



SuperServer Automation Assistant
UEFI
(SAA)
User's Guide

Revision 1.1.0

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Version History

Date	Rev	Description
May-7-2024	1.0.0	<ol style="list-style-type: none">1. Created this document. Initial release of SAA, formerly known as SUM.2. Added support for X14/H14 ROT2.0 OpenBMC AST2600 systems.3. Added support for X14 GD3 ROT2.0 AST2600 systems.4. Added support for AOM SCM OpenBMC AST2600 systems.5. Added support for X13/H13 OpenBMC AST2600 systems.6. Added support for X13 ROT2.0 AST2600 systems.7. Added support for H13 AST2600 ROT2.0 Delta Next systems.8. Added support for H13SRA-F/TF systems.9. Added support for H12 with CPLD RoT1.0+ systems.10. Added support for AST2500 JBOF systems.11. Added support for non-RoT SSE with AST2600.12. Added support for ARM64 architecture.13. Added support for the UpdateCpld command on X13/H13 Non-RoT systems.14. Added support for H12 with CPLD RoT1.0+ systems.15. Added support for the BmcLanManage command to manage BMC LAN configuration.16. Added CpldRotManage command for CPLD RoT FW management.17. Added GetSwitchBoardCpldInfo and UpdateSwitchBoardCpld commands to support multiple CPLD management on switch boards on X13 Delta Next systems.18. Added GetFanBoardCpldInfo and UpdateFanBoardCpld commands to support multiple CPLD management on FAN boards on X13 Delta Next systems.19. Added GetBackplaneCpldInfo and UpdateBackplaneCpld commands to

Date	Rev	Description
		<p>support NVMe backplane CPLD management.</p> <p>20. Added support for multiple motherboard CPLD in the GetCpldInfo and UpdateCpld commands for CPLD management on X13 Delta Next systems.</p> <p>21. Added support for the GetGpuInfo and UpdateGpu commands on H100 system.</p> <p>22. Added support for the BmcReset command to reset BMC system.</p> <p>23. Added support for the UpdateBios command on X13SAW ClientME systems.</p> <p>24. Added the ChassisIntrusion command to get chassis status.</p> <p>25. Added the GetFruInfo command to get FRU information.</p> <p>26. Added the ChangeFruInfo command to change FRU information.</p> <p>27. Added the CheckSensorData command to list sensor status.</p> <p>28. Added the GetBiosInfo command to identify Siena and Bergamo AMD CPU.</p> <p>29. Added support for TLSv1.2 ECDHE cipher suite.</p> <p>30. Upgraded openssl 1.1.0i.</p> <p>31. Added the GetBiosInfo and UpdateBios commands on X13/H13 OpenBMC systems.</p> <p>32. Added the GetBmcInfo and UpdateBmc commands on X13/H13 OpenBMC systems.</p> <p>33. Added support for the GetSystemInfo command to get system information.</p>
August-28-2024	1.1.0	<p>1. Added support for Motherboard FPGA management.</p> <p>2. Added support for AOM board CPLD management.</p> <p>3. Added the LoadDefaultBmcCfg command to load the default factory BMC configuration.</p> <p>4. Added GetLinkStatus action for BmcLanManage command.</p>

Date	Rev	Description
		5. Added GetPsulInfo command.
		6. Added TpInfo command.
		7. Added BmcHostName command.
		8. Added GetEventLog command.
		9. Added ClearEventLog command.
		10. Added GetMaintenEventLog command.
		11. Added ClearMaintenEventLog command.
		12. Added CheckSensorData command.
		13. Added CheckSelfTest command.
		14. Added GetLockDownMode command.
		15. Added RestoreFruInfo command.
		16. Added GetPsFruInfo command.

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1. Overview

The SuperServer Automation Assistant (SAA) is designed to help IT administrators easily update firmware images and configurations on Supermicro systems. Advanced applications are also provided to facilitate system management. To update configurations, users can edit system DMI information from readable text files as well as by using this automation assistant.

The SAA supports both Redfish and IPMI for system management. Users can manage BMC-based systems on the local host through an in-band channel.

1.1. Features

- Command-line interface (CLI) and scriptable
- Operates through in-band methods
- System Management
 - Obtains a summary of information from the managed system
 - Gets the FRU information from the managed system or an input dumped FRU file
 - Restores dumped FRU information to the managed system
 - Updates FRU information.
- BIOS Management
 - Updates BIOS
 - Gets the BIOS information of the managed system/input BIOS image file
 - Gets the DMI information of the managed system
 - Edits the given DMI information text file
 - Updates DMI information
- BMC Management
 - Updates BMC
 - Gets the BMC information of the managed system/input BMC image file
 - Loads the default factory BMC configuration
 - Performs BMC reset
 - Manages BMC LAN

-
- Gets/Sets the BMC host name
 - Applications
 - Sends IPMI raw commands
 - GPU Management
 - Gets the GPU information of the managed system
 - Updates Delta or Delta-Next GPU firmware
 - CPLD Management
 - Gets the CPLD information of the managed system/input CPLD image file
 - Updates CPLD
 - Gets the Switchboard CPLD information of the managed system
 - Executes updates on Switchboard CPLD based on type selected
 - Gets the backplane CPLD information of the managed system
 - Updates Backplane CPLD
 - Gets the Fanboard CPLD information of the managed system
 - Executes updates on Fanboard CPLD based on type selected
 - Security Management
 - Executes RoT-related actions
 - Gets system lockdown status
 - Health Management
 - Gets and clears the chassis intrusion status for the managed system
 - Gets the IPMI sensor values of the managed system
 - Checks and reports the basic health status of the BMC
 - System Event Log
 - Gets the event log of the managed system
 - Clears the event log of the managed system
 - Gets the maintenance event Log of the managed system
 - Clears the maintenance event log of the managed system
 - Multi-Node Management
 - Gets or sets the TwinPro information of the managed system

1.2. Operations Requirements

1.2.1. In-Band Usage Requirements

With the use of in-band, SAA can perform BIOS/BMC/CPLD 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	X12/H12 select systems
Operating System	EFI shell

The software you need in advance:

OS	Program/Script	Description
EFI shell	SAA.efi	The main program for SAA

Please contact Supermicro for any necessary drivers.

1.2.2. Additional In-Band Usage Requirements

For in-band commands, the managed system must have a BMC firmware image and an IPMI driver installed.

The BMC firmware image should meet the following requirements.

Firmware Image	Requirement
BMC Version	X12 ATEN platform (SMT_X12): 1.00 or later H12 ATEN platform (SMT_H12): 1.00 or later

1.3. Typographical Conventions

This manual uses the following typographical conventions.

Convention	Description or usage
Bold	Keywords needing attention are in bold.
<i>Italics</i>	Variables and section names are in italics.
{ }	Curly braces indicate that at least one of the enclosed items is required.
[]	Square brackets indicate that the enclosed item or items are optional.
< >	Angle brackets enclose the parameters in the syntax description.
	A vertical bar separates the items in a list.
Courier-New fontsize 10	represents Command Line Interface (CLI) instructions in Linux terminal mode.
[shell]#	represents the input prompt in Linux terminal mode.
[SAA_HOME]#	represents the SAA home directory prompt in Linux terminal mode.

- **Obligatory choices**

Curly braces and vertical bars – choose only one option.

{ --enable | --disable }

- **Optional choices**

One item in square brackets – You can choose it or omit it.

[--overwrite]

Square brackets and vertical bars – choose none or only one.

[--load_unique_password | --load_default_password]

2. Installation and Setup

To install SAA in EFI shell, follow these steps.

- Extract the saa_x.x.x_UEFI_x86_64_YYYYMMDD.zip archive file.
- Go to the extracted saa_x.x.x_UEFI_x86_64 directory. Name this directory as “SAA_HOME”.
- Copy the directory saa_x.x.x_UEFI_x86_64 to a USB device.
- Inject plug the USB device into the target system.
- Run SAA in the SAA_HOME directory.

Linux Example:

```
[shell]# FS0:
```

```
[FS0:\]# cd SAA_HOME
```

```
[SAA_HOME]# SAA.efi
```



Note: It is recommended that SAA tool with SAA release package should be used because binary files are required for certain commands.

3. Basic User Interface

UEFI SAA is a binary executable file written in the C++ language. To display the usage information, use this command:

```
[SAA_HOME]# SAA.efi
```

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

```
[SAA_HOME]# SAA.efi -h -c <command name>
```

Example:

```
[SAA_HOME]# SAA.efi -h -c UpdateBios
```

Usage Information

Options	Description or usage
-h	Shows help information.
-v	Displays the verbose output on the screen.
-l	<InterfaceName> (case sensitive) Redfish_HI = Executes in-band commands using Redfish Host Interface.
-u	<BMC/CMM user ID>
-p	<BMC/CMM user password>
-c	<command name>

System Management	
Commands	Long Options
GetSystemInfo	None
GetFruInfo	--file <file name> Saves the dumped FRU data to a file. --file_only <file only> Works with the --file option, and only reads FRU information from the input dumped FRU file. --overwrite Overwrites the output file. --dump Works with the --file option, and dumps FRU data.
ChangeFruInfo	--item <item>

System Management	
Commands	Long Options
	<p>Updates the FRU information with given FRU field.</p> <p>CT = Chassis Type CP = Chassis Part Number CS = Chassis Serial Number BDT = Board Mfg. Date/Time ("YYYY/MM/DD HH:MM") BM = Board Manufacturer BPN = Board Product Name BS = Board Serial Name BP = Board Part Number BV = Board Version PM = Product Manufacturer PN = Product Name PPM = Product Part/Model Number PV = Product Version PS = Product Serial Number PAT = Asset Tag --value <assignment value> Updates the value of the given FRU field.</p>
GetPsFruInfo	None
RestoreFruInfo	<p>--file <file name> Reads dumped FRU file.</p>

BIOS Management	
Commands	Long Options
UpdateBios	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--file <file name> Updates the BIOS with the given BIOS image file.</p> <p>--reboot (Optional) Forces the managed system to reboot or power up after operation.</p> <p>--flash_smbios (Optional) Overwrites and resets the SMBIOS data. This option is used only for specific purposes. Unless you are familiar with SMBIOS data, do not use this option.</p> <p>--preserve_nv (Optional) Preserves the NVRAM region.</p> <p>--preserve_mer (Optional) Preserves the ME firmware region. This option is used only for specific purposes. Unless you are familiar with ME firmware image, do not use</p>

BIOS Management	
Commands	Long Options
	<p>this option. (Not available on X12 and later RoT systems.)</p> <p>--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.</p> <p>--erase_OA_key (Optional) Erases the OA key.</p> <p>--backup (Optional) Backs up the current BIOS image. (Only supported by RoT systems.)</p> <p>--forward (Optional) Confirms the Rollback ID and upgrades to the next revision. (Only available on X12/H12 and later platforms except the H12 non-RoT systems.)</p> <p>--staged <action> (Optional) Sets action to: 1 = update: The update process will start at the next system boot. 2 = abort: Aborts the previously staged update task. 3 = getinfo: Checks if there was any pending staged update task.</p> <p>--clear_password (Optional) Clears the BIOS password.</p> <p>--erase_secure_boot_key (Optional) Erases the secure boot key.</p> <p>--reset_boot_option (Optional) Resets BIOS boot configurations.</p> <p>--restore_optimized_default (Optional) Restores the BIOS default configurations to optimized default.</p>
GetBiosInfo	<p>-I Redfish_HI (Optional) Uses the Redfish Host Interface.</p> <p>--file <file name> (Optional) Reads BIOS information from an input BIOS image file.</p> <p>--showall (Optional) Prints the BIOS version, BIOS revision, and BIOS OEM FID information.</p> <p>--file_only (Optional) Works with --file and only reads BIOS information from the input image file.</p>
GetDmiInfo	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--file <file name> (Optional)</p>

BIOS Management	
Commands	Long Options
	<p>Saves the DMI information to a file.</p> <p>Prints the DMI information appearing on the screen if the file-saving function is not available.</p> <p>--overwrite (Optional) Overwrites the output file.</p>
EditDmiInfo	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--file <file name> The DMI information file to be edited (or created if it does not exist).</p> <p>--item_type <item type> Specifies the item type.</p> <p>--item_name <item name> Specifies the item name.</p> <p>--shn <short name> Specifies the item in short name format.</p> <p>--value <assignment value> Assigns the value to the item.</p> <p>--default Assigns the default value to the item.</p> <p>Notes:</p> <ul style="list-style-type: none"> • Either [--item_type, --item_name] or [--shn] is required. • Either [--value] or [--default] is required.
ChangeDmiInfo	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--file <file name> Updates the DMI information with the given text file.</p> <p>--reboot (Optional) Forces the managed system to reboot or power up after operation.</p>

BMC Management	
Commands	Long Options
UpdateBmc	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--file <file name> Updates the BMC with the given BMC file.</p> <p>--overwrite_cfg (Optional) Overwrites the current BMC configuration using the factory default</p>

BMC Management	
Commands	Long Options
	<p>values in the given BMC image file.</p> <p>--overwrite_sdr (Optional) Overwrites current BMC SDR data. For AMI BMC FW, it must use the --overwrite_cfg option as well.</p> <p>--overwrite_ssl (Optional) Overwrites the current BMC SSL configuration.</p> <p>--backup (Optional) Backs up the current BMC image. (Only supported by RoT systems.)</p> <p>--forward (Optional) Confirms the Rollback ID and upgrades to the next revision.</p>
GetBmcInfo	<p>-I Redfish_HI (Optional) Uses the Redfish Host Interface.</p> <p>--file <file name> (Optional) Reads the BMC information from the input BMC image file.</p> <p>--file_only (Optional) Works with --file, and only reads BMC information from the input image file.</p>
BmcLanManage	<p>--action <action> Sets action to: 1 = GetInfo 2 = ChangeIp 3 = ChangeMac 4 = ChangeSubnetMask 5 = ChangeGateway 6 = EnableDHCP 7 = DisableDHCP 8 = GetLinkStatus</p> <p>-- bmc_ip (Optional) Sets the BMC IP Address.</p> <p>-- bmc_mac (Optional) Sets the BMC MAC Address.</p> <p>-- bmc_subnet_mask (Optional) Sets the BMC subnet mask. (Optional)</p> <p>-- bmc_gateway (Optional) Sets the BMC gateway.</p>
LoadDefaultBmcCfg	--reboot (Optional)

BMC Management	
Commands	Long Options
	<p>Forces the managed system to reboot or power up after operation.</p> <p>--clear_user_cfg (Optional) Clears the user configuration.</p> <p>--preserve_user_cfg (Optional) Preserves the user configuration.</p> <p>--load_unique_password (Optional) Loads the unique BMC password.</p> <p>--load_default_password (Optional) Loads the default BMC password.</p> <p>--load_default_lan (Optional) Loads the default BMC LAN configuration.</p> <p>--load_default_fru (Optional) Loads the default FRU configuration.</p> <p>--bmc_boot_check (Optional) Checks if the BMC is booted up after reset.</p>
BmcReset	<p>--boot_check Checks if BMC boots up within 4 minutes after reset.</p>
BmcHostName	<p>--action <action> Sets action to: 1 = Get 2 = Set</p> <p>--value <value> (Optional) Works with the --action Set option. Sets the BMC host name to a specified value.</p>

Commands	Long Options
GetCpldInfo	<p>-I Redfish_HI (Optional) Uses the Redfish Host Interface.</p> <p>--file <file name> (Optional) Reads the CPLD information from an input CPLD image file.</p> <p>--file_only (Optional) Works with --file, and only reads CPLD information from the input image file.</p>
UpdateCpld	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--file <file name></p>

Commands	Long Options
	<p>Updates the CPLD with the given CPLD image file.</p> <p>--reboot Forces the managed system to reboot or power up after operation.</p> <p>--index <number> (Optional) Updates the specific CPLD with the given index.</p>
GetSwitchboardCpldInfo	<p>-I Redfish_HI Uses Redfish Host Interface.</p>
UpdateSwitchboardCpld	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--file <file name> Updates the Main or Side Switchboard CPLD with the given image file.</p> <p>--reboot (Optional) Forces the managed system to reboot or power up after operation.</p> <p>--type Sets action to: 1 = Main 2 = Left 3 = Right</p> <p>--index (Optional) Sets the CPLD index, default value is 1. The index count starts from 1.</p>
GetBackplaneCpldInfo	<p>-I Redfish_HI Uses the Redfish Host Interface.</p>
UpdateBackplaneCpld	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--manual_ejected Confirms all drives on backplane have been ejected manually.</p> <p>--file <file name> Updates the backplane CPLD with the given FW image file.</p> <p>--index <number> Updates the specific backplane CPLD with the given index.</p> <p>--dev_id <number> (Optional) Sets the CPLD index. The default value is 1.</p>
GetFanboardCpldInfo	<p>-I Redfish_HI (Optional) Uses the Redfish Host Interface.</p>
UpdateFanboardCpld	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--file <file name> Updates the Fanboard CPLD with the given Fanboard CPLD image file.</p>

Commands	Long Options
	<p>--type Sets action to: 1 = Front 2 = Rear or the corresponding Fanboard ID number.</p> <p>--index (Optional) Sets the CPLD index, default value is 1. The index count starts from 1.</p> <p>--reboot (Optional) Forces the managed system to reboot or power up after operation.</p>

Applications	
Commands	Long Options
RawCommand	--raw <raw command> Inputs hex-value commands

GPU Management	
Commands	Long Options
GetGpuInfo	-I Redfish_HI Uses the Redfish Host Interface. --file <file name> (Optional) Reads the GPU information from an input GPU image file. --file_only (Optional) Works with the --file option, and only reads GPU information from the input image file.
UpdateGPU	-I Redfish_HI Uses the Redfish Host Interface. --file <file name> Updates the GPU with the given firmware package. --item <item name> FW item type of GPU firmware: 1. HGX_H100 2. H100_FPGA 3. H100_HMC 4. H100_HMC_EROT 5. H100_FPGA_EROT 6. H100_PCIESWITCH 7. H100_PCIESWITCH_EROT 8. H100_GPU 9. H100_GPU_EROT 10. H100_NVSWITCH 11. H100_NVSWITCH_EROT 12. H100_RETIMER 13. MI300X --reboot (Optional) Forces the managed system to reboot or power up after operation.

Security Management	
Commands	Long Options
BiosRotManage	-I Redfish_HI Uses the Redfish Host Interface. --action <action> Sets action to: 1 = GetInfo 2 = UpdateGolden 3 = Recover --reboot (Optional) Works with the --action UpdateGolden and Recover options. Forces the managed system to reboot or power up after operation.
BmcRotManage	-I Redfish_HI Uses the Redfish Host Interface. --action <action> Sets action to: 1 = GetInfo 2 = UpdateGolden 3 = Recover
CpldRotManage	-I Redfish_HI Uses the Redfish Host Interface. --action <action> Sets action to: 1 = GetInfo 2 = UpdateGolden
GetLockdownMode	None

Health Management	
Commands	Long Options
ChassisIntrusion	--action <action> Sets action to: 1 = Clear
CheckSensorData	--action <action> Sets action to: 1 = Show 2 = Delete 3 = GetVer 4 = SetVer --file <file name> (Optional)

Health Management	
Commands	Long Options
	<p>Saves the SDR information to a file.</p> <p>Prints the SDR information appearing on the screen if the file-saving function is not available.</p> <p>--overwrite (Optional) Overwrites the output file.</p> <p>--sdr_id (Optional) The SDR ID for deletion.</p> <p>--sdr_major_version The SDR major version.</p> <p>--sdr_minor_version The SDR minor version.</p>
CheckSelfTest	None

System Event Log	
Commands	Long Options
GetEventLog	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--file <file name> (Optional) Saves the event log to a file. Prints the event log on screen if the file-saving function is not available.</p> <p>--overwrite (Optional) Overwrites the output file.</p> <p>--info (Optional) Displays the current and total capacity of the event log.</p> <p>--year <year> (Optional) Filters event logs by year.</p> <p>--month <month> (Optional) Filters event logs by month.</p> <p>--day <day> (Optional) Filters event logs by day.</p> <p>--format <file format> (Optional) Saves the event log to a file in CSV format.</p>
ClearEventLog	None
GetMaintenEventLog	<p>--st <start time> (Optional) Enters the start time in YYYYMMDD format.</p> <p>--et <end time> (Optional) Enters the end time in YYYYMMDD format.</p> <p>--file <file name> (Optional)</p>

System Event Log	
Commands	Long Options
	<p>Saves the maintenance event log to a file.</p> <p>Prints the maintenance event log on screen if the file-saving function is not available.</p> <p>--count <maintenance log count> (Optional) Enters the log count.</p> <p>If the count is zero, the entire maintenance event log will display.</p> <p>--overwrite (Optional) Overwrites the output file.</p>
ClearMaintenEventLog	<p>--gen_log (Optional) Generates a log entry indicating the successful clearing of the maintenance event log.</p>

Motherboard FPGA Management	
Commands	Long Options
GetMotherboardFpgaInfo	<p>-I Redfish_HI Uses the Redfish Host Interface.</p>
UpdateMotherboardFpga	<p>-I Redfish_HI Uses the Redfish Host Interface.</p> <p>--file <file name> Updates the FPGA with the given FPGA image file.</p> <p>--reboot Forces the managed system to reboot or power up after operation.</p>

Multi-Node Management	
Commands	Long Options
TpInfo	<p>--action <action> Sets action to: 1 = GetInfo 2 = Set</p> <p>--item <item> (Optional) Sets item to: 1 = nodeID 2 = systemName 3 = systemPN 4 = systemSN 5 = chassisPN 6 = chassisSN</p>

Multi-Node Management	
Commands	Long Options
	7 = backPlanePN 8 = backPlaneSN 9 = chassisLocation 10 = bpLocation 11 = bpnRevision 12 = bpnID 13 = nodePN 14 = nodeSN 15 = configID --value <value> (Optional) Works with the --action Set and --item options. Sets the value for the specific item.

Power Management	
Commands	Long Options
GetPsuInfo	None



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.

3.1. DMI Information Text File Format

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 "//" (two slashes).
 - 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 that 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 SAA according to the BIOS of the managed system for DMI version control.
-

3.2. Redfish Host Interface

The Redfish Host Interface can be used by software running on a computer system to access the Redfish Service used to manage the computer system. For details on the Redfish Host Interface, refer to the Redfish Host Interface Specification by DMTF.

3.2.1. Using Redfish Host Interface

Syntax:

```
SAA.efi -I Redfish_HI -u <username> -p <password> -c <command>
```

Different from the standard in-band operation, you need <username> and <password> to access the managed system.

4. Managing Systems

In this chapter, we describe basic user operations for managing a single system through the in-band channel.

For the node product key requirement please see [Appendix B. Management Interface and License Requirements](#).

4.1. System Management

4.1.1. Getting System Summary Firmware Image Information

Use the 'GetSystemInfo' command to retrieve comprehensive firmware image information from the managed system. This command provides a system-wide summary that encompasses the firmware details of components including System, LAN, BMC, BIOS, CPLD, and SCP version, if supported.

Single System	
In-Band	SAA.efi -c GetSystemInfo

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c GetSystemInfo
```

```
SuperServer Automation Assistant (for UEFI BIOS) 1.0.0 (2023/08/30) (UEFI)
```

```
Copyright(C) 2023 Super Micro Computer, Inc. All rights reserved.
```

```
Managed system.....localhost
  IPv4.....10.168.24.116
  BMC MAC address.....3A:EC:EF:CE:41:3B
  Firmware revision.....00.23.37
  Firmware build time.....2021/06/28
  BIOS version.....1.1
  BIOS build time.....06/21/2021
  CPLD version.....F0.09.46
```

IPv6.....FE80:0000:0000:0000:AEEC:FFFF:FECE:413B/64
System LAN1 MAC address...3A:EC:EF:CE:40:0F
System LAN2 MAC address...3A:EC:EF:CE:40:A5

4.1.2. Managing FRU Information

4.1.2.1. Getting FRU Information

Use the "GetFruInfo" command to get or dump FRU information from the managed system and read FRU information from the local FRU file.

Single System	
In-Band	SAA.efi -c GetFruInfo [--file <filename> {--dump [--overwrite] [--file_only]]}

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c GetFruInfo
```

The console output contains the following information:

```
FRU information
=====

[BMC]

Chassis Type (CT): 01
Chassis Part Number (CP): FruCP03
Chassis Serial Number (CS): FruCS03
Board mfg. Date/Time (BDT): 2024/03/17 10:47
Board Manufacturer Name (BM): FruBM03
Board Product Name (BPN): FruBPN03
Board Serial Number (BS): FruBS03
Board Part Number (BP): FruBP03
Product Manufacturer (PM): FruPM03
Product Name (PN): FruPN03
Product Part/Model Number (PPM): FruPPM03
Product Version (PV): FruPV03
Product Serial Number (PS): FruPS03
Product Asset Tag (PAT): FruPAT03
```

```
[SAA_HOME]# SAA.efi -c GetFruInfo --file dumpedFile --dump --overwrite
```

FRU information

=====

[BMC]

```
Chassis Type (CT): 01
Chassis Part Number (CP): FruCP03
Chassis Serial Number (CS): FruCS03
Board mfg. Date/Time (BDT): 2024/03/17 10:47
Board Manufacturer Name (BM): FruBM03
Board Product Name (BPN): FruBPN03
Board Serial Number (BS): FruBS03
Board Part Number (BP): FruBP03
Product Manufacturer (PM): FruPM03
Product Name (PN): FruPN03
Product Part/Model Number (PPM): FruPPM03
Product Version (PV): FruPV03
Product Serial Number (PS): FruPS03
Product Asset Tag (PAT): FruPAT03
```

File "dumpedFile" is created

```
[SAA_HOME]# SAA.efi -c GetFruInfo --file dumpedFile --file_only
```

The console output contains the following information:

```
Chassis Type (CT): 01
Chassis Part Number (CP): FruCP03
Chassis Serial Number (CS): FruCS03
Board mfg. Date/Time (BDT): 2024/03/17 10:47
Board Manufacturer Name (BM): FruBM03
Board Product Name (BPN): FruBPN03
Board Serial Number (BS): FruBS03
Board Part Number (BP): FruBP03
```

```
Product Manufacturer (PM): FruPM03
Product Name (PN): FruPN03
Product Part/Model Number (PPM): FruPPM03
Product Version (PV): FruPV03
Product Serial Number (PS): FruPS03
Product Asset Tag (PAT): FruPAT03
```

4.1.2.2. Changing FRU Information

Use the “ChangeFruInfo” command to change the FRU information from the managed system.

Single System	
In-Band	SAA.efi -c ChangeFruInfo --item <item name> --value <assignment value>

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c ChangeFruInfo --item CT --value 0x01
```

The console output contains the following information:

```
ChangeFruInfo command is completed.

Chassis Type (CT): 01

Chassis Part Number (CP):

Chassis Serial Number (CS):

Board mfg. Date/Time (BDT): 2021/08/30 18:01

Board Manufacturer Name (BM): Supermicro

Board Product Name (BPN):

Board Serial Number (BS): WM218S011157

Board Part Number (BP):
```

Product Manufacturer (PM):

Product Name (PN):

Product Part/Model Number (PPM):

Product Version (PV):

Product Serial Number (PS):

Product Asset Tag (PAT):

4.1.2.3. Restoring FRU Information

Use the “RestoreFruInfo” command to restore the FRU information on the managed system.

Single System	
In-Band	SAA.efi -c RestoreFruInfo --file <filename>

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c RestoreFruInfo --file dumpedFile
```

The console output contains the following information:

RestoreFruInfo command is completed.

Chassis Type (CT): 01

Chassis Part Number (CP):

Chassis Serial Number (CS):

Board mfg. Date/Time (BDT): 2021/08/30 18:01

Board Manufacturer Name (BM): Supermicro

Board Product Name (BPN):

Board Serial Number (BS): WM218S011157

Board Part Number (BP):

Product Manufacturer (PM):

Product Name (PN):

Product Part/Model Number (PPM):

Product Version (PV):

Product Serial Number (PS):

Product Asset Tag (PAT):

4.1.3. Getting PSFRU Health Information

Use the “GetPsFruInfo” command to get the current PSFRU(Power Supply Field Replaceable unit) information from the managed system.

Single System	
In-Band	SAA.efi -c GetPsFruInfo

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c GetPsFruInfo
```

Output:

```
[Module 1] (SlaveAddress = 0x70)
    Status: ON
    Temperature: 62 C
    Fan 1: 7067 RPM
    FAN 2: N/A
```

GetPsFruInfo with -h option (e.g. SAA.efi -c GetPsFruInfo -h) shows help message.

4.2. BIOS Management

4.2.1. Getting BIOS Firmware Image Information

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

Single System	
In-Band	SAA.efi [-I Redfish_HI -u <username> -p <password>] -c GetBiosInfo [--file <filename> [--file_only]] [--showall]

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c GetBiosInfo --file  
Supermicro_BIOS_signed.rom
```

The console output contains the following information when secure flash is signed from a local BIOS image.

```
Managed system.....169.254.3.254  
    Board ID.....0660  
    BIOS build date.....2012/10/17  
Local BIOS image file....Supermicro_BIOS_signed.rom  
    Board ID.....0988  
    BIOS build date.....2018/5/7
```

In-Band:

```
[SAA_HOME]# SAA.efi -c GetBiosInfo --file Supermicro_BIOS_signed.rom --file_only
```

The console output contains the following information when RoT is signed from a local BIOS image.

```
Local BIOS image file....Supermicro_BIOS_signed.rom  
    Board ID.....1B6A
```

BIOS build date.....2021/01/12

4.2.2. Updating the BIOS Firmware Image

Use the “UpdateBios” command with the BIOS firmware image Supermicro_BIOS.rom to run SAA to update the managed system.

Single System	
In-Band	<code>SAA.efi -I Redfish_HI -u <username> -p <password> -c UpdateBios --file <filename> [options...]</code>

Option Commands	Descriptions
--reboot	Forces the managed system to reboot or power up after operation.
--flash_smbios	Overwrites and resets the SMBIOS data.
--preserve_mer	Preserves the ME firmware region.
--preserve_nv	Preserves the NVRAM.
--preserve_setting	Preserves BIOS configurations.
--erase_OA_key	Erases the OA key.
--backup	Backs up the current BIOS image. (Only supported by RoT systems.)
--forward	Confirms the Rollback ID and upgrades to the next revision.
--staged <action>	Sets action to: <ul style="list-style-type: none">• 1 = update: The Update process will start at the next system boot.• 2 = abort: Aborts the previous staged update task.• 3 = getinfo: Checks if there was any pending staged update task.
--clear_password	Clears the BIOS password.
--erase_secure_boot_key	Erases the secure boot key.
--reset_boot_option	Resets the BIOS boot configurations.
--restore_optimized_default	Restores BIOS configurations to optimized defaults.



Notes:

- X12/H12 RoT platforms support staged updates only if both BMC and CPLD support it as well.
- For some X12/H12 RoT platforms, BIOS can only be updated while the system is powered off. In this case, the --reboot option is required. Therefore, for in-band BIOS updates, SAA will power off the system after uploading a BIOS image to start the update process. The system will be powered on automatically after the BIOS update has completed.
- For X12/H12 and later RoT platforms, in-band BIOS updates can only be done through the Redfish Host Interface. For details, refer to [3.2 Redfish Host Interface](#).
- The --backup option backs up the current BIOS image on the managed system, not the

BIOS file to be updated.

- Due to a known GRUB2 loader issue, the system may not be able to boot and may hang up after BIOS update is upgraded. If the GRUB2 loader version is not the latest, please downgrade the BIOS to the previous version and upgrade the GRUB2 loader to the latest version. Then perform a BIOS upgrade to the target BIOS again. For more details, please refer to the FAQ on the Supermicro website <https://www.supermicro.com/support/faqs/faq.cfm?faq=33400>.
-

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c UpdateBios --file  
Supermicro_BIOS.rom --reboot
```



Notes:

- 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 must reboot or power up the managed system for the changes to take effect.
 - DO NOT flash the BIOS and BMC firmware images at the same time.
 - The --preserve_nv and --flash_smbios options cannot be used at the same time.
 - The --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.
 - The --preserve_nv option is used to preserve BIOS NVRAM data. Unless you are familiar with BIOS NVRAM, do not use this option.
 - The --preserve_mer option is used to preserve the ME firmware region. Unless you are familiar with the ME firmware region, do not use this option.
 - The --preserve_setting is used to preserve the BIOS setup configuration.
-

4.2.3. Getting DMI Information

Use the “GetDmiInfo” command to execute SAA 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 a 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. SAA will only show supported items.
-

Single System	
In-Band	<code>SAA.efi -I Redfish_HI -u <username> -p <password> -c GetDmiInfo --file <DMI.txt> [--overwrite]</code>

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c GetDmiInfo --file  
DMI.txt --overwrite
```

4.2.4. 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 [4.2.3 Getting DMI Information](#) to get the DMI information text file (DMI.txt).
2. Replace the item values in the DMI.txt file with the desired values illustrated in [3.1 DMI Information XML Text Format](#).
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 update (or add) the specified DMI item in the specified DMI.txt file. When you edit 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 get a DMI.txt file, follow the steps in [4.2.3 Getting DMI Information](#).

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c EditDmiInfo --file <DMI.txt> {--item_type <Item Type> --item_name <Item Name> --shn <Item Short Name>} {--value <Item Value> --default}

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c EditDmiInfo --file DMI.txt --item_type "System" --item_name "Version" --value "1.02"
```

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c EditDmiInfo --file DMI.txt --shn SYVS --value "1.02"
```

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c EditDmiInfo --file  
DMI.txt --shn SYVS -default
```

4.2.5. Updating DMI Information

1. Follow the steps in [4.2.4 Editing DMI Information](#) to prepare the edited DMI.txt file for updating DMI information.
2. Use the “ChangeDmiInfo” command with the edited DMI.txt file to run SAA 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.
-

Single System	
In-Band	<code>SAA.efi -I Redfish_HI -u <username> -p <password> -c ChangeDmiInfo--file <DMI.txt> [--reboot]</code>

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c ChangeDmiInfo --file  
DMI.txt --reboot
```

4.3. BMC Management

4.3.1. Getting BMC Firmware Image Information

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

Single System	
In-Band	SAA.efi [-I Redfish_HI -u <username> -p <password>] -c GetBmcInfo [--file <filename> [--file_only]]

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c GetBmcInfo --file  
Supermicro_BMC.rom
```

In-Band:

```
[SAA_HOME]# SAA.efi -c GetBmcInfo --file Supermicro_BMC.bin --file_only
```

The console output contains the following information.

```
Local BMC image file.....Supermicro_BMC.bin  
    BMC type.....X13_ATEN_AST2600_1_1  
    BMC version.....01.01.13
```



Note: Three-digit BMC version numbers are supported.

4.3.2. Updating the BMC Firmware Image

Use the “UpdateBmc” command with BMC firmware image Supermicro_BMC.rom to run SAA to update the managed system.



Notes:

- BMC will be reset after updating.
 - BMC configurations will be preserved by default after updating unless the --overwrite_cfg option is used.
 - DO NOT flash BIOS and BMC firmware images at the same time.
 - The --overwrite_cfg option overwrites the current BMC configuration using the factory default values in the given BMC image file.
 - The --overwrite_sdr option overwrites current BMC SDR data. For AMI BMC FW, it is also required to use the --overwrite_cfg option.
 - Signed BMC update is supported.
 - In-band updates of the BMC can only be done through Redfish Host Interface. For details, refer to [3.2 Redfish Host Interface](#).
 - The --backup option backs up the current BMC image on the managed system, not the BMC file updated to the managed system.
-

Single System	
In-Band	<code>SAA.efi -I Redfish_HI -u <username> -p <password> -c UpdateBmc --file <filename> [--overwrite_cfg] [--overwrite_sdr] [--backup] [--forward] [--overwrite_ssl]</code>

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c UpdateBmc --file  
Supermicro_BMC.rom
```

4.3.3. Managing the BMC LAN

Use the “BmcLanManage” command to manage the BMC LAN from the managed system. This command supports the following features.

- **Getting Information**

Use the “BmcLanManage” command with the “--action GetInfo” option to retrieve BMC LAN information.

- **Setting BMC IP**

Use the “BmcLanManage” command with the “--action ChangeIp” option to set BMC IP.

- **Setting BMC MAC**

Use the “BmcLanManage” command with the “--action ChangeMac” option to set BMC MAC.

- **Setting BMC Subnet Mask**

Use the “BmcLanManage” command with the “--action ChangeSubnetMask” option to set the BMC subnet mask.

- **Setting BMC Gateway**

Use the “BmcLanManage” command with the “--action ChangeGateway” option to set the BMC gateway.

- **Setting DHCP**

Use the “BmcLanManage” command with the “--action EnableDHCP” or “--action DisableDHCP” option to enable or disable DHCP, respectively.

- **Getting Link Status**

Use the “BmcLanManage” command with the “--action GetLinkStatus” option to retrieve the connection status of the BMC LAN interface.

Single System	
In-Band	<code>SAA.efi -c BmcLanManage --action <action> [--bmc_ip --bmc_mac --bmc_subnet_mask --bmc_gateway]</code>

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c BmcLanManage --action GetInfo
```

The console output contains the following information.

```
Managed system.....localhost
    IPv4 Address.....192.168.34.56
    BMC MAC Address.....3C:EC:EF:99:79:EE
```

```
[SAA_HOME]# SAA.efi -c BmcLanManage --action ChangeIp --bmc_ip 192.168.34.56
```

The console output contains the following information.

Status: After receiving the command, the BMC will reboot itself. The BMC will temporarily not respond to any commands.

.....

Done

Status: Please check the IP Address for results.

```
[SAA_HOME]# SAA.efi -c BmcLanManage --action ChangeMac --bmc_mac
AA:BB:CC:DD:EE:FF
```

The console output contains the following information.

Status: After receiving the command, the BMC will reboot itself. BMC will temporarily not respond to any commands.

.....

Done

Status: Please check the MAC Address for results.

```
[SAA_HOME]# SAA.efi -c BmcLanManage --action GetLinkStatus
```

The console output contains the following information.

```
Managed system.....localhost
```

```
General
```

```
=====
```

```
HostName.....Test
```

```
MAC Address.....3C:EC:EF:98:79:EC
```

```
VLAN.....Off
```

```
VLAN ID.....N/A
```

```
LAN Interface.....Dedicate
```

```
RMCP Port.....623
```

```
Active Interface.....Dedicate
```

```
Dedicated
```

```
=====
```

```
Link.....Auto Negotiation
```

```
Status.....Connected
```

```
Speed.....1G
```

```
Duplex.....Full Duplex
```

```
Share
```

```
=====
```

```
Speed.....Disconnected
```

```
Speed.....Unknown
```

```
Duplex.....Unknown
```



Note: SAA can't set the BMC IP address, subnet mask, and gateway if DHCP service is enabled.

4.3.4. Loading Factory BMC Settings

Supermicro has implemented a new security feature for the BMC firmware stack. Supermicro no longer uses the default password “ADMIN” for new devices or systems. All such systems are shipped with a “Unique Pre-Programmed Password” for user admin on every hardware device with BMC. For more information about the implementation and location of the BMC unique, please refer to the [BMC Unique Password Guide](#).

Use the “LoadDefaultBmcCfg” command to execute SAA to reset the BMC of the managed system to its factory default settings. Allowed option combinations depend on the managed system state. Unsupported option combinations will be denied.

Option \ Action	Reset Network	Reset User Cfg	Reset FRU	Reset Password to
--preserve_user_cfg	N	N	N	Preserved
--clear_user_cfg with --load_default_password	N	Y	N	ADMIN
--clear_user_cfg with --load_unique_password	N	Y	N	Unique Password
--clear_user_cfg with --load_unique_password and --load_default_lan	Y	Y	N	Unique Password
--clear_user_cfg with --load_unique_password, --load_default_lan and -- load_default_fru	Y	Y	Y	Unique Password

Single System	
In-Band	<code>SAA.efi -c LoadDefaultBmcCfg {--preserve_user_cfg --clear_user_cfg {--load_default_password --load_unique_password [--load_default_lan [--load_default_fru]]}} [--bmc_boot_check [--reboot]]</code>

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c LoadDefaultBmcCfg --preserve_user_cfg --bmc_boot_check --reboot
```

```
[SAA_HOME]# SAA.efi -c LoadDefaultBmcCfg --clear_user_cfg --  
load_default_password  
  
[SAA_HOME]# SAA.efi -c LoadDefaultBmcCfg --clear_user_cfg --load_unique_password  
  
[SAA_HOME]# SAA.efi -c LoadDefaultBmcCfg --clear_user_cfg --load_unique_password  
--load_default_lan  
  
[SAA_HOME]# SAA.efi -c LoadDefaultBmcCfg --clear_user_cfg --load_unique_password  
--load_default_lan --load_default_fru --bmc_boot_check
```

The console output contains the following information.

Restoring BMC user, FRU, and network configuration to factory default settings and resetting the BMC password to the unique password.

Please wait for the BMC to reboot, which may take about 3 to 4 minutes.

```
.....  
.....  
... ..
```

Checking BMC status...Done

BMC rebooted successfully.

After restoring the BMC to its default settings, some SAA commands may not work correctly. If you encounter issues, please reboot the managed system.



Note: The `--load_unique_password` option only supports systems installed with a BMC unique password.

4.3.5. Performing a BMC Unit Reset

Use the “BmcReset” command to unit reset the BMC for the target system.

Single System	
In-Band	SAA.efi -c BmcReset [--boot_check]

Example:

In-band:

```
[SAA_HOME]# SAA.efi -c BmcReset
```

The console output contains the following information.

The BMC will be reset immediately.

```
[SAA_HOME]# SAA.efi -c BmcReset --boot_check
```

The console output contains the following information.

The BMC will be reset immediately.

Please wait a few minutes for the BMC to restart.

.....

Done.

4.3.6. Getting and Setting the BMC Host Name

Use the “BmcHostName” command to get and set the BMC host name.

Single System	
In-Band	<code>SAA.efi -c BmcHostName --action <action> [--value <value>]</code>

Example:

In-band:

```
[SAA_HOME]# SAA.efi -c BmcHostName --action Set --value testHostName
```

```
[SAA_HOME]# SAA.efi -c BmcHostName -action Get
```

The console output contains the following information.

```
Host name : testHostName
```

4.4. Applications

4.4.1. Sending an IPMI Raw Command

Use the “RawCommand” command to send an IPMI raw command to the target system.

Single System	
In-Band	<code>SAA.efi -c RawCommand --raw <raw command></code>

Example:

In-band:

```
[SAA_HOME]# SAA.efi -c RawCommand --raw "06 01"
```

```
[SAA_HOME]# SAA.efi -c RawCommand --raw "0x06 0x01"
```

The console output contains the following information.

00

20 01 09 95 02 BF 7C 2A 00 7A 09 00 10 00 00

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



Note: A raw command must be quoted.

4.5. GPU Management

4.5.1. Getting GPU Information

Use the “GetGpuInfo” command to get the current GPU information of the HGX H100 from the managed system.

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c GetGpuInfo
In-Band	SAA.efi -c GetGpuInfo --file <filename> --file_only

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c GetGpuInfo
```

The console output contains the following information for the HGX H100 on X13/H13 systems.

```
Managed system.....169.254.3.254

HGX Model.....NVIDIA HGX 8-GPU

HMC

version.....HGX-22.10-1-rc31

ERot version...00.02.0120.0000_n00

FPGA

version.....2.0E

ERot version.....00.02.0120.0000_n00

PCIe Switch

version.....1.7.5F

ERot version.....00.02.0120.0000_n00
```

GPU SXM [1]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

GPU SXM [2]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

GPU SXM [3]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

GPU SXM [4]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

GPU SXM [5]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

GPU SXM [6]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

GPU SXM [7]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

GPU SXM [8]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

NVSwitch [0]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

NVSwitch [1]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

NVSwitch [2]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

NVSwitch [3]

version.....96.00.61.00.01

ERot version.....00.02.0120.0000_n00

PCIe Retimer [0]

version.....1.31.X

PCIe Retimer [1]

version.....1.31.X

PCIe Retimer [2]

version.....1.31.X

PCIe Retimer [3]

version.....1.31.X

PCIe Retimer [4]

version.....1.31.X

PCIe Retimer [5]

version.....1.31.X

PCIe Retimer [6]

version.....1.31.X

PCIe Retimer [7]

version.....1.31.X

HGX information

=====

[GPU1]

Location.....1

Model.....H100 80GB HBM3

Serial Number.....1655022001438

Part Number.....2330-885-A1

Firmware Version.....96.00.61.00.01

Temperature (C)42

[GPU2]

Location.....2
Model.....H100 80GB HBM3
Serial Number.....1655022002786
Part Number.....2330-885-A1
Firmware Version.....96.00.61.00.01
Temperature(C)37

[GPU3]

Location.....3
Model.....H100 80GB HBM3
Serial Number.....1655022002925
Part Number.....2330-885-A1
Firmware Version.....96.00.61.00.01
Temperature(C)39

[GPU4]

Location.....4
Model.....H100 80GB HBM3
Serial Number.....
Part Number.....2330-885-A1
Firmware Version.....96.00.61.00.01
Temperature(C)39

[GPU5]

Location.....5
Model.....H100 80GB HBM3
Serial Number.....1654422019860
Part Number.....2330-885-A1
Firmware Version.....96.00.61.00.01
Temperature(C)41

[GPU6]

Location.....6
Model.....H100 80GB HBM3
Serial Number.....
Part Number.....2330-885-A1
Firmware Version.....96.00.61.00.01
Temperature(C)36

[GPU7]

Location.....7
Model.....H100 80GB HBM3
Serial Number.....1654422019241
Part Number.....2330-885-A1
Firmware Version.....96.00.61.00.01
Temperature(C)36

[GPU8]

Location.....8
Model.....H100 80GB HBM3
Serial Number.....1654522011398
Part Number.....2330-885-A1
Firmware Version.....96.00.61.00.01
Temperature(C)40

HGX Delta-Next System Temperature

=====

[HBM]

Reading Temperature....35 degreeC
HBM 1 Temperature.....35 degreeC
HBM 2 Temperature.....31 degreeC
HBM 3 Temperature.....32 degreeC
HBM 4 Temperature.....34 degreeC
HBM 5 Temperature.....34 degreeC
HBM 6 Temperature.....31 degreeC
HBM 7 Temperature.....31 degreeC
HBM 8 Temperature.....34 degreeC

[FPGA]

Reading Temperature....43 degreeC

[PCI Switch]

Reading Temperature....54 degreeC

[PLX]

Reading Temperature....48 degreeC

PLX 1 Temperature.....48 degreeC

PLX 2 Temperature.....41 degreeC

PLX 3 Temperature.....44 degreeC

PLX 4 Temperature.....48 degreeC

PLX 5 Temperature.....29 degreeC

[ReTimer]

Reading Temperature....73 degreeC

ReTimer 1 Temperature..70 degreeC

ReTimer 2 Temperature..69 degreeC

ReTimer 3 Temperature..63 degreeC

ReTimer 4 Temperature..64 degreeC

ReTimer 5 Temperature..69 degreeC

ReTimer 6 Temperature..70 degreeC

ReTimer 7 Temperature..71 degreeC

ReTimer 8 Temperature..73 degreeC

[NVSwitch]

Reading Temperature....37 degreeC

NVSwitch 1 Temperature.35 degreeC

NVSwitch 2 Temperature.35 degreeC

NVSwitch 3 Temperature.37 degreeC

NVSwitch 4 Temperature.35 degreeC

In-band:

```
[SAA_HOME]# SAA.efi -c GetGpuInfo --file NVDIA_HGX_H100.pkg --file_only
```

The console output contains the following information.

Managed system.....local

Local Firmware File.....NVDIA_HGX_H100.pkg

Version.....HGX-H100x8_0002_230428.1.2



Note: GetGPUInfo is only available on NVIDIA H100 Delta-Next and MI300X systems. For details, refer to [Appendix G. Supported Platform Matrix for GetGpuInfo/UpdateGpu](#) and the following URL: <https://www.supermicro.com/support/resources/gpu/>

4.5.2. Updating the GPU Firmware Image

Use the “UpdateGpu” command with the HGX H100 GPU firmware image to update the GPU firmware of a managed system.

Single System	
In-Band	<code>SAA.efi -I Redfish_HI -u <username> -p <password> -c UpdateGpu --file <filename> --item <itemname> [--reboot]</code>

The --item option supports the following values:

Item name
HGX_H100
H100_FPGA
H100_HMC
H100_HMC_EROT
H100_FPGA_EROT
H100_PCIESWITCH
H100_PCIESWITCH_EROT
H100_GPU
H100_GPU_EROT
H100_NVSWITCH
H100_NVSWITCH_EROT
H100_RETIMER
MI300X

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c UpdateGpu --item  
hgx_h100 --file NVDIA_HGX_H100.pkg --reboot
```

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c UpdateGpu --item  
MI300X --file MI300X.pldm --reboot
```



Note: The UpdateGPUInfo command is only available on NVIDIA H100 Delta-Next and MI300X systems. For details, refer to [Appendix G. Supported Platform Matrix for GetGpuInfo/UpdateGpu](#).

4.6. CPLD Management

4.6.1. Getting CPLD Firmware Image Information

Use the “GetCpldInfo” command to get the CPLD firmware image information from the managed system as well as the local CPLD firmware image (with the --file option).

Single System	
In-Band	SAA.efi [-I Redfish_HI -u <username> -p <password>] -c GetCpldInfo [--file <filename> [--file_only]]

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c GetCpldInfo --file  
CPLD.bin
```

The console output contains the following information.

```
Managed system.....169.254.3.254  
    Motherboard CPLD version.....F1.00.BD  
Local CPLD image file....CPLD.bin  
    CPLD version.....F1.00.CD
```

In-Band:

```
[SAA_HOME]# SAA.efi -c GetCpldInfo --file CPLD.bin --file_only
```

The console output contains the following information.

```
Local CPLD image file....CPLD.bin  
    CPLD version.....F1.00.CD
```



Note: There could be multiple motherboard CPLDs on a single motherboard, in which case their information would be shown indexed.

4.6.2. Updating the CPLD Firmware Image

Use the “UpdateCpld” command with the CPLD firmware image CPLD.bin to run SAA to update the motherboard CPLD of a managed system and use the --index option to specify the CPLD index for systems with multiple motherboard CPLDs supported. The command will update the first motherboard CPLD without the --index input.

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c UpdateCpld --file <filename> [--index <num>] --reboot

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c UpdateCpld --file  
CPLD.bin --reboot
```



Notes:

- This command is only available on X12/H12 RoT, X13/H13, and later platforms.
 - The system needs to be powered off while updating the CPLD firmware.
 - This command will update the first motherboard CPLD by default.
 - DO NOT update CPLD firmware with a wrong index.
-

4.6.3. Getting Switchboard CPLD Firmware Image Information

The command “GetSwitchboardCpldInfo” supports the following features on CPLD RoT systems of X13/H13 and later platforms. Execute the command to get firmware installed on all the switchboards of the managed system. However, currently, local switchboard firmware image information is not yet supported (with the --file_only option).

Currently, this command is only supported through Redfish communication. Hence, in-band commands can only be done through the Redfish Host Interface.

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c GetSwitchboardCpldInfo

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c GetSwitchboardCpldInfo
```

The console output contains the following information of all switchboard CPLDs that can be updated:

```
Managed system.....169.254.3.254

[Main Switchboard]

    CPLD 1 version.....10

    CPLD 2 version.....0F

[Left Switchboard]

    CPLD 2 version.....32

[Right Switchboard]

    CPLD 2 version.....3F
```

The switchboard CPLD has the following details:

Type	Description
Main Switchboard	<i>It is possible to install many main switchboards.</i>
Left Switchboard	<i>It is possible to install many left switchboards.</i> Left switchboards only can be displayed if the system has fully booted up.
Right Switchboard	<i>It is possible to install many right switchboards.</i> Right switchboards only can be displayed if the system has fully booted up.



Notes:

- Left/Right Switchboard CPLD #1 does not support user retrieval of information.
 - When the system is in the process of powering up, it is possible for this command to fail. Please wait until system has fully booted up and try again.
-

4.6.4. Updating Switchboard CPLD Firmware Image

The command “UpdateSwitchboardCpld” supports the following features on CPLD RoT systems of X13/H13 and later platforms. Execute the command with the Switchboard CPLD image switchboard.jed to update the managed system.

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c UpdateSwitchboardCpld --file <filename> --type <type> [--index <index>] [--reboot]

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c UpdateSwitchboardCpld
--file Left_Switchboard_CPLD2.jed --type Left --index 2
```

The console output displays the following information:

```
Managed system.....169.254.3.254
```

```
[Left Switchboard]
```

```
CPLD 2 version.....3F
```

```
Status: Start updating Switchboard CPLD for 169.254.3.254
```

```
*****WARNING*****
```

```
Do not remove AC power from the server.
```

```
*****
```

4.6.5. Getting Backplane CPLD Firmware Information

Use the “GetBackplaneCpldInfo” command to get the backplane CPLD firmware information from the backplane on the managed system.

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c GetBackplaneCpldInfo

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c GetBackplaneCpldInfo
```

The console output contains the following information.

```
Backplane CPLD information
=====
Managed system.....169.254.3.254
    [Backplane 0]
        Backplane CPLD ID.....0023
        Backplane CPLD Revision.....0C
```



Notes:

- This command is only available on platforms with storage backplanes installed.
 - A maximum of four backplane CPLDs can be detected.
-

4.6.6. Updating the Backplane CPLD Firmware Image

Use the “UpdateBackplaneCpld” command with the backplane CPLD firmware image to update the backplane CPLD firmware of a managed system.

Single System	
In-Band	<code>SAA.efi -I Redfish_HI -u <username> -p <password> -c UpdateBackplaneCpld --file BPN_CPLD.jed --manual_ejected --index <0 1 2 3> [--dev_id <dev_id>]</code>

Example:

In-Band through Redfish Host Interface :

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c UpdateBackplaneCpld --index 0 --file BPN_CPLD.jed --manual_ejected
```

The console output contains the following information.

```
Status: Start updating Backplane CPLD for 169.254.3.254
```

```
*****WARNING*****
```

```
Do not remove AC power from the server.
```

```
*****
```

```
Warning: All drives on backplane will be force ejected due to backplane reset after update.
```

```
Managed system.....169.254.3.254
```

```
Backplane CPLD ID.....0023
```

```
Backplane CPLD Revision.....0C
```

```
Local CPLD image file.....BPN_CPLD.jed
```

4.6.8. Updating Fanboard CPLD Firmware Image

Use the “UpdateFanboardCpld” command with the Fanboard CPLD firmware image fanboard.jed to run SAA on CPLD RoT systems of X13/H13 and later platforms to update the Fanboard CPLD of a managed system.

Single System	
In-Band	<code>SAA.efi -I Redfish_HI -u <username> -p <password> -c UpdateFanboardCpld --file <filename> --type <Fanboard_ID> [--index <CPLD_ID>]</code>

Example:

In-Band Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c UpdateFanboardCpld --  
file Fanboard_CPLD.bin --type 1 --index 1
```

4.6.9. Getting AOM Board CPLD Firmware Image Information

Use the “GetAomboardCpldInfo” command to get the Aomboard CPLD firmware image information from the managed system (for X13/H13 and later platforms).

Single System	
In-Band	SAA.efi [-I Redfish_HI -u <username> -p <password>] -c GetAomboardCpldInfo [--file <filename> [--file_only]]

Example:

In-Band Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -c GetAomboardCpldInfo -I Redfish_HI -u ADMIN -p ADMIN --
file CPLD.jed
```

The console output contains the following information.

```
Managed system.....169.254.3.254
  [AOM board 1]
    CPLD 1 Name.....CPLD AOM BMC AOM-SCM-DC6
    CPLD 1 ID.....06E0
    CPLD 1 Rev.....E1
Local CPLD image file.....CPLD.jed
  CPLD 1 UFFN.....CPLD_AOM-SCM-DC6-
17XX06E0_20240515_E1.XX.XX_STDsp.jed
  CPLD 1 ID.....06E0
  CPLD 1 Rev.....E1
```

4.6.10. Updating AOM Board CPLD Firmware Image

Use the “UpdateAomboardCpld” command with the AOM board CPLD firmware image to update the AOM board CPLD of a managed system on X13/H13 and later platforms.

Single System	
In-Band	<code>SAA.efi -I Redfish_HI -u <username> -p <password> -c UpdateAomboardCpld --file <filename> --dev_id <AOMboard_ID> [--index <CPLD_INDEX>]</code>

Example:

In-Band Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c UpdateAomboardCpld --  
file CPLD.jed --dev_id 1
```

4.7. Security Management

4.7.1. Managing BIOS RoT Functions

The “BiosRotManage” command supports the following features on RoT systems:

- **Getting Information on BIOS**

Use the “BiosRotManage” command with the “--action GetInfo” option to retrieve information on active BIOS, backed-up BIOS and Golden BIOS.

- **Updating the Golden BIOS Image**

Use the “BiosRotManage” command with the “--action UpdateGolden” option to replace the Golden image with an active BIOS image.

- **Recovering BIOS**

Use the “BiosRotManage” command with the “--action Recover” option to recover BIOS from the backup image or the Golden image. By priority, the managed system recovers BIOS from the backup image. If the backup image is corrupted, it will then try to recover from the Golden image.



Note: To execute the “UpdateGolden” or “Recover” commands, it is necessary to power off a system, and requires the --reboot option.

Single System	
In-Band	<code>SAA.efi -I Redfish_HI -u <username> -p <password> -c BiosRotManage --action <action> [--reboot]</code>

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c BiosRotManage --action GetInfo
```

The console output contains the following information.

```
Managed system.....169.254.3.254
  BIOS build date.....2020/06/08

  Backup BIOS build date.....2020/05/05
  Golden BIOS build date.....2020/06/08
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c BiosRotManage --action
UpdateGolden --reboot
```

The console output contains the following information.

```
.....
Note: The system will be powered off shortly to continue the process. Please
wait for the system to power on again, then check the Maintenance Event log for
results.

Warning: Please wait for the system to power on again. Do not remove AC power
before the system reboots.

Status: System shutdown command issued.
```

4.7.2. Managing BMC RoT Functions

The “BmcRotManage” command supports the following features on RoT systems:

- **Getting Information on BMC**
Use the “BmcRotManage” command with the option “--action GetInfo” to retrieve information on an active BMC, backed-up BMC, or Golden BMC.
- **Updating the Golden Image**
Use the “BmcRotManage” command with the “--action UpdateGolden” option to replace the Golden image with an active BMC firmware.
- **Recovering BMC**
Use the “BmcRotManage” command with the “--action Recover” option to recover BMC from the backup image or the Golden image. By priority, the managed system recovers the BMC from the backup image. If the backup image is corrupted, it will then recover from the Golden image.

Single System	
In-Band	<code>SAA.efi -I Redfish_HI -u <username> -p <password> -c BmcRotManage --action <action></code>

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c BmcRotManage --action GetInfo
```

The console output contains the following information.

```
Managed system.....169.254.3.254
  BMC version.....09.10.19
  Backup BMC version.....00.10.08
  Golden BMC version.....09.10.19
```

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c BmcRotManage --action
UpdateGolden
```

The console output contains the following information.

```
.....
Status: System is backing up current FW as golden image and BMC will be offline
for 6 minutes.
.....
.....
Done
Status: Please check Maintenance Event log for result.
```

4.7.3. Managing CPLD RoT Functions

The “CpldRotManage” command supports the following features on RoT systems of X13 RoT2.0 and later platforms:

- **Getting Information on CPLD**
Use the “CpldRotManage” command with the option “--action GetInfo” to retrieve information on an active CPLD or Golden CPLD.
- **Updating the Golden Image**
Use the “CpldRotManage” command with the “--action UpdateGolden” option to replace the Golden image with active CPLD firmware.

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c CpldRotManage --action <action>

Example:

In-Band through Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c CpldRotManage --action GetInfo
```

The console output contains the following information.

```
Managed system.....169.254.3.254
  CPLD version.....F5.07.02
  Golden CPLD version.....F5.07.01
```

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c CpldRotManage --action UpdateGolden
```

The console output contains the following information.

```
.....
Status: System is backing up current FW as golden image. Please wait for 2
minutes.
```

```
.....  
.....
```

Done

Status: Please check golden FW version for result.

4.7.4. Acquiring the BMC System Lockdown Mode

When a managed system lockdown mode is enabled, neither setting configurations nor updating firmware is allowed. To learn about the managed system status, use the “GetLockdownMode” command.

Single System	
In-Band	SAA.efi -c GetLockdownMode

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c GetLockdownMode
```

The console output contains the following information.

```
Managed system.....169.254.3.254  
  System Lockdown.....No
```

4.8. Health Management

4.8.1. ChassisIntrusion

The “ChassisIntrusion” command can be used to manage the chassis intrusion sensor status. Use the --action Clear option to clear the chassis intrusion sensor status:

Single System	
In-Band	SAA.efi -c ChassisIntrusion --action <action>

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c ChassisIntrusion --action Clear
```

The console output contains the following information.

```
Chassis intrusion has been cleared successfully.
```

4.8.2. Checking Sensor Data

Use the “CheckSensorData” command to get the SDR information from the managed system.

Single System	
In-Band	SAA.efi -c CheckSensorData --action <action> [--sdr_id] [--sdr_major_version <major_version> --sdr_minor_version <minor_version>] [--file <SDR.txt> [--overwrite]]

- Shows SDR and saves into file

Use the “CheckSensorData” command with the “--action Show | 1” option to retrieve BMC Sensor Data Record and with the “--file <filename>” option to save SDR to a file.

- Deletes a specified SDR

Use the “CheckSensorData” command with the “--action Delete | 2 --sdr_id <sdr_id>” option to delete a specified BMC Sensor Data Record from the output of the “--action Show” command.

- Gets SDR version

Use the “CheckSensorData” command with the “--action GetVer | 3 ” option to get the BMC Sensor Data Record version. The format is <Major>.<Minor>.

- Sets SDR version

Use the “CheckSensorData” command with the “--action SetVer | 4 --sdr_major_version <major_version> --sdr_minor_version <minor_version>” option to set the BMC Sensor Data Record version.

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c CheckSensorData --action Show
```

The console output contains the following information.

Status	(#) Sensor	Reading	Low Limit	High Limit
-----	-----	-----	-----	-----
OK	(4) CPU Temp	53C/127F	5C/41F	100C/212F
OK	(71) PCH Temp	45C/113F	5C/41F	90C/194F
OK	(138) System Temp	35C/95F	5C/41F	85C/185F
OK	(205) Peripheral Temp	34C/93F	5C/41F	85C/185F
OK	(272) CPU_VRMIN Temp	38C/100F	5C/41F	100C/212F
OK	(339) PVCC_CPU	1.24 V	0.00 V	1.89 V
	(406) M2_SSD1 Temp	N/A	N/A	N/A
	(473) NVMe_SSD1 Temp	N/A	N/A	N/A
	(540) NVMe_SSD2 Temp	N/A	N/A	N/A
OK	(607) DIMMAB Temp	34C/93F	5C/41F	85C/185F

(674) FAN		N/A	N/A	N/A
OK (741) 12V		12.16 V	10.80 V	13.18 V
OK (808) 5VCC		5.08 V	4.49 V	5.50 V
OK (875) 3.3VCC		3.30 V	2.97 V	3.62 V
(942) VBAT		N/A	N/A	N/A
OK (1009) P5V_AUX		5.08 V	4.49 V	5.50 V
OK (1076) P3V3_AUX		3.30 V	2.95 V	3.63 V
OK (1143) P1V8_AUX		1.79 V	1.61 V	1.97 V
OK (1210) PVCCIN_PCH_AUX		1.81 V	1.61 V	1.98 V
OK (1277) P1V05_PCH_AUX		1.03 V	0.94 V	1.15 V
OK (1344) 2.5V BMC		2.49 V	2.23 V	2.74 V
OK (1411) P1V2_VDDQ		1.22 V	1.07 V	1.39 V
OK (1478) 1.0V BMC		0.98 V	0.90 V	1.09 V
OK (1545) P3.3V_BMC_RGM		3.28 V	2.95 V	3.62 V
(2081) PS1 Status		N/A	N/A	N/A
OK (2148) MLP_NIC Temp		48C/118F	5C/41F	100C/212F

In-Band:

```
[SAA_HOME]# SAA.efi -c CheckSensorData --action Delete --sdr_id 2148
```

The console output contains the following information.

The record of sensor ID 2148 has been deleted.

In-Band:

```
[SAA_HOME]# SAA.efi -c CheckSensorData --action GetVer
```

The console output contains the following information.

SDR version is 2c.2c

In-Band:

```
[SAA_HOME]# SAA.efi -c CheckSensorData --action SetVer --sdr_major_version 100 -
-sdr_minor_version 100
```

The console output contains the following information.

```
SDR version is 64.64
```

4.8.3. Checking and Reporting Basic Health Status of the BMC

Use the “CheckSelfTest” command to show the basic status of the BMC system.

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c CheckSelfTest

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p ADMIN -c CheckSelfTest
```

The console output contains the following information.

```
Self-test passed.
```

4.9. System Event Log

4.9.1 Getting System Event Log

Use the “GetEventLog” command to display the current system event log (including both BIOS and BMC event logs) from the managed system. With the --file option, the event log can be saved in the EventLog.txt file.

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c GetEventLog [--year --month --day] [--file <EventLog.txt> [--overwrite]] [--format CSV]
In-Band	SAA.efi -c GetEventLog --info [--file <EventLog.txt> [--overwrite]]

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u <username> -p <password> -c GetEventLog
```

The console output contains the following information.

Event ID	Created Time	Sensor Type	Severity	Message
-----	-----	-----	-----	-----
1	2024-03-30T19:14:05Z	OEM	OK	[LAN-0005] Dedicated LAN Link Up - Assert
2	2024-03-30T19:16:39Z	OEM	OK	[LAN-0003] System NIC (1) Link Up - Assert
3	2024-03-30T19:34:57Z	OEM	OK	[LAN-0003] System NIC (1) Link Up - Assert
4	2024-03-30T19:34:57Z	OEM	Warning	[LAN-0004] System NIC

(2) Link Down - Assert

5 | 2024-03-30T19:40:44Z | OEM | OK | [LAN-0005] Dedicated

LAN Link Up - Assert

In-Band:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u <username> -p <password> -c GetEventLog -  
format csv --file EventLog.txt
```

The console output contains the following information.

```
Event ID, Created Time, Sensor Type, Severity, Message,  
  
1, 2023-11-04T20:27:08Z, OEM, OK, [LAN-0005] Dedicated LAN Link Up,  
  
2, 2023-11-04T20:32:51Z, OEM, OK, [LAN-0003] System NIC (1) Link Up,  
  
3, 2023-11-04T20:32:51Z, OEM, Warning, [LAN-0004] System NIC (2) Link Down,  
  
4, 2023-11-04T20:37:54Z, OEM, OK, [LAN-0003] System NIC (1) Link Up,  
  
5, 2023-11-04T20:59:12Z, OEM, OK, [LAN-0003] System NIC (1) Link Up,
```

In-Band:

```
[SAA_HOME]# SAA.efi -c GetEventLog --info
```

The console output contains the following information.

```
Total Entries:          32  
  
SEL Version:            1.5  
  
Free Space:             65535 bytes  
  
Recent Entry Added:     2023/08/23 00:56:11
```

Recent Entry Erased:	2023/08/19 18:41:24
Number of alloc units:	512
Alloc unit size:	20 bytes
Number of free alloc units:	480
Largest free blk:	480
Max record size:	20
Get/Set SEL Time:	2023/08/28 05:37:12

4.9.2 Clearing the System Event Log

Use the “ClearEventLog” command to clear ONLY the BMC event logs on the managed system.

Single System	
In-Band	SAA.efi -c ClearEventLog

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c ClearEventLog
```

The console output contains the following information.

```
Status: Clearing BMC event log.
```

4.9.3 Getting the System Maintenance Event Log

Use the “GetMaintenEventLog” command to display the managed system’s current maintenance event logs (including both BIOS and BMC maintenance event logs). The --st and --et options can be used to specify a time range for the logs. With the “--count” option, the GetMaintenEventLog command can display the specified number of logs. With the “--file” option, the maintenance event log can be saved to a MaintenEventLog.txt file.

Single System	
In-Band	SAA.efi -c GetMaintenEventLog [--st <start time> --et <end time>] [--count <log count>] [--file < MaintenEventLog.txt> [--overwrite]]

Example:

In-Band:

```
[SAA_HOME]# ./saa -c GetMaintenEventLog --file MaintenEventLog.txt --overwrite

[SAA_HOME]# ./saa -c GetMaintenEventLog --count 5 --file MaintenEventLog.txt --
overwrite

[SAA_HOME]# ./saa -c GetMaintenEventLog --st 20200601 --et 20200602 -file
MaintenEventLog.txt --overwrite

[SAA_HOME]# ./saa -c GetMaintenEventLog --st 20200601 --et 20200602 --count 5 -
file MaintenEventLog.txt --overwrite
```

4.9.4 Clearing the System Maintenance Event Log

Use the “ClearMaintenEventLog” command to clear the maintenance event log on the target system.

Single System	
In-Band	SAA.efi -c ClearMaintenEventLog [--gen_log]

Example:

In-Band:

```
[SAA_HOME]# SAA.efi -c ClearMaintenEventLog
```

```
[SAA_HOME]# SAA.efi -c ClearMaintenEventLog --gen_log
```

The console output contains the following information.

Done.

4.10. Motherboard FPGA Management

4.10.1. Getting Motherboard FPGA Information

Use the “GetMotherboardFpgaInfo” command to get the Motherboard FPGA information from the managed system.

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c GetMotherboardFpgaInfo

Example:

In-Band Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -c GetMotherboardFpgaInfo -I Redfish_HI -u ADMIN -p ADMIN
```

The console output contains the following information.

```
Managed system.....169.254.3.254
    FPGA version.....F3.74.33
```

4.10.2. Updating the Motherboard FPGA Firmware Image

Use the “UpdateMotherboardFpga” command with the Motherboard_FPGA.bin firmware image to run SAA to update the motherboard FPGA on a managed system.

Single System	
In-Band	SAA.efi -I Redfish_HI -u <username> -p <password> -c UpdateMotherboardFpga --file <filename> --reboot

Example:

In-Band Redfish Host Interface:

```
[SAA_HOME]# SAA.efi -I Redfish_HI -u ADMIN -p PASSWORD -c UpdateMotherboardFpga
--file Motherboard_FPGA.bin --reboot
```

The console output contains the following information.

```
Managed system.....169.254.3.254
    FPGA version.....F3.74.33
Local FPGA image file....Motherboard_FPGA.bin
Status: Start updating FPGA for 169.254.3.254

*****WARNING*****
    Do not remove AC power from the server.
*****

Uploading FW.....Done

Note: System will be powered off shortly to continue the update process.

Warning: Please AC cycle the system after update completed. Do not remove AC
power before update completed.
```

Status: System shutdown command applied.



Notes:

- The in-band usage of this function does not require node product key activation.
 - Before updating, make sure the AOM CPLD is updated to a version compatible with the motherboard FPGA firmware images, as they are highly interdependent.
 - The system will power off during the update process. Please manually power on the system once the process is complete.
-

4.11. Multi-Node Management

4.11.1. Managing the TwinPro Information

Use the “TpInfo” command to get and change the TwinPro information.

Single System	
In-Band	SAA.efi -c TpInfo --action <action> [--item <item> [--value <value>]]

Example:

In-band:

```
[SAA_HOME]# SAA.efi -c TpInfo --action GetInfo
```

The console output contains the following information.

Node	Power	IP	Watts	Current	CPU1	CPU2	System
----	-----	-----	-----	-----	----	----	-----
1	Active	192.168.34.56	38W	2.2A	28C	N/A	37C
2							

Node	Node P/N	Node S/N
----	-----	-----
1		
2		

```
Configuration ID : 2
Current Node ID  : 1
System Name      :
System P/N       :
System S/N       :
Chassis P/N      :
Chassis S/N      :
Backplane P/N    :
Backplane S/N    :
Chassis Location : 00 00 00 00 00
```

```
BP Location      : Left
MCU Version      : 0.07
BPN Revision     : 1.02
```

```
[SAA_HOME]# SAA.efi -c TpInfo --action Set --item systemName --value testName
```

```
[SAA_HOME]# SAA.efi -c TpInfo --action GetInfo --item systemName
```

The console output contains the following information.

```
systemname : testName
```

4.12. Power Management

4.12.1. Get the power supply unit information

Use the “GetPsuInfo” command to get the power supply unit information.

Single System	
In-Band	SAA.efi -c GetPsuInfo

Example:

In-band:

```
[SAA_HOME]# SAA.efi -c GetPSUInfo
```

The console output contains the following information.

```
[SAA_HOME]# SAA.efi -c GetPSUInfo
```

```
[Module 1] (SlaveAddress = 0x78)
```

```
PWS Module Number: PWS-605P-1H
```

```
PWS Serial Number: P605A0E39B07611
```

```
PWS Revision: REV1.1
```

```
PMBus Revision: 0x8B22
```

```
Status: [STATUS OK] (00h)
```

```
AC Input Voltage: 122.00 V
```

```
AC Input Current: 0.46 A
```

```
DC 12V Output Voltage: 12.38 V
```

```
DC 12V Output Current: 4.50 A
```

```
Temperature 1: 25 C
```

Temperature 2: 53 C

Fan 1: 2688 RPM

Fan 2: N/A

DC 12V Output Power: 55 W

AC Input Power: 55 W

Current Sharing Control: Not Supported



Appendix A. SAA 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	Cannot 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
39	FTP server reports error
GROUP3 (60~79) File parsing errors	
60	Invalid configuration file
61	Utility internal error
62	Invalid input file
63	Invalid firmware flash ROM
64	Invalid download file
65	Invalid 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
109	This operation is prohibited.
GROUP6 (120~199) IPMI communication errors	
120	Invalid Redfish response
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 delivered 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.
249	Special action is required.
250	Managed firmware error
251	Rooted exception
252	Nested exception
253	Known limitation
254	Manual steps are required.

Appendix B. Management Interface and License Requirements

[Group] Command	Management Interface Supported	Execution Mode File-based (F) / Command-based (C)	Minimum Required License for Managed System	Notes
	In-Band			
	(Local)			
[System Management]				
GetSystemInfo	Yes	C	No license required	
GetFruInfo	Yes	F + C	No license required	
ChangeFruInfo	Yes	C	No license required	
RestoreFruInfo	Yes	F	No license required	
GetPsFruInfo	Yes	C	No license required	
[BIOS Management]				
GetBiosInfo	Yes	C	No license required	
UpdateBios	Yes	C	No license required	
GetDmiInfo	Yes	F	SFT-OOB-LIC	
ChangeDmiInfo	Yes	F	SFT-OOB-LIC	
EditDmiInfo	Yes	F	SFT-OOB-LIC	
[BMC Management]				
GetBmcInfo	Yes	C	No license required	
UpdateBmc	Yes	C	No license required	
BmcLanManage	Yes	C	No license required	
LoadDefaultBmcCfg	Yes	C	No license required	
BmcReset	Yes	C	No license required	

BmcHostName	Yes	C	No license required	
[Applications]				
RawCommand	Yes	C	No license required	
[GPU Management]				
GetGpuInfo	Yes	C	SFT-DCMS-SINGLE	
UpdateGpu	Yes	C	SFT-DCMS-SINGLE	
[CPLD Management]				
GetCpldInfo	Yes	C	No license required	
UpdateCpld	Yes	C	No license required	
GetSwitchboardCpldInfo	Yes	C	No license required	
UpdateSwitchboardCpld	Yes	C	No license required	
GetFanboardCpldInfo	Yes	C	No license required	
UpdateFanboardCpld	Yes	C	No license required	
GetBackplaneCpldInfo	Yes	C	No license required	
UpdateBackplaneCpld	Yes	C	No license required	
[Security Management]				
BiosRotManage	Yes	C	No license required	SFT-DCMS-SINGLE is required for Recovery
BmcRotManage	Yes	C	No license required	SFT-DCMS-SINGLE is required for Recovery
CpldRotManage	Yes	C	No license required	
GetLockdownMode	Yes	C	SFT-DCMS-SINGLE	
[Health Management]				
ChassisIntrusion	Yes	C	No license required	
CheckSensorData	Yes	C	No license required	
CheckSelfTest	Yes	C	SFT-OOB-LIC	
[System Event Log]				
GetEventLog	Yes	C	No license required	

ClearEventLog	Yes	C	No license required	
GetMaintenEventLog	Yes	C	No license required	
ClearMaintenEventLog	Yes	C	No license required	
[Motherboard FPGA Management]				
GetMotherboardFpgaInfo	Yes	C	No license required	
UpdateMotherboardFpga	Yes	C	No license required	
[Multi-Node Management]				
TpInfo	Yes	C	No license required	
[Power Management]				
GetPsuInfo	Yes	C	No license required	

Appendix C. Known Limitations

BIOS Management
<ul style="list-style-type: none">System will be powered off during BIOS updates on X12/H12 RoT platforms if the BMC and CPLD firmware does not support BIOS update without power off.

Appendix D. Third-Party Software

The following open-source libraries are used in the SAA package:

Program	Library	License
SAA	simpleopt	MIT
SAA	Libcurl	MIT
SAA	openssl	OpenSSL
SAA	EDK2 Compress/Decompress	BSD
SAA	EDK2 JSON	BSD

Appendix E. System Lockdown Mode Table

[Group] Command	Authority for System Lockdown Mode
	Read only
[System Management]	
GetSystemInfo	Yes
GetFruInfo	Yes
ChangeFruInfo	No
RestoreFruInfo	No
GetPsFruInfo	Yes
[BIOS Management]	
UpdateBios	No
GetBiosInfo	Yes
GetDmiInfo	Yes
EditDmiInfo	Yes
ChangeDmiInfo	No
[BMC Management]	
UpdateBmc	No
GetBmcInfo	Yes
BmcLanManage	Yes for action GetInfo and GetLinkStatus
LoadDefaultBmcCfg	No
BmcReset	No
BmcHostName	Yes for action Get
[Applications]	
RawCommand	Yes
[GPU Management]	
GetGpuInfo	Yes
UpdateGpu	No
[CPLD Management]	
GetCpldInfo	Yes
UpdateCpld	No
GetSwitchboardCpldInfo	Yes
UpdateSwitchboardCpld	No
GetBackplaneCpldInfo	Yes
UpdateBackplaneCpld	No
GetFanboardCpldInfo	Yes

[Group] Command	Authority for System Lockdown Mode
	Read only
UpdateFanboardCpld	No
[Security Management]	
BiosRotManage	Yes for action GetInfo
BmcRotManage	Yes for action GetInfo
CpldRotManage	Yes for action GetInfo
GetLockdownMode	Yes
[Health Management]	
ChassisIntrusion	No
CheckSensorData	Yes
CheckSelfTest	No
[System Event Log]	
GetEventLog	Yes
ClearEventLog	No
GetMaintenEventLog	Yes
ClearMaintenEventLog	No
[Motherboard FPGA Management]	
GetMotherboardFpgaInfo	Yes
UpdateMotherboardFpga	Yes
[Multi-Node Management]	
TpInfo	Yes for action GetInfo
[Power Management]	
GetPsuInfo	

Appendix F. Component Firmware Information

Component	Command		
	Get Information	Update Firmware	RoT Management
BIOS	GetBiosInfo	UpdateBios	BiosRotManage
BMC	GetBmcInfo	UpdateBmc	BmcRotManage
CPLD	GetCpldInfo	UpdateCpld	CpldRotManage
GPU	GetGpuInfo	UpdateGpu	N/A
Backplane storage CPLD	GetBackplaneCpldInfo	UpdateBackplaneCpld	N/A
Fan board CPLD	GetFanboardCpldInfo	UpdateFanboardCpld	N/A
PCIe Switchboard CPLD	GetSwitchboardCpldInfo	UpdateSwitchboardCpld	N/A
Motherboard FPGA	GetMotherboardFpgaInfo	UpdateMotherboardFpga	N/A

Appendix G. Supported Platform Matrix for GetGpuInfo/UpdateGpu

The table below provides a mapping of GPU platforms to corresponding Supermicro product SKUs, along with the supported status of the GetGpuInfo and UpdateGpu commands on SAA UEFI. The GetGpuInfo command checks the detailed GPU information and the UpdateGpu command performs firmware updates on GPU components.

Platform	Supermicro Product SKUs	GetGpuInfo	UpdateGpu
Intel PVC	SYS-821GV-TNR	X	X
Intel Gaudi 2	SYS-820GH-TNR2	X	X
Nvidia H100 DeltaNext	<ul style="list-style-type: none">• SYS-821GE-TNHR• AS-8125GS-TNHR	V	V
Nvidia H100 4-GPUs 40 GB/80 GB	SYS-420GU-TNXR	X	X
Nvidia A100 Delta	<ul style="list-style-type: none">• SYS-420GP-TNAR• AS-4124GO-NART	X	X
Nvidia A100 Redstone	<ul style="list-style-type: none">• SYS-421GU-TNXR• SYS-420GU-TNXR• SYS-220GQ-TNAR• AS-2124GQ-NART	X	X

Appendix H. MGX(CG1) Platform Supported Command Table

The table below provides a scoped list of commands that are already supported and not yet supported on MGX(CG1) platforms.

Component	Command		
	Get Information	Update Firmware	RoT Management
BIOS	GetBiosInfo	UpdateBios	BiosRotManage
BMC	GetBmcInfo	UpdateBmc	BmcRotManage
GPU	GetGpuInfo	UpdateGpu	N/A
Backplane storage CPLD	GetBackplaneCpldInfo	UpdateBackplaneCpld	N/A
AOM board CPLD	GetAomboardCpldInfo	UpdateAomboardCpld	N/A
Miscellaneous CPLD	GetMiscCpldInfo	UpdateMiscCpld	N/A
Motherboard FPGA	GetMotherboardFpgaInfo	UpdateMotherboardFpga	FpgaRotManage
CPU ERoT	GetCpuErotInfo	UpdateCpuErot	CpuERotManage
GPU ERoT	GetGpuErotInfo	N/A	N/A

■ Supported

■ Not Yet Supported

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