Intel® Rack Scale Architecture PSME

User Guide

Software Release 1.1

September 2015

Revision 003

Contents

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Tables

Revision History

Revision	Description	Date
001	Initial release	July 31, 2015
002	Added sample software and PSME configuration chapters.	August 17, 2015
003	Minor changes.	August 31, 2015

1 Introduction

1.1 Scope

This document contains information about the installation and management of Intel® Rack Scale Architecture Pooled System Management Engine (PSME) Software Release 1.1.

1.2 Intended audience

The intended audiences for this document include:

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

1.3 Terminology

Table 1   Terminology

Term	Definition
BMC	Baseboard management controller
CIMI	Cloud Infrastructure Management Interface
HTTP	Hypertext Transfer Protocol
IBL	Intel Business Link
JSON	JavaScript Object Notation
Lid	Localization ID
OCCI	Open Cloud Computing Interface
OData	Open Data Protocol
OVF	Open Virtualization Format
pod	A physical collection of multiple racks
PODM	Pod Manager
RCPM	Rack Control Plane Manager; an equivalent of PODM run at the rack level and managing resources within this rack only
REST	Representational state transfer
RSA	Rack Scale Architecture
SDV	Software Development Vehicle
TMC	Tray management controller
URI	Uniform resource identifier
UUID	Universally unique identifier
VM	Virtual machine
XML	Extensible Markup Language

1.4   References

Number	Title	Location
332971	Intel® Rack Scale Architecture Getting Started Guide	*https://github.com/01org/RSA*
332868	Intel® Rack Scale Architecture GAMI API Specification	*https://github.com/01org/RSA*
332869	Intel® Rack Scale Architecture Pod Manager API Specification	*https://github.com/01org/RSA*
332870	Intel® Rack Scale Architecture Pod Manager Release Notes	*https://github.com/01org/RSA*
332871	Intel® Rack Scale Architecture Pod Manager User Guide	*https://github.com/01org/RSA*
332872	Intel® Rack Scale Architecture PSME Release Notes	*https://github.com/01org/RSA*
332873	Intel® Rack Scale Architecture PSME API Specification	*https://github.com/01org/RSA*
332874	Intel® Rack Scale Architecture PSME User Guide	This document.
332875	Intel® Rack Scale Architecture RMM Installation Guide	*https://github.com/01org/RSA*
332876	Intel® Rack Scale Architecture RMM Release Notes	*https://github.com/01org/RSA*
332877	Intel® Rack Scale Architecture RMM API Specification	*https://github.com/01org/RSA*
332878	Intel® Rack Scale Architecture Storage Services API Specification	*https://github.com/01org/RSA*
	Scalable Platforms Management	*http://dmtf.org/standards/wip*

1.5   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 PSME Software Installation

This section explains how to install the PSME software.

2.1 Prerequisites

2.1.1 Acquire the PSME Software

The PSME software contains sourcecode in a GitHub source tree which can be downloaded from *https://github.com/01org/intelrackscalearchitecture*.

It contains source code for the following components:

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

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

2.1.2 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.

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3 Building and compiling from source code

3.1 Dependencies

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

3.1.1 Fedora OS package requirements

The following Fedora Linux OS packages must be manually downloaded and installed. They are required for PSME software compilation and full functionality:

Table 3   Fedora package requirements

Module	Version	Description
gcc	4.9.2	GCC compiler
gcc-c++	4.9.2	GCC C++ compiler
cmake	>=3.0.2	Cmake Build tool
uuid-c++-devel	1.6.2-27.fc21	C++ development support for UUID
libnl3-devel	3.2.25-6.fc21	Netlink Protocol Development Library [1]
libudev-devel	216-25.fc21	Libudev Development Library [1]
scsi-target-utils	1.0.48-2.fc21	SCSI target daemon and utility programs [2] [3]

(1)   *Required for Network Module.*
(2)   *Required for Storage Module.*
(3)   *Not required for compilation. But must be installed before managing iscsi targets.*

The following modules are downloaded and installed as part of the CMake step in the initial compilation:

Table 4   Fedora package modules

Module	Version	Description
curl	7.41.0	Curl library
libmicrohttpd	0.9.34	Library for embedding a webserver in applications
jsoncpp	0.6.0-0.14.rc2.fc21	JSON library implementation in C++
libjson-rpc-cpp	0.5.0	JSON RPC server for C++
ncurses	5.9	Ncurses Terminal Handling Library
OpenIPMI	2.0.18	IPMI library and tools [1]
sysfsutils	2.1.0	Utilities for interfacing with sysfs [2]
lvm2	2.2.02.111	Logical Volume Management (LVM) toolset [2]

(1)   *Downloaded if compiling the Compute Module.*
(2)   *Downloaded if compiling the Storage Module.*

3.1.2　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:

Table 5　Unbuntu package dependencies

Module	Version	Description
gcc	4.9.2	GCC compiler
g++	4.9.2	GCC C++ compiler
cmake	≥3.0.2	Cmake Build tool
libossp-uuid-dev	1.6.2-1.3ubuntu1	C++ development support for UUID
libnl-3-dev	3.2.21-1	Netlink Protocol Development Library [1]
libnl-route-3-200	3.2.21-1	Netlink Route Interface Package [1]
libudev-dev	204-5ubuntu20.13	Libudev Development Library [1]
tgt	1:1.0.43-0ubuntu4	Linux Target Framework (TGT) [2]

(1)　Required for Network module
(2)　Required for Storage module

The following modules are downloaded and installed as part of the CMake compilation step:

Table 6　Unbuntu package modules

Module	Version	Description
curl	7.41.0	Required by libjsonrcpcpp
microhttpd	0.9.34	Required to run the PSME & HTTP server
jsoncpp	1.6.0	JSON library implementation in C++
json-rpc-cpp	0.5.0	JSON RPC server for C++
ncurses	5.9	Ncurses Terminal Handling Library
OpenIPMI	2.0.18	IPMI library and tools [1]
sysfsutils	2.1.0	Utilities for interfacing with sysfs [2]
lvm2	2.2.02.111	Logical Volume Management (LVM) toolset [2]

(1)　Downloaded if compiling the Compute Module
(2)　Downloaded if compiling the Storage Module

3.2 Building and compiling

The location of the PSME projects and their project locations are as follows in Table 7:

Table 7   PSME projects and locations

Name	Project location
PSME Rest Server	<PSME_root>/application
PSME Compute Agent	<PSME_root>/agent-intel/compute
PSME Network Agent	<PSME_root>/agent/network
PSME Storage Agent	<PSME_root>/agent/storage
PSME Compute Agent Stubs	<PSME_root>/agent-stubs/compute
PSME Network Agent Stubs	<PSME_root>/agent-stubs/network
PSME GAMI Framework	<PSME_root>/common/agent-framework

3.2.1 Cumulative compilation of the PSME REST server and all agents

This method is used to cumulatively build and compile the PSME Rest Server, Compute Agent, Network Agent, and Storage agent. It is useful for scenarios where all agents run on the same BMC or hardware component.

Perform the following steps to build both the PSME Rest Server and all associated Agents:

```
cd <PSME_root>
mkdir build
cd build
cmake ..
make
```

The following executables can be found in <PSME_root>/build/bin:

- psme-rest-server
- psme-compute-intel
- psme-compute-stubs
- psme-network
- psme-network-stubs
- psme-storage

3.2.2 Individual component compilation

This method provides the ability to selectively compile individual components. It is useful for scenarios where the agents will run on different hardware components.

3.2.2.1 PSME REST server

Perform the following steps to build both the PSME Rest Server:

```
cd <PSME_root>/application
mkdir build
cd build
cmake ..
make
```

The following executables can be found in <PSME_root>/applicationbuild/bin:

- psme-rest-server

3.2.2.2   Compute agent

Depending on the package content, this step will build an agent or agent stub. It can be modified to support the desired hardware.

3.2.2.2.1   Agent

Change to the agent source directory:

```
cd <PSME_root>/agent-intel/compute
```

3.2.2.2.2   Agent stub

Change to the agent stub source directory:

```
cd <PSME_root>/agent-stubs/compute
```

3.2.2.2.3   Build procedure

Perform the following steps to build the Compute Agent (or agent-stub):

```
mkdir build
cd build
cmake ..
make
```

The following executable can be found in:

Table 8   Compute agent executables

Type	Directory	Executable
Agent	<PSME_root>/agent-intel/compute/build/bin	psme-compute
Agent-stub	<PSME_root>/agent-stubs/compute/build/bin	psme-compute-stub

3.2.2.3   Network agent

Depending on the package content, this step will build an agent or agent stub. It can be modified to support desired hardware.

3.2.2.3.1   Agent

Change to the agent source directory:

```
cd <PSME_root>/agent/network
```

3.2.2.3.2   Agent stub

Change to the agent stub source directory:

```
cd <PSME_root>/agent-stubs/network
```

3.2.2.3.3   Build procedure

Perform the following steps to build the Network Agent (or agent-stub):

```
mkdir build
cd build
cmake ..
make
```

The following executable can be found in:

Table 9   Network agent executables

Type	Directory	Executable
Agent	<PSME_root>/agent/network/build/bin	psme–network
Agent-stub	<PSME_root>/agent-stubs/network/build/bin	psme-network-stub

3.2.2.4   Storage agent

Since no storage agent stub exists, this step will only build a storage agent. It can be modified to support desired hardware.

3.2.2.4.1   Agent

Change to the agent source directory:

```
cd <PSME_root>/agent/storage
```

3.2.2.4.2   Build procedure

Perform the following steps to build the Storage Agent:

```
mkdir build
cd build
cmake ..
make
```

The following executable can be found in:

Table 10   Storage agent executables

Type	Directory	Executable
Agent	<PSME_root>/agent/storage/build/bin	psme-storage

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4 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.

4.1 PSME Configuration File

The configuration file details and properties can be found in Section 7 of this document.

Table 11 shows the configuration files and their location.

Table 11   PSME software configuration files

Modules	Configuration files
PSME Rest Server	<PSME_root>/application/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 Compute Agent Stubs	<PSME_root>/agent-stubs/compute/configuration.json
PSME Network Agent Stubs	<PSME_root>/agent-stubs/network/configuration.json

4.2 Logging

The default PSME logging outputs to STDOUT.

4.2.1 Fedora Logging

Logging on Fedora 21 is managed by **systemd**. It can be viewed with the Fedora **journalctl** command.

4.2.2 Ubuntu Logging

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

4.3   PSME REST server

Table 12 shows the PSME Rest Server binary executable and its location.

Table 12   PSME software configuration files

Cumulative Compilation	<PSME_root>/build/bin/psme-rest-server
Individual Compilation	<PSME_root>/application/build/bin/psme-rest-server

4.3.1   Default Configuration

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

```
 {
"server": { "url": "http://localhost:8888", "network-interface-name" :
"enp0s20f0.4094"},
"registration": {"port": 8383, "minDelay": 3},
"commands": { "generic": "Registration" },
"eventing" : {"enabled": false, "address" : "localhost", "port" : 5667,
"poll-interval-sec" : 10},
"rest-server" : {"storage-service-mode" : false},
"service-uuid-file" : "service_uuid.json"
}
```

4.4   PSME agent modules

4.4.1   PSME compute module

Table 13 shows the PSME Compute Module binary executable and its location..

Table 13   Compute module executables

Cumulative Compilation	<PSME_root>/build/bin/psme-compute
Individual Compilation	<PSME_root>/agent-intel/compute/build/bin/psme-compute
Individual Stub Compilation	<PSME_root>/agent-stubs/compute/build/bin/psme-compute-stubs

4.4.1.1   Default Configuration

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

```
 {
"agent":{"type":"Compute"},
"commands":{"*":{"implementation":"OpenIPMI"}},
"server":{"port":7777,
"ipv4":"localhost"},"registration":{"ipv4":"localhost","port":8383,"interval"
:3},

"modules":[]
}
```

4.4.2   PSME network module

Table 14 shows the PSME Network Module binary executable and its location.

Table 14   Network module executables

Cumulative Compilation	<PSME_root>/build/bin/psme-network
Individual Compilation	<PSME_root>/agent/network/build/bin/psme-network
Individual Stub Compilation	<PSME_root>/agent-stubs/network/build/bin/psme-network-stubs

4.4.2.1   Default Configuration

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

```
{
"agent":{"type":"Network"},
"commands":{"*":{"implementation":"fm6000"}},
"server":{"port":7777, "ipv4":"localhost"},
"registration":{"ipv4":"localhost","port":8383,"interval":3},
"modules":[]
}
```

4.4.3   PSME storage module

Table 15 shows the PSME Storage Module binary executable and its location.

Table 15   Network module executables

Cumulative Compilation	<PSME_root>/build/bin/psme-storage
Individual Compilation	<PSME_root>/agent/storage/build/bin/psme-storage

4.4.3.1   Default Configuration

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

```
{
"agent":{"type":"Storage"},
"commands":{"*":{"implementation": "ConfigurationBased"}},
"server":{"port":7778, "ipv4":"localhost"},
"registration":{"ipv4":"localhost","port":8383,"interval":3},
"modules":[]
}
```

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5 Sample PSME Cumulative Build (Compute, Network, and Storage) from Source on Fedora

The following steps can be performed to successfully build, compile, and install the PSME v1.1 REST Server, Compute Module Stubs, Network Module Stubs, and Storage Module on Fedora Linux version 21 with:

- 4GB RAM
- 20GB Storage

5.1 Prerequisites

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.

5.1.1 Create a Linux user (rsa)

Create the OS account *rsa*.

Note: For this demonstration, the home directory is */home/rsa*.

5.1.2 Acquire the PSME v1.1 sourcecode

Download the PSME source code and untar in:

```
/home/rsa
```

5.1.3 Update the toolchain to 4.9.2

Obtain **root** access and perform the following steps to update the toolchain to 4.9.2:

```
yum install –y gcc gcc-c++ cmake uuid-c++-devel libnl3-devel libudev-devel
scsi-target-utils
```

5.2 Build and compile all of the PSME projects

Log in with the **rsa** account and perform the following steps to build the PSME Rest Server, Compute Agent stub, Network Agent stub, and Storage Agent::

```
cd /home/rsa/<PSME_source>
mkdir build
cd build
cmake ..
make
```

The following executables can be found in /home/rsa/<PSME_source>/build/bin:

- psme-rest-server
- psme-compute-intel
- psme-compute-stubs
- psme-network
- psme-network-stubs
- psme-storage

5.3   Start the PSME REST server

1. Change to the binary executable location:
```
cd /home/rsa/<PSME_source>/build/bin
```
2. Copy the default configuration file to the current directory:
```
cp /home/rsa/<PSME_source>/application/configuration.json server.json
```
3. Execute as root:
```
./psme-rest-server server.json
```
4. From a web browser, enter the address of the PSME REST Server to see a PSME REST API collections.
```
https://<URL_of_REST_Server>:8888/rest/v1
```

5.4   Start the PSME compute agent stubs

1. Change to the binary executable location:
```
cd /home/rsa/<PSME_source>/build/bin
```
2. Copy the default PSME Compute Agent Stubs configuration file to the current directory:
```
cp /home/rsa/<PSME_source>/agent-stubs/compute/configuration.json
compute.json
```
3. Execute as root:
```
./psme-compute-stubs compute.json
```

5.5   Start the PSME network agent stubs

1. Change to the binary executable location:
```
cd /home/rsa/<PSME_source>/build/bin
```
2. Copy the default PSME Network Agent Stubs configuration file to the current directory:
```
cp /home/rsa/<PSME_source>/agent-stubs/network/configuration.json
network.json
```
3. Execute as root:
```
./psme-network-stubs network.json
```

5.6   Start the PSME storage agent

1. Change to the binary executable location:
```
cd /home/rsa/<PSME_source>/build/bin
```
2. Copy the default PSME Storage Agent configuration file to the current directory:
```
cp /home/rsa/<PSME_source>/agent/storage/configuration.json
storage.json
```
3. Execute as root:
```
./psme-storage storage.json
```

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6 Sample PSME Cumulative Build (Compute, Network, and Storage) from Source on Ubuntu

The following steps can be performed to successfully build, compile, and install the PSME v1.1 REST Server, Compute Module Stubs, Network Module Stubs, and Storage Module on Ubuntu Linux version 14.04 with:

- 4 GB RAM
- 20 GB storage.

6.1 Prerequisites

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.

6.1.1 Create a Linux user (rsa)

Create the OS account: rsa

Note: For this demonstration, the home directory is:
```
/home/rsa
```

6.1.2 Acquire the PSME v1.1 sourcecode

Download the PSME source code and untar in:
```
/home/rsa
```

6.1.3 Update the toolchain to 4.9.2

Obtain root access and perform the following steps to to install update the toolchain to 4.9.2:
```
add-apt-repository ppa:ubuntu-toolchain-r/test
apt-get update
apt-get install -y gcc g++ cmake libossp-uuid-dev libnl-3-dev libnl-route-3-200
libudev-dev tgt
```

6.2 Build and compile all of the PSME projects

Perform the following steps to build the PSME Rest Server, compute agent stub, network agent stub, and storage agent.
```
cd /home/rsa/<PSME_source>
mkdir build
cd build
cmake ..
make
```

The following executables can be found in */home/rsa/<PSME_source>/build/bin*:

- psme-rest-server
- psme-compute-intel
- psme-compute-stubs

- psme-network
- psme-network-stubs
- psme-storage

6.3   Start the PSME REST server

1. Change to the binary executable location:
   ```
   cd /home/rsa/<PSME_source>/build/bin
   ```
2. Copy the default configuration file to the current directory:
   ```
   cp /home/rsa/<PSME_source>/application/configuration.json server.json
   ```
3. Execute as root:
   ```
   ./psme-rest-server server.json
   ```
4. From a web browser, enter the address of the PSME REST Server to see a PSME REST API collections.
   ```
   http://<URL_of_REST_Server>:8888/rest/v1
   ```

6.4   Start the PSME compute agent stubs

1. Change to the binary executable location:
   ```
   cd /home/rsa/<PSME_source>/build/bin
   ```
2. Copy the default PSME Compute Agent Stubs configuration file to the current directory:
   ```
   cp /home/rsa/<PSME_source>/agent-stubs/compute/configuration.json
   compute.json
   ```
3. Execute as root:
   ```
   ./psme-compute-stubs compute.json
   ```

6.5   Start the PSME network agent stubs

1. Change to the binary executable location:
   ```
   cd /home/rsa/<PSME_source>/build/bin
   ```
2. Copy the default PSME Network Agent Stubs configuration file to the current directory:
   ```
   cp /home/rsa/<PSME_source>/agent-stubs/network/configuration.json
   network.json
   ```
3. Execute as root:
   ```
   ./psme-network-stubs network.json
   ```

6.6   Start the PSME storage agent

4. Change to the binary executable location:
   ```
   cd /home/rsa/<PSME_source>/build/bin
   ```
5. Copy the default PSME Network Agent configuration file to the current directory:
   ```
   cp /home/rsa/<PSME_source>/agent/storage/configuration.json
   storage.json
   ```
6. Execute as root:
   ```
   ./psme-compute network.json
   ```

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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-configuaration.json`

7.1.2 Properties

Table 16   PSME REST server properties

Name	Type	Description	Required	Item type
/:commands	object	Configuration which implementation of the commands use to communicate with server.	True	N/A
/:commands:generic	string	Generic command. Implementation based only on POSIX sockets.	True	N/A
/:eventing	object	Eventing feature configuration.	True	N/A
/:eventing:poll-interval-sec	integer	Delay between polling tries. Busy waiting interval.	True	N/A
/:eventing:enabled	boolean	Disable of enable eventing feature. Disabling eventing mechanism will turn on polling feature.	True	N/A
/:eventing:port	integer	Listen port number used for eventing.	True	N/A
/:eventing:address	string	URL of the listening address used for eventing.	True	N/A
/:service-uuid-file	string	Path to service uuid file, containing UUID of psme-rest-server application.	True	N/A
/:server	object	Information about REST server communication. Port numbers, addresses.	True	N/A
/:server:url	string	URI address of the server with port.	True	N/A
/:server:network-interface-name	string	Name of the management network interface.	True	N/A
/:rest-server	object	General PSME REST server configuration.	True	N/A
/:rest-server:storage-service-mode	boolean	Enabling Storage Service Mode. This is needed when REST is running on Storage Module.	True	N/A
/:registration	object	Configuration for the agent registration process.	True	N/A
/:registration:minDelay	integer	Minimum delay in seconds between heart-beat checks.	True	N/A
/:registration:port	integer	Port number used by agents to register.	True	N/A
/:logger	object	Configuration of the logger used for PSME REST server.	True	N/A
/:logger:app	object	Container for REST application settings.	True	N/A
/:logger:app:level	string	Choose one of the 7 severity levels (EMERGENCY, ALERT, CRITICAL, ERROR, WARNING, NOTICE, INFO, DEBUG). For more info check man syslog.	False	N/A
/:logger:app:color	boolean	Enable or disable colors in log file.	False	N/A
/:logger:app:streams	array	Configuration of output methods for logger.	False	Object
/:logger:app:streams:type	string	Choose one of the output methods. Like FILE of STDOUT.	False	N/A
/:logger:app:timeformat	string	Define format used for timestamps in log file: DATE_NS, DATE_US, DATE_MS, DATE_SEC	False	N/A
/:logger:app:output	boolean	Turn on, off logging.	False	N/A
/:logger:app:moredebug	boolean	Enable/disable additional debug info in log file.	False	N/A
/:logger:app:tagging	boolean	Turn on/turn off tagging in application	False	N/A

7.1.3   Example

Configuration Example:

```
{
    "server": {
        "url": "http://localhost:8888",
        "network-interface-name" : "enp0s20f0.4094"
    },
    "registration": {
        "port": 8383,
        "minDelay": 3
    },
    "commands": {
        "generic": "Registration"
    },
    "eventing" : {
        "enabled" : false,
        "address": "localhost",
        "port" : 5567,
        "poll-interval-sec" : 20
    },
    "rest-server" : {
        "storage-service-mode" : false
    },
    "service-uuid-file" : "/etc/psme/service_uuid.json",
    "logger" : {
        "app" : {
            "level" : "INFO",
            "timeformat" : "DATE_NS",
            "color" : true,
            "output" : true,
            "tagging" : true,
            "moredebug" : false,
            "streams" : [
                {
                    "type" : "STDOUT"
                }
            ]
        }
    }
}
```

7.1.4   Schema

Configuration schema:

```
{
    "title": "PSME Rest Server",
    "description": "Detailed JSON schema documentation used for PSME REST
server configuration file. Configuration file is pure JSON format.",
    "name": "/",
    "type": "object",

    "properties": {
        "server": {
```

```
                "description": "Information about REST server communication. Port
numbers, addresses.",
                "name": "server",
                "type": "object",
                "properties": {
                    "url": {
                        "description": "URI address of the server with port.",
                        "name": "url",
                        "type": "string"
                    },

                    "network-interface-name": {
                        "description": "Name of the network interface used to
send and receive packets.",
                        "name": "network-interface-name",
                        "type": "string"
                    }
                },

                "required": [
                    "url",
                    "network-interface-name"
                ]
            },

            "registration": {
                "title": "Registration schema.",
                "description": "Configuration for the agent registration
process.",
                "name": "registration",
                "type": "object",
                "properties": {
                    "port": {
                        "description": "Port number used by agents to register.",
                        "name": "port",
                        "type": "integer"
                    },

                    "minDelay": {
                        "description": "Minimum delay between heart-beat
checks.",
                        "name": "minDelay",
                        "type": "integer"
                    }
                },

                "required": [
                    "port",
                    "minDelay"
                ]
            },

            "commands": {
                "title": "Commands schema.",
```

```
            "description": "Configuration which implementation of the
commands use to communicate with server.",
            "name": "commands",
            "type": "object",
            "properties": {
                "generic": {
                    "description": "Generic command. Implementation based
only on POSIX sockets.",
                    "name": "generic",
                    "type": "string"
                }
            },

            "required": [
                "generic"
            ]
        },

        "eventing": {
            "title": "Eventing schema.",
            "description": "Eventing feature configuration.",
            "name": "eventing",
            "type": "object",
            "properties": {

                "enabled": {
                    "title": "Enabled schema.",
                    "description": "Disable of enable eventing feature.
Disabling eventing mechanism will turn on polling feature. ",
                    "name": "enabled",
                    "type": "boolean"
                },

                "address": {
                    "title": "Address schema.",
                    "description": "URL of the listening address used for
eventing.",
                    "name": "address",
                    "type": "string"
                },

                "port": {
                    "title": "Port schema.",
                    "description": "Listen port number used for eventing.",
                    "name": "port",
                    "type": "integer"
                },

                "poll-interval-sec": {
                    "title": "TODO Poll interval sec??? schema.",
                    "description": "Delay between polling tries. Busy waiting
interval.",
                    "name": "poll-interval-sec",
                    "type": "integer"
                }
```

```
            },

            "required": [
                "enabled",
                "address",
                "port",
                "poll-interval-sec"
            ]
        },

        "rest-server": {
            "title": "Rest server schema.",
            "description": "General PSME REST server configuration.",
            "name": "rest-server",
            "type": "object",
            "properties": {

                "storage-service-mode": {
                    "title": "Storage service mode schema.",
                    "description": "Enabling Storage Service Mode. This is
needed when REST is running on Storage Module.",
                    "name": "storage-service-mode",
                    "type": "boolean"
                }
            },

            "required": [
                "storage-service-mode"
            ]
        },

        "service-uuid-file": {
            "title": "Service uuid file schema.",
            "description": "Path to service uuid file.",
            "name": "service-uuid-file",
            "type": "string"
        },

        "logger": {
            "title": "Logger schema.",
            "description": "Configuration of the logger used for PSME REST
server.",
            "name": "logger",
            "type": "object",
            "properties": {
                "app": {
                    "description": "Container for REST application
settings.",
                    "name": "app",
                    "type": "object",
                    "properties": {

                        "level": {
                            "description": "Choose one of the 7 severity
levels. For more info check man syslog.",
```

```
                                "name": "level",
                                "type": "string"
                        },

                        "timeformat": {
                                "description": "Define format used for timestamps
in log file.",
                                "name": "timeformat",
                                "type": "string"
                        },

                        "color": {
                                "description": "Enable or disable colors in log
file.",
                                "name": "color",
                                "type": "boolean"
                        },

                        "output": {
                                "description": "Turn on, off logging.",
                                "name": "output",
                                "type": "boolean"
                        },

                        "tagging": {
                                "description": "Turn on/turn off tagging in
application",
                                "name": "tagging",
                                "type": "boolean"
                        },

                        "moredebug": {
                                "description": "Enable/disable additional debug
info in log file.",
                                "name": "moredebug",
                                "type": "boolean"
                        },

                        "streams": {
                                "title": "Streams schema.",
                                "description": "Configuration of output methods
for logger.",
                                "name": "streams",
                                "type": "array",
                                "items": {
                                    "type": "object",
                                    "properties": {
                                        "type": {
                                            "title": "Type schema.",
                                            "description": "Choose one of the
output methods. Like FILE of STDOUT.",
                                            "name": "type",
                                            "type": "string"
                                        }
                                    },
```

```
                              "required": [
                                    "type"
                              ]
                        }
                  }
            }
      },

      "required": [
            "app"
      ]
   }
},

"required": [
      "server",
      "registration",
      "commands",
      "eventing",
      "rest-server",
      "service-uuid-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 17 PSME compute agent properties

Name	Type	Description	Required	Item type
/: commands	object	Container for agent commands configuration.	True	N/A
/: commands:*	object	Star covers all commands.	True	N/A
/: commands: * : implementation	string	Command implementation selector string: OpenIPMI.	True	N/A
/: modules	array	List of all modules. Each entry represents single module.	True	object
/: modules: username	string	Module's BMC username.	False	N/A
/: modules: slot	integer	Slot number in drawer.	False	N/A
/: modules: submodules	array	Configuration for each submodule. Each entry is for single submodule (host).	False	object
/: modules: submodules: slot	integer	Submodule slot number.	False	N/A
/: modules: submodules: storageControllers	array	List of storage controllers.	False	object
/: modules: submodules: storageControllers: status	object	Status health stubs.	False	N/A
/: modules: submodules: storageControllers: status: state	string	State stub.	True	N/A
/: modules: submodules: storageControllers: status: health	string	Health stub.	True	N/A
/: modules: submodules: storageControllers: drives	array	List of drives.	False	object
/: modules: submodules: storageControllers: drives: status	object	Drive status stub.	False	N/A
/: modules: submodules: storageControllers: drives: status: state	string	State stub.	True	N/A
/: modules: submodules: storageControllers: drives: status: health	string	Health stub.	True	N/A
/: modules: submodules: storageControllers: drives: capacityGB	integer	Drive capacity in GiB stub	False	N/A

Name	Type	Description	Required	Item type
/: modules: submodules: storageControllers: drives: rpm	integer	Revolutions per minute stub.	False	N/A
/: modules: submodules: storageControllers: drives: fruInfo	object	Drive Fru Info	False	N/A
/: modules: submodules: storageControllers: drives: fruInfo: modelNumber	string	Stub for model number.	True	N/A
/: modules: submodules: storageControllers: drives: fruInfo: partNumber	string	Stub for part number.	True	N/A
/: modules: submodules: storageControllers: drives: fruInfo: serialNumber	string	Stub for serial number.	True	N/A
/: modules: submodules: storageControllers: drives: fruInfo: manufacturer	string	Stub for manufacturer name.	True	N/A
/: modules: submodules: storageControllers: drives: oem	object	OEM specific inforamtion stub.	False	N/A
/: modules: submodules: storageControllers: drives: interface	string	Drive interface name.	False	N/A
/: modules: submodules: storageControllers: drives: type	string	Drive type stub.	False	N/A
/: modules: submodules: storageControllers: fruInfo	object	Fru info stubs.	False	N/A
/: modules: submodules: storageControllers: fruInfo: modelNumber	string	Model number stub.	True	N/A
/: modules: submodules: storageControllers: fruInfo: partNumber	string	Part number stub.	True	N/A
/: modules: submodules: storageControllers: fruInfo: serialNumber	string	Serial number stub.	True	N/A
/: modules: submodules: storageControllers: fruInfo: manufacturer	string	Manufacturer name stub.	True	N/A
/: modules: submodules: storageControllers: oem	object	OEM specific inforamtion stub.	False	N/A
/: modules: submodules: storageControllers: driveCount	integer	Number of drives.	False	N/A
/: modules: submodules: storageControllers: interface	string	Interface name.	False	N/A

Name	Type	Description	Required	Item type
/: modules: submodules: storageControllers: type	string	Type of the Storage Controller.	False	N/A
/: modules: submodules: port	integer	Port number used to communicate with submodule.	False	N/A
/: modules: submodules: networkInterfaces	array	List of network interfaces. Stubs which can be override by real data on runtime.	False	object
/: modules: submodules: networkInterfaces: ipv4Address	object	Container for interface IP version 4.	False	N/A
/: modules: submodules: networkInterfaces: ipv4Address: subnetMask	string	Subnet mask. Example: 255.255.255.0	True	N/A
/: modules: submodules: networkInterfaces: ipv4Address: addressOrigin	string	How address was achieved. Static/DHCP./	True	N/A
/: modules: submodules: networkInterfaces: ipv4Address: gateway	string	IP address of the gateway.	True	N/A
/: modules: submodules: networkInterfaces: ipv4Address: address	string	IP address.	True	N/A
/: modules: submodules: networkInterfaces: macAddress	string	Mac address: XX:XX:XX:XX:XX:XX	False	N/A
/: modules: submodules: networkInterfaces: frameSize	integer	Size of the frame.	False	N/A
/: modules: submodules: networkInterfaces: ipv6Address	object	Container for interface IP version 6.	False	N/A
/: modules: submodules: networkInterfaces: ipv6Address: addressState	string	Name of the address state.	True	N/A
/: modules: submodules: networkInterfaces: ipv6Address: addressOrigin	string	How address was achieved. Static/DHCP./	True	N/A
/: modules: submodules: networkInterfaces: ipv6Address: prefixLength	integer	IP address version 6 prefix.	True	N/A
/: modules: submodules: networkInterfaces: ipv6Address: address	string	IP address version 6.	True	N/A
/: modules: submodules: networkInterfaces: linkTechnology	string	Name of the link technology. Example: Ethernet .	False	N/A
/: modules: submodules: networkInterfaces: neighborInfo	object	Information about network topology.	False	N/A
/: modules: submodules:	string	UUID of the neighbour switch.	True	N/A

Name	Type	Description	Required	Item type
networkInterfaces: neighborInfo: switchIdentifier				
/: modules: submodules: networkInterfaces: neighborInfo: portIdentifier	string	Port ID	True	N/A
/: modules: submodules: networkInterfaces: vlanEnable	boolean	Enable/disable VLAN.	False	N/A
/: modules: submodules: networkInterfaces: oem	object	Stubs for additonal information from OEM.	False	N/A
/: modules: submodules: networkInterfaces: autosense	boolean	Enable / Disable autosense.	False	N/A
/: modules: submodules: networkInterfaces: speedGbps	integer	Network interface speed in Gbps.	False	N/A
/: modules: submodules: networkInterfaces: vlanCount	integer	Number of VLANs	False	N/A
/: modules: ipv4	string	Internal IP address of the module.	False	N/A
/: modules: gpio	object	GPIO configuration for module.	False	N/A
/: modules: gpio: bus	integer	Bus number for GPIO.	True	N/A
/: modules: gpio: inverted	boolean	Enable / Disable inverted logic on pins INPUT/OUTPUT.	True	N/A
/: modules: gpio: address	integer	GPIO address	True	N/A
/: modules: gpio: pins	array	Which pins use for this module.	True	integer
/: modules: gpio: model	string	GPIO controller model name	True	N/A
/: modules: gpio: bank	integer	GPIO pins bank. 0 for 0-7 pins 1 for 8 - 15 pins.	True	N/A
/: modules: password	string	Module's BMC password.	False	N/A
/: modules: port	integer	Module's BMC port number	False	N/A
/: agent	object	Container for agent specific information.	True	N/A
/: agent: vendor	string	Information about agent vendor.	False	N/A
/: agent: type	string	Type of the agent, one of: storage, compute, network.	True	N/A
/: agent: port	integer	Listen port number. For example 7777.	False	N/A
/: server	object	Information for agent about access to REST server.	True	N/A
/: server: port	integer	Port number to register to REST server. Must be the same as configured in PSME REST Server.	True	N/A
/: chassis	object	Configuration for general Chassis during discovery.	False	N/A
/: chassis: locationOffset	integer	Location identifier offset.	True	N/A
/: chassis: computeZones	array	List of supported compute zones.	True	object
/: chassis: size	integer	Size of the chassis in units [U].	True	N/A
/: registration	object	Registration to server configuration container.	True	N/A

Name	Type	Description	Required	Item type
/: registration: interval	integer	Delay between next registration try in seconds.	True	N/A
/: registration: ipv4	string	PSME REST server IP address or hostname.	True	N/A
/: registration: port	integer	PSME REST server registration port number.	True	N/A
/: logger	object	Logger configuration.	True	N/A
/: logger: agent	object	Agent logging configuration.	True	N/A
/: logger: agent: level	string	Severity level compatible with syslog.	False	N/A
/: logger: agent: color	boolean	Enable / disable colors in log file.	False	N/A
/: logger: agent: streams	array	Logger output streams configuration.	False	object
/: logger: agent: streams: type	string	Stream type. FILE or STDOUT.	False	N/A
/: logger: agent: timeformat	string	Timestamp format.	False	N/A
/: logger: agent: output	boolean	Enable / disable output.	False	N/A
/: logger: agent: moredebug	boolean	Additional debug info in log file.	False	N/A
/: logger: agent: tagging	boolean	Enable / disable tagging.	False	N/A

7.2.3   Example

```
{
    "agent": {
        "type": "Compute",
        "vendor" : "Intel Corporation",
        "port" : 7777
    },
    "commands" : {
        "*": {
            "implementation": "OpenIPMI"
        }
    },
    "server": {
        "port": 7777
    },
    "registration": {
        "ipv4": "localhost",
        "port": 8383,
        "interval": 3
    },
    "chassis": {
        "size": 1,
        "locationOffset": 1,
        "computeZones": [
            {}
        ]
    },
    "modules": [
        {
            "ipv4": "1.1.2.1",
            "username": "USER",
            "password": "PASSWORD",
```

```
            "port": 623,
            "slot": 1,
            "gpio": {"model": "PCA9555", "bus": 3, "address": 32, "bank": 0, "pins":
[0, 3], "inverted": false},
            "submodules": [
                {
                    "port": 62000,
                    "slot": 1,
                    "networkInterfaces": [
                        {
                            "status": {
                                "state": "Enabled",
                                "health": "OK"
                            },
                            "frameSize": 1520,
                            "linkTechnology": "Ethernet",
                            "speedGbps": 1,
                            "autosense": true,
                            "macAddress": "AA:BB:CC:DD:EE:FF",
                            "ipv4Address": {
                                "address": "10.0.2.10",
                                "subnetMask": "255.255.255.0",
                                "addressOrigin": "DHCP",
                                "gateway": "10.0.2.1"
                            },
                            "ipv6Address": {
                                "address": "::fe80:1ec1:deff:fe6f:1c37",
                                "prefixLength": 16,
                                "addressOrigin": "DHCP",
                                "addressState": "Preferred"
                            },
                            "neighborInfo": {
                                "switchIdentifier": "123e4567-e89b-12d3-a456-
426655440000",

                                "portIdentifier": "19"
                            },
                            "vlanEnable": true,
                            "vlanCount": 1,
                            "oem": {}
                        }
                    ],
                    "storageControllers":[
                        {
                            "type":"RSAStorageController",
                            "status":{
                                "state":"Enabled",
                                "health":"OK"
                            },
                            "interface":"SAS",
                            "fruInfo":{
                                "serialNumber":"123feacde123",
                                "manufacturer":"LSI Logic",
                                "modelNumber":"SAS3008 PCI-Express Fusion-MPT SAS-3",
                                "partNumber":"rev2"
```

```
			},
			"driveCount":1,
			"drives":[
				{
					"status":{
						"state":"Enabled",
						"health":"OK"
					},
					"interface":"SAS",
					"type":"HDD",
					"capacityGB":500,
					"rpm":7200,
					"fruInfo":{
						"serialNumber":"JP1572FL18JRJK",
						"manufacturer":"Samsung",
						"modelNumber":"ST1000NM0033-9ZM",
						"partNumber":"SN03"
					},
					"oem":{

					}
				}
			],
			"oem":{

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

7.2.4   Configuring blade storage controllers and drives

The BMC doesn`t provide information about Storage Controllers and Drives. The user can provide stubbed data adding a "storageControllers" section to submodule in the "submodules" collection. Please see the configuration example in 9.2.3.

Configured Storage Controller resource is exposed on REST API as:

```
/rest/v1/Drawers/<ID>/ComputeModules/<ID>/Blades/<ID>/StorageControllers/<ID>
```

The user may also add a list of hard drives (Drives) attached to the defined Storage Controller. The "drives" section contains a collection of Drives. Each drive contains a list of properties that may be configured. Please see the configuration example in 9.2.3.

List of defined Drives is exposed on REST API as:

```
/rest/v1/Drawers/<ID>/ComputeModules/<ID>/Blades/<ID>/StorageControllers/<ID>
/Drives
```

Details of configured Drives are available on the following resource:

```
/rest/v1/Drawers/<ID>/ComputeModules/<ID>/Blades/<ID>/StorageControllers/<ID>
/Drives/<ID>
```

7.2.5   Configuring blade network interface

The BMC doesn`t provide information about Network Interfaces. The user can provide stubbed data by adding a "networkInterfaces" section to submodule in the "submodules" collection. Each network Interface contains a list of properties that may be configured. Please see the configuration example in 9.2.3.

The configured network interface resource is exposed on the REST API as:

```
/rest/v1/Drawers/<ID>/ComputeModules/<ID>/Blades/<ID>/EthernetInterfaces/<ID>
```

7.2.6   Schema

```
{
    "title": "PSME Compute Agent Configuration Schema",
    "description": "Detailed description of the PSME Compute Agent
configuration file.",
    "name": "/",
    "type": "object",
    "properties": {
        "agent": {
            "description": "Container for agent specific information.",
            "name": "agent",
            "type": "object",
            "properties": {
                "type": {
                    "description": "Type of the agent: storage, compute,
network.",
                    "name": "type",
                    "type": "string"
                },
                "vendor": {
                    "description": "Information about agent vendor.",
                    "name": "vendor",
                    "type": "string"
                },
                "port": {
```

```
                "description": "Listen port number. For example 7777.",
                "name": "port",
                "type": "integer"
            }
        },
        "required": [
            "type"
        ]
    },
    "commands": {
        "description": "Container for agent commands configuration.",
        "name": "commands",
        "type": "object",
        "properties": {
            "*": {
                "description": "Star covers all commands. ",
                "name": "*",
                "type": "object",
                "properties": {
                    "implementation": {
                        "description": "Type of implementation: generic
or OpenIPMI.",
                        "name": "implementation",
                        "type": "string"
                    }
                },
                "required": [
                    "implementation"
                ]
            }
        },
        "required": [
            "*"
        ]
    },
    "server": {
        "description": "Information for agent about access to REST
server.",
        "name": "server",
        "type": "object",
        "properties": {
            "port": {
                "description": "Port number to register to REST server.
Must be the same as configured in PSME REST Server.",
                "name": "port",
                "type": "integer"
            }
        },
        "required": [
            "port"
        ]
    },
    "registration": {
        "description": "Registration to server configuration container.",
        "name": "registration",
```

```
            "type": "object",
            "properties": {
                "ipv4": {
                    "description": "PSME REST server IP address or
hostname.",
                    "name": "ipv4",
                    "type": "string"
                },
                "port": {
                    "description": "PSME REST server registration port
number.",
                    "name": "port",
                    "type": "integer"
                },
                "interval": {
                    "description": "Delay between next registration try in
seconds.",
                    "name": "interval",
                    "type": "integer"
                }
            },
            "required": [
                "ipv4",
                "port",
                "interval"
            ]
        },
        "chassis": {
            "description": "Configuration for general Chassis during
discovery.",
            "name": "chassis",
            "type": "object",
            "properties": {
                "size": {
                    "description": "Size of the chassis in units [U].",
                    "name": "size",
                    "type": "integer"
                },
                "locationOffset": {
                    "description": "Location identifier offset.",
                    "name": "locationOffset",
                    "type": "integer"
                },
                "computeZones": {
                    "description": "List of supported compute zones.",
                    "name": "computeZones",
                    "type": "array",
                    "items": {
                        "type": "object",
                        "description": "Compute Zone",
                        "properties": {},
                        "required": []
                    }
                }
            },
```

```
            "required": [
                "size",
                "locationOffset",
                "computeZones"
            ]
        },
        "modules": {
            "description": "List of all modules. Each entry represents single
module.",
            "name": "modules",
            "type": "array",
            "items": {
                "type": "object",
                "properties": {
                    "ipv4": {
                        "description": "Internal IP address of the module.",
                        "name": "ipv4",
                        "type": "string"
                    },
                    "username": {
                        "description": "Module's BMC username.",
                        "name": "username",
                        "type": "string"
                    },
                    "password": {
                        "description": "Module's BMC password.",
                        "name": "password",
                        "type": "string"
                    },
                    "port": {
                        "description": "Module's BMC port number",
                        "name": "port",
                        "type": "integer"
                    },
                    "slot": {
                        "description": "Slot number in drawer.",
                        "name": "slot",
                        "type": "integer"
                    },
                    "gpio": {
                        "description": "GPIO configuration for module.",
                        "name": "gpio",
                        "type": "object",
                        "properties": {
                            "model": {
                                "description": "GPIO controller model name",
                                "name": "model",
                                "type": "string"
                            },
                            "bus": {
                                "description": "Bus number for GPIO.",
                                "name": "bus",
                                "type": "integer"
                            },
                            "address": {
```

```
                                                "description": "GPIO address",
                                                "name": "address",
                                                "type": "integer"
                                    },
                                    "bank": {
                                                "description": "GPIO pins bank. 0 for 0-7
pins 1 for 8 - 15 pins.",
                                                "name": "bank",
                                                "type": "integer"
                                    },
                                    "pins": {
                                                "description": "Which pins use for this
module.",
                                                "name": "pins",
                                                "type": "array",
                                                "items": {
                                                        "type": "integer"
                                                }
                                    },
                                    "inverted": {
                                                "description": "Enable / disable inverted
logic on pins INPUT/OUTPUT.",
                                                "name": "inverted",
                                                "type": "boolean"
                                    }
                            },
                            "required": [
                                    "model",
                                    "bus",
                                    "address",
                                    "bank",
                                    "pins",
                                    "inverted"
                            ]
                    },
                    "submodules": {
                            "description": "Configuration for each submodule.
Each entry is for single submodule (host).",
                            "name": "submodules",
                            "type": "array",
                            "items": {
                                    "type": "object",
                                    "properties": {
                                            "port": {
                                                    "description": "Port number used to
communicate with submodule.",
                                                    "name": "port",
                                                    "type": "integer"
                                            },
                                            "slot": {
                                                    "description": "Submodule slot number.",
                                                    "name": "slot",
                                                    "type": "integer"
                                            },
                                            "networkInterfaces": {
```

```
                              "description": "List of network
interfaces. Stubs which can be override by real data on runtime.",
                              "name": "networkInterfaces",
                              "type": "array",
                              "items": {
                                  "type": "object",
                                  "properties": {
                                      "frameSize": {
                                          "description": "Size of the
frame.",
                                          "name": "frameSize",
                                          "type": "integer"
                                      },
                                      "linkTechnology": {
                                          "description": "Name of the
link technology. Example: .",
                                          "name": "linkTechnology",
                                          "type": "string"
                                      },
                                      "speedGbps": {
                                          "description": "Network
interface speed in Gbps.",
                                          "name": "speedGbps",
                                          "type": "integer"
                                      },
                                      "autosense": {
                                          "description": "Enable /
disable autosense.",
                                          "name": "autosense",
                                          "type": "boolean"
                                      },
                                      "macAddress": {
                                          "description": "Max address:
XX:XX:XX:XX:XX:XX",
                                          "name": "macAddress",
                                          "type": "string"
                                      },
                                      "ipv4Address": {
                                          "description": "Container for
interface IP version 4.",
                                          "name": "ipv4Address",
                                          "type": "object",
                                          "properties": {
                                              "address": {
                                                  "description": "IP
address.",
                                                  "name": "address",
                                                  "type": "string"
                                              },
                                              "subnetMask": {
                                                  "description":
"Subnet mask. Example: 255.255.255.0",
                                                  "name": "subnetMask",
                                                  "type": "string"
                                              },
```

```
                                                "addressOrigin": {
                                                    "description": "How
address was achieved. Static/DHCP./",
                                                    "name":
"addressOrigin",
                                                    "type": "string"
                                                },
                                                "gateway": {
                                                    "description": "IP
address of the gateway.",
                                                    "name": "gateway",
                                                    "type": "string"
                                                }
                                            },
                                            "required": [
                                                "address",
                                                "subnetMask",
                                                "addressOrigin",
                                                "gateway"
                                            ]
                                        },
                                        "ipv6Address": {
                                            "description": "Container for
interface IP version 6.",
                                            "name": "ipv6Address",
                                            "type": "object",
                                            "properties": {
                                                "address": {
                                                    "description": "IP
address version 6.",
                                                    "name": "address",
                                                    "type": "string"
                                                },
                                                "prefixLength": {
                                                    "description": "IP
address version 6 prefix.",
                                                    "name":
"prefixLength",
                                                    "type": "integer"
                                                },
                                                "addressOrigin": {
                                                    "description": "How
address was achieved. Static/DHCP./",
                                                    "name":
"addressOrigin",
                                                    "type": "string"
                                                },
                                                "addressState": {
                                                    "description": "Name
of the address state.",
                                                    "name":
"addressState",
                                                    "type": "string"
                                                }
                                            },
```

```
                                            "required": [
                                                "address",
                                                "prefixLength",
                                                "addressOrigin",
                                                "addressState"
                                            ]
                                        },
                                        "neighborInfo": {
                                            "description": "Information
about network topology.",
                                            "name": "neighborInfo",
                                            "type": "object",
                                            "properties": {
                                                "switchIdentifier": {
                                                    "description": "UUID
of the neighbour switch.",
                                                    "name":
"switchIdentifier",
                                                    "type": "string"
                                                },
                                                "portIdentifier": {
                                                    "description": "Port
ID",
                                                    "name":
"portIdentifier",
                                                    "type": "string"
                                                }
                                            },
                                            "required": [
                                                "switchIdentifier",
                                                "portIdentifier"
                                            ]
                                        },
                                        "vlanEnable": {
                                            "description":
"Enable/disable VLAN.",
                                            "name": "vlanEnable",
                                            "type": "boolean"
                                        },
                                        "vlanCount": {
                                            "description": "Number of
VLANs",
                                            "name": "vlanCount",
                                            "type": "integer"
                                        },
                                        "oem": {
                                            "description": "Stubs for
additonal information from OEM.",
                                            "name": "oem",
                                            "type": "object",
                                            "properties": {},
                                            "required": []
                                        }
                                    }
                                }
                            }
```

```
                                              },
                                "storageControllers": {
                                        "description": "List of storage
controllers.",
                                        "name": "storageControllers",
                                        "type": "array",
                                        "items": {
                                            "type": "object",
                                            "properties": {
                                                "type": {
                                                    "description": "Type of the
Storage Controller.",
                                                        "name": "type",
                                                        "type": "string"
                                                },
                                                "status": {
                                                    "description": "Status health
stubs.",
                                                        "name": "status",
                                                        "type": "object",
                                                        "properties": {
                                                            "state": {
                                                                "description": "State
stub.",
                                                                    "name": "state",
                                                                    "type": "string"
                                                            },
                                                            "health": {
                                                                "description":
"Health stub.",
                                                                    "name": "health",
                                                                    "type": "string"
                                                            }
                                                        },
                                                        "required": [
                                                            "state",
                                                            "health"
                                                        ]
                                                },
                                                "interface": {
                                                    "description": "Interface
name.",
                                                        "name": "interface",
                                                        "type": "string"
                                                },
                                                "fruInfo": {
                                                    "description": "Fru info
stubs.",
                                                        "name": "fruInfo",
                                                        "type": "object",
                                                        "properties": {
                                                            "serialNumber": {
                                                                "description":
"Serial number stub.",
```

```
                                                    "name":
"serialNumber",

                                                    "type": "string"
                                                },
                                                "manufacturer": {
                                                    "description":
"Manufacturer name stub.",

                                                    "name":
"manufacturer",

                                                    "type": "string"
                                                },
                                                "modelNumber": {
                                                    "description": "Model
number stub.",

                                                    "name":
"modelNumber",

                                                    "type": "string"
                                                },
                                                "partNumber": {
                                                    "description": "Part
number stub.",

                                                    "name": "partNumber",
                                                    "type": "string"
                                                }
                                            },
                                            "required": [
                                                "serialNumber",
                                                "manufacturer",
                                                "modelNumber",
                                                "partNumber"
                                            ]
                                        },
                                        "driveCount": {
                                            "description": "Number of
drives.",

                                            "name": "driveCount",
                                            "type": "integer"
                                        },
                                        "drives": {
                                            "description": "List of
drives.",

                                            "name": "drives",
                                            "type": "array",
                                            "items": {
                                                "type": "object",
                                                "properties": {
                                                    "status": {
                                                        "description":
"Drive status stub.",

                                                        "name": "status",
                                                        "type": "object",
                                                        "properties": {
                                                            "state": {

"description": "State stub.",
```

```
                                                                "name":
"state",
                                                                "type":
"string"

                                                            },
                                                            "health": {

"description": "Health stub.",

"name":
"health",

"type":
"string"

                                                            }
                                                        },
                                                        "required": [
                                                            "state",
                                                            "health"
                                                        ]
                                                    },
                                                    "interface": {
                                                        "description":
"Drive interface name.",

                                                        "name":
"interface",

                                                        "type": "string"
                                                    },
                                                    "type": {
                                                        "description":
"Drive type",

                                                        "name": "type",
                                                        "type": "string"
                                                    },
                                                    "capacityGB": {
                                                        "description":
"Drive capacity in GiB",

                                                        "name":
"capacityGB",

                                                        "type": "integer"
                                                    },
                                                    "rpm": {
                                                        "description":
"Revolutions per minute schema.",

                                                        "name": "rpm",
                                                        "type": "integer"
                                                    },
                                                    "fruInfo": {
                                                        "description":
"Drive Fru Info",

                                                        "name":
"fruInfo",

                                                        "type": "object",
                                                        "properties": {

"serialNumber": {
```

```
"description": "Stub for serial number.",
                                                   "name":
"serialNumber",
                                                   "type":
"string"
                                               },

"manufacturer": {

"description": "Stub for manufacturer name.",
                                                   "name":
"manufacturer",
                                                   "type":
"string"
                                               },

"modelNumber": {

"description": "Stub for model number.",
                                                   "name":
"modelNumber",
                                                   "type":
"string"
                                               },
                                               "partNumber":
{

"description": "Stub for part number.",
                                                   "name":
"partNumber",
                                                   "type":
"string"
                                           }
                                       },
                                       "required": [

"serialNumber",

"manufacturer",

"modelNumber",

                                           "partNumber"
                                       ]
                                   },
                                   "oem": {
                                       "description":
"OEM specific inforamtion stub.",

                                       "name": "oem",
                                       "type": "object",
                                       "properties": {},
                                       "required": []
                                   }
                               },
                               "required": [
```

```
                                                "status",
                                                "interface",
                                                "type",
                                                "capacityGB",
                                                "rpm",
                                                "fruInfo",
                                                "oem"
                                            ]
                                        }
                                    },
                                    "oem": {
                                        "description": "OEM specific
inforamtion stub.",
                                        "name": "oem",
                                        "type": "object",
                                        "properties": {},
                                        "required": []
                                    }
                                },
                                "required": [
                                    "status",
                                    "interface",
                                    "fruInfo",
                                    "driveCount",
                                    "drives",
                                    "oem"
                                ]
                            }
                        }
                    },
                    "required": [
                        "port",
                        "slot",
                        "storageControllers"
                    ]
                }
            }
        },
        "required": [
            "ipv4",
            "username",
            "password",
            "port",
            "slot",
            "gpio",
            "submodules"
        ]
    }
},
"logger": {
    "description": "Logger configuration.",
    "name": "logger",
    "type": "object",
    "properties": {
        "agent": {
```

```
                        "description": "Agent logging configuration.",
                        "name": "agent",
                        "type": "object",
                        "properties": {
                            "level": {
                                "description": "Severity level compatible with
syslog.",
                                "name": "level",
                                "type": "string"
                            },
                            "timeformat": {
                                "description": "Timestamp format.",
                                "name": "timeformat",
                                "type": "string"
                            },
                            "color": {
                                "description": "Enable / disable colors in log
file.",
                                "name": "color",
                                "type": "boolean"
                            },
                            "output": {
                                "description": "Enable / disable output.",
                                "name": "output",
                                "type": "boolean"
                            },
                            "tagging": {
                                "description": "Enable / disable tagging.",
                                "name": "tagging",
                                "type": "boolean"
                            },
                            "moredebug": {
                                "description": "Additional debug info in log
file.",
                                "name": "moredebug",
                                "type": "boolean"
                            },
                            "streams": {
                                "description": "Logger output streams
configuration.",
                                "name": "streams",
                                "type": "array",
                                "items": {
                                    "type": "object",
                                    "properties": {
                                        "type": {
                                            "description": "Stream type. FILE or
STDOUT.",
                                            "name": "type",
                                            "type": "string"
                                        }
                                    },
                                    "required": [
                                        "type"
                                    ]
```

```
                                    }
                                }
                            }
                        }
                    },
                    "required": [
                        "agent"
                    ]
                }
            },
            "required": [
                "agent",
                "commands",
                "server",
                "registration",
                "modules",
                "logger"
            ]
    }
```

7.2.7   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:

- If the key file does not exist, then tool will generate a new key file.

- The default key file path is: **/etc/psme/psme-key**

- The tool can be found inside the psme-compute package.

- The key must be at least 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 18   PSME storage agent properties

Name	Type	Description	Required	Item type
/:commands	object	Container for agent commands configuration.	True	N/A
/:commands:*	object	Star covers all commands.	True	N/A
/:commands: * :implementation	string	Type of implementation: ConfigurationBased.	True	N/A
/:modules	array	List of modules. For Storage Agent there should be only one entry in this array.	True	object
/:modules:username	string	Module's BMC username. Not used in PSME Storage Agent.	False	N/A
/:modules:password	string	Module's BMC password. Not used in PSME Storage Agent (leave empty string).	False	N/A
/:modules:submodules	array	Configuration for each submodule. For Storage Agent there should be only one entry in this array.	False	object
/:modules:submodules:storageControllers	array	List of storage controllers. For Storage Agent there should be only one entry.	False	object
/:modules:submodules:storageControllers:status	object	Storage controller status.	False	N/A
/:modules:submodules:storageControllers:status:state	string	Storage controller state stub	True	N/A
/:modules:submodules:storageControllers:status:health	string	Storage controller health stub	True	N/A
/:modules:submodules:storageControllers:drives	array	List of drives. Should be empty array, will be override on runtime.	False	string
/:modules:submodules:storageControllers:fruInfo	object	FRU information.	False	N/A
/:modules:submodules:storageControllers:fruInfo:modelNumber	string	Model number.	True	N/A
/:modules:submodules:storageControllers:fruInfo:partNumber	string	Part number.	True	N/A
/:modules:submodules:storageControllers:fruInfo:serialNumber	string	Serial number.	True	N/A
/:modules:submodules:storageControllers:fruInfo:manufacturer	string	Manufacturer name.	True	N/A
/:modules:submodules:storageControllers:oem	object	OEM specific data.	False	N/A
/:modules:submodules:storageControllers:driveCount	integer	Number of drives. Will be override on runtime.	False	N/A
/:modules:submodules:storageControllers:interface	string	Storage controller interface: SATA, SAS, etc.	False	N/A
/:modules:submodules:iscsi	object	iSCSI configuration container.	False	N/A
/:modules:submodules:iscsi:username	string	Username used to authentication to iSCSI.	True	N/A
/:modules:submodules:iscsi:initiator	string	iSCSI initiator name	True	N/A

/:modules:submodules:iscsi:portal-interface	string	Network interface of iSCSI portal.	True	N/A
/:modules:submodules:iscsi:port	integer	Port on which iSCSI portal is listening.	True	N/A
/:modules:submodules:iscsi:password	string	Password used to authentication to iSCSI.	True	N/A
/:modules:submodules:iscsi:config-path	string	Path within filesystem where tgt configuration files are located.	True	N/A
/:modules:submodules:type	string	Submodule type	False	N/A
/:modules:submodules:port	integer	Submodule port number. Not used in PSME Storage Agent (leave 0).	False	N/A
/:modules:submodules:networkInterfaces	array	List of network interfaces. Should be empty array.	False	string
/:modules:ipv4	string	Internal IP address of the module.	False	N/A
/:modules:port	integer	Module's BMC port number. Not used in PSME Storage Agent (leave 0).	False	N/A
/:agent	object	Container for agent specific information.	True	N/A
/:agent:type	string	Type of the agent: storage, compute, network.	True	N/A
/:server	object	Information for agent about access to REST server.	True	N/A
/:server:port	integer	Port number to register to REST server. Must be the same as configured in PSME REST Server.	True	N/A
/:registration	object	Registration to server configuration container.	True	N/A
/:registration:interval	integer	Interval between next registration try in seconds.	True	N/A
/:registration:ipv4	string	PSME REST server IP address or hostname.	True	N/A
/:registration:port	integer	PSME REST server registration port number.	True	N/A
/:logger	object	Logger configuration.	True	N/A
/:logger:agent	object	Agent logging configuration.	True	N/A
/:logger:agent:level	string	Severity level compatible with syslog.	False	N/A
/:logger:agent:color	boolean	Enable / disable colors in log file.	False	N/A
/:logger:agent:streams	array	Logger output streams configuration.	False	object
/:logger:agent:streams:type	string	Stream type. FILE or STDOUT.	False	N/A
/:logger:agent:timeformat	string	Timestamp format.	False	N/A
/:logger:agent:output	boolean	Enable / disable output.	False	N/A
/:logger:agent:moredebug	boolean	Additional debug info in log file.	False	N/A
/:logger:agent:tagging	boolean	Enable / disable tagging.	False	N/A

7.3.3 Example

```
{
    "agent":{
        "type":"Storage"
    },
    "commands":{
        "*": {
            "implementation": "ConfigurationBased"
        }
    },
    "server":{
        "port":7777
    },
    "registration":{
        "ipv4":"localhost",
```

```
            "port":8383,
            "interval":3
    },
    "modules":[
        {
            "ipv4" : "127.0.0.1",
            "username" : "USER",
            "password" : "PASSWORD",
            "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",
                                "modelNumber":"Wellsburg 6-Port SATA
Controller",

                                "partNumber":"rev2"
                            },
                            "driveCount": 1,
                            "drives": [],
                            "oem":{

                            }
                        }
                    ]
                }
            ]
        }
    ],
    "logger":{
        "agent":{
            "level": "INFO",
            "timeformat":"DATE_NS",
            "color":true,
            "output":true,
            "tagging":true,
            "moredebug":false,
```

```
        "streams":[
            {
                "type": "STDOUT"
            }
        ]
    }
  }
}
```

7.3.4 Schema

```
{
    "title": "PSME Storage Agent Configuration Schema",
    "description": "Detailed description of the PSME Storage Agent
configuration file.",
    "name": "/",
    "type": "object",
    "properties": {

        "agent": {
            "description": "Container for agent specific information.",
            "name": "agent",
            "type": "object",
            "properties": {

                "type": {
                    "description": "Type of the agent: storage, compute,
network.",
                    "name": "type",
                    "type": "string"
                }
            },

            "required": [
                "type"
            ]
        },

        "commands": {
            "description": "Container for agent commands configuration.",
            "name": "commands",
            "type": "object",
            "properties": {

                "*": {
                    "description": "Star covers all commands.",
                    "name": "*",
                    "type": "object",
                    "properties": {

                        "implementation": {
                            "description": "Type of implementation:
ConfigurationBased.",
                            "name": "implementation",
                            "type": "string"
                        }
```

```
                },

                "required": [
                    "implementation"
                ]
            }
        },

        "required": [
            "*"
        ]
    },

    "server": {
        "description": "Information for agent about access to REST
server.",
        "name": "server",
        "type": "object",
        "properties": {

            "port": {
                "description": "Port number to register to REST server.
Must be the same as configured in PSME REST Server.",
                "name": "port",
                "type": "integer"
            }
        },

        "required": [
            "port"
        ]
    },

    "registration": {
        "description": "Registration to server configuration container.",
        "name": "registration",
        "type": "object",
        "properties": {

            "ipv4": {
                "description": "PSME REST server IP address or
hostname.",
                "name": "ipv4",
                "type": "string"
            },

            "port": {
                "description": "PSME REST server registration port
number.",
                "name": "port",
                "type": "integer"
            },

            "interval": {
```

```
                        "description": "Interval between next registration try in
seconds.",
                        "name": "interval",
                        "type": "integer"
                    }
                },

                "required": [
                    "ipv4",
                    "port",
                    "interval"
                ]
            },

            "modules": {
                "description": "List of modules. For Storage Agent there should
be only one entry in this array.",
                "name": "modules",
                "type": "array",
                "items": {
                    "type": "object",
                    "properties": {

                        "ipv4": {
                            "description": "Internal IP address of the module.",
                            "name": "ipv4",
                            "type": "string"
                        },

                        "username": {
                            "description": "Module's BMC username. Not used in
PSME Storage Agent.",
                            "name": "username",
                            "type": "string"
                        },
                        "password": {
                            "description": "Module's BMC password. Not used in
PSME Storage Agent.",
                            "name": "password",
                            "type": "string"
                        },
                        "port": {
                            "description": "Module's BMC port number. Not used in
PSME Storage Agent.",
                            "name": "port",
                            "type": "integer"
                        },

                        "submodules": {
                            "description": "Configuration for each submodule. For
Storage Agent there should be only one entry in this array.",
                            "name": "submodules",
                            "type": "array",
                            "items": {
                                "type": "object",
```

```
                        "properties": {

                                "type": {
                                        "description": "Submodule type:
StorageServices",
                                        "name": "type",
                                        "type": "string"
                                },

                                "port": {
                                        "description": "Submodule port number.
Not used in PSME Storage Agent.",
                                        "name": "port",
                                        "type": "integer"
                                },

                                "iscsi": {
                                        "description": "iSCSI configuration
container.",
                                        "name": "iscsi",
                                        "type": "object",
                                        "properties": {
                                            "config-path": {
                                                "description": "Path within
filesystem where tgt configuration files are located.",
                                                "name": "config-path",
                                                "type": "string"
                                            },

                                            "portal-interface": {
                                                "description": "Network interface
of iSCSI portal.",
                                                "name": "portal-interface",
                                                "type": "string"
                                            },

                                            "port": {
                                                "description": "Port on which
iSCSI portal is listening.",
                                                "name": "port",
                                                "type": "integer"
                                            },

                                            "username": {
                                                "description": "Username used to
authentication to iSCSI.",
                                                "name": "username",
                                                "type": "string"
                                            },

                                            "password": {
                                                "description": "Password used to
authentication to iSCSI.",
                                                "name": "password",
                                                "type": "string"
```

```
                            },

                            "initiator": {
                                "description": "iSCSI initiator
name: psme-storage",

                                "name": "initiator",
                                "type": "string"
                            }
                        },

                        "required": [
                            "config-path",
                            "portal-interface",
                            "port",
                            "username",
                            "password",
                            "initiator"
                        ]
                    },

                    "networkInterfaces": {
                        "description": "List of network
interfaces. Should be empty array.",
                        "name": "networkInterfaces",
                        "type": "array",
                        "items": {
                            "type": "string"
                        }
                    },

                    "storageControllers": {
                        "description": "List of storage
controllers. For Storage Agent there should be only one entry.",
                        "name": "storageControllers",
                        "type": "array",
                        "items": {
                            "type": "object",
                            "properties": {

                                "status": {
                                    "description": "Storage
controller status.",
                                    "name": "status",
                                    "type": "object",
                                    "properties": {

                                        "state": {
                                            "description":
"Storage controller state: Enabled",
                                            "name": "state",
                                            "type": "string"
                                        },

                                        "health": {
```

```
                                                        "description":
"Storage controller health: OK",

                                                        "name": "health",
                                                        "type": "string"
                                                }
                                        },

                                        "required": [
                                                "state",
                                                "health"
                                        ]
                                },

                                "interface": {
                                        "description": "Storage
controller interface: SATA, SAS, etc.",

                                        "name": "interface",
                                        "type": "string"
                                },

                                "fruInfo": {
                                        "description": "FRU
information.",

                                        "name": "fruInfo",
                                        "type": "object",
                                        "properties": {

                                                "serialNumber": {
                                                        "description":
"Serial number.",

                                                        "name":
"serialNumber",

                                                        "type": "string"
                                                },

                                                "manufacturer": {
                                                        "description":
"Manufacturer name.",

                                                        "name":
"manufacturer",

                                                        "type": "string"
                                                },

                                                "modelNumber": {
                                                        "description": "Model
number.",

                                                        "name":
"modelNumber",

                                                        "type": "string"
                                                },

                                                "partNumber": {
                                                        "description": "Part
number.",

                                                        "name": "partNumber",
```

```
                                                    "type": "string"
                                                }
                                            },

                                             "required": [
                                                "serialNumber",
                                                "manufacturer",
                                                "modelNumber",
                                                "partNumber"
                                            ]
                                        },

                                        "driveCount": {
                                            "description": "Number of
drives. Will be override on runtime.",
                                            "name": "driveCount",
                                            "type": "integer"
                                        },

                                        "drives": {
                                            "description": "List of
drives. Should be empty array, will be override on runtime.",
                                            "name": "drives",
                                            "type": "array",
                                            "items": {
                                                "type": "string"
                                            }
                                        },

                                        "oem": {
                                            "description": "OEM specific
data.",
                                            "name": "oem",
                                            "type": "object",
                                            "properties": {

                                            },

                                            "required": [

                                            ]
                                        }
                                    },

                                    "required": [
                                        "status",
                                        "interface",
                                        "fruInfo",
                                        "driveCount",
                                        "drives",
                                        "oem"
                                    ]
                                }
                            }
                        },
```

```
                                "required": [
                                    "type",
                                    "port",
                                    "iscsi",
                                    "networkInterfaces",
                                    "storageControllers"
                                ]
                            }
                        }
                    },

                    "required": [
                        "ipv4",
                        "username",
                        "password",
                        "port",
                        "submodules"
                    ]
                }
            },

            "logger": {
                "description": "Logger configuration.",
                "name": "logger",
                "type": "object",
                "properties": {
                    "agent": {
                        "description": "Agent logging configuration.",
                        "name": "agent",
                        "type": "object",
                        "properties": {
                            "level": {
                                "description": "Severity level compatible with
syslog.",
                                "name": "level",
                                "type": "string"
                            },
                            "timeformat": {
                                "description": "Timestamp format.",
                                "name": "timeformat",
                                "type": "string"
                            },
                            "color": {
                                "description": "Enable / disable colors in log
file.",
                                "name": "color",
                                "type": "boolean"
                            },
                            "output": {
                                "description": "Enable / disable output.",
                                "name": "output",
                                "type": "boolean"
                            },
                            "tagging": {
```

```
                              "description": "Enable / disable tagging.",
                              "name": "tagging",
                              "type": "boolean"
                          },
                          "moredebug": {
                              "description": "Additional debug info in log
file.",
                              "name": "moredebug",
                              "type": "boolean"
                          },
                          "streams": {
                              "description": "Logger output streams
configuration.",
                              "name": "streams",
                              "type": "array",
                              "items": {
                                  "type": "object",
                                  "properties": {
                                      "type": {
                                          "description": "Stream type. FILE or
STDOUT.",
                                          "name": "type",
                                          "type": "string"
                                      }
                                  },
                                  "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 19   PSME network agent properties

Name	Type	Description	Required	Item type
/:commands	object	Container for agent commands configuration.	True	N/A
/:commands:*	object	Star covers all commands.	True	N/A
/:commands: * :implementation	string	Type of implementation: generic or OpenIPMI.	True	N/A
/:network	object	Network configuration.	True	N/A
/:network:mgmt_port	string	Management port number.	True	N/A
/:modules	array	List of all modules. Each entry represents single module.	True	object
/:modules:username	string	Module's BMC username.	False	N/A
/:modules:password	string	Module's BMC password.	False	N/A
/:modules:submodules	array	Submodules description.	False	object
/:modules:submodules:vlans	array	VLANs configuration.	False	object
/:modules:submodules:vlans:untagged_ports	array	List of untagged ports.	False	integer
/:modules:submodules:vlans:id	integer	VLAN ID number.	False	N/A
/:modules:submodules:vlans:tagged_ports	array	List of tagged ports.	False	integer
/:modules:submodules:type	string	Submodule type.	False	N/A
/:modules:submodules:port	integer	Submodule port number.	False	N/A
/:modules:submodules:ports	array	List of all ports.	False	object
/:modules:submodules:ports:link_state	string	State of the link stub.	False	N/A
/:modules:submodules:ports:autoneg	string	Autonegotiation	False	N/A
/:modules:submodules:ports:id	integer	Port ID number.	False	N/A
/:modules:submodules:ports:ethmod	string	Ethmod name	False	N/A
/:modules:ipv4	string	Internal IP address of the module.	False	N/A
/:modules:port	integer	Module's BMC port number	False	N/A
/:agent	object	Container for agent specific information.	True	N/A
/:agent:vendor	string	Information about agent vendor.	False	N/A
/:agent:type	string	Type of the agent: storage, compute, network.	True	N/A
/:agent:port	integer	Listen port number. For example 7777.	False	N/A
/:server	object	Information for agent about access to REST server.	True	N/A
/:server:port	integer	Port number to register to REST server. Must be the same as configured in PSME REST Server.	True	N/A
/:registration	object	Registration to server configuration container.	True	N/A
/:registration:interval	integer	Delay between next registration try in seconds.	True	N/A
/:registration:ipv4	string	PSME REST server IP address or hostname.	True	N/A
/:registration:port	integer	PSME REST server registration port number.	True	N/A
/:logger	object	Logger configuration.	True	N/A
/:logger:agent	object	Agent logging configuration.	True	N/A
/:logger:agent:level	string	Severity level compatible with syslog.	False	N/A

/:logger:agent:color	boolean	Enable / disable colors in log file.	False	N/A
/:logger:agent:streams	array	Logger output streams configuration.	False	object
/:logger:agent:streams:type	string	Stream type. FILE or STDOUT.	False	N/A
/:logger:agent:timeformat	string	Timestamp format.	False	N/A
/:logger:agent:output	boolean	Enable / disable output.	False	N/A
/:logger:agent:moredebug	boolean	Additional debug info in log file.	False	N/A
/:logger:agent:tagging	boolean	Enable / disable tagging.	False	N/A

7.4.3   Example

```
{
    "agent": {
        "type": "Network",
        "vendor" : "Intel Corporation",
        "port" : 7779
    },
    "commands" : {
        "*": {
            "implementation": "fm6000"
        }
    },
    "network": {
        "mgmt_port": "em1"
    },
    "server": {
        "port": 7779
    },
    "registration": {
        "ipv4": "localhost",
        "port": 8383,
        "interval": 3
    },
    "modules": [
        {
            "type": "RSAFabricModule",
            "ipv4": "127.0.0.1",
            "username": "USER",
            "password": "PASSWORD",
            "port": 623,
            "submodules": [
                {
                    "type": "RSASwitch",
                    "port": 62000,
                    "ports" : [
                        { "id" : 1, "link_state" : "up", "ethmod" : "AN_73",
"autoneg" : "clause_73" },
                        { "id" : 2, "link_state" : "up" },
                        { "id" : 3, "link_state" : "up" },
                        { "id" : 4, "link_state" : "up" },
                        { "id" : 5, "link_state" : "up", "ethmod" : "AN_73",
"autoneg" : "clause_73" },
                        { "id" : 6, "link_state" : "up" },
                        { "id" : 7, "link_state" : "up" },
                        { "id" : 8, "link_state" : "up" },
```

```
                        { "id" : 9, "link_state" : "up", "ethmod" : "AN_73",
"autoneg" : "clause_73" },
                        { "id" : 10, "link_state" : "up" },
                        { "id" : 11, "link_state" : "up" },
                        { "id" : 12, "link_state" : "up" },
                        { "id" : 13, "link_state" : "up", "ethmod" : "AN_73",
"autoneg" : "clause_73" },
                        { "id" : 14, "link_state" : "up" },
                        { "id" : 15, "link_state" : "up" },
                        { "id" : 16, "link_state" : "up" },
                        { "id" : 17, "link_state" : "up", "ethmod" : "AN_73",
"autoneg" : "clause_73" },
                        { "id" : 18, "link_state" : "up" },
                        { "id" : 19, "link_state" : "up" },
                        { "id" : 20, "link_state" : "up" },
                        { "id" : 21, "link_state" : "up", "ethmod" : "AN_73",
"autoneg" : "clause_73" },
                        { "id" : 22, "link_state" : "up" },
                        { "id" : 23, "link_state" : "up" },
                        { "id" : 24, "link_state" : "up" },
                        { "id" : 25, "link_state" : "up" },
                        { "id" : 26, "link_state" : "up" },
                        { "id" : 27, "link_state" : "up" },
                        { "id" : 28, "link_state" : "up" },
                        { "id" : 29, "link_state" : "up" },
                        { "id" : 30, "link_state" : "up" },
                        { "id" : 31, "link_state" : "up" },
                        { "id" : 32, "link_state" : "up" },
                        { "id" : 33, "link_state" : "up" },
                        { "id" : 34, "link_state" : "up" },
                        { "id" : 35, "link_state" : "up" },
                        { "id" : 36, "link_state" : "up" },
                        { "id" : 37, "link_state" : "up" },
                        { "id" : 38, "link_state" : "up" },
                        { "id" : 39, "link_state" : "up" },
                        { "id" : 40, "link_state" : "up" },
                        { "id" : 41, "link_state" : "up" },
                        { "id" : 42, "link_state" : "up" },
                        { "id" : 43, "link_state" : "up" },
                        { "id" : 44, "link_state" : "up" },
                        { "id" : 45, "link_state" : "up" },
                        { "id" : 46, "link_state" : "up" },
                        { "id" : 47, "link_state" : "up" },
                        { "id" : 48, "link_state" : "up" },
                        { "id" : 49, "link_state" : "up" },
                        { "id" : 50, "link_state" : "up" },
                        { "id" : 51, "link_state" : "up" },
                        { "id" : 52, "link_state" : "up" },
                        { "id" : 53, "link_state" : "up" },
                        { "id" : 54, "link_state" : "up" },
                        { "id" : 55, "link_state" : "up" },
                        { "id" : 56, "link_state" : "up" },
                        { "id" : 57, "link_state" : "up" },
                        { "id" : 58, "link_state" : "up" },
                        { "id" : 59, "link_state" : "up" },
```

```
                              { "id" : 60, "link_state" : "up" },
                              { "id" : 61, "link_state" : "up", "ethmod" :
"10GBASE_CR" },
                              { "id" : 62, "link_state" : "up", "ethmod" :
"10GBASE_CR" },
                              { "id" : 63, "link_state" : "up", "ethmod" :
"10GBASE_CR" },
                              { "id" : 64, "link_state" : "up", "ethmod" :
"10GBASE_CR" },
                              { "id" : 65, "link_state" : "up", "ethmod" :
"10GBASE_CR" },
                              { "id" : 66, "link_state" : "up", "ethmod" :
"10GBASE_CR" },
                              { "id" : 67, "link_state" : "up", "ethmod" :
"10GBASE_CR" },
                              { "id" : 68, "link_state" : "up", "ethmod" :
"10GBASE_CR" }
                          ],
                          "vlans" : [
                              {
                                  "id" : 1,
                                  "tagged_ports" : [
                                   ],
                                  "untagged_ports" : [
1,9,17,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,

40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,
                                      58,59,60,61,62,63,64,65,66,67,68
                                  ]
                              },
                              {
                                  "id" : 4093,
                                  "tagged_ports" : [
                                      61,62,63,64,65,66,67,68
                                  ],
                                  "untagged_ports" : [
                                      3,6,8
                                  ]
                              },
                              {
                                  "id" : 170,
                                  "tagged_ports" : [
                                      3,6,8,24
                                  ],
                                  "untagged_ports" : [
                                      2,4,7
                                  ]
                              },
                              {
                                  "id" : 100,
                                  "tagged_ports" : [
1,3,6,8,9,17,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,
```

```
40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,
                            59,60,61,62,63,64,65,66,67,68
                        ],
                        "untagged_ports" : []
                    },
                    {
                        "id" : 200,
                        "tagged_ports" : [
1,3,6,8,9,17,25,26,27,28,29,30,31,32,33,34,35,36,37,38,39,

40,41,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,
                            59,60,61,62,63,64,65,66,67,68
                        ],
                        "untagged_ports" : []
                    }
                ]
            }
        ]
    }
],
    "logger" : {
        "agent" : {
            "level" : "INFO",
            "timeformat" : "DATE_NS",
            "color" : true,
            "output" : true,
            "tagging" : true,
            "moredebug" : false,
            "streams" : [
                {
                    "type" : "STDOUT"
                }
            ]
        }
    }
}
```

7.4.4   Schema

```
{
    "title": "PSME Network Agent Configuration Schema",
    "description": "Detailed documentation PSME Network Agent configuration
file.",
    "name": "/",
    "type": "object",
    "properties": {
        "agent": {
            "description": "Container for agent specific information.",
            "name": "agent",
            "type": "object",
            "properties": {
                "type": {
```

```
                    "description": "Type of the agent: storage, compute,
network.",
                    "name": "type",
                    "type": "string"
                },
                "vendor": {
                    "description": "Information about agent vendor.",
                    "name": "vendor",
                    "type": "string"
                },
                "port": {
                    "description": "Listen port number. For example 7777.",
                    "name": "port",
                    "type": "integer"
                }
            },
            "required": [
                "type"
            ]
        },
        "commands": {
            "description": "Container for agent commands configuration.",
            "name": "commands",
            "type": "object",
            "properties": {
                "*": {
                    "description": "Star covers all commands. ",
                    "name": "*",
                    "type": "object",
                    "properties": {
                        "implementation": {
                            "description": "Type of implementation: generic
or OpenIPMI.",
                            "name": "implementation",
                            "type": "string"
                        }
                    },
                    "required": [
                        "implementation"
                    ]
                }
            },
            "required": [
                "*"
            ]
        },

        "network": {
            "description": "Network configuration.",
            "name": "network",
            "type": "object",
            "properties": {

                "mgmt_port": {
                    "description": "Management port number.",
```

```
                    "name": "mgmt_port",
                    "type": "string"
                }
            },

            "required": [
                "mgmt_port"
            ]
        },

        "server": {
            "description": "Information for agent about access to REST
server.",
            "name": "server",
            "type": "object",
            "properties": {
                "port": {
                    "description": "Port number to register to REST server.
Must be the same as configured in PSME REST Server.",
                    "name": "port",
                    "type": "integer"
                }
            },
            "required": [
                "port"
            ]
        },
        "registration": {
            "description": "Registration to server configuration container.",
            "name": "registration",
            "type": "object",
            "properties": {
                "ipv4": {
                    "description": "PSME REST server IP address or
hostname.",
                    "name": "ipv4",
                    "type": "string"
                },
                "port": {
                    "description": "PSME REST server registration port
number.",
                    "name": "port",
                    "type": "integer"
                },
                "interval": {
                    "description": "Delay between next registration try in
seconds.",
                    "name": "interval",
                    "type": "integer"
                }
            },
            "required": [
                "ipv4",
                "port",
                "interval"
```

```
            ]
        },

    "modules": {
        "description": "List of all modules. Each entry represents single
module.",
            "name": "modules",
            "type": "array",
            "items": {
                "type": "object",
                "properties": {
                    "ipv4": {
                        "description": "Internal IP address of the module.",
                        "name": "ipv4",
                        "type": "string"
                    },
                    "username": {
                        "description": "Module's BMC username.",
                        "name": "username",
                        "type": "string"
                    },
                    "password": {
                        "description": "Module's BMC password.",
                        "name": "password",
                        "type": "string"
                    },
                    "port": {
                        "description": "Module's BMC port number",
                        "name": "port",
                        "type": "integer"
                    },

                    "submodules": {
                        "description": "Submodules description.",
                        "name": "submodules",
                        "type": "array",
                        "items": {
                            "type": "object",
                            "properties": {

                                "type": {
                                    "description": "Submodule type.",
                                    "name": "type",
                                    "type": "string"
                                },

                                "port": {
                                    "description": "Submodule port number.",
                                    "name": "port",
                                    "type": "integer"
                                },

                                "ports": {
                                    "description": "List of all ports.",
                                    "name": "ports",
```

```
                                        "type": "array",
                                        "items": {
                                            "type": "object",
                                            "properties": {
                                                "id": {
                                                    "description": "Port ID
number.",

                                                    "name": "id",
                                                    "type": "integer"
                                                },

                                                "link_state": {
                                                    "description": "State of the
link stub.",

                                                    "name": "link_state",
                                                    "type": "string"
                                                },

                                                "ethmod": {
                                                    "description": "Ethmod name",
                                                    "name": "ethmod",
                                                    "type": "string"
                                                },

                                                "autoneg": {
                                                    "description":
"Autonegotiation",

                                                    "name": "autoneg",
                                                    "type": "string"
                                                }
                                            },

                                            "required": [
                                                "id",
                                                "link_state"
                                            ]
                                        }
                                    },

                                    "vlans": {
                                        "description": "VLANs configuration. Each
element is ",
                                        "name": "vlans",
                                        "type": "array",
                                        "items": {
                                            "type": "object",
                                            "properties": {

                                                "id": {
                                                    "description": "VLAN ID
number.",

                                                    "name": "id",
                                                    "type": "integer"
                                                },
```

```
                                        "tagged_ports": {
                                            "description": "List of
tagged ports.",

                                            "name": "tagged_ports",
                                            "type": "array",
                                            "items": {
                                                "description": "Number of
tagged port.",

                                                "type": "integer"
                                            }
                                        },

                                        "untagged_ports": {
                                            "description": "List of
untagged ports",

                                            "name": "untagged_ports",
                                            "type": "array",
                                            "items": {
                                                "description": "Number of
untagged port.",

                                                "type": "integer"
                                            }
                                        }
                                    },

                                    "required": [
                                        "id",
                                        "tagged_ports",
                                        "untagged_ports"
                                    ]
                                }
                            }
                        },

                        "required": [
                            "type",
                            "port",
                            "ports",
                            "vlans"
                        ]
                    }
                }
            },

            "required": [
                "ipv4",
                "username",
                "password",
                "port",
                "submodules"
            ]
        }
    },

    "logger": {
```

```
            "description": "Logger configuration.",
            "name": "logger",
            "type": "object",
            "properties": {
                "agent": {
                    "description": "Agent logging configuration.",
                    "name": "agent",
                    "type": "object",
                    "properties": {
                        "level": {
                            "description": "Severity level compatible with
syslog.",
                            "name": "level",
                            "type": "string"
                        },
                        "timeformat": {
                            "description": "Timestamp format.",
                            "name": "timeformat",
                            "type": "string"
                        },
                        "color": {
                            "description": "Enable / disable colors in log
file.",
                            "name": "color",
                            "type": "boolean"
                        },
                        "output": {
                            "description": "Enable / disable output.",
                            "name": "output",
                            "type": "boolean"
                        },
                        "tagging": {
                            "description": "Enable / disable tagging.",
                            "name": "tagging",
                            "type": "boolean"
                        },
                        "moredebug": {
                            "description": "Additional debug info in log
file.",
                            "name": "moredebug",
                            "type": "boolean"
                        },
                        "streams": {
                            "description": "Logger output streams
configuration.",
                            "name": "streams",
                            "type": "array",
                            "items": {
                                "type": "object",
                                "properties": {
                                    "type": {
                                        "description": "Stream type. FILE or
STDOUT.",
                                        "name": "type",
                                        "type": "string"
```

```
                                                    }
                                            },
                                            "required": [
                                                    "type"
                                            ]
                                    }
                            }
                    }
            }
        },
        "required": [
                "agent"
        ]
    }
},

"required": [
    "agent",
    "commands",
    "server",
    "registration",
    "modules",
    "logger"
]
}
```

§