Intel® Rack Scale Design (Intel® RSD) Pooled System Management Engine (PSME)

Release Notes
Software v2.3.2

September 2018

Revision 003US

Contents

Tables

Revision History

Revision	Description	Date
003US	Intel® RSD Software Maintenance Release v2.3.2 • Inserted defect HSD-ES 1806364280 into Section 3.0, Known Issues • Inserted Table 7. Fixed Issues	September 2018
002US	Intel® RSD software release v2.3.1 • Change title to Section 2.0 to Overview • Inserted new Section 2.2. Overview	July 2018
001US	Initial release for Intel® RSD software release v2.3	May 2018

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1.0   *Introduction*

These release notes are intended for the Intel® Rack Scale Design (Intel® RSD) Pooled System Management Engine (PSME) v2.3.2 release of Intel® RSD build PSME_2.3.0.288.0. This document will be referred to as the PSME throughout this document.

1.1   Intended Audience

The intended audiences for this document include:

- Independent Software Vendors (ISVs) of pod management software, who make use of POD Manager (PODM) to discover, compose, and manage drawers, regardless of the hardware vendor, and/or manage drawers in a multivendor environment.
- Original Equipment Manufacturers (OEMs) of PSME firmware who would like to provide Intel® RSD PODM API on top of their hardware platform.

1.2   Conventions

The key words/phrases "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in *Key Words for Use in RFCs to Indicate Requirement Levels,* RFC 2119, Table 3.

1.3   Revision Numbers of Package Components

Table 1.   Package Components

Subproject (component)	Revision
Intel® Rack Scale Design PSME	RSD_PSME_2.3.2

1.4   Terminology

Table 2   Terminology

Term	Definition
BDC	Bulldog Creek
BMC	Baseboard Management Controller
CA	Certificate Authority
CM	Control Module
DCBX	Data Center Bridging eXchange
DMTF	Distributed Management Task Force
ETS	Enhanced Transmission Selection
IPMI	Intelligent Platform Management Interface
IPsec	Internet Protocol Security
iSCSI	Internet Small Computer Systems Interface
ISV	Independent Software Vendor
LAG	Link Aggregation Group

Term	Definition
MAC	Media Access Control
MMP	Management Mid Plane
NVM	Node Version Managbhhhhher
NVMe-oF*	NVMe over Fabrics*
PFC	Priority Flow Control
PSME	Pooled System Management Engine
PSU	Power Supply Unit
OEMs	Original Equipment Manufacturers
QoS	Quality of Service
QSFP	Quad Small Form-factor Pluggable
RMM	Rack Management Module
Intel® RSD	Intel® Rack Scale Design
SMBIOS	System Management BIOS
TLS	Transport Layer Security
TPM	Trusted Platform Module

1.5   References

Table 3   Reference Documents and Resources

Doc ID	Title	Location
337196	*Intel® Rack Scale Design (Intel® RSD) Pooled System Management Engine (PSME) User Guide Software v2.3.2*	*http://www.intel.com/intelRSD*
337197	*Intel® Rack Scale Design (Intel® RSD) Conformance and Software Reference Kit Getting Started Guide Software v2.3.2*	
337198	*Intel® Rack Scale Design (Intel® RSD) POD Manager (PODM) Release Notes Software v2.3.2*	
337199	*Intel® Rack Scale Design (Intel® RSD) POD Manager (PODM) User Guide Software v2.3.2*	
337201	*Intel® Rack Scale Design (Intel® RSD) Firmware Extension Specification Software v2.3.2*	
337202	*Intel® Rack Scale Design (Intel® RSD) Storage Services API Specification Software v2.3.2*	
337203	*Intel® Rack Scale Design (Intel® RSD) Architecture Specification Software v2.3.2*	
337204	*Intel® Rack Scale Design (Intel® RSD) POD Manager (PODM) Representational State Transfer (RESTful) API Specification Software v2.3.2*	
337205	*Intel® Rack Scale Design (Intel® RSD) Rack Management Module (RMM) Representational State Transfer (RESTful) API Specification Software v2.3.2*	
337206	*Intel® Rack Scale Design (Intel® RSD) Generic Assets Management Interface (GAMI) API Software v2.3.2*	
337207	*Intel® Rack Scale Design (Intel® RSD) Pooled System Management Engine (PSME) Representational State Transfer (REST) API Specification Software v2.3.2*	
DSP8010	*Redfish Schema v2016.3 (Compute)*	*https://www.dmtf.org/sites/default/files/standards/documents/DSP8010_2016.3.zip*
DSP8010	*Redfish API Schema Readme v2017.3 (Fabric)*	*https://www.dmtf.org/sites/default/files/DSP8010_2017.3.zip*

Doc ID	Title	Location
DSP0266	*Scalable Platforms Management API Specification v1.4.0*	*https://www.dmtf.org/sites/default/files/DSP0266_1.4.0.pdf.*
N/A	*Swordfish* Scalable Storage Management API Specification Version 1.0.4*	*https://www.snia.org/sites/default/files/SMI/swordfish/v104/Swordfish_v1.0.4_Specification.pdf*
N/A	*Date and time format - ISO 8601*	*https://www.iso.org/iso-8601-date-and-time-format.html*
RFC2068	*Hypertext Transfer Protocol - HTTP/1.1*	*https://tools.ietf.org/html/rfc2616*
RFC2119	*Key Words for Use in RFCs to Indicate Requirement Levels, March 1997*	*https://ietf.org/rfc/rfc2119.txt*

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2.0 Overview

2.1 New Features for Intel® RSD v2.3.2

A sample implementation of the NVMe* over Fabrics (NVMe-oF*) initiator script described in the Intel® RSD PSME Release Notes Software v2.3.2 has been publically released.

2.2 New Features for Intel® RSD v2.3.1

In addition to stability improvements, the Intel® RSD v2.3.1 (PSME_2.3) release introduces the following features:

1. Refer to Table 3 for the Distributed Management Task Force (DMTF) Redfish*/SNIA Swordfish*:
   - Compute API is based on Redfish Schema Readme v2016.3
   - Storage Service API is based on Swordfish 1.0.4
   - Fabric API is based on to Redfish Schema Readme v2017.3.
2. NVMe-oF* – provided Discovery Service, and Node Version Manager (NVM) subsystem that supports Discovery controllers only.
3. Two Way Authentication – PSME has Certificate Authority (CA) signed certificate to be able to be authenticated by client.
4. Quality of Service (QoS) – support for Quality of Service features for Ethernet Arista* switch Priority Flow Control (PFC), Enhanced Transmission Selection (ETS), Data Center Bridging eXchange (DCBX).

2.3 Deprecation Notices

The following features are considered deprecated in Intel® RSD v2.3.2 release and may be dropped in future releases:

> Deep Discovery - the in-band method of discovery was succeeded by out-of-band discovery methods based of the Intel® RSD Firmware Extensions.

2.4 Limitations

The following list describes all the limitations for Intel® RSD v2.3.2 release. Described limitations are targeted for future releases:

- The code was verified with Intel® RSD Software Development Vehicle Rack and Arista* switch hardware.

  For details on Bull Dog Creek (BDC) and Arista* firmware versions, contact your Intel representative.

- To refresh data in System Management BIOS (SMBIOS) (like after unbinding drive) user needs to perform the platform restart.

- REST API:

  Some information on the REST API is not discovered from hardware, but read from configuration files, which the user must set up according to the *Intel® Rack Scale Design (Intel® RSD) Pooled System Management Engine (PSME) User Guide*, Software v2.3.2, refer to Table 3.

- Network Limitations:

Note: Arista's* startup-configuration file cannot contain any settings for the interfaces with postfix /2, /3 and /4 (for instance, Ethernet 25/2) if the Quad Small Form-factor Pluggable (QSFP) to 4xSFP+ splitter-cable is not plugged in.

Users must remove all settings for such interfaces, perform copy runtime configuration to startup configuration, and restart the switch.

In the *Intel® Rack Scale Design (Intel® RSD) Architecture Specification Software v2.3.2*, Section 10.1.2 Switch PSME Support for Base Network Services, (refer to Table 3) the PSME APIs are required to support specific network services, but the following features were not implemented in the Intel reference code:

- – Link Aggregation Group (LAG) configuration using a number of ports
- – Access Control List (ACL) configuration
- – Media Access Control (MAC) Address - view and configure switch MAC address tables for the purpose of defining rules about which packets are forwarded or discarded

- Telemetry Limitations

The following PSME APIs are defined in *Intel® RSD PSME REST API Specification Software v2.3.2* in Table 3, but are not implemented in the Intel reference code:

- – Baseboard Ambient Temperature
- – Power Supply Unit (PSU) Temperature
- – Fan Speed Revolutions Per Minute (RPM)
- – `InputACPowerWatts`

2.5   Security Recommendations

It is recommended to implement the following isolation, administration, and security procedures to use the Intel® RSD v2.3.2 reference code in a production environment:

Table 4.   Security Recommendations

Issue	Recommendation
Unauthorized log on to Discovery Service or Storage Server	The Intel® RSD v2.3.2 provisioning of the Discovery Service Host and Storage Server requires admin/root access to the host for placing manager credentials. Confirm the admin account is secured.
Network adversary provisions bogus credentials to PSME	To withstand network attacks, the communication between PODM and the Storage PSME must be secured. To provide this security, the communication channel between the PODM and PSME uses Transport Layer Security (TLS).
Compromise discovery/storage service authentication credential provisioning process	Internet Protocol Security (IPsec) is not used in Intel® RSD v2.3.2 and this credential will not be provisioned to the storage client. This credential will also not be used between the storage client and the Discovery Service or Storage server.
Authorized admin is fooled into installing/updating a compromised image	There must be mechanisms in place to verify that every firmware and software element within the Intel® RSD trust boundary has not changed from the original version delivered by the author. Typically, the firmware/software should be delivered using a cryptographically signed file to ensure code has not been altered. R*efer to* Table 3, *Intel® Rack Scale Design (Intel® RSD) Architecture Specification Software v2.3.2,* Platform Security section for more details.
Attacker impersonates a PODM	Access to NVMe-oF target management APIs is only allowed when the PODM and NVMe-oF targets establish a Transport Layer Security (TLS) connection before they can communicate. Refer to Table 3, *Intel® Rack Scale Design (Intel® RSD) Architecture Specification Software v2.3.2,* Ethernet Pooled Storage - Security section or more details.

Issue	Recommendation
Attacker eavesdrops on communication between client and Storage Server	Protection is for the datacenter to allow only trusted entities to access the storage access network.
Attacker modifies data flowing between client and storage server	Protection for the datacenter to only allow trusted entities to access the storage access network.
Attacker obtains a drive that has been discarded, and accesses data in that drive by mounting it on its own system	The default policy in the PODM shall be to erase the drive during decomposition where the PSME must securely erase the drive. As always, ensure security measures are enacted to safeguard the security of your physical drives during and after use.
Attacker gains access to a drive previously assigned to a different user with the old user's data still in it.	The default policy in the PODM shall be to erase the drive during decomposition when the PSME must secure erase the drive.

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3.0   Known Issues

This section presents known issues found during the prior testing of Intel® RSD PSME software v2.3.2.

Table 5.   Status Definitions

Status	Description
Under investigation	The sighting is being investigated.
Root cause identified	The root cause of the defect is identified.
Workaround available	A temporary solution to the defect is provided until the bug is fixed.
As designed	The issue reported is not a defect and the behavior will not be modified.
Closed no repro	The situation is not observed anymore and no further investigation is scheduled.
Fixed	The defect has been fixed.

Table 6 is a detailed description of all known issues. Each issue provides a problem statement, implication, workaround, note, and status for each.

Table 6.   Known Issues

Issue	Description
HSD-ES 180511937	Cannot PATCH System Boot to Disable or None
Problem	PSME will change both fields (`BootSourceOverrideEnabled` to Disabled and `BootSourceOverrideTarget` to None) on REST API if user sends value (Disabled or None) for only one field.
Implication	Sending a PATCH for one field (`BootSourceOverrideEnabled` or `BootSourceOverrideTarget`) will change both on REST APIs.
Note	This does not affect functionality. Set values will be respected.
Workaround	PATCH both fields in a single request.
Status	Root cause identified
HSD-ES 1806364280	Node is in failed state after assemble from snapshot
Problem	The PSME creates a lock on the Baseboard Management Controller (BMC) for exclusive operations on the MDR region, and then performs the operations (writing an Internet Small Computer Systems Interfaces (iSCSI) boot attempt in the region). This lock has a timeout. In the defect, the thread performing writes appears to have been preempted, because the lock timed-out before the thread could finish writing.
Implication	Setting iSCSI OOB Boot attributes on PSME sporadically fails. This causes the node to enter "Failed" state. The node cannot be recovered from the state and must be deleted.
Note	If it occurs, this issue causes a failure of Node assembly.
Workaround	Delete the failed Node, Allocate, and Assemble it again until successful.
Status	Root cause identified.

Issue	Description
HSD-ES 2201225313	Too many tasks will slow down performance of PSME
Problem	Too many tasks can slow down Assemble and Delete Node operations.
Implication	If the user sends Power Off and then Power On command before the first command is applied, the platform will shut down but will not start.
Note	N/A
Workaround	Control number of tasks by performing DELETE action on unnecessary task on Intel® RSD PSME REST API Specification, Table 3.
Status	Root cause identified.
Under investigation	The sighting is being investigated.
Root cause identified	The root cause of the defect is identified.
Workaround available	A temporary solution to the defect is provided until the bug is fixed.
As designed	The issue reported is not a defect and the behavior will not be modified.
Closed no repro	The situation is not observed anymore and no further investigation is scheduled.
Fixed	The defect has been fixed.
HSD-ES 2007327970	Sometimes Trusted Platform Module (TPM) is not enabled after assemble node with `TpmPresent`: true
Problem	TPM in Software Development Vehicle has defects and acts differently than described in the specification.
Implication	PSME reads values exposed by the hardware. If hardware has issues, they will propagate to the Intel® RSD PSME API too. Refer to Table 3.
Note	N/A
Workaround	N/A
Status	Root cause identified
HSD-ES 1805940149	TPM state is changing on system after default node assemble
Problem	TPM in Software Development Vehicle has defects and acts differently than described in specification.
Implication	PSME reads values exposed by hardware. If hardware has issues, they will propagate to Intel® RSD PSME API too. Refer to Table 3.
Note	N/A
Workaround	N/A
Status	Root cause identified.
HSD-ES 1806082424	After 100 times reinstall PSME doesn't see Systems
Problem	Software Development Vehicle hardware has issues and sometimes it is impossible to send commands via I^{2}C.
Implication	PSME cannot detects systems.
Note	N/A
Workaround	Restart Management Mid Plane (MMP) and Control Module (CM) in hardware.
Status	Root cause identified.

Issue	Description
HSD-ES 1806009205	Multiple iSCSI out-of-band (OOB) structures not handled correctly by the Basic Input/output System (BIOS)
Problem	Software Development Vehicle BIOS does not support multi-attempt feature.
Implication	PSME cannot set multi-attempt if hardware does not support it.
Note	N/A
Workaround	N/A
Status	Root cause identified.
HSD-ES 1806030821	500 Internal Server Error after sending DELETE on node (Reason: Received null response from Intelligent Platform Management Interface (IPMI))
Problem	Software Development Vehicle hardware has issues and sometimes it is impossible to send commands via I^{2}C.
Implication	PSME cannot send IPMI commands and fails to power off machine.
Note	N/A
Workaround	Restart BMC module in hardware.
Status	Root cause identified.
HSD-ES 1806049311	User cannot enable TPM
Problem	TPM in Software Development Vehicle has defects and acts differently than described in specification.
Implication	PSME set values using hardware. If hardware fails to do so, PSME will fail action too.
Note	N/A
Workaround	N/A
Status	Root cause identified.
HSD-ES 1805965644	After install new build sleds are not visible on REST API
Problem	Software Development Vehicle hardware has issues and sometimes it is impossible to send commands via I^{2}C.
Implication	PSME cannot perform any action with IPMI if hardware hangs.
Note	N/A
Workaround	N/A
Status	Root cause identified.
HSD-ES 1805949233	Sporadically POD returns 404 on different resources after restart PSME
Problem	After restart PSME build-up resources structure from scratch. It should not expose resources before discovery process is finished and all resources are enumerated.
Implication	PODM returns 404 on resources that are already in PODM database but have not been discovered by PSME yet.
Note	N/A
Workaround	N/A
Status	Root cause identified.
HSD-ES 1805769257	No information about malformed configuration file after setting incorrect value
Problem	PSME will not log if values in configuration files exceed maximum value.
Implication	PSME will use the wrong value.
Note	N/A
Workaround	N/A
Status	Root cause identified

Intel® RSD PSME
September 2018   Release Notes Software v2.3.2
Document Number: 337200-003US   13

Issue	Description
HSD-ES 1805839304	PSU has disappeared from REST API
Problem	Software Development Vehicle hardware has issues and sometimes it is impossible to send commands via I^{2}C.
Implication	PSME will remove PSUs that are not accessible via I^{2}C and `PMLink`*.
Note	N/A
Workaround	Restart the MMP and CM module in hardware.
Status	Root cause identified.
HSD-ES 1805935704	When changing TPM state, there are two power cycles instead of one
Problem	TPM in Software Development Vehicle has defects and acts differently than described in specification.
Implication	Node needs to be restarted twice before applying TPM settings.
Note	N/A
Workaround	N/A
Status	Root cause identified.
HSD-ES 1805891456	Rest Server needs long time to get certificate
Problem	Software Development Vehicle hardware has issues and sometimes it is impossible to send commands via I^{2}C.
Implication	PSME will not receive certificate.
Note	N/A
Workaround	Restart MMP and CM module in hardware.
Status	Root cause identified.
HSD-ES 1806364280	Node is in failed state after assemble from snapshot
Problem	The PSME creates a lock on the BMC for exclusive operations on the MDR region, and then performs the operations (writing an iSCSI boot attempt in the region). This lock has a timeout. In the defect, the thread performing writes appears to have been preempted, because the lock timed-out before the thread could finish writing.
Implication	Setting iSCSI OOB Boot attributes on PSME sporadically fails.
Note	If it occurs, this issue causes a failure of Node assembly.
Workaround	Repeat setting the iSCSI OOB boot options until successful.
Status	Root cause identified.

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4.0 Fixed Issues

This section presents Fixed issues for Intel® RSD PSME software v2.3.2.

Note: The Fixed issues in this revision were resolved in prior Intel® RSD PSME Software testing.

Table 7.   Fixed Issues

Issue	Description
HSD-ES 1805738755	Limited support for ISO8601 interval
Problem	PSME provides limited support for *Date and time format - ISO 8601*, refer to Table 3, time duration pattern
Implication	*Intel® RSD PODM REST API Specification* accepts only the time duration expressed in seconds. Refer to Table 3.
Note	According to Date and time format - ISO 8601, refer to Table 3, standard the user can express a duration using different patterns, for instance "PT1M, P2Y, P3Y, 6M55S…" however, the PSME accepts duration provided in seconds only.
Workaround	User needs to recalculate and provide the duration in XYZS format, where **XYZ** represents the value in seconds.
Status	Fixed in Intel® RSD v2.3.1 software release.
HSD-ES 1805800999	Deep Discovery process fails if system is in power-on state
Problem	Sending consecutive Power On and Power Off commands results in some of the commands being ignored.
Implication	If the user will send **Power Off** and then **Power On** commands before the first command is applied, the platform will shut down but will not start up.
Note	BMC will ignore **Power On** command if previous **Power Off** command has not been applied.
Workaround	User should send the Power command and the check power status of the platform before performing next power command.
Status	Fixed in Intel® RSD v2.3.1 release.
HSD-ES 1805820930	Wrong HTTP Status Code when patching `PrimaryLUN` Value with invalid number
Problem	PSME returns HTTP 200 OK instead of error code.
Implication	PSME REST returns **200 OK** when the user is trying to patch the `PrimaryLUN` with an invalid number. The proper response should be 400 (Bad Request).
Note	PSME will accept the wrong parameter, but the value will not be set.
Workaround	User can check on REST API if the value has been set.
Status	Fixed in Intel® RSD v2.3.1 release.

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