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<tr>
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<th>Description</th>
<th>Date</th>
</tr>
</thead>
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<tr>
<td>002</td>
<td>Minor updates.</td>
<td>August 28, 2015</td>
</tr>
<tr>
<td>003</td>
<td>Minor updates.</td>
<td>September 2, 2015</td>
</tr>
<tr>
<td>004</td>
<td>Minor updates.</td>
<td>September 29, 2015</td>
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Introduction

1 Introduction

1.1 Scope
This purpose of this document is to provide the recommended installation and debug procedures for Intel® Rack Scale Architecture Rack Management Module (RMM) software version 1.1.3.

1.2 Intended audience
The intended audiences for this document include:

- Server rack management software vendors, who may be investigating Intel® Rack Scale Architecture RMM API functionalities, such as discovery, composition, and management, in a single- or multivendor environment.
- Firmware vendors who are exploring Intel® Rack Scale Architecture RMM API as a tool to offer easy firmware adoption/migration.

1.3 Terminology

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>ACL</td>
<td>Access Control List</td>
</tr>
<tr>
<td>BMC</td>
<td>Baseboard Management Controller</td>
</tr>
<tr>
<td>CIMI</td>
<td>Cloud Infrastructure Management Interface</td>
</tr>
<tr>
<td>HTTP</td>
<td>Hypertext Transfer Protocol</td>
</tr>
<tr>
<td>JSON</td>
<td>JavaScript Object Notation</td>
</tr>
<tr>
<td>Lid</td>
<td>Localization ID</td>
</tr>
<tr>
<td>OCCI</td>
<td>Open Cloud Computing Interface</td>
</tr>
<tr>
<td>OData</td>
<td>Open Data Protocol</td>
</tr>
<tr>
<td>OS</td>
<td>Operating System</td>
</tr>
<tr>
<td>OVF</td>
<td>Open Virtualization Format</td>
</tr>
<tr>
<td>POD</td>
<td>A physical collection of multiple racks</td>
</tr>
<tr>
<td>PODM</td>
<td>POD Manager</td>
</tr>
<tr>
<td>RCPM</td>
<td>Rack Control Plane Manager</td>
</tr>
<tr>
<td>REST</td>
<td>Representational State Transfer</td>
</tr>
<tr>
<td>RMM</td>
<td>Rack Management Module</td>
</tr>
<tr>
<td>SDV</td>
<td>Software Development Vehicle</td>
</tr>
<tr>
<td>SVN</td>
<td>Subversion Repository Number</td>
</tr>
<tr>
<td>TMC</td>
<td>Tray Management Controller</td>
</tr>
<tr>
<td>URI</td>
<td>Uniform Resource Identifier</td>
</tr>
<tr>
<td>UUID</td>
<td>Universally Unique Identifier</td>
</tr>
<tr>
<td>VM</td>
<td>Virtual Machine</td>
</tr>
<tr>
<td>XML</td>
<td>Extensible Markup Language</td>
</tr>
</tbody>
</table>
1.4 References

Table 2 Reference documents

<table>
<thead>
<tr>
<th>Number</th>
<th>Title</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>332971</td>
<td>Intel® Rack Scale Architecture Getting Started Guide</td>
<td><a href="https://github.com/01org/RSA">https://github.com/01org/RSA</a></td>
</tr>
<tr>
<td>332868</td>
<td>Intel® Rack Scale Architecture GAMI API Specification</td>
<td><a href="https://github.com/01org/RSA">https://github.com/01org/RSA</a></td>
</tr>
<tr>
<td>332869</td>
<td>Intel® Rack Scale Architecture Pod Manager API Specification</td>
<td><a href="https://github.com/01org/RSA">https://github.com/01org/RSA</a></td>
</tr>
<tr>
<td>332870</td>
<td>Intel® Rack Scale Architecture Pod Manager Release Notes</td>
<td><a href="https://github.com/01org/RSA">https://github.com/01org/RSA</a></td>
</tr>
<tr>
<td>332871</td>
<td>Intel® Rack Scale Architecture Pod Manager User Guide</td>
<td><a href="https://github.com/01org/RSA">https://github.com/01org/RSA</a></td>
</tr>
<tr>
<td>332872</td>
<td>Intel® Rack Scale Architecture PSME Release Notes</td>
<td><a href="https://github.com/01org/RSA">https://github.com/01org/RSA</a></td>
</tr>
<tr>
<td>332873</td>
<td>Intel® Rack Scale Architecture PSME API Specification</td>
<td><a href="https://github.com/01org/RSA">https://github.com/01org/RSA</a></td>
</tr>
<tr>
<td>332875</td>
<td>Intel® Rack Scale Architecture RMM Installation Guide</td>
<td>This document.</td>
</tr>
<tr>
<td>332876</td>
<td>Intel® Rack Scale Architecture RMM Release Notes</td>
<td><a href="https://github.com/01org/RSA">https://github.com/01org/RSA</a></td>
</tr>
<tr>
<td>332877</td>
<td>Intel® Rack Scale Architecture RMM API Specification</td>
<td><a href="https://github.com/01org/RSA">https://github.com/01org/RSA</a></td>
</tr>
<tr>
<td>332878</td>
<td>Intel® Rack Scale Architecture Storage Services API Specification</td>
<td><a href="https://github.com/01org/RSA">https://github.com/01org/RSA</a></td>
</tr>
<tr>
<td></td>
<td>Scalable Platforms Management</td>
<td><a href="http://dmtf.org/standards/wip">http://dmtf.org/standards/wip</a></td>
</tr>
<tr>
<td></td>
<td>Intel® Rack Scale Architecture System Manageability Architecture Specification</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intel® Rack Scale Architecture Platform Design Guide</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Intel® Rack Scale Architecture Customer Release Notes</td>
<td></td>
</tr>
</tbody>
</table>

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 ellipsis does not mean no extensibility point exists, rather it is just not explicitly called out.
2 RMM Software Build and Installation

2.1 Prerequisites

2.1.1 Intel® Rack Scale Architecture RMM version 1.1.3 source code

The RMM source code can be downloaded from the file server or from IBL System.

2.1.2 Configure server Internet access

Intel Rack Scale Architecture RMM 1.1.3 installation and debugging procedures may require access to the worldwide web. It is at the user’s discretion to setup proper networking, firewall, and proxy configurations.

2.1.3 OS package requirements

The following Linux OS packages may be required for Intel Rack Scale Architecture RMM 1.1.3 compilation:

<table>
<thead>
<tr>
<th>Module</th>
<th>Version</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unbuntu</td>
<td>12.04</td>
<td>Operating system requirement</td>
</tr>
<tr>
<td>build-essential</td>
<td>N/A</td>
<td>Build tool chain</td>
</tr>
<tr>
<td>Cmake</td>
<td>2.8.12</td>
<td>Make tool</td>
</tr>
<tr>
<td>Automake</td>
<td>1.4.1</td>
<td>Automates part of the compilation process</td>
</tr>
<tr>
<td>Autoconf</td>
<td>2.69</td>
<td>Produces configuration file for compilation</td>
</tr>
</tbody>
</table>

2.1.4 Linked third party libraries

The following opensource libraries has been linked Intel RSA RMM 1.1.3 source code. RMM build script will get the third party libraries during RMM build time from each official web site:

<table>
<thead>
<tr>
<th>Module</th>
<th>Version</th>
<th>Source link</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>jansson</td>
<td>2.5</td>
<td><a href="http://www.digip.org/jsonnson/">http://www.digip.org/jsonnson/</a></td>
<td>Jansson is a C library for encoding, decoding and manipulating JSON data.</td>
</tr>
<tr>
<td>openssl</td>
<td>1.0.1i</td>
<td><a href="http://www.openssl.org">http://www.openssl.org</a></td>
<td>The OpenSSL Project is a collaborative effort to develop a robust, commercial-grade, full-featured, and Open Source toolkit implementing the Secure Sockets Layer (SSL v2/v3) and Transport Layer Security (TLS v1) protocols as well as a full-strength general purpose cryptography library. This product includes software developed by the OpenSSL Project for use in the OpenSSL Toolkit (<a href="http://www.openssl.org/">http://www.openssl.org/</a>) This product includes cryptographic software written by Eric Young (<a href="mailto:eay@cryptsoft.com">eay@cryptsoft.com</a>). This product includes software written by Tim Hudson (<a href="mailto:tjh@cryptsoft.com">tjh@cryptsoft.com</a>)</td>
</tr>
<tr>
<td>libcurl</td>
<td>7.40.0</td>
<td><a href="http://curl.haxx.se">http://curl.haxx.se</a></td>
<td>Curl is a command line tool for transferring data specified with URL syntax. libcurl is the library curl is using to do its job. It is readily available to be used by your software.</td>
</tr>
<tr>
<td>Flat UI</td>
<td>2.2.1</td>
<td><a href="https://github.com/designduo/Flat-UI">https://github.com/designduo/Flat-UI</a></td>
<td>Flat style theme for web UI.</td>
</tr>
<tr>
<td>zlib</td>
<td>1.2.8</td>
<td><a href="http://www.zlib.net">http://www.zlib.net</a></td>
<td>zlib is designed to be a free, general-purpose, legally unencumbered -- that is, not covered by any patents -- lossless data-compression library for use on virtually any computer hardware and operating system.</td>
</tr>
<tr>
<td>net-snmp</td>
<td>5.7.2.1</td>
<td><a href="http://www.net-snmp.org/about/license.html">http://www.net-snmp.org/about/license.html</a></td>
<td>Net-SNMP is a suite of applications used to implement SNMP v1, SNMP v2c and SNMP v3 using both IPv4 and IPv6.</td>
</tr>
</tbody>
</table>
2.2 Building

2.2.1 Code checkout

Checking out the latest version of RMM source code from file server:

\Shwdeopenics008\rmm_1.1.3.0

Or from IBL system.

Unzipping RMM_1.1.3.0.zip and RMM_Driver_1.1.3.0.zip with password “intel@123”

One will get two tarballs:

RMM_1.1.3.0.tar.gz and RMM_Driver_1.1.3.0.tar.gz

Where RMM_1.1.3.0.tar.gz contains the RMM reference stack source code, and RMM_Driver_1.1.3.0.tar.gz contains the RMM HAL driver source for BDC-R.

2.2.2 Build Intel Rack Scale Architecture RMM 1.1.3 software

Combining the RMM reference stack code and RMM HAL driver code together:

```
tar -xvf Decompress RMM_Driver_1.1.3.0.tar.gz
tar -xvf
```

Copy customized_hal_driver code to directory RSA_RMM_1.1.3.0.tar.gz

```
mv asset_module 1/src/module
edit
Append ADD_SUBDIRECTORY(customized_hal_driver) in file RSA_RMM_1.1.3.1/src/module/CMakeLists.txt and uncomment #ADD_SUBDIRECTORY(asset_module)
```

Starting the code compiling process:

```
cd rsa_rmmRSA_RMM_1.01.3.1/utils
./rmm_release.sh
```

Accessing the binaries:

```
rsa_rmmRSA_RMM_1.01.3.1/build/release
```

2.3 Installing

Untarring the tarball of the binaries:

```
tar -xvf rsa-rmm-1.1.3.1.tar.gz
```

Installing the packages:

```
cd rsa-rmm-1.1.3.1
sudo dpkg -i *.deb
```

Starting the RMM service:

```
sudo service rmm start
```
3 Uninstalling and Debugging

3.1 Uninstalling

To uninstall the software, do the following:

Stop the RMM service:

```
sudo service rmm stop
```

Remove the RMM packages:

```
sudo dpkg --purge rsa-rmm-all
sudo dpkg --purge rsa-rmm-consolecontrol
sudo dpkg --purge rsa-rmm-api
sudo dpkg --purge rsa-rmm-base
```

3.2 CM password encryption

To encrypt CM password or username, please use the encrypt tool with below format:

```
$ encrypt <password> <key_file>
```

Then copy the output string to RMM configuration file in "UserName" or “Password” field.

```
/etc/rmm/rmm.cfg
```

And copy the generated keyfile to directory /etc/rmm

- If key file does not exist, tool will generate a new one.
- Tool can be built from rmm source code under directory utils/encrypt_text.
- Key must be 8 characters long.
- The default key file name is "keyfile".

3.3 Debugging

3.3.1 RMM Service

Checking the RMM service status with the following command:

```
sudo service rmm status
```

Accessing the service log:

```
sudo cat /var/log/{component_name}/logfile
```

3.3.2 Memdb

Dumping memdb and accessing the dumped content with the following commands:

```
sudo dumpmemdb
sudo cat /var/log/memdbd/dump.out
```

3.3.3 Minicom

Using minicom to connect to CM console for debugging:

```
sudo minicom -D /dev/ttyCm2Console
```
Use the "--help" command to list all supported commands (for example, the CM IP address).

3.3.4 Ipmitool

Use ipmitool to ensure CM software stack is working correctly:

```
ipmitool -H {cm_ip} -U admin -P admin raw 0x06 0x01
```

§