



**Supermicro Update Manager
(SUM)
User's Guide**

Revision 2.0a

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Version History

Date	Rev	Description
July-02-2013	1.0	1. Created this document.
July-30-2013	1.0a	1. Revised the software description of SUM and SMCIPMITool.jar in 1.2.1 Remote Management Server Requirements .
September-12-2013	1.1	1. Added in-band Usage related sections. 2. Changed the command LoadFactoryDefault to LoadDefaultBiosCfg.
October-02-2013	1.2	1. Added Get/Change DMI information capability. 2. Added multi-system usage for OOB channel. 3. Eliminated –me_type option for the in-band UpdateBios command. 4. In-band UpdateBios command supports X10 MB.
January-06-2014	1.2a	1. Required BMC firmware image and IPMI driver to be installed for all in-band commands except the UpdateBios command. 2. Required product key to be activated for all in-band commands except the UpdateBios command. 3. Added the summary of running multiple systems. 4. Added exit code 80. Description: Product key is not activated.
June-09-2014	1.3	Major revision with new management command groups. 1. Added BMC Management commands: GetBmcInfo, UpdateBmc, GetBmcCfg, ChangeBmcCfg. 2. Added System Check commands: CheckAssetInfo, CheckSensorData, CheckSystemUtilization. 3. Added System Event Log commands: GetEventLog and ClearEventLog. 4. Added in-band-usage for ActivateProductKey command. 5. Added exit code 68. Description: Invalid BMC configuration text file.

		6. Added exit code 69. Description: Invalid asset information.
July-31-2014	1.4	<p>1. Added Application commands: TpmProvision, MountIsoImage, UnmountIsoImage.</p> <p>2. For X10 Grantley platform, in-band update bios requires –reboot option.</p> <p>3. Revised CheckSystemUtilization output message for HDD/Network.</p> <p>4. Revise output message for CheckAssetInfo: Units format matches dmidecode output.</p> <p>5. Added exit code 36. Required device does not exist.</p> <p>6. Added exit code 37. Required device does not work.</p> <p>7. Added notices for exit code when using in-band command with –reboot option through SSH connection.</p>
Feb-06-2015	1.4a	<p>1. Added a notice for in-band UpdateBios command for jumper-less solution: You should use default OS when multi-boot is installed.</p> <p>2. Changed the TpmProvision command: cleartpm option should be used with –image_url option.</p> <p>3. Added support for checking SFT-SUM and SFT-DCMS-Single node product keys.</p> <p>4. Added a notice for In-band UpdateBios command: The command will disable some functions in OS, but they will be recovered after OS reboot.</p> <p>5. Added a notice for in-band UpdateBios using SSH connection: Change the timeout length for both SSH client and server site to be two times longer than the typical time length of execution.</p> <p>6. Changed the name “Product Key” to “Node Product Key”.</p> <p>7. Added exit code 11. Invalid command line data.</p> <p>8. Added the notice of using the CheckSensorData command output.</p> <p>9. Updated the CheckAssetInfo command output: adding the CPU version field and changing the name “Network Interface” to “Add-on Network Interface”.</p>

		<p>10. Added <i>Appendix C: Platform Feature Support Matrix</i>.</p> <p>11. Added the OS architecture information in the CheckSystemUtilization command output message.</p> <p>12. Added a reminder for In-band Windows driver setup.</p>
July-23-2015	1.5	<p>1. Added in-band support for BMC management commands: GetBmcInfo, UpdateBmc, GetBmcCfg, and ChangeBmcCfg.</p> <p>2. Added in-band support for EventLog management commands: GetEventLog and ClearEventLog.</p> <p>3. Added in-band support for CheckOOBSupport command.</p> <p>4. Removed requirement of actool.</p> <p>5. Removed JAVA environment requirement for all commands, except OOB UpdateBios and UpdateBmc commands.</p> <p>6. Changed the ActivateProductKey command: supports 344 bytes node product key format.</p> <p>7. Added Key management commands: QueryProductKey, ClearProdcutKey.</p> <p>8. Added a BIOS management command: EditDmilInfo.</p> <p>9. Added Appendix D Third-Party Software.</p> <p>10. Added the log support when rare exceptions occurred.</p> <p>11. Added exit code 12: Function access denied.</p>
January-28-2016	1.6	<p>1. Supported X11 platform.</p> <p>2. Removed JAVA requirement.</p> <p>3. Supported FreeBSD OS for FreeBSD 7.1 x86_64 or later.</p> <p>4. Supported RHEL4 OS for RHEL4u3 x86_64 or later</p> <p>5. Added auto-activation feature using credential files</p> <p>6. Added <code>--overwrite_cfg</code> and <code>--overwrite_sdr</code> option for UpdateBmc command.</p> <p>7. In-Band UpdateBios supported MEDisabling feature which has similar</p>

		<p>procedure as original jumperless procedure that requires twice reboot.</p> <p>8. Added HTTP image server support for MountIsoImage and TpmProvision commands.</p> <p>9. Added exit code 38: Function is not supported.</p> <p>10. Added Feature Toggled On information in CheckOOBSupport command output.</p> <p>11. Third-Party Software: Removed ipmitool/Jline. Added openssl/libcurl.</p> <p>12. In-Band jumperless procedure show full log path when twice reboot is needed.</p> <p>13. Removed TAS from package. Added TAS requirement note.</p>
August-03-2016	1.6a	<p>1. Renamed the TPM ISO image file to 20151217.</p> <p>2. Added troubleshooting for BMC FW web server being unreachable after BMC FW was updated.</p> <p>3. Added the description of failure to install Client ME Windows driver on Server ME system.</p> <p>4. Added the recommended usage of running the OOB UpdateBios command.</p> <p>5. Added the requirements for using an OOB network.</p>
January-06-2017	1.6b	<p>1. Renamed the TPM ISO image file to 20161013.</p> <p>2. Added two options: --no_banner to suppress output banner messages and --no_progress UI option to suppress output progress messages.</p> <p>3. Renamed the command names GetDefaultBiosCfg and GetCurrentBiosCfg, and deprecated the old commands GetDefaultBiosCfgTextFile and GetCurrentBiosCfgTextFile, respectively.</p> <p>4. Added OOB support for the CMM management commands: GetCmmInfo, UpdateCmm, GetCmmCfg, and ChangeCmmCfg.</p> <p>5. Modified the command In-band UpdateBios to not to require the --reboot option and removed the --manual_reboot option.</p>

July-21-2017	1.7	<ol style="list-style-type: none"> 1. Renamed the TPM ISO image file to TPM_1.2_20170410. 2. Added the Storage Management commands: GetRaidControllerInfo, UpdateRaidController, GetRaidCfg, ChangeRaidCfg, GetSataInfo and GetNvmeInfo. 3. Added support for IPV6. 4. Added the option --lock to the command TpmProvision. 5. Revised the command format --image_url to TpmProvision. 6. Added support for TAS for FreeBSD. 7. Added support for B2 and K1 platforms. 8. Changed exit code 8 from "File does not exist" to "Can not open file." 9. No support has been provided for B9 Romley platform since SUM 1.7.0. 10. RAID related commands are only licensed to SFT-DCMS-Single key. 11. Supported Denvertion platform. 12. Added the BBS boot priority function in a BIOS configuration file. 13. Added information about where the logs are stored 14. Supported Apollo platform. 15. Added <i>Appendix F. Using the Command Line Tool (XMLStarlet) to Edit XML Files.</i>
October-27-2017	2.0	<ol style="list-style-type: none"> 1. Added HII support for the Purley and the platforms of later versions. 2. Renamed the command GetCurrentBiosCfgTextFile to be GetCurrentBiosCfg. 3. Renamed the command GetDefaultBiosCfgTextFile to be GetDefaultBiosCfg. 4. Modified the command CheckAssetInfo to support for Add-on Network Interface and Onboard/Add-on PCI Devices. 5. Added "Appendix E. How to Change BIOS Configurations in XML Files". 6. Added the option --preserve_setting for the command UpdateBios.

		<p>7. Added the TPM command options to support Purley platform.</p> <p>8. Added support for AMD Naples platform.</p> <p>9. Renamed the TPM ISO image file to TPM_1.3_20170802.</p> <p>10. Add the option --skip_unknown for the command UpdateBios.</p> <p>11. Added support for checking SFT-DCMS-SVC-KEY node product key.</p> <p>12. Supported Debian OS for Debian 7 x86_64 or later.</p> <p>13. Added exit code 155. Description: IPMI received invalid data..</p>
February -02-2018	2.0a	<p>1. Added the option --skip_bbs for the command ChangeBiosCfg.</p> <p>2. CMM related commands do not require any license.</p>

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1 Overview

The Supermicro Update Manager (SUM) can be used to manage the BIOS, BMC/CMM and Broadcom 3108 RAID firmware image update and configuration update for select Supermicro systems. In addition, system checks as well as event log management are also supported. Moreover, special applications are also provided to facilitate system management. To update configurations, you can edit system BIOS settings, DMI information, BMC/CMM configurations and RAID configurations from readable text files, as well as use this update manager to apply these configurations.

Two channels are possible for management: the OOB (Out-Of-Band) channel, i.e. communication through the IPMI interface, and the in-band channel, i.e. communication through the local system interfaces. By the OOB channel, most management commands (except CheckSystemUtilization) can be executed independently of the OS on the managed system and even before the system OS is installed.

1.1 Features

- Command-line interfaced (CLI) and scriptable
- Independent from OS on managed systems (for OOB usage)
- Operates through OOB (Out-Of-Band) and in-band methods
- Supports concurrent execution of OOB commands on multiple systems through a system list file
- System Check
 - Checks asset device information/health remotely
 - Checks system utilization remotely
- BIOS Management
 - Pre-checks system board ID to prevent flashing the wrong BIOS firmware image
 - Supports readable text files of BIOS configuration in plain text or XML format
 - Supports readable DMI information text file to be edited
 - Updates basic input/output system (BIOS) ROM
 - Jumperless update of ME Flash Descriptor (FDT) region when locally update BIOS ROM
 - Updates BIOS configurations (settings)
 - Updates DMI information

-
- BMC Management
 - Supports readable text files of BMC configuration in XML format
 - Updates BMC firmware image
 - Updates BMC configuration
 - System Event Log
 - Retrieves and clears BMC and BIOS event logs
 - CMM Management
 - Supports readable text file of CMM configuration in XML format
 - Updates CMM firmware image remotely only
 - Updates CMM configuration remotely only
 - Applications
 - Provision/clear trusted platform module (TPM) remotely only
 - Mount/Unmount ISO image file from SAMBA/HTTP-shared folder remotely only
 - Storage Management
 - Retrieves RAID image information from local firmware image or remote RAID controller
 - Updates RAID controller firmware image remotely
 - Supports the readable text files of RAID configuration in XML format
 - Updates RAID configuration remotely only
 - Retrieves SATA HDD information remotely only
 - Retrieves NVMe information remotely only

1.2 Operations Requirements

1.2.1 OOB Usage Requirements (Remote Management Server)

To run remote update operations, you must meet the following requirements:

System Requirements:

Environment	Requirements
Hardware	50 MB free disk space
	128 MB available RAM
	Ethernet network interface card
Operating System	Linux: Red Hat Enterprise Linux Server 4 Update 3 (x86_64) or later Linux: Ubuntu 12.04 LTS (x86_64) or later Linux: Debian 7 (x86_64) or later Windows: Windows Server 2008 (x86_64) or later FreeBSD: FreeBSD 7.1 (x86_64) or later

The software you should have in advance:

Program/Script	Description
SUM	The main program for SUM

1.2.2 OOB Usage Requirements (Network)

Below network communication protocol and ports are required for running OOB commands.

Command	Network Requirements
All OOB commands	RMCP+ protocol through IPV4/IPV6 UDP with port 623.
OOB UpdateBios, UpdateBmc, UpdateCmm ,UpdateRaidController	In addition to RMCP+ protocol through IPV4/IPV6 UDP with port 623, HTTP or HTTPS protocol through IPV4/IPV6 with the port defined in BMC/CMM configuration is required. The default HTTP and HTTPS ports are defined as ports 80 and 443, respectively.

1.2.3 OOB Usage Requirements (Managed Systems)

SUM can remotely manage the selected Supermicro motherboards/systems. Before use, you must activate the node product key for the managed systems. For details, see [3. Licensing Managed Systems](#).

In addition, both the BMC and BIOS firmware images must meet the following requirements.

Firmware image	Requirements
BMC Version	X9 ATEN platform (SMT_X9): 3.14 or later X10 ATEN platform (SMT_X10): 1.52 or later X11 ATEN platform (SMT_X11): 1.00 or later X9 AMI platform (SMM_X9): 2.32 or later
CMM Version	ATEN platform (SMT_MBIPMI): 2.45 or later
BIOS Version	Version 2.0 or later for select X9 Romley and X10 Denlow systems Version 1.0 or later for select X10 Grantley/X11 systems

The TPM provision command requires TPM ISO files.

Program/Script	Description
TPM_1.3_20170802.zip	EFI/TPM_LOCK.ISO Image for TPM provision. ReleaseNote.txt Release note for TPM ISO images usage. TPM_Detect.ISO Image for detecting platform and TPM version.

The CheckSystemUtilization command requires additional packages to be installed on the managed system.

Program/Script	Description	Privilege Requirement
TAS_1.5.1_build.180202.zip	A Thin Agent Service (TAS) program to be installed on the managed systems Collect utilization information on managed system and update	To install and execute, TAS needs the root privilege of the operating system running on the managed system.

	information to BMC	
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Below OS and tools are pre-requisite for TAS to be installed successfully on the managed system.

OS	Supported OS list	Program/Script
Windows	Windows 2008 R2 SP1 Windows 2012 R2	<ol style="list-style-type: none"> 1. .NET framework 3.5 2. smartmontools 6.5-1 3. NVMe vendor specific driver (only required for using the nvme function) 4. Windows patch "KB3033929" (only required for Windows Server 2008 R2 SP1) 5. Intel RST CLI tool 13.2.0.1016 and 13.2.x.xxxx RSTe driver (specify tool version for specify RSTe driver version)
Linux	RHEL 6.5, 6.6 RHEL 7.0, 7.1 SLES 11 SP3 Ubuntu 14.04 LTS CentOS 6.5	<ol style="list-style-type: none"> 1. ethtool package 2.6.33 2. openlpmi driver 3. smartmontools 6.5 4. glibc 2.12 5. storcli 1.20.15 (for Linux LSI) 6. mdadm 3.2.5 (for RAID) 7. nmcli 0.8.1 8. net-tools 1.60-110.el6-2 9. lsscsi 0.23-2.el6 10. lsblk 2.17.2
FreeBSD	10.1 release	<ol style="list-style-type: none"> 1. smartmontools 6.5 2. libc 7 3. storcli 1.20.15 (for LSI 3108) 4. graid (starting with FreeBSD 9.1 for RAID) and geom_raid.ko 5. pciutils 3.5.2 6. mfip.ko (for LSI MegaRAID SMART)

Below firmware image is pre-requisite for TAS to run successfully on the managed system.

Firmware image	Requirements
BMC Version	X10 ATEN platform (SMT_X10): 1.58 or later X11 ATEN platform (SMT_X11): 1.00 or later

1.2.4 In-Band Usage Requirements

With the use of in-band, SUM can perform BIOS/BMC/EventLog Management functions for selected Supermicro motherboards/systems. The managed system must meet the following requirements.

System Requirements:

Environment	Requirements
Hardware	50 MB free disk space
	128 MB available RAM
Firmware image	BIOS Version 3.0 or later for X9 Romley and X10 Denlow select systems. BIOS Version 1.0 or later for X10 Grantley/X11 select systems.
Operating System	Linux: Red Hat Enterprise Linux Server 4 updates 3 (x86_64) or later. Linux: Ubuntu 12.04 LTS (x86_64) or later Linux: Debian 7 (x86_64) or later Windows: Windows Server 2008 (x86_64) or later FreeBSD: FreeBSD 7.1 (x86_64) or later



Note: Though SUM can be run on Red Hat Enterprise Linux Server 4 updates 3 or later, several OS might not be supported by hardware. For the list of supported operating systems, please check [OS compatibility support list](#).

Execution Privilege Requirements:

Privilege	Description
SUM Execution Privilege	To execute in-band functions, SUM needs the root/Administrator privilege of the operating system running on the managed system.

The software you should get in advance:

OS	Program/Script	Description
----	----------------	-------------

Linux/Windows/FreeBSD	SUM	The main program for SUM
Windows	driver/phymem64.sys driver/pmdll64.dll	Access physical memory and IO ports

Please contact Supermicro for any necessary drivers.



Note: For Windows 2008 (Win7) server, Windows driver requires Windows patch #3033929.

<https://technet.microsoft.com/en-us/library/security/3033929.aspx>

Click the link below to download the patch

<https://www.microsoft.com/en-us/download/confirmation.aspx?id=46083>

1.2.5 Additional In-Band Usage Requirements

For in-band commands (except for GetBiosInfo and UpdateBios), the managed system must have BMC firmware image and IPMI driver installed. The BMC firmware image should meet the following requirements.

Firmware image	Requirement
BMC Version	X9 ATEN platform (SMT_X9): 3.14 or later X10 ATEN platform (SMT_X10): 1.19 or later X11 ATEN platform (SMT_X11): 1.00 or later X9 AMI platform (SMM_X9): 2.32 or later

The drivers you should get in advance:

OS	Program/Script	Description
Red Hat. Enterprise Linux Server 4u3 or later (x86_64)/Ubuntu 12.04 or later (x86_64)/FreeBSD 7.1 or later (x86_64)	built-in IPMI driver	Sends/Receives data to/from BMC

If the Linux/FreeBSD OS does not have the built-in IPMI driver, you should install the following software:

Program/Script	Description
OpenIPMI.x86_64	IPMI driver for accessing BMC through its KCS interface

1.3 Typographical Conventions

This manual uses the following typographical conventions.

`Courier-New font size 10` represents Command Line Interface (CLI) instructions in Linux terminal mode.

Bold is used for keywords needing attention.

Italics is used for variables and section names.

<> encloses the parameters in the syntax description. `[shell]#` represents the input prompt in Linux terminal mode.

`[SUM_HOME]#` represents the SUM home directory prompt in Linux terminal mode.

| A vertical bar separates the items in a list.

2 Installation and Setup

2.1 Installing SUM

To install SUM in Linux/FreeBSD OS, follow these steps. Windows installation and usage is similar.

1. Extract the `sum_x.x.x_Linux_x86_64_YYYYMMDD.tar.gz` archive file.
2. Go to the extracted `sum_x.x.x_Linux_x86_64` directory. Name this directory as “SUM_HOME”.
3. Run SUM in the SUM_HOME directory.

Linux Example:

```
[shell]# tar xzf sum_x.x.x_Linux_x64_YYYYMMDD.tar.gz
```

```
[shell]# cd sum_x.x.x_Linux_x86_64
```

```
[SUM_HOME]# ./sum
```

2.2 Setting Up OOB Managed Systems

To setup OOB managed systems, follow these steps:

1. Connect the BMC/CMM to the LAN.
2. Update the BMC/CMM firmware image in the managed systems to support OOB functions (if the current version does not support it). Note that you can use the SUM `UpdateBmc/UpdateCmm` command to flash BMC/CMM firmware image even when BMC/CMM does not support OOB functions.
3. Flash the BIOS ROM to the managed systems to support OOB functions (if the current version does not support it). Note that you can use the SUM `UpdateBios` command (either in-band or OOB) to flash BIOS even when BIOS does not support OOB functions. However, when using an OOB channel, if the onboard BIOS or the BIOS firmware image does not support OOB functions, the DMI information (such as the MB serial number) might be lost after system reboot.
4. Install the TAS package on the OS of the managed system (for `CheckSystemUtilization` command only).

2.2.1 Installing TAS package

TAS package (TAS_version_build.date.zip) can be acquired from Supermicro. Only Windows, Linux and FreeBSD platforms are supported. To install TAS, follow below steps.

1. Copy the TAS_version_build.YYMMDD.zip package to the operation system (OS) of managed system.
2. Extract the TAS_version_build.YYMMDD.zip archive file. Three archive files will be created, e.g., TAS_version_build.YYMMDD_Windows.zip/Linux.tar.gz/Freebsd.tar.gz, for Windows/Linux/FreeBSD systems. One additional readme file will be created. You can check the INSTALLATION section in the readme file or follow the steps below.
3. Install TAS pre-requisite tools listed in [1.2.3 OOB Usage Requirements \(Managed Systems\)](#)
4. For Windows systems,
 - a. Extract the file TAS_version_build.YYMMDD_Windows.zip
 - b. Select the correct system architecture. For x86_64/x86_32 system, select folder 64/32.
 - c. Run setup.bat
5. For Linux systems,
 - a. Extract the file TAS_version_build.YYMMDD_Linux.tar.gz
 - b. Select the correct system architecture.
 - c. Run install.sh

Example: for x86_64 Linux system

```
[shell]# tar xzf TAS_1.5.1_build.180202_Linux.tar.gz
```

```
[shell]# cd 64bit
```

```
[shell]# ./install.sh
```

6. For FreeBSD systems,
 - a. Extract the file TAS_version_build.YYMMDD_Freebsd.tar.gz
 - b. Run install

2.3 Setting Up In-Band Managed Systems

For Windows OS, no action is required. As a reminder, if the version of the currently installed Windows driver is old, SUM would stop TAS/SD5, load a new driver and restart TAS/SD5. For Linux OS, the following actions are required unless “InBand SMI E7h” support is noted in BIOS release note. If E7h is not supported by BIOS, to set up the Linux in-band managed systems, simply copy and paste the OS specific driver file "sum_bios.ko", under the SUM_HOME/driver directory, to the SUM_HOME directory.

3 Licensing Managed Systems

Each node is licensed by a product key. To access most SUM functions, it is required that a managed system activates the node product keys. To view a complete list of these functions, please refer to [Appendix B. Management Interface and License Requirements](#). Product key activation is not required on the management server running SUM. The node product key is binding in the MAC address of the BMC LAN port. Two license key formats are supported: xxxx-xxxx-xxxx-xxxx-xxxx-xxxx for SFT-OOB-LIC and a 344-byte ASCII string for the other node product keys.

The following sections describe the steps for activation. First, you can receive the node product keys from Supermicro as in [3.1 Receiving Node Product Keys from Supermicro](#). With these node product keys, you can then activate these systems as described in [3.2 Activating Managed Systems](#). SUM also provided auto-activation methods for customer usage. For this usage please refer to [3.3 Auto-Activating Managed Systems](#).

3.1 Receiving Node Product Keys from Supermicro

To receive node product keys from Supermicro, follow these steps:

1. Collect BMC MAC address and list them in one file, e.g., mymacs.txt.

Example:

```
003048001012
003048001013
003048001014
```

2. Send this file (mymacs.txt) to Supermicro to obtain a node product key file (mymacs.txt.key). The node product key file includes the MAC address and node product key.

Example:

```
003048001012;1111-1111-1111-1111-1111-1111
003048001013;2222-2222-2222-2222-2222-2222
003048001014;3333-3333-3333-3333-3333-3333
```

3.2 Activating Managed Systems

To activate a single system, see [5.1.1 Activating a Single Managed System](#). To simultaneously activate multiple systems see [6.2.1 Activating Multiple Managed Systems](#).

3.3 Auto-Activating Managed Systems

Sometimes, activation product key is a burden on customers. To relief customer from activating product keys, SUM provides an auto-activation feature to do activation automatically. Follow below steps to do auto-activation.

1. Receive credential file (cred.bin) from Supermicro by providing the MAC address list (mymac.txt) which can be obtained by Step 1 of [3.1 Receiving Node Product Keys from Supermicro](#).
2. Put the credential file into SUM_HOME/credential directory
3. SUM will auto-activate product key from cred.bin when running license required commands.

4 Basic User Interface

SUM is a binary executable file written in C++ language. Running this file on either Windows or Linux/FreeBSD is similar. In this document, we only provide you with the examples of running on Linux. To display the usage information, use this command:

```
[SUM_HOME]# ./sum
```

To display the usage information for each SUM command, use this syntax:

```
[SUM_HOME]# ./sum -h -c <command name>
```

Example:

```
[SUM_HOME]# ./sum -h -c UpdateBios
```

Usage Information

Options	Description or usage
-h	Shows help information (case insensitive)
-v	Displays the verbose output on the screen
--no_banner	Hides the version and copyright banner
--no_progress	Hides the progress message
-i	<BMC/CMM IP address or host name>
-l	<BMC/CMM system list file name>
-u	<BMC/CMM user ID>
-p	<BMC/CMM user password>
-c	<command name> (case insensitive)

System Check	
Commands	Long options
CheckOOBSupport	None
CheckAssetInfo (OOB only)	None
CheckSensorData (OOB only)	None
CheckSystemUtilization (OOB only) (TAS thin agent required)	None
Key Management	

Commands	Long options
ActivateProductKey	--key <node product key value> Uses the node product key to activate the managed system.
QueryProductKey	None
ClearProductKey	--key_index <node product key index> The index of the key to be cleared --key_name <node product key name> The name of the key to be cleared Valid key name: OOB, SSM, SD5, SUM, SPM, SCM, SFT-DCMS-Single, DCMS-SITE and SFT-DCMS-SVC-KEY (Either --key_index or --key_name is required)
BIOS Management	
Commands	Long options
UpdateBios	--file <file name> Updates with the given BIOS firmware image. --reboot (Optional) Forces the managed system to reboot. Feature is supported (since X10 Grantley platform). --flash_smbios (Optional) Overwrites SMBIOS data. This option is used only for specific purposes. Unless you are familiar with SMBIOS data, do not use this option. --preserve_mer (Optional) Preserves ME firmware region. This option is used only for specific purposes. Unless you are familiar with ME firmware image, do not use this option. --preserve_nv (Optional) Preserves NVRAM. This option is used only for specific purposes. Unless you are familiar with BIOS NVRAM, do not use this option. --preserve_setting (Optional) Preserves BIOS configurations. This option is used only for specific purposes. Unless you are familiar with BIOS configurations, do not use this option.
GetBiosInfo	--file <file name> (Optional) Shows the information of the given BIOS firmware image.
GetDefaultBiosCfg	--file <file name> (Optional) Saves the default BIOS configurations to the assigned file. If this option is not used, the default BIOS configurations will be shown on the screen output by default. --overwrite (Optional) Overwrites the assigned file if existing.
GetCurrentBiosCfg	--file <file name> (Optional) Saves the current BIOS configurations to the assigned file. If this option is not used, the current BIOS configurations will be shown on the screen output by default.

	--overwrite (Optional) Overwrites the assigned file if existing.
ChangeBiosCfg	--file <file name> Updates with the given BIOS configuration file. --reboot (Optional) Forces the managed system to reboot or power up. --skip_unknown (Optional) Skips the unknown settings and menus in BIOS configuration file. --skip_bbs (Optional) Skips the BBS related menus in the BIOS configuration file.
LoadDefaultBiosCfg	--reboot (Optional) Forces the managed system to reboot or power up.
GetDmiInfo	--file <file name> (Optional) Saves the current DMI information to the assigned file. If this option is not used, the current DMI configurations will be shown on the screen output by default. --overwrite (Optional) Overwrites the output file.
EditDmiInfo	--file <file name> The DMI information file to be edited (created when it does not exist). --item_type <item type> Specifies the item type name. --item_name <item name> Specifies the item name. --shn <short name> Specifies the item in short name format. --value <assignment value> Assigns the value to the item. --default Assigns the default value to the item. Notes: 1. Either [--item_type, --item_name] or [--shn] is required. 2. Either [--value] or [--default] is required.
ChangeDmiInfo	--file <file name> Updates from the given DMI information file. --reboot (Optional) Forces the managed system to reboot or power up.
SetBiosAction	--BBS <yes/no> Shows/hides the settings related to BBS priority. Selecting yes will show the settings related to BBS priority, and selecting no will hide them. --reboot (Optional) Forces the managed system to reboot or power up.
BMC Management	
Commands	Long options

UpdateBmc	--file <file name> Updates with the given BMC firmware image. --overwrite_cfg (Optional) Overwrites current BMC configurations including network settings using factory default values in the given BMC firmware image. This might cause IPMI connection lost. For ATEN BMC FW or AMI Hermon BMC FW, this option requires --overwrite_sdr option. --overwrite_sdr (Optional) Overwrites current BMC SDR data For AMI BMC FW, this option requires --overwrite_cfg option.
GetBmcInfo	--file <file name> (Optional) Shows the information of the given BMC firmware image.
GetBmcCfg	--file <file name> (Optional) Saves the current BMC configuration to the assigned file. If this option is not used, the current BMC configurations will be shown on the screen output by default. --overwrite (Optional) Overwrites the assigned file if existing.
ChangeBmcCfg	--file <file name> Updates from the given BMC configuration file.
System Event Log	
Commands	Long options
GetEventLog	--file <file name> (optional) Saves the system event log to a file. If this option is not used, the log will be shown on the screen output.
ClearEventLog	--reboot (Optional) Forces the managed system to reboot or power up.
CMM Management (OOB Only)	
Commands	Long options
UpdateCmm	--file <file name> Updates with the given CMM firmware image. --overwrite_cfg (Optional) Overwrites the current CMM configurations, including network settings using factory default values in the given CMM firmware image. This might cause the IPMI connection to be lost.
GetCmmInfo	--file <file name> (Optional) Shows information on the given CMM firmware image.
GetCmmCfg	--file <file name> (Optional) Saves the current CMM configuration to the assigned file. If this option is not used, the current CMM configurations will be shown on the screen output by default. --overwrite (Optional)

	Overwrites the output file.
ChangeCmmCfg	--file <file name> Updates from the given CMM configuration file.
Applications (OOB Only)	
Commands	Long options
TpmProvision	--reboot --image_url <URL> The URL to access the shared ISO image SAMBA URL: 'smb://<host name or ip>/<shared point>/<file path>' SAMBA UNC: '\\<host name or ip>\<shared point>\<file path>' HTTP URL: 'http://<host name or ip>/<shared point>/<file path>' --lock <yes> Locks TPM PS index --id <ID> (optional) The specified ID to access the shared file --pw <Password> (optional) The specified password to access the shared file --cleartpm (optional) Clears the ownership of TPM module.
MountIsoImage	--image_url <URL> The URL to access the shared ISO image SAMBA URL: 'smb://<host name or ip>/<shared point>/<file path>' SAMBA UNC: '\\<host name or ip>\<shared point>\<file path>' HTTP URL: 'http://<host name or ip>/<shared point>/<file path>' --id <ID> (optional) The specified ID to access the shared file --pw <Password> (optional) The specified password to access the shared file
UnmountIsoImage	None
Storage Management	
Commands	Long options
GetRaidControllerInfo	--file <file name> (Optional) Shows the information of the given RAID firmware image. --dev_id <DEVICE_ID> (optional) Shows the information of specified device
UpdateRaidController (OOB Only)	--file <file name> Updates with the given RAID firmware image. --dev_id <DEVICE_ID> Updates the specified device. --reboot (Optional) Forces on the managed system to reboot or power up.
GetRaidCfg	--file <file name> (Optional) Saves the current BIOS configurations to the assigned file. If this option is not used, the current BIOS configurations will be shown on

	the screen output by default. --overwrite (Optional) Overwrites the output file.
ChangeRaidCfg	--file <file name> Updates from the given RAID configuration file.
GetSataInfo (OOB Only)	None
GetNvmeInfo (OOB Only)	--dev_id <DEVICE_ID> (optional) Shows the information of the specified device.



Notes:

- During execution, DO NOT remove the AC power on the managed system.
- DO NOT flash BMC and BIOS firmware images at the same time.
- To execute SUM, use either the relative path method, e.g. ./sum or absolute path method, e.g. /opt/sum_x.x.x_Linux_x64/sum in script file or shell command line.
- DO NOT update firmware image and configuration at the same managed system concurrently by in-band and OOB method.
- Before running the OOB UpdateBios command, it is recommended that the managed system is shut down first.
- For in-band usage, simply ignore the -l, -i, -u and -p options.
- For concurrent execution of OOB commands for managing multiple systems, use the -l option. For details on how to manage multiple systems, see [6 Managing Multiple Systems \(OOB Only\)](#).
- When a command is executed, it will be recorded in *sum.log*. In addition, when rare exceptions occur in BMC/CMM/RAID configurations get/set commands, timestamp logs will be created. These logs are stored at “/var/log/supermicro/SUM” or \$PWD (present working directory). If the folder “/var/log/supermicro/SUM” exists, the logs will be stored there. Otherwise, they are stored in the same folder as \$PWD.
- For --reboot option in OOB usage, if target OS does not support software shutdown, system will be forced powered off and then powered up. Please make sure usage of this option to avoid data lost. For RedHat 7.x OS, to enable software shutdown support, we can run below command in console prompt:
gsettings set org.gnome.settings-daemon.plugins.power button-power shutdown
- For --reboot option in OOB usage, if target OS does not support software shutdown, system will be forced powered off and then powered up. Please make sure usage of this option to avoid data lost. For RedHat 7.x OS, to enable software shutdown support, we can run below command in console prompt:

4.1 Format of BIOS Settings Text File

The BIOS settings file is designed to display the BIOS setup menu in text format for easier configurations. Each setup item consists of a variable, a value, options and dependency(if available). The example below shows how BIOS settings are displayed.

```
[Advanced|CPU Configuration|CPU Power Management Configuration]
```

```
Power Technology=01    // 00 (Disabled), *01 (Energy Efficient), 02 (Custom)
```

```
EIST=01                // 00 (Disabled), *01 (Enabled)          Power Technology =  
"Custom"
```

```
Turbo Mode=01          // 00 (Disabled), *01 (Enabled)          Power Technology =  
"Custom" and EIST = "Enabled"
```

```
C1E Support=01         // 00 (Disabled), *01 (Enabled)          Power Technology =  
"Custom"
```

- A setup submenu is quoted by brackets. Setup items are next to the setup submenu.
- A variable (of one setup item) always stays on the left side of the "=" character.
- A value (of one variable) always stays on the right side of the "=" character.
- Annotated options (of one variable) are shown after "//", and "*" indicates the default option.
- A dependency (if available) will be separated from an option command by eight spaces. It indicates that the variable is visible and configurable when other variable(s) are set to a designated value.

In this example, the *Power Technology* item in the *CPU Power Management configuration* submenu is currently set to 01 for Energy Efficient (the default setting) and can be set to 00 for Disabled or 02 for Customer. The *EIST* variable is equal to 01 for Enabled (the default setting) and can be set to 00 when the *Power Technology* variable is set to 02 for Custom.

If the desired changes are limited to the *Power Technology* configuration, delete all except the two lines:

```
[Advanced|CPU Configuration|CPU Power Management Configuration]
```

```
Power Technology=01      // 00 (Disable), *01 (Energy Efficient), 02 (Custom)
```

**Notes:**

- You can remove unnecessary menu items (or variables), and their values still remain the same after an update.
 - If all menu items are removed (or the file becomes empty), no configurations are changed.
 - The Setup submenu is required for setting up the items.
-

4.1.1 An Example of BBS Boot Priority

On pre-Purley platforms, the command `SetBiosAction` is required to execute with the `--BBS` option set to `yes`, to activate the BIOS settings related to BBS Boot Priority.

This is an example of the boot order:

```
[Boot|Hard Disk Drive BBS Priorities]
```

```
HDD Boot Order #1=0000      // *0000 (INTEL SSDSC2BB120G6), 0001  
(SEAGATE ST3500418AS), 0002 (Disabled)
```

```
HDD Boot Order #2=0001      // 0000 (INTEL SSDSC2BB120G6), *0001  
(SEAGATE ST3500418AS), 0002 (Disabled)
```

In this example, *HDD Boot Order #1* is currently set to 0000 for INTEL SSDSC2BB120G6, and *HDD Boot Order #2* is set to 0001 for SEAGATE ST3500418AS. Boot orders could be swapped after changing BIOS configuration with the setting modified as below.

```
[Boot|Hard Disk Drive BBS Priorities]
```

```
HDD Boot Order #1=0001      // *0000 (INTEL SSDSC2BB120G6), 0001  
(SEAGATE ST3500418AS), 0002 (Disabled)
```

```
HDD Boot Order #2=0000      // 0000 (INTEL SSDSC2BB120G6), *0001  
(SEAGATE ST3500418AS), 0002 (Disabled)
```

The device is mapped with the boot order. Please note that after BIOS configurations are changed, the boot order indices ("0000" and '0001' are boot order indices in the example above) and the mapped devices may be different. In this example, after ChangeBiosCfg took effect, GetCurrentBiosCfg will have the configuration as below:

```
[Boot|Hard Disk Drive BBS Priorities]
```

```
HDD Boot Order #1=0000                // *0000 (SEAGATE ST3500418AS), 0001  
(INTEL SSDSC2BB120G6), 0002 (Disabled)
```

```
HDD Boot Order #2=0001                // 0000 (SEAGATE ST3500418AS), *0001  
(INTEL SSDSC2BB120G6), 0002 (Disabled)
```



Note: The settings of boot orders should not be the same except Disabled.

4.2 Format of BIOS Settings XML File

For easier configurations, the BiosCfg.xml file is designed to display the BIOS setup menu in XML format. An example below shows how this file demonstrates BIOS setup settings. Each setting consists of a default value and a current value.

```
<Menu name="System Event Log">
  <Information>
    <Help><![CDATA[Press <Enter> to change the SEL event log configuration.]]></Help>
  </Information>
  <Subtitle>Enabling/Disabling Options</Subtitle>
  <Setting name="SEL Components" selectedOption="Enabled" type="Option">
    <Information>
      <AvailableOptions>
        <Option value="0">Disabled</Option>
        <Option value="1">Enabled</Option>
      </AvailableOptions>
      <DefaultOption>Enabled</DefaultOption>
      <Help><![CDATA[Change this to enable or disable all features of System Event Logging during boot.]]></Help>
    </Information>
  </Setting>
  <Subtitle></Subtitle>
  <Subtitle>Erasing Settings</Subtitle>
  <Setting name="Erase SEL" selectedOption="No" type="Option">
    <Information>
      <AvailableOptions>
        <Option value="0">No</Option>
        <Option value="1">Yes, On next reset</Option>
        <Option value="2">Yes, On every reset</Option>
      </AvailableOptions>
      <DefaultOption>No</DefaultOption>
      <Help><![CDATA[Choose options for erasing SEL.]]></Help>
```

```
<WorkIf><![CDATA[ 0 != SEL Components  ]]></WorkIf>  
</Information>  
</Setting>
```

- The XML version is shown in the first line.
- The root table name is “*BiosCfg*”. Its name tag pair is `<BiosCfg>` and `</BiosCfg>`. All configurations of the root table is enclosed in-between this name tag pair.
- The direct children name tag pairs `<BiosCfg>` are all `<Menu>` which is the root of any setting configuration.
- Each name tag pair `<Menu>` encloses name tag pairs `<Menu>`, `<Information>`, `<Setting>`, `<Subtitle>` and `<Text>`.
- `<Information>` is designed to display name tag pairs `<Help>` and `<WorkIf>`. In addition, the setting-specific information is listed. For example, `<Setting>` with attribute ‘name’ as ‘Option’ have `<AvailableOptions>` and `<DefaultOption>` to indicate selectable options and default option, respectively. Any modification in `<Information>` enclosure is unnecessary and NEVER takes effect.
- `<Setting>` is the only configurable part in XML configuration. There are five supported setting types: ‘Option’, ‘CheckBox’, ‘Numeric’, ‘String’ and ‘Password’. `<Setting>` enclosures are various depending on setting type. For instance, the accepted values for the setting ‘Option’ in `<SelectedOption>` enclosure are listed in `<AvailableOptions>` enclosure and any other setting values will cause exception thrown.
- `<Subtitle>` and `<Text>` are designed to indicate what is coming up next in configuration.
- `<Help>` is designed to provide more explanations for menus and settings.
- `<WorkIf>` is designed to determine if the setting modification will take effect or not. If `<WorkIf>` enclosure is not shown, it implies the modified setting value will always take effect.

In this exemplary XML file, the setting ‘SEL Components’ is enclosed in menu ‘System Event Log’. The setting configuration will take effect only when `<WorkIf>` enclosure is evaluated as true (in this case, the setting ‘BMC Support’ is not equal to 0). If the setting value is modified in XML file and `<WorkIf>` enclosure is evaluated as false, the warning messages will indicate that the changes will not take effect. Besides, if the setting value in `<SelectedOption>` enclosure is neither ‘Enabled’ nor ‘Disabled’, an exception will be thrown.

Moreover, two or more settings in the XML file might refer to the same variable in the BIN file. In this scenario, those setting values are expected to be consistent. For example, the setting 'Quiet Boot' in the menu 'Setup'->'Advanced'->'Boot Feature' and the setting 'Quiet Boot' in the menu 'Setup'->'Boot' are actually two different settings (different settings can have the same name). Indeed, they even refer to the same variable in the BIN file. If the setting values in these two questions are conflicted in the XML file, SUM will then throw an exception. For more details on usages, see [Appendix E. How to Change BIOS Configurations in XML Files](#).



Notes:

- Unchanged settings can be deleted to skip update.
 - XML version line and the root `<BiosCfg>` should not be deleted.
 - XML configuration contains extended ASCII characters, i.e. ©, ® and µ. It is REQUIRED to use a text editor that supports extended ASCII characters (ISO-8859-1 encoding). Otherwise, the extended ASCII characters might be lost after they are saved. It is suggested that Notepad++ in Windows and Vim in Linux could be used to view and edit the XML configuration.
 - For using tools to edit XML files, please refer to [Appendix F. Using the Command Line Tool \(XMLStarlet\) to Edit XML Files](#).
-

4.3 Format of DMI Information Text File

DMI.txt is designed to display the supported editable DMI items in text format for easier update. An example below shows how this file demonstrates the DMI information items. Each item consists of an item name, a short name, a value, and comments.

```
[System]
Version           {SYVS}      = "A Version"           // string value
Serial Number     {SYSN}      = $DEFAULT$             // string value
UUID              {SYUU}      = 00112233-4455-6677-8899-AABBCCDDEEFF // 4-2-
2-2-6 formatted 16-byte hex values
    // Bytes[ 0-3 ]: The low field of the timestamp
    // Bytes[ 4-5 ]: The middle field of the timestamp
    // Bytes[ 6-7 ]: The high field of the timestamp (multiplexed with
    //                the version number)
    // Bytes[ 8-9 ]: The clock sequence (multiplexed with the variant)
    // Bytes[10-15]: The spatially unique node identifier
    // Byte Order   :
    //      UUID {00112233-4455-6677-8899-AABBCCDDEEFF} is stored as
    //      33 22 11 00 55 44 77 66 88 99 AA BB CC DD EE FF
```

- A DMI type is quoted by brackets. DMI information items are next to the DMI type.
- The name of a DMI information item is always followed by its short name.
- The item name and its short name stays at the left side of the "=" character.
- A short name is always enclosed by brackets.
- A value (of one information item) always stays at the right side of the "=" character.
- String values are enclosed by double quotation marks.
- \$DEFAULT\$ signature without double quotation marks is used to load default value for a string-valued item.
- There is no default value for non-string-value items.

-
- Do not use quotation marks for non-string-value items.
 - The value type is always shown after a value and begins with "//".
 - The value meanings for a non-string-value item are listed next to the item.

In this example, the “*Version*” DMI item belongs to the “*System*” DMI type with short name SYVS. It is string-value by “A Version” and can be changed to any other string value. For the “*Serial Number*” item, its value is set as \$DEFAULT\$. After updating the DMI information, the item value of the “*Serial Number*” will be reset to factory default. The *UUID* item is a specially formatted hex-value item. Its value meanings are explained next to it.



Notes:

- You can remove unnecessary DMI items so that its value will not be changed after an update.
 - The DMI type is required for DMI items.
 - Each item can be identified either by its short name or by the combination of its item type and item name.
 - Any line begins with "//" will be ignored.
 - A version number is included at the beginning of every DMI.txt file. This version number should not be modified because it is generated by SUM according to the BIOS of the managed system for DMI version control.
-

4.4 Format of BMC Configuration XML File

The BMC configuration file is designed to display the supported and editable BMC configuration elements in XML format for an easier update process. An example below shows how this file demonstrates the BMC configurable elements.

```
<?xml version="1.0"?>
<BmcCfg>
  <!--You can remove unnecessary elements so that-->
  <!--their values will not be changed after update-->
  <StdCfg Action="None">
    <!--Supported Action:None/Change-->
    <!--Standard BMC configuration tables-->
    <FRU Action="Change">
      <!--Supported Action:None/Change-->
      <Configuration>
        <!--Configuration for FRU data-->
        <BoardMfgName>Supermicro</BoardMfgName>
        <!--string value, 0~16 characters-->
      </Configuration>
    </FRU>
  </StdCfg>
  <OemCfg Action="Change">
    <!--Supported Action:None/Change-->
    <!--OEM BMC configuration tables-->
    <ServiceEnabling Action="Change">
      <!--Supported Action:None/Change-->
      <Configuration>
        <!--Configuration for ServiceEnabling-->
        <HTTP>Enable</HTTP>
        <!--Enable/Disable-->
      </Configuration>
    </ServiceEnabling>
  </OemCfg>
</BmcCfg>
```

-
- The XML version is shown in the first line.
 - The root table name is *"BmcCfg"*. Its name tag pair is *<BmcCfg>* and *</BmcCfg>*. All information belongs to the root table is enclosed in-between this name tag pair.
 - There could be two direct children for the root table: *"StdCfg"* and *"OemCfg"*.
 - *"StdCfg"* and *"OemCfg"* could have child tables.
 - Configurable elements are listed in the *"Configuration"* field of each child table.
 - Each configurable element has a name tag pair. The element value is enclosed by its name tag pair.
 - Comments could be given following any element or table name tag. Each comment is enclosed by *"<!--"* and *"-->"* tags. The supported usage of each element and table are shown in its following comments.
 - Configuration tables could have *"Action"* attribute. Supported actions are shown in the comments. If action is *"None"*, all the configurations and children of this table will be skipped.
 - Configuration tables could contain more table specific attributes in case needed.

In this example, the *Action* is *None* for the *StdCfg* table. As such, SUM will skip updating the element *BoardMfgName* of the table *FRU*. On the other hand, SUM will try to update the value as *Enable* for the *HTTP* element of the *ServiceEnabling* table in the *OemCfg* table.



Notes:

- Child tables or configurable elements can be deleted to skip update for these tables or configuration elements.
 - Child tables or configurable elements cannot be left alone without parents.
 - XML version line and the root table should not be deleted.
 - For using tools to edit XML files, please refer to [Appendix F. Using the Command Line Tool \(XMLStarlet\) to Edit XML Files](#).
-

4.5 Format of RAID Configuration XML File

The RAID configuration file is designed to display the supported editable RAID configuration elements in XML format for easier update. The example below shows how the RAID configurable elements are demonstrated in this file.

- The XML version is shown in the first line.
- The root table name is *"RAIDCfg"*. *<RAIDCfg>* and *</RAIDCfg>* are its tag pair. All information in the root table is enclosed between this tag pair.
- There could be two child tags for the root table: *"Information"* and *"RAIDController"*.
- *"Information"* and *"RAIDController"* could have child tables.
- Configurable elements are listed in the *"Configuration"* field of each child table.
- Each configurable element has a tag pair. The element value is enclosed by its tag pair.
- Comments may be given following any element or table tag. Each comment is enclosed by the *"<!--"* and *"-->"* tags. The supported usage of each element and table are shown in the comments that follow.
- Configuration tables may have *"Action"* attributes. Supported actions are shown in the comments. If action is *"None"*, all configuration and child tables of this table will be skipped.
- Configuration tables may contain more table specific attributes when needed.
- To create a logical volume, RAIDInfo action should be *"Change"*, and RAID action should be *"Create"*. *"PhysicalDriveList"* field must contain all drive IDs for RAID creation, and *"ArrayID"* field should be set to *"-1"*.
- To delete a logical volume, RAIDInfo action should be *"Change"*, RAID action should be *"Delete"* and assign corresponding logical drive ID or *"ALL"* to *"DeletingLogicalDriveList"* field.
- To delete all arrays built in the RAID controller, RAIDInfo action should be *"ClearAll"*.
- To change RAID configuration, you have to delete original RAID and create new RAID, with proper modification of *"Level"*, *"Span"* and *"PhysicalDriveList"* fields.
- To enable HDD LED in RAID controller, fill drive ID to *"LocatingPhysicalDriveIDList"* field and set RAID action to *"Locate"*

-
- To disable HDD LED in RAID controller, fill drive ID to “*UnlocatePhysicalDriveIDList*” field and set RAID action to “*Unlocate*”



Notes:

- Child tables or configurable elements can be deleted to skip the update for these tables or configuration elements.
- Child tables or configurable elements must stick to the parent tables.
- XML version line and the root table should not be deleted.
- Supported RAID level : 0/1/5/6/10/50/60
- Supported span value:

RAID level	Span value	Minimum number of physical HDD
0	1	1
1	1	2
5	1	3
6	1	3
10	2 or 4	4
50/60	3 or 4	6

- The number of physical hard drives must be a multiple of the "Span" value.
 - For using tools to edit XML files, please refer to [Appendix F. Using the Command Line Tool \(XMLStarlet\) to Edit XML Files](#).
-

Example:

```
<?xml version="1.0"?>
<RAIDCfg>
  <Information>
    <TotalRaidController>1</TotalRaidController>
  </Information>
  <RAIDController Action="Change" DeviceID="0">
    <!--Supported Action:None/Change-->
    <ControllerProperties Action="None">
      <!--Supported Action:None/Change-->
      <Configuration>
        <BiosBootMode>Stop on Error</BiosBootMode>
        <!--RAID controller BIOS boot mode, enumerated string value-->
        <!--Supported values: Stop on Error/Pause on Error/Ignore Errors/Safe Mode on Error-->
      </Configuration>
    </ControllerProperties>
  <RAIDInfo Action="Change">
    <!--Supported Action:None/Change/ClearAll-->
    <RAID Action="None" ArrayID="-1">
      <!--Supported Action:None/Add/Delete/Create/Locate/Unlocate-->
      <Information>
        <PhysicalDriveCount>0</PhysicalDriveCount>
        <!--Total number of physical drives in this RAID-->
        <LogicalDriveCount>0</LogicalDriveCount>
        <!--Total number of logical drives in this RAID-->
        <LocatedPhysicalDriveList></LocatedPhysicalDriveList>
        <!--located physical drives-->
        <FreeSize>0</FreeSize>
        <!--Free size of RAID, unit: MB-->
        <LogicalDriveInfo></LogicalDriveInfo>
      </Information>
    </RAID>
  </RAIDInfo>
</RAIDController>
</RAIDCfg>
```

```
<Configuration>
  <!--For each field, default support Create/Add actions if not specially commented-->
  <Level>RAID0</Level>
  <!--RAID level, enumerated string value-->
  <!--Supported values: RAID0/RAID1/RAID5/RAID6/RAID10/RAID50/RAID60-->
  <!--Only used for "Create" action-->
  <Span>1</Span>
  <!--PD span value, integer value-->
  <!--For RAID 0/1/5/6, valid value is 1-->
  <!--For RAID 10, valid value is 2 or 4-->
  <!--For RAID 50/60, valid value is 3 or 4-->
  <!--Only used for "Create" action-->
  <PhysicalDriveList></PhysicalDriveList>
  <!--Number of physical hard drive must be multiple of "Span" value-->
  <!--Physical drive ID list of this RAID, integer values separated by comma.-->
  <!--Can not use physical hard drive which present in other RAID.-->
  <!--Can not use "Error" status physical HDD.-->
  <!--Can not use repeated physical hard drive ID in same RAID.-->
  <!--Physical hard drive ID can not use negative number.-->
  <!--Physical hard drive count can't be more than 32.-->
  <!--For RAID0, minimum number of physical HDD is 1.-->
  <!--For RAID1, minimum number of physical HDD is 2.-->
  <!--For RAID5, minimum number of physical HDD is 3.-->
  <!--For RAID6, minimum number of physical HDD is 3.-->
  <!--For RAID10, minimum number of physical HDD is 4.-->
  <!--For RAID50, minimum number of physical HDD is 6.-->
  <!--For RAID60, minimum number of physical HDD is 6.-->
  <!--Only used for "Create" action.-->
  <NewLogicalCount>1</NewLogicalCount>
  <!--Number of new Logical drive to be created/added-->
  <!--Integer value, valid value from 1 to 16-->
  <!--Can not run "Add" action when RAID has no any physical hard drive.-->
```

```

<!--Only used for "Create" and "Add" action-->
<PercentageToUsed>100</PercentageToUsed>
<!--Percentage to use, integer value between 1 and 100.-->
<!--Only used for "Create" and "Add" action-->
<StripSize>256KB</StripSize>
<!--Strip size of each logical drive-->
<!--Enumerated integer value, unit is Byte-->
<!--Valid value: 64KB/128KB/256KB/512KB/1MB-->
<!--Default value: 256KB-->
<!--Only used for "Create" and "Add" action-->
<LogicalDriveName></LogicalDriveName>
<!--Name of logical drive, string value-->
<!--Maximum length: 15, empty string is accepted-->
<!--Only used for "Create" and "Add" action-->
<LogicalDriveReadPolicy>No Read Ahead</LogicalDriveReadPolicy>
<!--Read policy of logical drive, enumerated string value-->
<!--Possible values: No Read Ahead/Always Read Ahead-->
<!--Default value: No Read Ahead-->
<!--The value in this field does not indicate current setting, it is the reference value for configuring
purpose only-->
<!--Only used for "Create" and "Add" action-->
<LogicalDriveWritePolicy>Write Back</LogicalDriveWritePolicy>
<!--Write policy of logical drive, enumerated string value-->
<!--Possible values: Write Through/Write Back/Write Back With BBU-->
<!--Default value: Write Back-->
<!--The value in this field does not indicate current setting, it is the reference value for configuring
purpose only-->
<!--Only used for "Create" and "Add" action-->
<LogicalDriveIoPolicy>Direct IO</LogicalDriveIoPolicy>
<!--IO policy of logical drive, enumerated string value-->
<!--Possible values: Direct IO/Cached IO-->
<!--Default value: Direct IO-->

```

<!--The value in this field does not indicate current setting, it is the reference value for configuring purpose only-->

<!--Only used for "Create" and "Add" action-->

<AccessPolicy>Read Write</AccessPolicy>

<!--Access policy of logical drive, enumerated string value-->

<!--Possible values: Read Write/Read Only/Blocked-->

<!--Default value: Read Write-->

<!--The value in this field does not indicate current setting, it is the reference value for configuring purpose only-->

<!--Only used for "Create" and "Add" action-->

<DiskCachePolicy>UnChanged</DiskCachePolicy>

<!--Cache policy of logical drive, enumerated string value-->

<!--Possible values: UnChanged/Enable/Disable-->

<!--Default value: UnChanged-->

<!--The value in this field does not indicate current setting, it is the reference value for configuring purpose only-->

<!--Only used for "Create" and "Add" action-->

<InitState>No Init</InitState>

<!--Initial state of logical drive, enumerated string value-->

<!--Possible values: No Init/Quick Init/Full Init-->

<!--Default value: No Init-->

<!--The value in this field does not indicate current setting, it is the reference value for configuring purpose only-->

<!--Only used for "Create" and "Add" action-->

<DeletingLogicalDriveList></DeletingLogicalDriveList>

<!--Logical drive ID list for deleting, integer values separated by comma-->

<!--Logical drive for deleting can not use negative number-->

<!--Logical drive for deleting should be physical hard drive of this RAID-->

<!--Can not use repeated physical hard drive ID in same RAID.-->

<!--All logical physical hard drives of RAID will be deleted when fill "ALL"-->

<!--Can not run "Delete" action when RAID has no any physical hard drive.-->

<!--Only used for "Delete" action.-->

<LocatingPhysicalDriveIDList></LocatingPhysicalDriveIDList>

<!--Physical drive ID list for locating: integer values separated by comma-->

```

<!--Physical drive for locating can not use negative number-->
<!--Physical drive for locating should be physical hard drive of this RAID-->
<!--All physical hard drives of RAID will be located when fill "ALL"-->
<!--Can not use repeated physical hard drive ID in same RAID.-->
<!--Can not run "Locate" action when RAID has no any physical hard drive.-->
<!--Only used for "Locate" action-->
<UnlocatePhysicalDriveIDList></UnlocatePhysicalDriveIDList>
<!--Physical drive ID list for unlocating: integer values separated by comma-->
<!--Physical drive for unlocating can not use negative number-->
<!--Physical drive for unlocating should be physical hard drive of this RAID-->
<!--All physical hard drives of RAID will be unlocated when fill "ALL"-->
<!--Can not use repeated physical hard drive ID in same RAID.-->
<!--Can not run "Unlocate" action when RAID has no any physical hard drive.-->
<!--Only used for "Unlocate" action-->
</Configuration>
</RAID>
</RAIDInfo>
</RAIDController>
</RAIDCfg>

```

- To create an array:
Create a RAID 10 array with Span 2 and 4 HDDs, and “ArrayID” field can be set to “-1”:
For array ID “-1”, it will be used when no array exists. The setting enables a dummy array table for you to create the first array. Note that for the creation action, “ArrayID” is meaningless, and array ID will be generated after the array is created.

```

<RAIDInfo Action="Change">
    <RAID Action="Create" ArrayID="-1">
        <Level>RAID10</Level>
        <Span>2</Span>
        <PhysicalDriveList>0,1,2,3</PhysicalDriveList>
    </RAID>
</RAIDInfo>

```

- To create two or more arrays:
<RAIDInfo Action="Change">

Array 1

```
<RAID Action="Create" ArrayID="-1">  
  <Level>RAID10</Level>  
  <Span>2</Span>  
  <PhysicalDriveList>0,1,2,3</PhysicalDriveList>
```

Array 2

```
<RAID Action="Create" ArrayID="-1">  
  <Level>RAID10</Level>  
  <Span>2</Span>  
  <PhysicalDriveList>4,5,6,7</PhysicalDriveList>
```

- To delete logical drives:

Delete logical drive 0 and 1 from "Array0".

```
<RAIDInfo Action="Change">  
  <RAID Action="Delete" ArrayID="0">  
    <DeletingLogicalDriveList>0,1</DeletingLogicalDriveList>
```

-
- To delete an Array:
Use “ALL” to delete every logical drive from “Array0”. After this, “Array0” will be:
 <RAIDInfo Action="Change">
 <RAID Action="Delete" ArrayID="0">
 <DeletingLogicalDriveList>ALL</DeletingLogicalDriveList>
 - To delete all arrays:
Use “ClearAll” to delete every array. After this, every array will disappear.
 <RAIDInfo Action="ClearAll">
 - Locate HDDs:
Locate HDD1/HDD2/HDD3 in “Array0”. LEDs of HDD1/HDD2/HDD3 will be lighted.
 <RAIDInfo Action="Change">
 <RAID Action="Locate" ArrayID="0">
 <LocatingPhysicalDriveIDList>1,2,3</LocatingPhysicalDriveIDList>
 - Unlocate HDDs:
Unlocate HDD1/HDD4 in “Array0”. LEDe of HDD1/HDD4 will be dimmed.
 <RAIDInfo Action="Change">
 <RAID Action="Unlocate" ArrayID="0">
 <UnlocatePhysicalDriveIDList>1,4</UnlocatePhysicalDriveIDList>

4.6 Format of CMM Configuration Text File

The CMM configuration file is designed to display the supported and editable CMM configuration elements in XML format for an easier update process. An example below shows how this file demonstrates the CMM configurable elements.

```
<?xml version="1.0"?>
<CmmCfg>
  <!--Usage notes:-->
  <!--You can remove unnecessary elements so that-->
  <!--their values will not be changed after update-->
  <!--Please refer to SUM User's guide '4.6 Format of the CMM Configuration Text
File' for more details.-->
  <StdCfg Action="None">
    <!--Supported Action:None/Change-->
    <!--Standard Cmm configuration tables-->
    <SOL Action="Change">
      <!--Supported Action:None/Change-->
      <Configuration>
        <!--Configuration for SOL properties-->
        <Access>Enable</Access>
        <!--Enable/Disable-->
      </Configuration>
    </SOL>
  </StdCfg>
  <OemCfg Action="Change">
    <!--Supported Action:None/Change-->
    <!--OEM Cmm configuration tables-->
    <ServiceEnabling Action="Change">
      <!--Supported Action:None/Change-->
      <Configuration>
        <!--Configuration for ServiceEnabling-->
        <HTTP>Enable</HTTP>
        <!--Enable/Disable-->
      </Configuration>
    </ServiceEnabling>
```

```
</OemCfg>  
</CmmCfg>
```

- The version of the xml file is shown in the first line.
- The root table name is “*CmmCfg*”. Its name tag pairs are *<CmmCfg>* and *</CmmCfg>*. All information of the root table is enclosed in this name tag pair.
- “*StdCfg*” and “*OemCfg*” could be two child tables for the root table.
- “*StdCfg*” and “*OemCfg*” could have child tables.
- Configurable elements are listed in the “*Configuration*” field in each child table.
- Each configurable element has a name tag pair. The element value is enclosed in its name tag pair.
- Comments could be given following any element or table name tag. Each comment is enclosed in the tags “*<!--*” and “*-->*”. The usages of each element and table are shown in its following comments.
- Configuration tables could have “*Action*” attribute. Supported actions are shown in the comments. If action is “*None*”, all the configurations and children of this table will be skipped.
- Configuration tables could contain more specific table attributes in case they are needed.

In this example, the *Action* is *None* for the *StdCfg* table. As such, SUM will skip updating the element *Access* of the table *SOL*. On the other hand, SUM will try to update the value as *Enable* for the *HTTP* element of the *ServiceEnabling* table in the *OemCfg* table.



Notes:

- Child tables or configurable elements can be deleted to skip updates for these tables or configuration elements.
 - Child tables or configurable elements cannot be left alone without parents.
 - The XML version line and the root table should not be deleted.
 - For using tools to edit XML files, please refer to [Appendix F. Using the Command Line Tool \(XMLStarlet\) to Edit XML Files](#).
-

5 Managing a Single System

In this chapter, we describe basic user operations for managing a single system, either through the OOB channel or, if applicable, through the in-band channel. In-band channel usage is similar to OOB usage except for several differences:

1. For in-band usage, do not use the -l, -i, -u and -p options.
2. For in-band usage, supported commands and their node product key requirement might be different (see [Appendix B. Management Interface and License Requirements](#)).
3. A Linux driver might be required for in-band usage. For details, please see [2.3 Setting Up In-Band Managed Systems](#). If a Linux driver is required, and you are executing SUM in this server for the first time, you have to copy and paste the OS specific driver file "sum_bios.ko" under the SUM_HOME/driver directory to the SUM_HOME directory. For example, if the OS is RHEL 5.x. execute

```
[SUM_HOME]# cp ./driver/RHEL5_x86_64/sum_bios.ko ./
```

5.1 Key Management for a Single System

5.1.1 Activating a Single Managed System

To activate systems individually, follow these steps by using the command “ActivateProductKey”.

1. Obtain a node product key from Supermicro. See [3.1 Receiving Product Keys from Supermicro](#).
2. Use the following SUM command.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c ActivateProductKey --  
key <nodeproductkey>
```

Example:

OOB:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c ActivateProductKey --  
key 1111-1111-1111-1111-1111-1111
```

In-Band:

```
[SUM_HOME]# ./sum -c ActivateProductKey --key 1111-1111-1111-1111-1111-1111
```

5.1.2 Querying the Node Product Keys

To query the node product keys activated in the managed system, use the command “QueryProductKey.”

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c QueryProductKey
```

Example:

OOB:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c QueryProductKey
```

In-Band:

```
[SUM_HOME]# ./sum -c QueryProductKey
```

The console output contains the information below. Each line is a node product key that has been activated in the managed system. In each line, the first field is the key index while the second field is the key name. Except for the OOB key, all keys have extra fields describing detailed attributes.

```
[0] OOB
[1] SFT-DCMS-Single, version: none, invoice: none, creation date: 2017/09/13
05:32:55(Key is good.)
[2] SUM, version: none, invoice: none, creation date: 2014/09/10 09:51:38(Key is
expired.)
[3] SFT-DCMS-SVC-KEY, version: none, invoice: none, creation date: 2017/09/13
09:52:25(Key is good.)
```

Number of product keys: 3

5.1.3 Clearing Node Product Key

To clear the activated node product keys in the managed system, use the command “ClearProductKey”. Before executing the “ClearProductKey command,” query the existing NodeProductKeyName and NodeProductKeyIndex values from the output of the command “QueryProductKey” (see [5.1.2 Querying the Node Product Key](#)).

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c ClearProductKey --
key_name <NodeProductKeyName>

sum [-i <IP or host name> -u <username> -p <password>] -c ClearProductKey --
key_index <NodeProductKeyIndex>
```

Example:

OOB:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c ClearProductKey --
key_name SUM
```

In-Band:

```
[SUM_HOME]# ./sum -c ClearProductKey --key_index 1
```

In the OOB example, the SUM key will be cleared. In contrast, in the In-band example, the key with index 1 will be cleared.



Note: There is no one-to-one mapping between key name and key index.

5.2 System Checks for a Single System

5.2.1 Checking OOB Support

Use the command `CheckOOBSupport` to check if both BIOS and BMC firmware images support OOB functions.



Notes:

- If your BMC does not support OOB functions, you can update the BMC firmware image using the `SUM UpdateBmc` command.
 - To update the BIOS in the managed system to support OOB functions, you can use the `SUM UpdateBios` command (either in-band or OOB) to flash BIOS even when BIOS does not support OOB functions. For details, see [5.3.2 Updating the BIOS Image](#). However, when using OOB channel, if the onboard BIOS or the BIOS firmware image does not support OOB functions, the DMI information, such as MB serial number, might get lost after system reboot.
 - If Feature Toggled On is No, all licensed features will be turned OFF and Node Product Key Activated will be N/A.
-

Known Limitations:

- If we roll back BIOS from OOB-supported version to non-supported version, the information for “BIOS build date” and “OOB support in BIOS” fields will not be changed accordingly.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c CheckOOBSupport
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c CheckOOBSupport
```

The console output contains the following information.

```
[KEY]
```

```
Node Product Key Activated.....OOB
```

```
Feature Toggled On.....YES
```

[BMC]

BMC FW Version.....02.41

BMC Supports OOB BIOS Config.....Yes

BMC Supports OOB DMI Edit.....Yes

[BIOS]

BIOS Board ID.....0660

BIOS Build Date.....2013/9/18

BIOS Supports OOB BIOS Config.....Yes

BIOS Supports OOB DMI Edit.....Yes

5.2.2 Checking Asset Information (OOB Only)

Use the command “CheckAssetInfo” to check the asset information for the managed system.

Syntax:

```
sum -i <IP or host name> -u <username> -p <password> -c CheckAssetInfo
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c CheckAssetInfo
```

The console output contains the following information.

Supermicro Update Manager (for UEFI BIOS) 2.0.0 (2017/03/03) (x86_64)

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System

=====

Product Name: SuperPN

Product PartModel Number: SYS-1028U-E1CR4+-1-WM001

Version: 0123456789

Serial Number: SuperSN

UUID: 00000000-0000-0000-0000-0CC47A3A4094

Baseboard

=====

Product Name: SuperBPN

Version: 1.00

Serial Number: CM144S013179

CPU

===

[CPU(1)]

Family: Intel® Xeon® processor

Manufacturer: Intel(R) Corporation

Version: Intel(R) Genuine processor

Current Speed: 1800 MHz

Enabled Cores: 12

Total Cores: 12

CPU ID: 52 06 05 00 ff fb eb bf

[CPU(2)] N/A

Memory

=====

[MEM(1)] N/A

[MEM(2)] N/A

[MEM(3)] N/A

[MEM(4)] N/A

[MEM(5)] N/A

[MEM(6)] N/A

[MEM(7)] N/A

[MEM(8)] N/A

[MEM(9)] N/A

[MEM(10)] N/A

[MEM(11)]

Locator: P1-DIMMF1

Manufacturer: SK Hynix

Manufacturing Date (YY/WW): 14/05

Part Number: HMA41GR7MFR4N-TFT1

Serial Number: 101E19A4

Size: 8192 MB

Current Speed: 2133 MHz

[MEM(12)] N/A

[MEM(13)] N/A

[MEM(14)] N/A

[MEM(15)] N/A

[MEM(16)] N/A

[MEM(17)] N/A

[MEM(18)] N/A

[MEM(19)] N/A

[MEM(20)] N/A

[MEM(21)] N/A

[MEM(22)] N/A

[MEM(23)] N/A

[MEM(24)] N/A

Add-on Network Interface

=====

[NIC(1)]

Device Class: Network controller

Device Subclass: Ethernet controller

Vendor: Intel Corporation (ID:8086)

Subvendor: Super Micro Computer, Inc. (ID:15D9)

Device Name: (ID:1583)

Subsystem Name: (ID:0000)

Serial Number: VA168S018887

Part Number: AOC-S40G-i2Q

MAC Address1: 0CC47A1971AA

Current Speed: 1000Mb/s

MAC Address2: 0CC47A1971AB

Current Speed: 1000Mb/s

Slot Location: 1

Slot Type: SBX3 (Riser)

Add-on PCI Device

=====

[Device(1)]

Device Class: Network controller

Device Subclass: Ethernet controller

Vendor: Intel Corporation (ID:8086)

Subvendor: Super Micro Computer, Inc. (ID:15D9)

Device Name: (ID:1583)

Subsystem Name: (ID:0000)

Slot Location: 1

Slot Type: SBX3 (Riser)

Onboard Network Interface

=====

[NIC(1)]

Device Class: Network controller

Device Subclass: Ethernet controller

Vendor: Intel Corporation (ID:8086)

Subvendor: Super Micro Computer, Inc. (ID:15D9)

Device Name: (ID:1528)

Subsystem Name: AOC-UR-i2XT (ID:085D)

Serial Number: N/A

Part Number: N/A

MAC Address: N/A

Device Status of LAN1: Enabled

Device Type of LAN1: Ethernet

Reference Designation of LAN1: Intel Ethernet X540 #1

Device Status of LAN2: Enabled

Device Type of LAN2: Ethernet

Reference Designation of LAN2: Intel Ethernet X540 #2

Onboard PCI Device

=====

[Device(1)]

Device Class: Display controller

Device Subclass: VGA controller (VGA compatible controller)

Vendor: ASPEED Technology Inc. (ID:1A03)

Subvendor: Super Micro Computer, Inc. (ID:15D9)

Device Name: (ID:2000)

Subsystem Name: (ID:091C)

Device Status of Video1: Enabled

Device Type: Video

Reference Designation of Video1: ASPEED Video AST2500

[Device(2)]

Device Class: Network controller

Device Subclass: Ethernet controller

Vendor: Intel Corporation (ID:8086)

Subvendor: Super Micro Computer, Inc. (ID:15D9)

Device Name: (ID:1528)

Subsystem Name: AOC-UR-i2XT (ID:085D)

Device Status of LAN1: Enabled

Device Type of LAN1: Ethernet

Reference Designation of LAN1: Intel Ethernet X540 #1

Device Status of LAN2: Enabled

Device Type of LAN2: Ethernet

Reference Designation of LAN2: Intel Ethernet X540 #2

System Network Interface

=====

[LAN(1)]

MAC Address: 0CC47A3A4094

Current Speed: 1000Mb/s

[LAN(2)]

MAC Address: 0CC47A3A4095

Current Speed: 1000Mb/s

IPMI Network Interface

=====

[IPMI]

MAC Address: 0CC47A685A67



Notes:

- Items supported only since X10 Grantley platform and selected systems are: System: Version, UUID, CPU, BaseBoard, Memory, and Add-on Network Interface.
- Items supported only since X11 Purley platform and selected systems: Onboard Network Interface, Add-on PCI Device, and Onboard PCI Device.
- Items generally supported are: System: Product Name, Serial Number, System Network Interface, and IPMI Network Interface.
- Current Speed in Network Interface requires TAS installation in the managed system.

5.2.3 Checking Sensor Data (OOB Only)

Use the command “CheckSensorData” to check the sensor data for the managed system.



Notes:

- Supported sensors vary from different motherboards and firmware images.
- Since select X10 systems, network add-on card temperature can be retrieved.
- For PS and Chassis Intru sensors, the “Reading” field is only used to debug. You only

need to check if the “Status” field shows “OK”.

Syntax:

```
sum -i <IP or host name> -u <username> -p <password> -c CheckSensorData
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c CheckSensorData
```

For CPU temperature sensor, the console output contains the following information.

Status	(#) Sensor	Reading	Low Limit	High Limit
-----	-----	-----	-----	-----
OK	(4) CPU Temp	48C/118F	N/A	97C/207F

5.2.4 Checking System Utilization (OOB Only)

Use the command “CheckSystemUtilization” to check the device utilization status for the managed system.



Notes:

- This command requires a TAS agent to collect the system statuses. If a TAS agent is not installed on the managed system, the system statuses will be shown as N/A.
- The OS of the managed system must be booted for the TAS agent to collect the real-time device utilization.
- This command is supported since X10 platforms and select systems

Syntax:

```
sum -i <IP or host name> -u <username> -p <password> -c CheckSystemUtilization
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c CheckSystemUtilization
```

The console output contains the following information.

```
Time  
====
```

Last Sample Time: 2014-05-16_17:16:02

OS

==

OS Name: RedHatEnterpriseServer

OS Version: 6.4 x86_64

CPU

===

CPU Utilization: 2.74 %

Memory

=====

Memory Utilization: 8 %

LSI(1)

=====

HDD Name: /dev/sdb

Slot number: 1

SMART Status: Ok

HDD(1)

=====

HDD name: /dev/sda

SMART Status: Ok

Serial number: Z2AABXL3

Total Partitions: 2

[Partition(1)]

Partition Name: /dev/sda1

Utilization: N/A

Used Space: N/A

Total Space: 17.58 GB

[Partition(2)]

Partition Name: /dev/sda2

Utilization: 22.01 %

Used Space: 3.62 GB
Total Space: 17.30 GB

RSTe(1)

=====

Volume name: /dev/md126
Controller name: Intel RSTe
Numbers of Drives: 2
[HDD(1)]
HDD name: /dev/sdc
SMART Status: Ok
[HDD(2)]
HDD name: /dev/sdd
SMART Status: Ok

Network

=====

Total Devices: 2
[NIC(1)]
Device Name: eth0
Utilization: <1 %
Status: up
[NIC(2)]
Device Name: eth1
Utilization: 0 %
Status: down



Notes:

- RAID Device type LSI, RSTe and NVMe shows only if they have been installed on the host machine.
 - When RSTe Device installed on the host machine, normal Hard Disk type (HDD) information will not display.
-

5.3 BIOS Management for a Single System

5.3.1 Getting BIOS Firmware Image Information

Use the command “GetBiosInfo” to receive the BIOS firmware image information from the managed system as well as the local BIOS firmware image (with option --file).

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetBiosInfo [--file  
<filename>]
```

Example:

OOB:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetBiosInfo --file  
SMCI_BIOS.rom
```

In-Band:

```
[SUM_HOME]# ./sum -c GetBiosInfo --file SMCI_BIOS.rom
```

The console output contains the following information.

```
Managed system.....192.168.34.56  
    Board ID.....0660  
    BIOS build date.....2012/10/17  
  
Local BIOS image file....SMCI_BIOS.rom  
    Board ID.....0660  
    BIOS build date.....2012/10/17
```

5.3.2 Updating the BIOS Firmware Image

Use the command UpdateBios with BIOS firmware image SMCI_BIOS.rom to run SUM to update the managed system.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c UpdateBios --file  
<filename> [options...]
```

Option Commands	Descriptions
--reboot	Forces the managed system to reboot.
--flash_smbios	Overwrites SMBIOS data.
--preserve_mer	Preserves ME firmware region.
--preserve_nv	Preserves NVRAM.
--preserve_setting	Preserves setting configurations.

**Notes:**

- Before performing the OOB UpdateBios command, it is recommended to shut down the managed system first.
- When doing in-band UpdateBios command, SUM will disable watchdog and unload me/mei driver from the OS if exists.
- With the Server ME embedded on the Supermicro system, you may encounter a problem executing the in-band SUM command “UpdateBios” when the Client ME driver (MEIx64) is installed on the Windows platform. To prevent the system from hanging, you need to remove the driver before updating BIOS. The steps are displayed upon detection.
- When using SSH connection to do in-band UpdateBios command, SSH timeout on both client and server side should be adjusted to avoid broken pipe during command execution. Typical execution time is within 30 minutes. Timeout value should be longer than 30 minutes.
- If BIOS FDT (Flash Descriptor Table) is different or ME protection needs to be disabled when the In-band UpdateBios command is run, a warning message stating necessary actions is displayed.
- When multiple boot is installed, we should use default boot OS to run this command so that when FDT is different, the jumper-less solution can continue updating BIOS after the first reboot.
- OOB UpdateBios command has not been supported for MBs that implemented client ME such as X11SAE-F, X11SAT-F, X11SSZ-(Q)F/LN4F, X11SBA-(LN4)F and C7-series.
- X9DRL-3F/-iF MB does not support OOB update BIOS and OOB/In-band DMI information related commands.

Example:

OOB :

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c UpdateBios --file  
SMCI_BIOS.rom --reboot
```

In-Band:

```
[SUM_HOME]# ./sum -c UpdateBios --file SMCI_BIOS.rom --reboot
```



Notes:

- The OOB usage of this function is available when the BMC node product key is activated.
 - The in-band usage of this function does not require node product key activation.
 - The firmware image can be successfully updated only when the board ID of the firmware image and the managed system are the same.
 - You have to reboot or power up the managed system for the changes to take effect.
 - When using an OOB channel, if the onboard BIOS or the BIOS firmware image does not support OOB functions, the DMI information, such as the motherboard serial number, might be lost after system reboot.
 - DO NOT flash BIOS and BMC firmware images at the same time.
 - --preserve_nv and --flash_smbios options cannot be used at the same time.
 - --flash_smbios option is used to erase and restore SMBIOS information as factory default values. Unless you are familiar with SMBIOS data, do not use this option.
 - --preserve_nv option is used to preserve BIOS NVRAM data. Unless you are familiar with BIOS NVRAM, do not use this option.
 - --preserve_mer option is used to preserve ME firmware region. Unless you are familiar with ME firmware region, do not use this option.
 - --preserve_setting option requires SFT-OOB-LIC key (both OOB and In-Band), and it is only supported in Purley and later platforms. The preserved setting configurations will be listed in a preserved_settings.log. Another way to know which BIOS setting is preserved is to run the commands GetCurrentBioscfg and GetDefaultBioscfg after BIOS is updated. Compare the two files, and the different values between these two files are the preserved settings.
-

5.3.3 Receiving Current BIOS Settings

Use the command `GetCurrentBiosCfg` to execute SUM to get the current BIOS settings from the managed system and save it in the `USER_SETUP.file` file.



Notes:

- This BIOS configuration file is synchronized to BMC from BIOS when the system reboots or powers up.
- If the customer has flashed BMC firmware image, this function will not work until the managed system is first rebooted or powered up.
- Purley and the platforms of later versions support HII. The current BIOS settings will be generated as XML and plain text formats for HII and DAT respectively.
- The XML file of BIOS configuration contains extended ASC-II characters. Please use ISO 8859-1 encoding to view BIOS configuration XML file.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetCurrentBiosCfg --  
file <USER_SETUP.file> [--overwrite]
```

Example:

OOB:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetCurrentBiosCfg --  
file USER_SETUP.file --overwrite
```

In-Band:

```
[SUM_HOME]# ./sum -c GetCurrentBiosCfg --file USER_SETUP.file --overwrite
```

5.3.4 Updating BIOS Settings Based on the Current BIOS Settings

1. Follow the steps in [5.3.3 Receiving Current BIOS Settings](#).
2. Edit the item/variable values in the user setup text file `USER_SETUP.file` to the desired values as illustrated in [4.1 Format of BIOS Settings Text File \(for DAT\)](#) or [4.2 Format of BIOS Settings XML File \(for HII\)](#).
3. Remove unchanged settings/menus in the BIOS configuration file. Note that this step is optional. For details, see [Appendix G. Removing Unchanged BIOS Settings in an XML File](#).

-
4. Use the command `ChangeBiosCfg` with the updated file `USER_SETUP.file` to run `SUM` to update the BIOS configuration.



Notes:

- The editable BIOS configuration items may be changed for different BIOS versions. Please make sure the BIOS configurations are consistent with the BIOS version on the managed system.
- The uploaded configuration will only take effect after a system reboot or power up.
- For HII, when the new BIOS firmware image is flashed, there may be conflicts between the BIOS configuration file and the latest BIOS configuration in the managed system. The current BIOS configuration file should be re-downloaded, re-modified and then updated.
- When hardware resources are changed, a previously downloaded BIOS configuration file may become outdated. When a BIOS configuration file is inconsistent with the latest BIOS configuration in the managed system, using the options `--skip_unknown` and `--skip_bbs` may solve the problem.
For instance, when an AOC has been removed from the managed system, the BIOS configuration for the related menus or settings may become invalid. The option `--skip_unknown` is designed to skip all invalid menus and settings in the latest BIOS configuration in the managed system.
Another example is when a hard disk device is changed, the option string in the Option setting in the BBS related menus may become invalid as well. The option `--skip_bbs` is designed to skip all BBS related menus. The “related BBS menu” is defined as owning “Priorities” in its name and “Boot” for its parent menu.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c ChangeBiosCfg --file  
<USER_SETUP.file> [--reboot]
```

Example:

OOB:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c ChangeBiosCfg --file  
USER_SETUP.file --reboot
```

In-Band:

```
[SUM_HOME]# ./sum -c ChangeBiosCfg --file USER_SETUP.file --reboot
```

5.3.5 Receiving Factory BIOS Settings

Use the command `GetDefaultBiosCfg` to execute SUM to get the default factory BIOS settings from the managed system and save it in the `USER_SETUP.file` file.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetDefaultBiosCfg --  
file <USER_SETUP.file> [--overwrite]
```

Example:

OOB:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetDefaultBiosCfg --  
file USER_SETUP.txt --overwrite
```

In-Band:

```
[SUM_HOME]# ./sum -c GetDefaultBiosCfg --file USER_SETUP.file --overwrite
```

5.3.6 Updating BIOS Settings Based on the Factory Settings

1. Follow the steps in [5.3.5 Receiving Factory BIOS Settings](#).
2. Follow steps 2 to 4 in [5.3.4 Updating BIOS Settings Based on the Current BIOS Settings](#).

5.3.7 Loading Factory BIOS Settings

Use the command `LoadDefaultBiosCfg` to execute SUM to reset the BIOS settings of the managed system to the factory default settings.



Note: The uploaded configuration will take effect only after a reboot or power up.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c LoadDefaultBiosCfg [--  
reboot]
```

Example:

OoB:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c LoadDefaultBiosCfg --reboot
```

In-Band:

```
[SUM_HOME]# ./sum -c LoadDefaultBiosCfg --reboot
```

5.3.8 Receiving DMI Information

Use the command `GetDmiInfo` to execute SUM to get the current supported editable DMI information from the managed system and save it in the `DMI.txt` file.

**Notes:**

- This DMI file is synchronized to BMC from BIOS when the system reboots or powers up.
- If the customer has flashed BMC firmware image, this function will not work until the managed system is first rebooted or powered up.
- The supported editable DMI items could vary from BIOS to BIOS. SUM will only show supported items.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetDmiInfo --file  
<DMI.txt> [--overwrite]
```

Example:**OoB:**

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetDmiInfo --file  
DMI.txt --overwrite
```

In-Band:

```
[SUM_HOME]# ./sum -c GetDmiInfo --file DMI.txt --overwrite
```

5.3.9 Editing DMI Information

There are two ways to edit DMI information for the managed system. You can either execute the `EditDmiInfo` command or manually edit the received `DMI.txt` file.

Manually Editing

-
1. Follow the steps in [5.3.8 Receiving DMI Information](#) to receive the DMI information text file (DMI.txt).
 2. Replace the item values in the DMI.txt file with the desired values illustrated in [4.3 Format of DMI Information Text File](#).
 3. Remove the unchanged items in the text file. Note that this step is optional.



Note: The supported editable DMI items may be changed for different BIOS versions. The version variable of the DMI.txt file must be the same as that from the managed system and should not be edited.

Executing the EditDmiInfo Command

The EditDmiInfo command will only updates (or add if not exists) the specified DMI item in the specified DMI.txt file. When you edit from an empty file, a new file will be created. You can specify a DMI item using [--item_type, --item_name] options or using --shn option with the item's short name. The editable item type, item name and item short name can be found in the DMI.txt file. To receive a DMI.txt file, follow the steps in [5.3.8 Receiving DMI Information](#).

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c EditDmiInfo --file  
<DMI.txt> --item_type <Item Type> --item_name <Item Name> --value <Item Value>  
sum [-i <IP or host name> -u <username> -p <password>] -c EditDmiInfo --file  
<DMI.txt> --shn <Item Short Name> --value <Item Value>  
sum [-i <IP or host name> -u <username> -p <password>] -c EditDmiInfo --file  
<DMI.txt> --shn <Item Short Name> --default
```

Example:

OOB:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c EditDmiInfo --file  
DMI.txt --item_type "System" --item_name "Version" --value "1.02"  
  
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c EditDmiInfo --file  
DMI.txt --shn SYVS --value "1.02"  
  
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c EditDmiInfo --file  
DMI.txt --shn SYVS --default
```

In-Band:

```
[SUM_HOME]# ./sum -c EditDmiInfo --file DMI.txt --shn SYVS --value 1.01
```

5.3.10 Updating DMI Information

1. Follow the steps in [5.3.9 Editing DMI Information](#) to prepare the edited DMI.txt file for updating DMI information.
2. Use the command ChangeDmiInfo with the edited DMI.txt file to run SUM to update the DMI information.

**Notes:**

- The supported editable DMI items may be changed for different BIOS versions. The version variable of the DMI.txt file must be the same as that from the managed system and should not be edited.
 - The uploaded information will only take effect after a system reboots or powers up.
 - X9DRL-3F/-iF MB does not support DMI related functions.
-

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c ChangeDmiInfo --file  
<DMI.txt> [--reboot]
```

Example:**OOB:**

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c ChangeDmiInfo --file  
DMI.txt --reboot
```

In-Band:

```
[SUM_HOME]# ./sum -c ChangeDmiInfo --file DMI.txt --reboot
```

5.3.11 Setting Up BIOS Action

Use the command SetBiosAction to execute SUM to show or hide the settings related to BBS priority.



Note: The uploaded configurations will take effect only after the system is rebooted or powered up.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c SetBiosAction --BBS  
<yes/no> [--reboot]
```

Example:

OOB:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c SetBiosAction --BBS  
<yes/no> --reboot
```

In-Band:

```
[SUM_HOME]# ./sum -c SetBiosAction -BBS <yes/no> --reboot
```

5.4 BMC Management for a Single System

5.4.1 Getting BMC Firmware Image Information

Use the command “GetBmcInfo” to receive the BMC firmware image information from the managed system as well as the BMC firmware image.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetBmcInfo [--file  
<filename>]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetBmcInfo --file  
SMCI_BMC.rom
```

The console output contains the following information.

```
Managed system.....192.168.34.56  
    BMC type.....X10_ATEN  
    BMC version.....01.30  
Local BMC image file.....SMCI_BMC.rom  
    BMC type.....X10_ATEN  
    BMC version.....01.33
```

5.4.2 Updating the BMC Firmware Image

Use the command UpdateBmc with BMC firmware image SMCI_BMC.rom to run SUM to update the managed system.



Notes:

- BMC will be reset after updating.
- BMC configurations will be preserved by default after updating unless --overwrite_cfg option is used.
- DO NOT flash BIOS and BMC firmware images at the same time.
- UpdateBmc command does not support AMI BMC FW. For OOB UpdateBmc usage, please use SUM version 1.4.2.
- --overwrite_cfg option overwrites current BMC configurations including network

settings using factory default values in the given BMC firmware image. This might cause IPMI connection lost. For ATEN BMC FW or AMI Hermon BMC FW, this option requires `--overwrite_sdr` option.

- `--overwrite_sdr` option overwrites current BMC SDR data. For AMI BMC FW, this option requires `--overwrite_cfg` option.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c UpdateBmc --file  
<filename> [--overwrite_cfg] [--overwrite_sdr]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c UpdateBmc --file  
SMCI_BMC.rom
```

5.4.3 Receiving BMC settings

Use the command `GetBmcCfg` to execute SUM to get the current BMC settings from the managed system and save it in the `BMCCfg.xml` file.



Note: Received tables/elements might not be identical between two managed systems. Only supported tables/elements for the managed system will be received.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetBmcCfg --file  
<BMCCfg.xml> [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetBmcCfg --file  
BMCCfg.xml --overwrite
```

5.4.4 Updating BMC Settings

1. Follow the steps in [5.4.3 Receiving BMC settings](#).
2. Edit the configurable element values in the BMC configuration text file BMCCfg.xml to the desired values as illustrated in [4.4 Format of BMC Configuration Text File](#).
3. Skip unchanged tables in the text file by setting the Action attribute as “None”. Note that this step is optional.
4. Remove unchanged tables/elements in the text file. Note that this step is optional.
5. Use the command ChangeBmcCfg with the updated BMCCfg.xml file to run SUM to update the BMC configuration.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c ChangeBmcCfg --file  
<BMCCfg.xml>
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c ChangeBmcCfg --file  
BMCCfg.xml
```



Note: The connection could drop if the LAN configuration is changed.

5.5 Event Log Management for a Single System

5.5.1 Getting System Event Log

Use the command `GetEventLog` to execute SUM to show the current system event log (including both BIOS and BMC event log) from the managed system. With the `--file` option, the event log can be saved in the `EventLog.txt` file.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetEventLog [--file  
<EventLog.txt>] [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetEventLog --file  
EventLog.txt --overwrite
```

5.5.2 Clearing System Event Log

Use the command `ClearEventLog` to execute SUM to clear the event log (both BMC and BIOS event log) in the managed system.



Notes:

- BIOS event log in BMC will be cleared immediately.
- BIOS event log in BIOS will be cleared only after system BIOS reboot.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c ClearEventLog [--  
reboot]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c ClearEventLog --reboot
```

5.6 CMM Management for a Single System (OOB Only)

5.6.1 Receiving CMM Firmware Image Information

Use the command `GetCmmInfo` to receive the CMM firmware image information from the managed system as well as the CMM firmware image.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetCmmInfo [--file  
<filename>]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetCmmInfo --file  
SMCI_CMM.rom
```

The console output contains the following information.

```
Managed system.....192.168.34.56  
    CMM type.....MicroCMM  
    CMM version.....09.01  
Local CMM image file.....SMCI_CMM.rom  
    CMM type.....MicroCMM  
    CMM version.....09.10
```

5.6.2 Updating the CMM Firmware Image

Use the command `UpdateCmm` with the CMM firmware image `SMCI_CMM.rom` to update the managed system.



Notes:

- CMM will be reset after updating.
- CMM configurations will be reset to default values after updating unless the `--overwrite_cfg` option is used.
- DO NOT flash BIOS and BMC firmware images at the same time.
- For OOB `UpdateCmm` usage, please use SUM version 1.6.2 or later.
- The `--overwrite_cfg` option overwrites the current CMM configurations, including network settings using factory default values in the given CMM firmware image. This

-
-
- might cause the IPMI connection to be lost.
- If the CMM FW web server becomes unreachable after CMM FW is updated, use the ipmitool to troubleshoot. Follow these steps:
 - a. Reset CMM.
\$ ipmitool -H \${CMM_IP} -U {CMM_USER} -P {CMM_PASSWD} raw 0x30 0x34 0x05
 - b. Wait for 3 minutes, and then check if the CMM web is reachable. If it is reachable, the troubleshooting is done.
 - c. If the CMM web is still unreachable, load the CMM factory defaults.
(**Note:** All CMM settings except LAN/FRU will be LOST.)
\$ ipmitool -H \${CMM_IP} -U {CMM_USER} -P {CMM_PASSWD} raw 0x30 0x33 0x14
 - d. Wait for 3 minutes and check the CMM web again.
-

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c UpdateCmm --file  
<filename> [--overwrite_cfg]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c UpdateCmm --file  
SMCI_CMM.rom
```

5.6.3 Receiving CMM Settings

Use the command GetCmmCfg to execute SUM to get the current CMM settings from the managed system and save them in the CMMCfg.xml file.



Note: Received tables/elements might not be identical between two managed systems. Only tables/elements supported for the managed system will be received.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetCmmCfg --file  
<CMMCfg.xml> [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetCmmCfg --file  
CMMCfg.xml --overwrite
```

5.6.4 Updating CMM Settings

1. Follow the steps in [5.6.3 Receiving CMM settings](#).
2. Edit the configurable element values in the CMM configuration file CMMCfg.xml to the desired values as illustrated in [4.6 Format of CMM Configuration Text File](#).
3. Set the Action attribute as “None” to skip the unchanged tables in the text file. Note that this step is optional.
4. Remove unchanged tables/elements in the text file. Note that this step is optional.
5. Use the command ChangeCmmCfg with the updated CMMCfg.xml file to run SUM to update the CMM configuration.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c ChangeCmmCfg --file  
<CMMCfg.xml>
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c ChangeCmmCfg --file  
CMMCfg.xml
```



Note: The connection might be lost if the LAN configuration is changed.

5.7 Applications for a Single System (OOB Only)

5.7.1 Providing TPM Module Capabilities

Use the command `TpmProvision` to execute SUM to enable TPM module capabilities for the managed system. Before executing the command, the TPM module should be installed on the managed system.

Syntax:

```
sum -i <IP or host name> -u <username> -p <password> -c TpmProvision --image_url  
<URL> --reboot --lock <yes> [--id <id for URL> --pw <password for URL>]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p ADMIN -c TpmProvision --image_url  
'smb://192.168.35.1/MySharedPoint/MyFolder' --id smbuid --pw smbpasswd --reboot -  
-lock yes
```

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p ADMIN -c TpmProvision --image_url  
'http://192.168.35.1/MySharedPoint/MyFolder' --id smbuid --pw smbpasswd --reboot  
--lock yes
```

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p ADMIN -c TpmProvision --image_url  
'\\192.168.35.1\MySharedPoint\MyFolder\' --id smbuid --pw smbpasswd --reboot --  
lock yes
```



Notes:

- This command is supported since X10 Grantley platform.
- The TPM ISO images are not included in the SUM package. This ISO image can be acquired from Supermicro. Each SUM release could require different ISO images as noted in SUM release notes. Please acquire correct `TPM_version_YYYYMMDD.zip`, unzip the zip file and get TPM ISO images for usage.
- With TPM ISO images, TPM capabilities can be enabled or cleared.
- The BIOS will be rebooted several times during provisioning.
- To clear TPM capability, see [5.7.2 Clearing TPM Module Capabilities](#).
- Space character is prohibited for SAMBA password. SUM will check if TPM module status on the managed system. If not installed or malfunctioned, exit code 36/37 will be returned respectively. If the TPM is locked, exit code 37 will be returned.

-
- The --cleartpm option clears the ownership of the TPM module.
 - The --lock yes option locks the TPM module.
 - If CPU or platform does not support TXT, SUM stops TPM provision procedures.
-

5.7.2 Clearing TPM Module Capabilities

Use the command TpmProvision with options --cleartpm and --reboot to clear TPM module capabilities from the managed system. For usage of the --image_url option, refer to the Notes in [5.7.1 Providing TPM Module Capabilities](#).

Syntax:

```
sum -i <IP or host name> -u <username> -p <password> -c TpmProvision --image_url  
<URL> [--id <id for URL> --pw <password for URL>] --cleartpm --reboot
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p ADMIN -c TpmProvision --image_url  
'smb://192.168.35.1/MySharedPoint/MyFolder' --id smbaid --pw smbpasswd --cleartpm  
--reboot
```

5.7.3 Providing an ISO Image as a Virtual Media through BMC and File Server

Use the command MountIsoImage to mount ISO image as a virtual media to the managed system through SAMBA/HTTP server.

Syntax:

```
sum -i <IP or host name> -u <username> -p <password> -c MountIsoImage --  
image_url <URL> [--id <id for URL> --pw <password for URL>]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p ADMIN -c MountIsoImage --  
image_url 'smb://192.168.35.1/MySharedPoint/MyFolder/Image.iso' --id smbaid --pw  
smbpasswd
```

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p ADMIN -c MountIsoImage --  
image_url 'http://192.168.35.1/MySharedPoint/MyFolder/Image.iso' --id smbuid --pw  
smbpasswd
```

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p ADMIN -c MountIsoImage --  
image_url '\\192.168.35.1\MySharedPoint\MyFolder\Image.iso' --id smbuid --pw  
smbpasswd
```



Note: Space character is prohibited for SAMBA password.

5.7.4 Removing ISO Image as a Virtual Media

Use the command `UnmountIsoImage` to remove ISO image as a virtual media from the managed system.

Syntax:

```
sum -i <IP or host name> -u <username> -p <password> -c UnmountIsoImage
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p ADMIN -c UnmountIsoImage
```

5.8 Storage Management for a Single System

5.8.1 Getting RAID Firmware Image Information

Use the command `GetRaidControllerInfo` to receive the RAID firmware image information from the managed system or the RAID firmware image.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetRaidControllerInfo  
[--file <filename>] [--dev_id <controller_id>]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetRaidControllerInfo  
--file RAID.rom
```

The console output contains the following information.

```
Managed System.....192.168.34.56  
  RAID Controller device ID.....Device 0  
  RAID Controller Product Name.....Broadcom 3108 MegaRAID RO  
  RAID Controller Firmware Version...4.210.10-2910  
  
Local RAID FW image file.....RAID.rom  
  RAID Controller Product Name.....Broadcom 3108  
  RAID Controller Firmware Version...4.600.00-4837-TE
```

5.8.2 Updating the RAID Firmware Image

Use the command `UpdateRaidController` with RAID firmware image `RAID.rom` to update the managed system.



Note:

The command `UpdateRaidController` is supported by the following firmware images:

1. RAID firmware image of version 4.650.00-8095 and later.

-
2. For Grantley platform, BMC firmware images of version REDFISH 3.52 and later.
 3. For Greenlow platform, BMC firmware images of version ATEN X11 1.33 and later.
 4. For Purley platform, BMC firmware images of version ATEN X11DP 1.10 and later.
-

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c UpdateRaidController  
--file <filename> --dev_id <RAID controller device ID> [--reboot]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c UpdateRaidController --  
file RAID.rom --reboot
```

5.8.3 Receiving RAID Settings

Use the command GetRaidCfg to execute SUM to get the current RAID settings from the managed system and save it in the RAIDCfg.xml file.



Note: The received tables/elements between the two managed systems might not be identical. Only the supported tables/elements for the managed system will be received.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c GetRaidCfg --file  
<RAIDCfg.xml> [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetRaidCfg --file  
RAIDCfg.xml --overwrite
```

5.8.4 Updating RAID Settings

1. Follow the steps in [5.8.3 Receiving RAID Settings](#).

-
2. Edit the configurable element values in the RAID configuration text file RAIDCfg.xml as illustrated in [4.5 Format of RAID Configuration Text File](#).
 3. Set the Action attribute as “None” to skip the unchanged tables in the text file. Note that this step is optional.
 4. Remove the unchanged tables/elements in the text file. Note that this step is optional.
 5. Use the command ChangeRaidCfg with the updated RAIDCfg.xml file to run SUM to update the RAID configuration.

Syntax:

```
sum [-i <IP or host name> -u <username> -p <password>] -c ChangeRaidCfg --file  
<RAIDCfg.xml>
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c ChangeRaidCfg --file  
RAIDCfg.xml
```

5.8.5 Getting SATA HDD information

Use the command GetSataInfo to get the current SATA HDD information under on-board AHCI controller from the managed system.

Syntax:

```
sum -i <IP or host name> -u <username> -p <password> -c GetSataInfo
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetSataInfo
```

The console output contains the following information.

SATA HDD Information

=====

[HDD(0)]

Controller Name: PCH SATA

Configuration Type: AHCI

Slot ID: 0

Slot Populated: Yes

Model Name: INTEL SSDSC2BB120G4

Serial Number: PHWL542502J2120LGN

HDD Firmware Version: D201037

S.M.A.R.T. Supported: Yes

5.8.6 Getting NVMe information

Use the command `GetNvmeInfo` to get the current NVMe information from the managed system.

Syntax:

```
sum -i <IP or host name> -u <username> -p <password> -c GetNvmeInfo [--dev_id  
<device_id> ]
```

Example:

```
[SUM_HOME]# ./sum -i 192.168.34.56 -u ADMIN -p XXXXXX -c GetNvmeInfo -dev_id 0
```

The console output contains the following information.

NVMe Device information

=====

[NVMe Controller(1)]

[Group(1)]

Group ID: 0

[NVMe SSD(1)]

Slot: 0

Temperature: 37 degree C

Device Class: Mass storage controller

Device SubClass: Non-Volatile memory controller

Device Program Interface: NVM express

Vendor Name: Samsung Electronics Co., Ltd.

Serial Number: S1NONYAF800079

Model Number: MZWEI400HAGM-0003

Port 0 Max Link Speed: 8 GT/s

Port 0 Max Link Width: x4

Port 1 Max Link Speed: N/A

Port 1 Max Link Width: N/A

Initial Power Requirement: 10 Watts

Max Power Requirement: 25 Watts

Located Status: Not Located

6 Managing Multiple Systems (OOB Only)

For managing multiple systems, SUM provides the `-l` option to concurrently execute OOB command on multiple systems enumerated in a system list file.

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c <OOB command>
[command options]
```

The managed systems should be enumerated row-by-row in the system list file. Two formats are supported for general commands as follows. (For the `ActivateProductKey` command, different formats are used. See [6.2.1 Activating Multiple Managed Systems](#).)

Format 1: BMC_IP_or_HostName

Format 2: BMC_IP_or_HostName Username Password

Options `-u` and `-p` should be specified in the command line for Format 1. In contrast, options `-u` and `-p` can be removed from the command line for Format 2. In addition, the Username/Password in the system list file overwrites the options `-u` and `-p` in the command line.

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetDmiInfo --file DMI.txt
--overwrite
```

SList.txt:

```
192.168.34.56
192.168.34.57 ADMIN1 PASSWORD1
```

For the first managed system 192.168.35.56, SUM applies `-u ADMIN` and `-p PASSWORD` in command line to execute the `GetDmiInfo` command. On the other hand, for the second managed system 192.168.34.57, SUM adopts username (ADMIN1) and password (PASSWORD1) filled in SList.txt to execute the `GetDmiInfo`

command. Two executions are run concurrently and the execution status/results can be referenced in [6.1.2 File Output](#), [6.1.3 Screen Output](#) and [6.1.4 Log Output](#).

For the usage of commands that take input files as arguments such as the UpdateBios command, see [6.1.1 File Input](#) for its usage.



Note: Repeated managed system IPs or names in system list file are not allowed.

6.1 Input Output Controls for Multiple Systems

6.1.1 File Input

SUM uses the input file specified in the command line (through --file option) to manage multiple systems.

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c UpdateBios --file  
SMCI_BIOS.rom
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

In this example, SUM uses the input file SMCI_BIOS.rom specified in the command line to concurrently update BIOS for both managed systems 192.168.34.56 and 192.168.34.57 enumerated in the SList.txt file.



Note: SUM only supports single input files for managed systems in one command.

6.1.2 File Output

When SUM outputs files for managed systems, each managed system has one individual output file. The individual output file names are those specified in the command line (through --file option) appended by “.” and the “BMC/CMM_IP_or_Hostname”, which is obtained from the system list file.

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetDmiInfo --file DMI.txt
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

In this example, DMI information from the managed systems 192.168.34.56 and 192.168.34.57 is written to files “DMI.txt.192.168.34.56” and “DMI.txt.192.168.34.57”, respectively.

6.1.3 Screen Output

When SUM begins the execution for the managed systems, progress output will be continuously updated to a log file created when SUM is invoked.

When the SUM finishes execution, the final execution status for each managed system will be shown on the screen output row-by-row. Each row consists of "System Name", "Elapsed", "Status" and "Exit Code". "System name" is the "BMC/CMM_IP_or_Hostname" from the system list file. "Elapsed" is the time elapsed when the command is executed. "Status" is provided as indicator: "WAITING", "RUNNING", "SUCCESS", or "FAILED." The status summary will be shown before and after the status list. After listing the final status, SUM will exit and return the exit code of the concurrent executions.

You can also press the "ENTER" key to see the current execution status before the program is finished. The format of the current status is the same as the final status.

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetDmiInfo --file DMI.txt
--overwrite
```

SList.txt:

```
192.168.34.56
192.168.34.57
```

Screen Output:

```
Supermicro Update Manager (for UEFI BIOS) 1.2.0 (2013/10/02) Copyright (C) 2013
Super Micro Computer, Inc. All rights reserved
```

```
Start to do GetDmiInfo for machines listed in SList.txt
```

```
Log file created:
```

```
SList.txt.log_2013-10-02_15:57:40_7370
```

```
Press ENTER to see the current execution status:
```

```
-----Current Status-----
```

```
Executed Command:
```

```
./sum -l SList.txt -u ADMIN -p ***** -c GetDmiInfo --file DMI.txt --overwrite
```

Summary:

2 EXECUTIONS (WAITING: 0 RUNNING: 1 SUCCESS: 1 FAILED: 0)

Status List:

System Name		Elapsed		Status		Exit Code
192.168.34.56		00:00:02		SUCCESS		0
192.168.34.57		00:00:03		RUNNING		

Summary:

2 EXECUTIONS (WAITING: 0 RUNNING: 1 SUCCESS: 1 FAILED: 0)

-----Final Results-----

Executed Command:

./sum -l SList.txt -u ADMIN -p ***** -c GetDmiInfo --file DMI.txt --overwrite

Summary:

2 EXECUTIONS (WAITING: 0 RUNNING: 0 SUCCESS: 2 FAILED: 0)

Status List:

System Name		Elapsed		Status		Exit Code
192.168.34.56		00:00:02		SUCCESS		0
192.168.34.57		00:00:07		SUCCESS		0

Summary:

2 EXECUTIONS (WAITING: 0 RUNNING: 0 SUCCESS: 2 FAILED: 0)

6.1.4 Log Output

When SUM is executed for the managed systems, a log file will be created. This log file will be continuously updated with the execution message for every system. The log file name, which will be shown on the screen, is the system list file name appended by “.log_”, “yyyy-mm-dd_hh-mm-ss” (date and time) and “_PID” (process ID). The log file consists of one “Last Update Time” section, one “Execution parameters” section, one “Summary” section, one “Status List” section and, for each system, one “Execution Message” section. The following example shows the log file SList.txt.log_2013-10-02_15:57:40_7370 which was created from the example in [6.1.3 Screen Output](#).

The SList.log will be saved in /var/log/supermicro/SUM if it exists. Otherwise, it will be saved in the same folder as SList.txt.

Example:

```
-----Last Update Time-----
2013-10-02_15:57:47
Process finished.
-----Execution parameters-----
IPMI server port: 38927
Executed Command:
./sum -l SList.txt -u ADMIN -p ***** -c GetDmiInfo --file DMI.txt --overwrite
-----Summary-----
2 EXECUTIONS ( WAITING: 0  RUNNING: 0  SUCCESS: 2  FAILED: 0  )
-----Status List-----
System Name      |Start Time      |End Time        |Elapsed |Status   |Exit Code
192.168.34.56    |10-02_15:57:40 |10-02_15:57:42 |00:00:02|SUCCESS  |0
192.168.34.57    |10-02_15:57:40 |10-02_15:57:47 |00:00:07|SUCCESS  |0
-----Execution Message-----
System Name
192.168.34.56
Message
Supermicro Update Manager (for UEFI BIOS) 1.2.0 (2013/10/02) Copyright (C) 2013
Super Micro Computer, Inc. All rights reserved

File "DMI.txt.192.168.34.56" is created.
-----Execution Message-----
System Name
192.168.34.57
Message
Supermicro Update Manager (for UEFI BIOS) 1.2.0 (2013/10/02) Copyright (C) 2013
Super Micro Computer, Inc. All rights reserved

File "DMI.txt.192.168.34.57" is created.
```

6.2 Key Management for Multiple Systems

6.2.1 Activating Multiple Managed Systems

You can activate multiple systems concurrently using SUM through the `-l` option and the command `ActivateProductKey`. (You should first obtain the node product keys for the managed systems. See [3.1 Receiving Node Product Keys from Supermicro](#).)

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c ActivateProductKey
```

The managed systems should be enumerated row-by-row in the system list file. For the `ActivateProductKey` command, two formats are supported.

Format 1: BMC_IP_or_HostName Node_Product_Key

Format 2: BMC_IP_or_HostName Username Password Node_Product_Key

Options `-u` and `-p` options are required to specify in the command line for Format 1. The options `-u` and `-p` can be removed from the command line for Format 2. In addition, the Username/Password in the system list file overwrites the options `-u` and `-p` in the command line. If an option `--key` is specified in the command line, the exception will be thrown.

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c ActivateProductKey
```

SList.txt:

```
192.168.34.56 1111-1111-1111-1111-1111-1111
192.168.34.57 ADMIN1 PASSWORD1 2222-2222-2222-2222-2222-2222
```

For the first managed system 192.168.34.56, SUM applies `-u ADMIN` and `-p PASSWORD` in the command line and node product key 1111-1111-1111-1111-1111-1111 to execute the command `ActivateProductKey`. In contrast, for the second managed system 192.168.34.57, SUM adopts username ADMIN1, password

PASSWORD1 and node product key 2222-2222-2222-2222-2222-2222 to execute the command ActivateProductKey. These two managed systems will be activated concurrently. The presentation of execution status and results will be similar to [6.1.3 Screen Output](#) and [6.1.4 Log Output](#).

6.2.2 Querying Node Product Key

To query the node product keys activated in the managed systems, use the command QueryProductKey.

Syntax:

```
sum -l < system list file > [-u <username> -p <password>] -c QueryProductKey
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c QueryProductKey
SList.txt:
    192.168.34.56
    192.168.34.57
```

If the execution “Status” field of a managed system is SUCCESS, the node product keys activated in the managed system will be shown in the “Execution Message” section in the created log file.

6.2.3 Clearing Node Product Keys

To clear the node product keys activated in the managed systems, use the command ClearProductKey. However, before executing the command ClearProductKey, query the existing NodeProductKeyName and NodeProductKeyIndex values from the output of the command “QueryProductKey” (see [6.2.2 Querying Node Product Key](#)).

Syntax:

```
sum -l < system list file > [-u <username> -p <password>] -c ClearProductKey --
key_name <NodeProductKeyName>
```

```
sum -l < system list file > [-u <username> -p <password>] -c ClearProductKey --
key_index <NodeProductKeyIndex>
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c ClearProductKey --
key_name SUM
```

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c ClearProductKey --  
key_index 1  
SList.txt:  
    192.168.34.56  
    192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, for the --key_name example the SUM key is cleared from these two managed systems. For the --key_index example, the key with index 1 is cleared in these two managed systems.

6.3 System Checks for Multiple System

6.3.1 Checking OOB Support

Use the command CheckOOBSupport to check if both BIOS and BMC firmware images support OOB functions for the managed systems. The received information will be the same as that in [5.2.1 Checking OOB Support](#).

Syntax:

```
sum -l < system list file > [-u <username> -p <password>] -c CheckOOBSupport
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c CheckOOBSupport
SList.txt:
    192.168.34.56
    192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, the BIOS and BMC capabilities of the managed system will be shown in the “Execution Message” section in the created log file.

6.3.2 Checking Asset Information

Use the command CheckAssetInfo to check the asset information in the managed systems. The received information will be the same as that in [5.2.2 Checking Asset Information \(OOB Only\)](#).

Syntax:

```
sum -l < system list file > [-u <username> -p <password>] -c CheckAssetInfo
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c CheckAssetInfo
SList.txt:
    192.168.34.56
    192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, the asset configuration of the managed system will be shown in the “Execution Message” section in the created log file.

6.3.3 Checking Sensor Data

Use the command `CheckSensorData` to check the sensor data in the managed systems. The message output will be the same as that in [5.2.3 Checking Sensor Data \(OOB Only\)](#).

Syntax:

```
sum -l < system list file > [-u <username> -p <password>] -c CheckSensorData
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c CheckSensorData
SList.txt:
    192.168.34.56
    192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, the sensor data of the managed system will be shown in the “Execution Message” section in the created log file.

6.3.4 Checking System Utilization

Use the command `CheckSystemUtilization` to check the utilization status in the managed systems. The message output will be the same as that in [5.2.4 Checking System Utilization \(OOB Only\)](#).

Syntax:

```
sum -l < system list file > [-u <username> -p <password>] -c
CheckSystemUtilization
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c CheckSystemUtilization
SList.txt:
    192.168.34.56
    192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, the utilization status of the managed system will be shown in the “Execution Message” section in the created log file.

6.4 BIOS Management for Multiple Systems

6.4.1 Getting BIOS Firmware Image Information

Use the command `GetBiosInfo` to receive the BIOS firmware image information from the managed systems as well as the input BIOS firmware image. The message output will be the same as that in [5.3.1 Getting BIOS Image Information](#)

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetBiosInfo [--file  
<filename>]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetBiosInfo --file  
SMCI_BIOS.rom
```

SList.txt:

```
192.168.34.56
```

```
192.168.34.57
```



Note: If the execution “Status” field of a managed system is SUCCESS, the BIOS information of the managed system will be shown in its “Execution Message” section in the created log file.

6.4.2 Updating the BIOS Firmware Image

Use the command `UpdateBios` with the BIOS firmware image `SMCI_BIOS.rom` to update managed systems. For detailed usage notes of the `UpdateBios` command, see the usage notes in [5.3.2 Updating the BIOS Image](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c UpdateBios --file  
<filename> [options...]
```

Option Commands	
<code>--reboot</code>	Forces the managed systems to reboot.
<code>--flash_smbios</code>	Overwrites SMBIOS data.
<code>--preserve_mer</code>	Preserves ME firmware region.
<code>--preserve_nv</code>	Preserves NVRAM.
<code>--preserve_setting</code>	Preserves setting configurations.

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c UpdateBios --file
SMCI_BIOS.rom
```

SList.txt:

```
192.168.34.56
192.168.34.57
```

The execution progress for the managed system will be continuously updated to the “Execution Message” section of the managed system in the created log file.

6.4.3 Receiving Current BIOS Settings

Use the command `GetCurrentBiosCfg` to get the current BIOS settings from the managed systems and save it in the output files individually for each managed system enumerated in the system list file. Note that Purley and the platforms of later versions support HII configurations. A file in XML format will be generated for HII while a plain text file will be generated for DAT.

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetCurrentBiosCfg --
file <USER_SETUP.file> [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetCurrentBiosCfg --file
USER_SETUP.file --overwrite
```

SList.txt:

192.168.34.56

192.168.34.57

If the execution “Status” field for a managed system (e.g. 192.168.34.56) is SUCCESS, its current settings are stored in its output file, e.g. USER_SETUP.file.192.168.34.56. The option --overwrite is used to force overwrite the existing file, e.g. USER_SETUP.file.192.168.34.56, if the output file already exists.



Notes:

- Purley and the platforms of later versions support HII. The current BIOS settings will be generated as a file in XML format and plain text file for HII and DAT, respectively.
 - BIOS configuration XML file contains extended ASC-II characters. Please use ISO 8859-1 encoding to view BIOS configuration XML file.
-

6.4.4 Updating BIOS Settings Based on a Current Sample Settings

1. Select one managed system as the golden sample for current BIOS settings.
2. Follow the steps in [5.3.3 Receiving Current BIOS Settings](#) for that system.
3. Edit the item/variable values in the user setup file USER_SETUP.file to the desired values as illustrated in [4.1 Format of BIOS Settings Text File](#) (for DAT) or [4.2 Format of BIOS Settings XML File](#) (for HII).
4. Remove unchanged items/variables in the text file. Note that this step is optional.
5. Use the command ChangeBiosCfg with the modified USER_SETUP.file to update the BIOS configurations for managed systems.



Notes:

- The uploaded configurations will only take effect after the managed systems reboot or power up.
 - For HII, when the new BIOS firmware image is flashed, there may be conflicts between the XML files of new and old BIOS settings. The XML file of current BIOS settings should be re-downloaded, re-modified and then updated.
 - BIOS configuration XML file contains extended ASC-II characters. Please use ISO 8859-1 encoding to view and save BIOS configuration XML file.
-

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c ChangeBiosCfg --file  
<USER_SETUP.file> [--reboot]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c ChangeBiosCfg --file  
USER_SETUP.file --reboot
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

6.4.5 Receiving Factory BIOS Settings

Use the command `GetDefaultBiosCfg` to get the default factory BIOS settings from the managed systems and save it in the output files individually for each managed system enumerated in the system list file.

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetDefaultBiosCfg --  
file <USER_SETUP.file> [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetDefaultBiosCfg --file  
USER_SETUP.file
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

If the execution “Status” field for a managed system (e.g. 192.168.34.56) is SUCCESS, its default settings are saved in its output file, e.g. USER_SETUP.file.192.168.34.56. The option `--overwrite` is used to force overwrite the existing file, e.g. USER_SETUP.file.192.168.34.56, if the output file already exists.

6.4.6 Updating BIOS Settings Based on Factory Sample Settings

1. Select one managed system as the golden sample for factory default BIOS settings.
2. Follow the steps in [5.3.5 Receiving Factory BIOS Settings](#) for that system.
3. Follow steps 3 to 5 in [6.4.4 Updating BIOS Settings Based on a Current Sample Settings](#).

6.4.7 Loading Factory BIOS Settings

Use the command `LoadDefaultBiosCfg` to reset the BIOS settings of the managed systems to the factory default settings.



Note: The uploaded configurations will only take effect after the managed systems reboot or power up.

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c LoadDefaultBiosCfg [-reboot]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c LoadDefaultBiosCfg --reboot
```

SList.txt:

```
192.168.34.56
192.168.34.57
```

6.4.8 Receiving DMI Information

Use the command `GetDmiInfo` to get the current supported editable DMI information from the managed systems and save it in the output files individually for each managed system enumerated in the system list file. For detailed usage notes of the command `GetDmiInfo`, see [5.3.8 Receiving DMI Information](#)

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetDmiInfo --file <DMI.txt> [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetDmiInfo --file DMI.txt --overwrite
```

SList.txt:

```
192.168.34.56
192.168.34.57
```

If the execution “Status” field for a managed system (e.g. 192.168.34.56) is SUCCESS, its DMI settings are saved in its output file, e.g. DMI.txt.192.168.34.56. The option --overwrite is used to force overwrite its existing file, e.g.DMI.txt.192.168.34.56, if the output file already exists.

6.4.9 Editing DMI Information

Use the command EditDmiInfo to edit the editable DMI items. For details on the EditDmiInfo command, refer to [5.3.9 Editing DMI Information](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c EditDmiInfo --file
<DMI.txt> --item_type <Item Type> --item_name <Item Name> --value <Item Value>
sum -l <system list file> [-u <username> -p <password>] -c EditDmiInfo --file
<DMI.txt> --shn <Item Short Name> --value <Item Value>
sum -l <system list file> [-u <username> -p <password>] -c EditDmiInfo --file
<DMI.txt> --shn <Item Short Name> --default
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c EditDmiInfo --file
DMI.txt --item_type "System" --item_name "Version" --value "1.01"
```

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c EditDmiInfo --file
DMI.txt --shn SYVS --value "1.01"
```

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c EditDmiInfo --file
DMI.txt --shn SYVS --default
```

SList.txt:

```
192.168.34.56
```

```
192.168.34.57
```

If the execution “Status” field for a managed system (e.g. 192.168.34.56) is “SUCCESS”, its edited DMI information are updated in its output file, e.g. DMI.txt.192.168.34.56.

6.4.10 Updating DMI Information Based on a Sample DMI Information

1. Select one managed system as the golden sample for DMI information.

-
- Follow the steps in [5.3.9 Editing DMI Information](#) to prepare the edited DMI.txt file for updating DMI information.
 - Use the command ChangeDmiInfo with the edited DMI.txt file to update the DMI information for the managed systems.
-

**Notes:**

- The uploaded information will only take effect after the managed systems reboot or power up.
 - For detailed usage notes of the command ChangeDmiInfo, see [5.3.10 Updating DMI Information](#).
-

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c ChangeDmiInfo --file  
<DMI.txt> [--reboot]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c ChangeDmiInfo --file  
DMI.txt --reboot
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

6.4.11 Set BIOS Action

Use the command SetBiosAction to show/hide BBS priority related settings.



Note: The uploaded configurations will only take effect after the managed systems reboot or power up.

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c SetBiosAction --BBS  
<yes/no> [--reboot]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c SetBiosAction --BBS  
<yes/no> --reboot
```

SList.txt:

192.168.34.56

192.168.34.57

6.5 BMC Management for Multiple Systems

6.5.1 Getting BMC Firmware Image Information

Use the command `GetBmcInfo` to receive the BMC firmware image information from the managed systems as well as the input BMC firmware image. The information will be the same as that in [5.4.1 Getting BMC Image Information](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetBmcInfo [--file  
<filename>]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetBmcInfo --file  
SMCI_BMC.rom
```

SList.txt:

```
192.168.34.56
```

```
192.168.34.57
```

If the execution "Status" field for a managed system is SUCCESS, the BMC information of the managed system will be shown in the "Execution Message" section of the managed system in the created log file.

6.5.2 Updating the BMC Firmware Image

Use the command `UpdateBmc` with BMC firmware image `SMCI_BMC.rom` to update managed systems. For detailed usage notes of the `UpdateBmc` command, see the usage notes in [5.4.2 Updating the BMC Image](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c UpdateBmc --file  
<filename> [--overwrite_cfg] [--overwrite_sdr]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c UpdateBmc --file  
SMCI_BMC.rom
```

SList.txt:

192.168.34.56

192.168.34.57

The execution progress for the managed system will be continuously updated to the “Execution Message” section of the managed system in the created log file.

6.5.3 Receiving BMC Settings

Use the command GetBmcCfg to get the current BMC settings from the managed systems and save it in the output files individually for each managed system enumerated in the system list file. For detailed usage notes of the GetBmcCfg command, see the usage notes in [5.4.3 Receiving BMC Settings](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetBmcCfg --file <BMCCfg.xml> > [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetBmcCfg --file BMCCfg.xml --overwrite
```

SList.txt:

192.168.34.56

192.168.34.57

If the execution “Status” field for a managed system (e.g. 192.168.34.56) is SUCCESS, its current settings will be stored in its output file, e.g. BMCCfg.xml.192.168.34.56. The option --overwrite is used to force overwrite its existing file, e.g. BMCCfg.xml.192.168.34.56, if the output file already exists.

6.5.4 Updating BMC Settings

1. Select one managed system as the golden sample for current BMC settings.
2. Follow the steps in [5.4.3 Receiving BMC Settings](#) for the managed system.
3. Edit the configurable element values in the BMC configuration text file BMCCfg.xml to the desired values as illustrated in [4.4 Format of BMC Configuration Text File](#).

-
4. Skip unchanged tables in the text file by setting Action attribute as “None”. Note that this step is optional.
 5. Remove unchanged tables/elements in the text file. Note that this step is optional.
 6. Use the command `ChangeBmcCfg` with the modified `BMCCfg.xml` file to update the BMC configurations for multiple systems.

**Notes:**

- Some table settings cannot be applied to each managed system uniformly, e.g., FRU and LAN configurations. You might need to change its table action to “None” in step 4 or remove tables/elements in step 5.
- LAN `IPAddress` field will be skipped in multiple system usage.
- For detailed usage notes of the `ChangeBmcCfg` command, see the usage notes in [5.4.4 Updating BMC Settings](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c ChangeBmcCfg --file  
<BMCCfg.xml>
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c ChangeBmcCfg --file  
BMCCfg.xml
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, its BMC settings are updated.

6.6 Event Log Management for Multiple Systems

6.6.1 Getting System Event Log

Use the command `GetEventLog` to show the current system event log (including both BIOS and BMC event log) from the managed systems and save them in the output files individually for each managed system enumerated in the system list file with the `--file` option. Without `--file` option, you can choose to show the event log in the execution log file instead. For detailed execution notes, see [5.5.1 Getting System Event Log](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetEventLog [--file  
<EventLog.txt>] [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetEventLog --file  
EventLog.txt
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

If the execution “Status” field for a managed system (e.g. 192.168.34.56) is SUCCESS, its event logs are stored in its output file, e.g. `EventLog.txt.192.168.34.56`. The option `--overwrite` is used to force overwrite its existing file, e.g. `EventLog.txt.192.168.34.56`, if the output file already exists. If `--file` option is not used, the event log for each managed system will be shown in the “Execution Message” section of the managed system in the created execution log file.

6.6.2 Clearing System Event Log

Use the command `ClearEventLog` to clear the event log (both BMC and BIOS event log) for each managed systems. For detailed execution notes, see [5.5.2 Clearing System Event Log](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c ClearEventLog [--reboot]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c ClearEventLog --reboot
```

SList.txt:

```
192.168.34.56
```

```
192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, its event logs are cleared.

6.7 CMM Management for Multiple Systems

6.7.1 Receiving CMM Image Information

Use the command `GetCmmInfo` to receive the CMM firmware image from the managed systems as well as the input CMM firmware image. The information will be the same as that in [5.6.1 Getting CMM Image Information](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetCmmInfo [--file  
<filename>]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetCmmInfo --file  
SMCI_CMM.rom
```

SList.txt:

```
192.168.34.56
```

```
192.168.34.57
```

If the Status field for a managed system shows “SUCCESS”, the CMM information of the managed system will be shown in the “Execution Message” section of the managed system in the created log file.

6.7.2 Updating the CMM Firmware Image

Use the command `UpdateCmm` with the CMM firmware image `SMCI_CMM.rom` to update managed systems. For details on the `UpdateCmm` command, see the notes in [5.6.2 Updating the CMM Image](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c UpdateCmm --file  
<filename> [--overwrite_cfg]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c UpdateCmm --file  
SMCI_CMM.rom
```

SList.txt:

192.168.34.56

192.168.34.57

The execution progress of the system will be continuously updated in the “Execution Message” section of the managed system in the created log file.

6.7.3 Receiving CMM Settings

Use the command GetCmmCfg to get the current CMM settings from managed systems and save it in the output files individually for each managed system enumerated in the system list file. For details on the GetCmmCfg command, see the notes in [5.6.3 Receiving CMM Settings](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetCmmCfg --file <CMMCfg.xml> > [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetCmmCfg --file CMMCfg.xml --overwrite
```

SList.txt:

192.168.34.56

192.168.34.57

If the Status field of the managed system (e.g. 192.168.34.56) shows SUCCESS, its current settings are stored in its output file, e.g. CMMCfg.xml.192.168.34.56. The option --overwrite is used to force overwrite its existing file, e.g. CMMCfg.xml.192.168.34.56, if the output file already exists.

6.7.4 Updating CMM Settings

1. Select one managed system as the golden sample for the current CMM settings.
2. Follow the steps in [5.6.3 Receiving CMM settings](#).
3. Edit the configurable element values in the CMM configuration text file CMMCfg.xml to the desired values as illustrated in [4.6 Format of CMM Configuration Text File](#).

-
4. Set the Action attribute as “None” to skip unchanged tables in the text file. Note that this step is optional.
 5. Remove unchanged tables/elements in the text file. Note that this step is optional.
 6. Use the command `ChangeCmmCfg` with the modified `CMMCfg.xml` file to update the CMM configurations for multiple systems.
-

**Notes:**

- Some table settings cannot be applied to each managed system uniformly, e.g., LAN configurations. You might need to change its table action to “None” in step 4 or remove tables/elements in step 5.
 - LAN *IPAddress* field will be skipped in multiple system usage.
 - For details on the `ChangeCmmCfg` command, see the notes in [5.6.4 Updating CMM Settings](#).
-

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c ChangeCmmCfg --file  
<CMMCfg.xml>
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c ChangeCmmCfg --file  
CMMCfg.xml
```

SList.txt:

```
192.168.34.56
```

```
192.168.34.57
```

If the Status field of a managed system shows “SUCCESS”, its CMM settings are updated.

6.8 Applications for Multiple Systems

6.8.1 Providing TPM Module Capabilities

Use the command `TpmProvision` to enable TPM module capabilities for managed systems. Before executing the command, the TPM modules should be installed on managed systems. For detailed notes of the `TpmProvision` command, see [5.7.1 Providing TPM Module Capabilities](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c TpmProvision --  
image_url <URL> --reboot --lock <yes> [--id <id for URL> --pw <password for URL>]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p ADMIN -c TpmProvision --image_url  
'smb://192.168.35.1/MySharedPoint/MyFolder/' --id smbaid --pw smbpasswd --reboot  
--lock yes
```

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p ADMIN -c TpmProvision --image_url  
'http://192.168.35.1/MySharedPoint/MyFolder/' --id smbaid --pw smbpasswd --reboot  
--lock yes
```

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p ADMIN -c TpmProvision --image_url  
'\\192.168.35.1\MySharedPoint\MyFolder\' --id smbaid --pw smbpasswd --reboot --  
lock yes
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, its TPM capabilities are enabled.

6.8.2 Clearing TPM Module Capabilities

Use the command `TpmProvision` with options `--cleartpm` and `--reboot` to clear TPM module capabilities from managed systems. For detailed notes of the `--cleartpm` option usage, see [5.7.2 Clearing TPM Module Capabilities](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c TpmProvision --  
image_url <URL> [--id <id for URL> --pw <password for URL>] --cleartpm --reboot
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p ADMIN -c TpmProvision --image_url  
'\\192.168.35.1\MySharedPoint\MyFolder' --id smbids --pw smbpasswd --cleartpm --  
reboot
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, its TPM capabilities are cleared.

6.8.3 Providing an ISO Image as a Virtual Media through BMC and File Server

Use the command `MountIsoImage` to mount ISO image as a virtual media to managed systems through SAMBA/HTTP server. For detailed `MountIsoImage` command notes, see [5.7.3 Providing an ISO Image as a Virtual Media through BMC and File Server](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c MountIsoImage --  
image_url <URL> --reboot [--id <id for URL> --pw <password for URL>]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p ADMIN -c MountIsoImage --image_url  
'smb://192.168.35.1/MySharedPoint/MyFolder/Image.iso' --id smbuid --pw smbpasswd  
  
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p ADMIN -c MountIsoImage --image_url  
'http://192.168.35.1/MySharedPoint/MyFolder/Image.iso' --id smbuid --pw smbpasswd  
  
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p ADMIN -c MountIsoImage --image_url  
'\\192.168.35.1\MySharedPoint\MyFolder\Image.iso' --id smbuid --pw smbpasswd
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, the Image.iso is mounted as a virtual media to the managed system.

6.8.4 Removing ISO Image as a Virtual Media

Use the command UnmountIsoImage to unmount ISO image as a virtual media from managed system.

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c UnmountIsoImage
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p ADMIN -c UnmountIsoImage
```

SList.txt:

```
192.168.34.56  
192.168.34.57
```

If the execution “Status” field for a managed system is SUCCESS, the mounted virtual media will be removed from the managed system.

6.9 Storage Management for Multiple Systems

6.9.1 Getting RAID Firmware Image Information

Use the command `GetRaidControllerInfo` to receive the RAID firmware image information from the managed systems as well as the input RAID firmware image. The information will be the same as that in [5.8.1 Getting RAID Image Information](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetRaidControllerInfo  
[--dev_id <controller_id>] [--file <filename>]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetRaidControllerInfo --  
file RAID.rom
```

SList.txt:

```
192.168.34.56
```

```
192.168.34.57
```

If the execution "Status" field for a managed system is SUCCESS, the RAID information of the managed system will be shown in the "Execution Message" section of the managed system in the created log file.

6.9.2 Updating the RAID Firmware Image

Use the command `UpdateRaidController` with the RAID firmware image `RAID.rom` to update multiple systems. For details on using the `UpdateRaidController` command, see the usage notes in [5.8.2 Updating the RAID Image](#).



Note:

The command `UpdateRaidController` is supported by the following firmware images:

1. RAID firmware image of version 4.650.00-8095 and later.
2. For Grantley platform, BMC firmware images of version REDFISH 3.52 and later.
3. For Greenlow platform, BMC firmware images of version ATEN X11 1.33 and later.

4. For Purley platform, BMC firmware images of version ATEN X11DP 1.10 and later.

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c UpdateRaidController  
--dev_id <controller_id> --file <filename>
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c UpdateRaidController --  
file SMCI_RAID.rom
```

SList.txt:

192.168.34.56

192.168.34.57

The execution progress for the managed system will be continuously updated in the “Execution Message” section of the managed system in the created log file.

6.9.3 Receiving RAID Settings

Use the command GetRaidCfg to get the current RAID settings from managed systems, and save them separately for each managed system enumerated in the system list file. For details on using the GetRaidCfg command, see the usage notes in [5.8.3 Receiving RAID Settings](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetRaidCfg --file <  
RAIDCfg.xml > [--overwrite]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetRaidCfg --file  
RAIDCfg.xml --overwrite
```

SList.txt:

192.168.34.56

192.168.34.57

If the execution “Status” field for a managed system (e.g. 192.168.34.56) is SUCCESS, its current settings are stored in its output file, e.g. RAIDCfg.xml.192.168.34.56. The option --overwrite is used to force overwrite its existing file, e.g. RAIDCfg.xml.192.168.34.56, if the output file already exists.

6.9.4 Updating RAID Settings

1. Select one managed system as the golden sample for current RAID settings.
2. Follow the steps in [5.8.3 Receiving RAID Settings](#).
3. Edit the configurable element values in the RAID configuration text file RAIDCfg.xml as illustrated in [4.5 Format of the RAID Configuration Text File](#).
4. Set Action attribute as “None” to skip the unchanged tables in the text file. Note that this step is optional.
5. Remove the unchanged tables/elements in the text file. Note that this step is optional.
6. Use the command ChangeRaidCfg with the modified RAIDCfg.xml file to update the RAID configurations for multiple systems.



Notes:

- Some table settings cannot be uniformly applied to each managed system. You might need to change its table action to “None” in step 4 or remove the tables/elements in step 5.
- For details on the ChangeRaidCfg command, see the usage notes in [5.8.4 Updating RAID Settings](#).

Syntax:

```
sum -l <system list file> [-u<username> -p <password>] -c ChangeRaidCfg --file  
<RAIDCfg.xml>
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c ChangeRaidCfg --file  
RAIDCfg.xml
```

SList.txt:

```
192.168.34.56
```

192.168.34.57

If the execution “Status” field for a managed system is SUCCESS, its RAID settings are updated.

6.9.5 Getting SATA HDD Information

Use the command GetSataInfo to receive the SATA HDD information from the managed systems. The information will be the same as that in [5.8.5 Getting SATA HDD Information](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetSataInfo
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetSataInfo
```

SList.txt:

192.168.34.56

192.168.34.57

If the execution “Status” field for a managed system is SUCCESS, the SATA HDD information of the managed system will be shown in the console.

6.9.6 Getting NVMe Information

Use the command GetNvmeInfo to receive the NVMe information from managed systems. The information will be the same as that in [5.8.6 Getting NVMe Information](#).

Syntax:

```
sum -l <system list file> [-u <username> -p <password>] -c GetNvmeInfo [ --dev_id  
<device_id> ]
```

Example:

```
[SUM_HOME]# ./sum -l SList.txt -u ADMIN -p PASSWORD -c GetNvmeInfo
```

SList.txt:

192.168.34.56

192.168.34.57

If the execution “Status” field for a managed system is SUCCESS, the NVMe information of the managed system will be shown on the console.

Appendix A. SUM Exit Codes

Exit Code Number	Description
0	Successful
Others	Failed
GROUP1 (1~30) Command line parsing check failed	
1	GetOpt unexpected option code
2	Unknown option
3	Missing argument
4	No host IP/user/password
5	Missing option
6	Unknown command
7	Option conflict
8	Can not open file
9	File already exists
10	Host is unknown
11	Invalid command line data
12	Function access denied
GROUP2 (31~59) Resource management error	
31	File management error
32	Thread management error
33	TCP connection error
34	UDP connection error
35	Program interrupted and terminated
36	Required device does not exist

37	Required device does not work
38	Function is not supported
GROUP3 (60~79) File parsing errors	
60	Invalid BIOS configuration file
61	Utility internal error
62	Invalid firmware image file
63	Invalid firmware flash ROM
64	Invalid DMI information from BIOS
65	Invalid DMI information text file
66	Invalid DMI command line format
67	Invalid system list file
68	Invalid BMC configuration text file
69	Invalid asset information
70	Invalid CMM configuration text file
71	Invalid RAID configuration file
72	Invalid PCH asset information file format
73	Invalid full SMBIOS file format
74	Invalid VPD file format
75	Invalid BIOS internal file
GROUP4 (80~99) IPMI operation errors	
80	Node Product key is not activated
81	Internal communication error
82	Board information mismatch
83	Does not support OOB

84	Does not support get file
85	File is not available for download
86	Required tool does not exist
87	IPMI standard error
GROUP5 (100~119) In-band operation errors	
100	Cannot open driver
101	Driver input/output control failed
102	Driver report: ****execution of command failed****
103	BIOS does not support this in-band command
104	Driver report: ****file size out of range****
105	Cannot load driver
106	Driver is busy. Please try again later
107	ROM chip is occupied. Please try again later
108	Kernel module verification error
GROUP6 (120~199) IPMI communication errors	
144	IPMI undefined error
145	IPMI connect failed
146	IPMI login failed
147	IPMI execution parameter validation failed
148	IPMI execution exception occurred
149	IPMI execution failed
150	IPMI execution exception on slave CMM or unavailable
151	IPMI execution exception on module not present
152	IPMI execution only for CMM connected

153	IPMI execution on non-supported device
154	IPMI execution only for BMC connected
155	IPMI received invalid data
180	IPMI command not found
181	IPMI command IP format error
182	IPMI command parameter length invalid
GROUP7 (200~) Special Group	
200	System call failed
250	Managed firmware error
251	Rooted exception
252	Nested exception
253	Known limitation
254	Manual steps are required



Note: When using in-band commands with --reboot option through SSH connection to the managed OS, SSH connection would be closed by the managed OS when the system starts to reboot.

Appendix B. Management Interface and License Requirements

[Group] Command	Management Interface Supported		Node Product Key Required on the Managed System (SFT-OOB-LIC, or SFT-DCMS-Single)
	Out-Of-Band (Remote)	In-Band (Local)	
[System Check]			
CheckOOBSupport	Yes	Yes	Not Required
CheckAssetInfo	Yes	No	Required
CheckSystemUtilization	Yes	No	Required
CheckSensorData	Yes	No	Not Required
[Key Management]			
ActivateProductKey	Yes	Yes	Not Required
QueryProductKey	Yes	Yes	Not Required
ClearProductKey	Yes	Yes	Not Required
[BIOS Management]			
UpdateBios (without --preserve_setting)	Yes	Yes	Required for Out-Of-Band; Not Required for In-Band
UpdateBios (with --preserve_setting)	Yes	Yes	Required
GetBiosInfo	Yes	Yes	Not Required
GetDefaultBiosCfg	Yes	Yes	Required
GetCurrentBiosCfg	Yes	Yes	Required
ChangeBiosCfg	Yes	Yes	Required
LoadDefaultBiosCfg	Yes	Yes	Required
GetDmiInfo	Yes	Yes	Required
EditDmiInfo	Yes	Yes	Required
ChangeDmiInfo	Yes	Yes	Required
SetBiosAction	Yes	Yes	Required
[BMC Management]			
UpdateBmc	Yes	Yes	Not Required
GetBmcInfo	Yes	Yes	Not Required
GetBmcCfg	Yes	Yes	Required
ChangeBmcCfg	Yes	Yes	Required
[System Event Log]			
GetEventLog	Yes	Yes	Required
ClearEventLog	Yes	Yes	Required

[CMM Management]			
UpdateCmm	Yes	No	Not Required
GetCmmInfo	Yes	No	Not Required
GetCmmCfg	Yes	No	Not Required
ChangeCmmCfg	Yes	No	Not Required
[Storage Management]			
GetRaidControllerInfo	Yes	Yes	SFT-DCMS-Single only
UpdateRaidController	Yes	No	SFT-DCMS-Single only
GetRaidCfg	Yes	Yes	SFT-DCMS-Single only
ChangeRaidCfg	Yes	Yes	SFT-DCMS-Single only
GetSataInfo	Yes	No	Required
GetNvmeInfo	Yes	No	Required
[Applications]			
TpmProvision	Yes	No	Required
MountIsoImage	Yes	No	Required
UnmountIsoImage	Yes	No	Required

Appendix C. Platform Feature Support Matrix

SUM (OOB & In-Band) Solution Feature [Group] Command	HW & FW Compatibility		
	Without BMC	With BMC	
	All platform listed in the with BMC columns	X9 Romley	A1 series X10 Denlow
[Key Management]			
ActivateProductKey	No	Yes	Yes
QueryProductKey	No	Yes	Yes
ClearProductKey	No	Yes	Yes
Support SFT-OOB-LIC	No	Yes	Yes
Support SFT-SUM-LIC	No	No	Yes
Support SFT-DCMS-Single	No	No	Yes
[BIOS Management]			
UpdateBios	Yes for in-band No for OOB	Yes	Yes
GetBiosInfo	Yes for in-band No for OOB	Yes	Yes
GetDefaultBiosCfg	No	Yes	Yes
GetCurrentBiosCfg	No	Yes	Yes
ChangeBiosCfg	No	Yes	Yes
LoadDefaultBiosCfg	No	Yes	Yes
GetDmiInfo	No	Yes	Yes
EditDmiInfo	No	Yes	Yes
ChangeDmiInfo	No	Yes	Yes
SetBiosAction	No	No	No
[BMC Management]			
UpdateBmc	No	Yes	Yes
GetBmcInfo	No	Yes	Yes
GetBmcCfg	No	No	No
ChangeBmcCfg	No	No	No
[System Check]			
CheckOOBSupport	No	Yes	Yes
CheckAssetInfo	No	No	No
CheckSystemUtilization	No	No	No
CheckSensorData	No	Yes	Yes
[System Event Log]			
GetEventLog	No	No	No
ClearEventLog	No	No	No
[Storage Management]			
GetRaidControllerInfo	No	No	No
UpdateRaidController	No	No	No
GetRaidCfg	No	No	No

ChangeRaidCfg	No	No	No
GetSataInfo	No	No	No
GetNvmeInfo	No	No	No
[Application]			
TpmProvision	No	No	No
MountIsoImage	No	Yes	Yes
UnMountIsoImage	No	Yes	Yes

SUM (OOB & In-Band) Solution Feature	HW & FW Compatibility				
	With BMC				
	X10/B1/B2/B10/MicroBlade Grantley/	X11	K1	C7	Denver
[Key Management]					
ActivateProductKey	Yes	Yes	Yes	Yes	Yes
QueryProductKey	Yes	Yes	Yes	Yes	Yes
ClearProductKey	Yes	Yes	Yes	Yes	Yes
Support SFT-OOB-LIC	Yes	Yes	Yes	Yes	Yes
Support SFT-SUM-LIC	Yes	Yes	Yes	Yes	Yes
Support SFT-DCMS-Single	Yes	Yes	Yes	Yes	Yes
[BIOS Management]					
UpdateBios	Yes	Yes	Yes	Yes	Yes
GetBiosInfo	Yes	Yes	Yes	Yes	Yes
GetDefaultBiosCfgFile	Yes	Yes	Yes	Yes	Yes
GetCurrentBiosCfgFile	Yes	Yes	Yes	Yes	Yes
ChangeBiosCfg	Yes	Yes	Yes	Yes	Yes
LoadDefaultBiosCfg	Yes	Yes	Yes	Yes	Yes
GetDmiInfo	Yes	Yes	Yes	Yes	Yes
EditDmiInfo	Yes	Yes	Yes	Yes	Yes
ChangeDmiInfo	Yes	Yes	Yes	Yes	Yes
SetBiosAction	Yes	Yes	Yes	Yes	Yes
[BMC Management]					
UpdateBmc	Yes	Yes	Yes	Yes	Yes
GetBmcInfo	Yes	Yes	Yes	Yes	Yes
GetBmcCfg	Yes	Yes	Yes	Yes	Yes
ChangeBmcCfg	Yes	Yes	Yes	Yes	Yes
[System Check]					
CheckOOBSupport	Yes	Yes	Yes	Yes	Yes
CheckAssetInfo	Yes	Yes	Yes	Yes	Yes
CheckSystemUtilization	Yes	Yes	Yes	Yes	Yes
CheckSensorData	Yes	Yes	Yes	Yes	Yes
[System Event Log]					
GetEventLog	Yes	Yes	Yes	No	Yes
ClearEventLog	Yes	Yes	Yes	No	Yes
[Storage Management]					
GetRaidControllerInfo	Yes	Yes	Yes	No	No
UpdateRaidController	Yes	Yes	Yes	No	No
GetRaidCfg	Yes	Yes	Yes	No	No
ChangeRaidCfg	Yes	Yes	Yes	No	No
GetSataInfo	No	Yes	Yes	No	Yes
GetNvmeInfo	Yes	Yes	Yes	No	Yes
[Application]					

TpmProvision	Yes	Yes	No	No	No
MountIsoImage	Yes	Yes	Yes	Yes	Yes
UnMountIsoImage	Yes	Yes	Yes	Yes	Yes

SUM CMM OOB Commands Solution Feature	HW & FW Compatibility			
	Without CMM	With CMM		
	All platforms	B1 series	B10	MicroBlade
[CMM Management]				
UpdateCmm	No	Yes	Yes	Yes
GetCmmInfo	No	Yes	Yes	Yes
GetCmmCfg	No	Yes	Yes	Yes
ChangeCmmCfg	No	Yes	Yes	Yes



Notes:

- In-band UpdateBmc command does not support AMI BMC firmware image.
- OOB UpdateBios command does not support for MBs that implemented client ME such as X11SAE-F, X11SAT-F, X11SSZ-(Q)F/LN4F and X11SBA-(LN4)F. Besides, it does not support C7-series platform as well.
- DMI information related functions does not work for X9DRL-iF/3F MB

Appendix D. Third-Party Software

The following open source libraries are used in SUM package:

Program	Library	License
sum	simpleopt	MIT
sum	pugixml	MIT
sum	Libcurl	MIT
sum	openssl	OpenSSL
sum	CryptoPP	Boost 1.0
sum	EDK2 Compress/Decompress	BSD
sum	Jsoncpp	MIT
phymem.sys/pmdll.dll	phymem	CPOL

Appendix E. How to Change BIOS Configurations in XML Files

Five major setting types are provided as files in XML format: Numeric, CheckBox, Option, Password and String. The “Information” included in every setting is read-only. Executing the command ChangeBiosCfg does not affect the “information” enclosure. “Help” and “WorkIf” are two common fields in the “Information” enclosure of all settings. “Help” describes the target setting, and “WorkIf” specifies the setting dependency. If the expression does not match the set conditions, a warning message will appear and the related setting will not be changed.

E.1 Numeric

In Information, it contains the maximum value “MaxValue”/minimum value “MinValue”, default value, and the amount to increase or decrease the value when a user requests a value change (StepSize) each time. “numericValue” is the value that you want to apply to BIOS setting. “Help” contains the explanation to the setting.

1. Open the XML file in Notepad++ (Windows) or vim (Linux).
2. Find the setting “Correctable Error Threshold” in the XML file.

```
<Setting name="Correctable Error Threshold" numericValue="10" type="Numeric">
  <Information>
    <MaxValue>32767</MaxValue>
    <MinValue>0</MinValue>
    <StepSize>1</StepSize>
    <DefaultValue>10</DefaultValue>
    <Help><![CDATA[Correctable Error Threshold (1 - 32767) used for sparing, tagging, and leaky bucket]]></Help>
  </Information>
</Setting>
```

3. Change the “numericValue” value in “Correctable Error Threshold.” In this example, the value is changed from 10 to 20.

```
<Setting name="Correctable Error Threshold" numericValue="20" type="Numeric">
```


-
4. Save the XML file and then execute the command “ChangeBiosCfg.”

E.2 CheckBox

In CheckBox, the allowed input value in “checkedStatus” would be marked as “Checked” or “Unchecked.” “checkedStatus” is the value that you want to apply to BIOS setting. “Help” contains the explanation to the setting.

1. Open the XML file in Notepad++ (Windows) or vim (Linux).
2. Find the setting “Serial Port 1” in the XML file.

```
<Setting name="Serial Port 1" checkedStatus="Checked" type="CheckBox">
  <!--Checked/Unchecked-->
  <Information>
    <DefaultStatus>Checked</DefaultStatus>
    <Help><![CDATA[Enable or Disable Serial Port (COM)]]></Help>
    <WorkIf><![CDATA[]]></WorkIf>
  </Information>
</Setting>
```

3. Change the “checkedStatus” value in “Serial Port 1.” In this example, the value is changed from Checked to Unchecked.

```
<Setting name="Serial Port 1" checkedStatus="Unchecked" type="CheckBox">
```

4. Save the XML file and then execute the command “ChangeBiosCfg.”

E.3 Option

In Option, you may choose one option in “AvailableOptions.” “selectedOption” is the value that you want to apply to BIOS setting. “Help” contains the explanation to the setting. The following procedures demonstrate how to change a setting with WorkIf dependency.

-
1. Open the XML file in Notepad++ (Windows) or vim (Linux).
 2. Find the setting “When Log is Full” in the XML file.

```
<Setting name="When Log is Full" selectedOption="Do Nothing" type="Option">
  <Information>
    <AvailableOptions>
      <Option value="0">Do Nothing</Option>
      <Option value="1">Erase Immediately</Option>
    </AvailableOptions>
    <DefaultOption>Do Nothing</DefaultOption>
    <Help><![CDATA[Choose options for reactions to a full SMBIOS Event Log.]]></Help>
    <WorkIf><![CDATA[ ( 0 != SMBIOS Event Log ) ]]></WorkIf>
  </Information>
</Setting>
```

3. Change “selectedOption” from “Do Nothing” to “Erase Immediately”. Notice that there is “WorkIf” dependency “(0 != SMBIOS Event Log)” indicating that this setting is valid and can be modified only when the expression is evaluated true. That is, it is required to check the current value of setting “SMBIOS Event Log” as shown below.

```
<Setting name="SMBIOS Event Log" selectedOption="Disabled" type="Option">
  <Information>
    <AvailableOptions>
      <Option value="0">Disabled</Option>
      <Option value="1">Enabled</Option>
    </AvailableOptions>
    <DefaultOption>Enabled</DefaultOption>
    <Help><![CDATA[Change this to enable or disable all features of SMBIOS Event Logging during boot.]]></Help>
  </Information>
</Setting>
```

-
4. In “SMBIOS Event Log”, the selectedOption is “Disabled” which is corresponding to value 0. In other words, it makes the expression “(0 != SMBIOS Event Log)” evaluated as false. In order to make it evaluate as true, the selectedOption should be modified to “Enabled” as shown below.

```
<Setting name="SMBIOS Event Log" selectedOption="Enabled" type="Option">
```

5. Save the XML file and then execute command “ChangeBiosCfg.” After reboot, the “When Log is Full” should be taken effect to “Erase Immediately.”

E.4 Password

In Password, you have to set “NewPassword” and “ConfirmNewPassword” at the same so that the new password is in effect. The password length is limited, as “MinSize” represents the minimum length and MaxSize represents the maximum length. “HasPassword” indicates password is set or not. “Help” contains the explanation to the setting.

1. Open the XML file in Notepad++ (Windows) or vim (Linux).
2. Find the setting “Administrator Password” in the XML file.
3. Change “NewPassword” and “ConfirmNewPassword” in “Administrator Password.”

```
<Setting name="Administrator Password" type="Password">
```

```
<Information>
```

```
<Help>Set Administrator Password</Help>
```

```
<MinSize>3</MinSize>
```

```
<MaxSize>20</MaxSize>
```

```
<HasPassword>False</HasPassword>
```

```
</Information>
```

```
<NewPassword><![CDATA[]]></NewPassword>
```

```
<ConfirmNewPassword><![CDATA[]]></ConfirmNewPassword>
```

```
</Setting>
```

4. Save the XML file, and execute command “ChangeBiosCfg.”
5. After reboot, the password is taken effect and “HasPassword” turned to be “True”.

E.5 String

In String, you can fill a string with the minimum “MinSize” and maximum “MaxSize” length. The option “AllowingMultipleLine” indicates that you can input multiple lines in “StringValue”. The default string value is “DefaultString”. “StringValue” is the value that you want to apply to BIOS setting. “Help” contains the explanation to the setting.

1. Open the XML file in Notepad++ (Windows) or vim (Linux).
2. Find the setting “Add boot option” in the XML file.

```
<Setting name=" Add boot option" type="String">
  <Information>
    <MinSize>6</MinSize>
    <MaxSize>39</MaxSize>
    <DefaultString></DefaultString>
    <Help><![CDATA[Specify name for name boot option]]></Help>
    <AllowingMultipleLine>False</AllowingMultipleLine>
  </Information>
  <StringValue><![CDATA[]]></StringValue>
</Setting>
```

3. Change the “StringValue” in “Add boot option”

```
<StringValue><![CDATA[ATAPI: TSSTcorp DVD+]]></StringValue>
```

Save the XML file and then execute command “ChangeBiosCfg.”

Appendix F. Using the Command Line Tool (XMLStarlet) to Edit XML Files

F.1 Introduction

XMLStarlet is a set of command line utilities (tools) which can be used to transform, query, validate, and edit XML files. Two examples are in the following sections.

F.2 Getting/Setting a XML Value (XML Element)

```
<?xml version="1.0"?>
<BmcCfg>
  <!--Usage notes:-->
  <!--You can remove unnecessary elements so that-->
  <!--their values will not be changed after update-->
  <!--Please refer to SUM User's guide '4.3 Format of the BMC Configuration Text File' for more details.-->
  <StdCfg Action="Change">
    <!--Supported Action:None/Change-->
    <!--Standard BMC configuration tables-->
    <FRU Action="None">
      <!--Supported Action:None/Change-->
      <Configuration>
        <!--Configuration for FRU data-->
        <BoardMfgName>SUPERMICRO</BoardMfgName>
```

- To get a value (SUPERMICRO) from an element from a xpath(/BmcCfg/StdCfg/FRU/Configuration/BoardMfgName) and a filename(BMCCfg.xml), run the command

```
[shell]# xmlstarlet select --template -v "/BmcCfg/StdCfg/FRU/Configuration/BoardMfgName" BMCCfg.xml
```
- To set a value (SUPERMICRO) to an element from a xpath(/BmcCfg/StdCfg/FRU/Configuration/BoardMfgName) and a filename(BMCCfg.xml), run the command

```
[shell]# xmlstarlet edit --inplace --update "/BmcCfg/StdCfg/FRU/Configuration/BoardMfgName" --value SUPERMICRO BMCCfg.xml
```

F.3 Getting/Setting a XML Value (XML Attribute)

```
<?xml version="1.0"?>
<BmcCfg>
  <!--Usage notes:-->
  <!--You can remove unnecessary elements so that-->
  <!--their values will not be changed after update-->
  <!--Please refer to SUM User's guide '4.3 Format of the BMC Configuration Text File' for more details.-->
  <StdCfg Action="Change">
    <!--Supported Action:None/Change-->
    <!--Standard BMC configuration tables-->
    <FRU Action="None">
```

- To get the value (None) from an attribute
a xpath(/BmcCfg/StdCfg/FRU/@Action) and a filename(BMCCfg.xml),
run the command
[shell]# xmlstarlet sel -t -v /BmcCfg/StdCfg/FRU/@Action BMCCfg.xml
- To set the value (None) to an attribute
a xpath(/BmcCfg/StdCfg/FRU/@Action) and a filename(BMCCfg.xml),
run the command
[shell]# xmlstarlet ed -L -P -u /BmcCfg/StdCfg/FRU/@Action -v None BMCCfg.xml

Appendix G. Removing Unchanged BIOS Settings in an XML File

Not all BIOS settings are intended to be changed in each update. In SUM, the unchanged settings can be removed from a configuration file. Metadata tags such as **<Subtitle>**, **<Text>** and **<Information>** are not parsed in the ChangeBiosCfg command and can be removed as well. In the example below, the XML tags are kept to a minimum:

```
<?xml version="1.0" encoding="ISO-8859-1" standalone="yes"?>
<BiosCfg>
  <Menu name="Advanced">
    <Menu name="Boot Feature">
      <Setting name="Quiet Boot" checkedStatus="Checked" type="CheckBox">
      </Setting>
      <Setting name="Option ROM Messages" selectedOption="Force BIOS" type="Option">
      </Setting>
    </Menu>
  </Menu>
  <Menu name="Event Logs">
    <Menu name="Change SMBIOS Event Log Settings">
      <Setting name="MECI" numericValue="1" type="Numeric">
      </Setting>
    </Menu>
  </Menu>
  <Menu name="Boot">
    <Setting name=" Add boot option" type="String">
      <StringValue><![CDATA[]]></StringValue>
    </Setting>
  </Menu>
  <Menu name="Security">
    <Setting name="Administrator Password" type="Password">
      <CurrentPassword><![CDATA[]]></CurrentPassword>
```

```
<NewPassword><![CDATA[]]></NewPassword>
<ConfirmNewPassword><![CDATA[]]></ConfirmNewPassword>
</Setting>
</Menu>
</BiosCfg>
```

The first line is an XML declaration header. SUM specifies the encoding method as ISO-8859-1. If the text editor fails to deploy the encoding method ISO-8859-1, extended ASC-II characters in a configuration file may be lost after the file is saved.

<BiosCfg> in the second line is the BIOS configuration root. In other words, SUM only attempts to parse child tags enclosed in **<BiosCfg>**. Within **<BiosCfg>**, the first direct child tag must be **<Menu>**.

The **<Menu>** hierarchy represents the menu path in the BIOS configuration. Every setting has a menu path and the **<Menu>** hierarchy structure should always match. For example, the menu path for the setting "Quiet Boot" is "Advanced"->"Boot Feature". If "Advanced" is removed, SUM will try to find the match for "Quiet Boot" in the menu path "Boot Feature". Since the menu item "Boot Feature" is not in the first level of menu hierarchy in BIOS configuration in the managed system, an exception will be thrown.

In addition, for **<Menu>**, the attributes **"name"** and **"order"** (if applicable) should be neither changed nor removed. If any changes are made, a setting in the menu path will be failed to be matched and SUM will export error messages. Similarly, for **<Setting>**, the attributes **"name"**, **"order"** (if applicable) and **"type"** should be neither changed nor removed. SUM will fail to identify a setting if those are changed.

In contrast, for the settings Option, CheckBox and Numeric, you can change the current values in the attributes **"selectedOption"**, **"checkStatus"** and **"numericValue"**, respectively. For the String setting, you can change the current contents in the child tag **<StringValue>**. For the Password setting, you can change the current password in the child tags **<CurrentPassword>** (if applicable), **<NewPassword>** and **<ConfirmNewPassword>**.

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