default": "put_password_hash_here"
            },
            "port": {
                "type": "integer",
                "title": "Port schema.",
                "description": "Module's BMC port number.",
                "default": 623
            },
            "slot": {
                "type": "integer",
                "title": "Slot schema.",
                "description": "Slot number in drawer.",
                "default": 1
            },
            "serialConsoleEnabled": {
                "type": "boolean",
                "title": "SerialConsoleEnabled schema.",
                "description": "Enable / disable module's serial console.",
                "default": true
            }
        }
    },
    "required": [

```



```
        "ipv4",
        "username",
        "password",
        "port",
        "slot",
        "serialConsoleEnabled"
    ]
}
},
"required": [
    "slot",
    "chassis",
    "serialConsoleEnabled",
    "managers"
]
}
},
"logger": {
    "type": "object",
    "title": "Logger schema.",
    "description": "Logger configuration.",
    "properties": {
        "agent": {
            "type": "object",
            "title": "Agent schema.",
            "description": "Agent logging configuration.",
            "properties": {
                "level": {
                    "type": "string",
                    "title": "Level schema.",
                    "description": "Severity level compatible with syslog.",
                    "default": "WARNING"
                },
                "timeformat": {
                    "type": "string",
                    "title": "Timeformat schema.",
                    "description": "Timestamp format.",
                    "default": "DATE_NS"
                },
                "color": {
                    "type": "boolean",
                    "title": "Color schema.",
                    "description": "Enable / disable colors in log file.",
                    "default": true
                },
                "output": {
                    "type": "boolean",
                    "title": "Output schema.",
                    "description": "Enable / disable output.",
                    "default": true
                },
                "tagging": {
                    "type": "boolean",
                    "title": "Tagging schema.",
```




```

        "description": "Enable / disable tagging.",
        "default": true
    },
    "moredebug": {
        "type": "boolean",
        "title": "Moredebug schema.",
        "description": "Additional debug info in log file.",
        "default": false
    },
    "streams": {
        "type": "array",
        "title": "Streams schema.",
        "description": "Logger output streams configuration.",
        "items": {
            "type": "object",
            "properties": {
                "type": {
                    "type": "string",
                    "title": "Type schema.",
                    "description": "Stream type. FILE or STDOUT.",
                    "default": "STDOUT"
                },
                "file": {
                    "type": "string",
                    "title": "File schema.",
                    "description": "Path to the file, if stream type is set
to FILE.",
                    "default": ""
                }
            },
            "required": [
                "type"
            ]
        }
    },
    "required": [
        "agent"
    ]
},
"required": [
    "agent",
    "server",
    "registration",
    "cyMux",
    "managers",
    "logger"
]
}

```

§