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BIOS Setup

RenderCube Rack Gen2

Contents

BIOS Setup

Contents

4.1 Managing and updating your BIOS

The following utilities allow you to manage and update the motherboard Basic Input/Output System (BIOS) setup:

1. **CrashFree BIOS 3**
   To recover the BIOS using a bootable USB flash disk drive when the BIOS file fails or gets corrupted.
2. **EzFlash**
   Updates the BIOS using a USB flash disk.
3. **BUPDATER**
   Updates the BIOS in DOS mode using a bootable USB flash disk drive.

Refer to the corresponding sections for details on these utilities.

Save a copy of the original motherboard BIOS file to a bootable USB flash disk drive in case you need to restore the BIOS in the future. Copy the original motherboard BIOS using the BUPDATER utility.

4.1.1 CrashFree BIOS 3 utility

The CrashFree BIOS 3 is an auto recovery tool that allows you to restore the BIOS file when it fails or gets corrupted during the updating process. You can update a corrupted BIOS file using a USB flash drive that contains the updated BIOS file.

Prepare a USB flash drive containing the updated motherboard BIOS before using this utility.

Recovering the BIOS from a USB flash drive

To recover the BIOS from a USB flash drive:

1. Insert the USB flash drive with the original or updated BIOS file to one USB port on the system.
2. The utility will automatically recover the BIOS. It resets the system when the BIOS recovery finished.

DO NOT shut down or reset the system while recovering the BIOS! Doing so would cause system boot failure!

The recovered BIOS may not be the latest BIOS version for this motherboard. Visit the website at www..com to download the latest BIOS file.

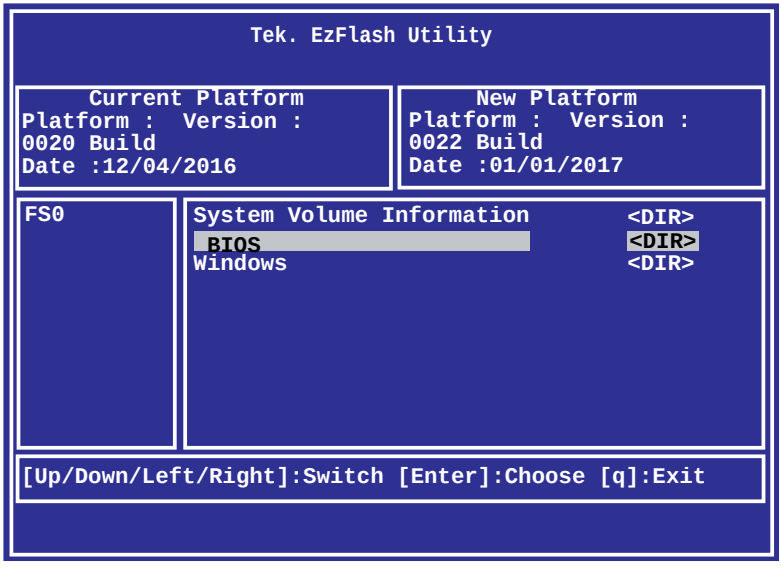
4.1.2 EZ Flash Utility

The EZ Flash Utility feature allows you to update the BIOS without having to use a DOS-based utility.

Before you start using this utility, download the latest BIOS from the website at www..com.

To update the BIOS using EZ Flash Utility:

1. Insert the USB flash disk that contains the latest BIOS file into the USB port.
2. Enter the BIOS setup program. Go to the **Tool** menu then select **EZ Flash Utility**. Press <Enter>.



3. Press <Tab> to switch to the **Drive** field.
4. Press the Up/Down arrow keys to find the USB flash disk that contains the latest BIOS, then press <Enter>.
5. Press <Tab> to switch to the **Folder Info** field.

6. Press the Up/Down arrow keys to find the BIOS file, and then press <Enter> to perform the BIOS update process. Reboot the system when the update process is done.

- This function can support devices such as a USB flash disk with FAT 32/16 format and single partition only.
- DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

Ensure to load the BIOS default settings to ensure system compatibility and stability. Press <F5> and select **Yes** to load the BIOS default settings.

4.1.3 BUPDATER utility

The succeeding BIOS screens are for reference only. The actual BIOS screen displays may not be the same as shown.

The BUPDATER utility allows you to update the BIOS file in the DOS environment using a bootable USB flash disk drive with the updated BIOS file.

Updating the BIOS file

To update the BIOS file using the BUPDATER utility:

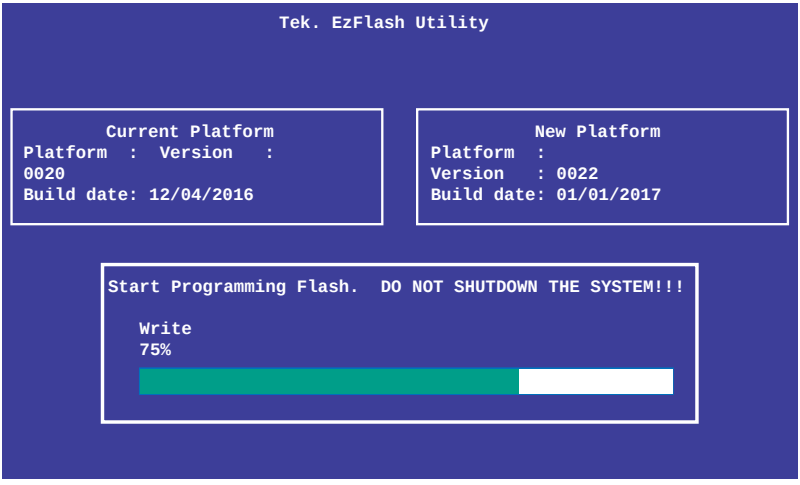
1. Download the latest BIOS file for the motherboard. Save the BIOS file to a bootable USB flash disk drive.
2. Copy the BUPDATER utility (BUPDATER.exe) from the support website to the bootable USB flash disk drive you created earlier.
3. Boot the system in DOS mode, then at the prompt, type:

   BUPDATER /i[filename].CAP

   where [filename] is the latest or the original BIOS file on the bootable USB flash disk drive, then press <Enter>.

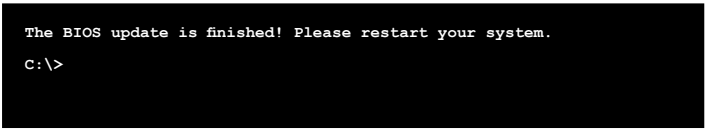
```
A:\>BUPDATER /i[file name].CAP
```

4. The utility verifies the file, then starts updating the BIOS file.



DO NOT shut down or reset the system while updating the BIOS to prevent system boot failure!

5. The utility returns to the DOS prompt after the BIOS update process is completed. Reboot the system from the hard disk drive.



4.2 BIOS setup program

This motherboard supports a programmable firmware chip that you can update using the provided utility described in section **4.1 Managing and updating your BIOS**.

Use the BIOS Setup program when you are installing a motherboard, reconfiguring your system, or prompted to “Run Setup.” This section explains how to configure your system using this utility.

Even if you are not prompted to use the Setup program, you can change the configuration of your computer in the future. For example, you can enable the security password feature or change the power management settings. This requires you to reconfigure your system using the BIOS Setup program so that the computer can recognize these changes and record them in the CMOS RAM of the firmware chip.

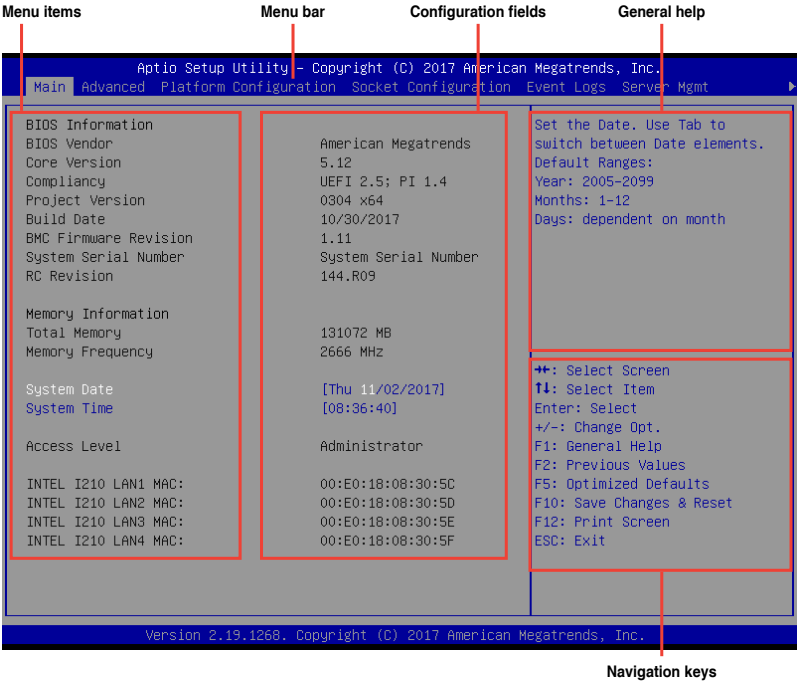
The firmware chip on the motherboard stores the Setup utility. When you start up the computer, the system provides you with the opportunity to run this program. Press <Del> during the Power-On Self-Test (POST) to enter the Setup utility; otherwise, POST continues with its test routines.

If you wish to enter Setup after POST, restart the system by pressing <Ctrl+Alt+Delete>, or by pressing the reset button on the system chassis. You can also restart by turning the system off and then back on. Do this last option only if the first two failed.

The Setup program is designed to make it as easy to use as possible. Being a menu-driven program, it lets you scroll through the various sub-menus and make your selections from the available options using the navigation keys.

- The default BIOS settings for this motherboard apply for most conditions to ensure optimum performance. If the system becomes unstable after changing any BIOS settings, load the default settings to ensure system compatibility and stability. Press <F5> and select Yes to load the BIOS default settings.
- The BIOS setup screens shown in this section are for reference purposes only, and may not exactly match what you see on your screen.
- Visit the website (www..com) to download the latest BIOS file for this motherboard.

4.2.1 BIOS menu screen



4.2.2 Menu bar

The menu bar on top of the screen has the following main items:

Main	For changing the basic system configuration
Advanced	For changing the advanced system settings
Platform Configuration	For changing the platform settings
Socket Configuration	For changing the socket settings
Event Logs	For changing the event log settings
Server Mgmt	For changing the server mgmt settings
Security	For changing the security settings
Boot	For changing the system boot configuration
Tool	For configuring options for special functions
Save & Exit	For selecting the save & exit options

To select an item on the menu bar, press the right or left arrow key on the keyboard until the desired item is highlighted.

4.2.3 Menu items

The highlighted item on the menu bar displays the specific items for that menu. For example, selecting Main shows the Main menu items.

The other items (Advanced, Platform Configuration, Socket Configuration, Event Logs, Server Mgmt, Security, Boot, Tool, and Save & Exit) on the menu bar have their respective menu items.

4.2.4 Submenu items

A solid triangle before each item on any menu screen means that the item has a submenu. To display the submenu, select the item then press <Enter>.

4.2.5 Navigation keys

At the bottom right corner of a menu screen are the navigation keys for the BIOS setup program. Use the navigation keys to select items in the menu and change the settings.

4.2.6 General help

At the top right corner of the menu screen is a brief description of the selected item.

4.2.7 Configuration fields

These fields show the values for the menu items. If an item is user-configurable, you can change the value of the field opposite the item. You cannot select an item that is not user-configurable.

A configurable field is enclosed in brackets, and is highlighted when selected. To change the value of a field, select it and press <Enter> to display a list of options.

4.2.8 Pop-up window

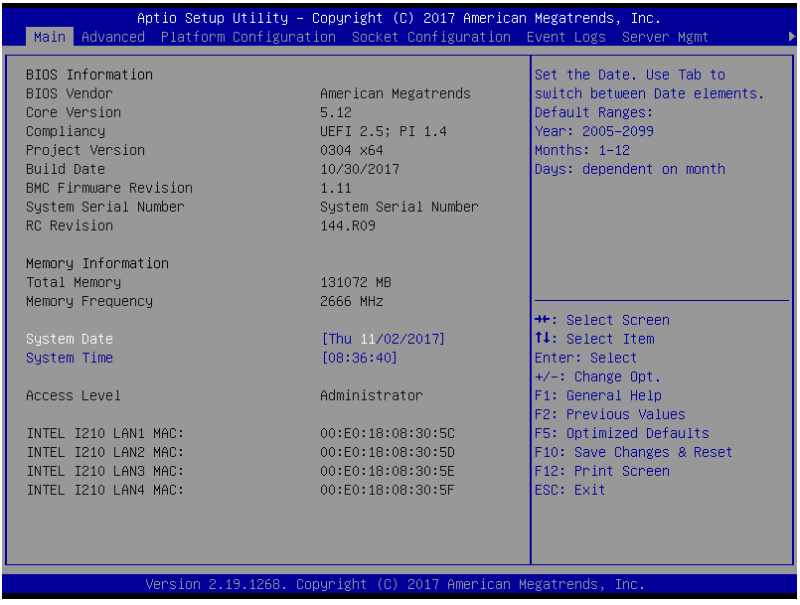
Select a menu item and press <Enter> to display a pop-up window with the configuration options for that item.

4.2.9 Scroll bar

A scroll bar appears on the right side of a menu screen when there are items that do not fit on the screen. Press the Up/Down arrow keys or <Page Up> / <Page Down> keys to display the other items on the screen.

4.3 Main menu

When you enter the BIOS Setup program, the Main menu screen appears. The Main menu provides you an overview of the basic system information, and allows you to set the system date, time, language, and security settings.



4.3.1 System Date [Day xx/xx/xxxx]

Allows you to set the system date.

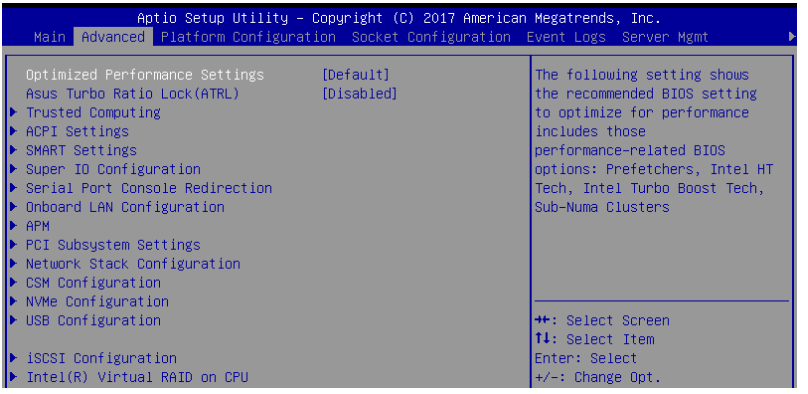
4.3.2 System Time [xx:xx:xx]

Allows you to set the system time.

4.4 Advanced menu

The Advanced menu items allow you to change the settings for the CPU and other system devices.

Take caution when changing the settings of the Advanced menu items. Incorrect field values can cause the system to malfunction.



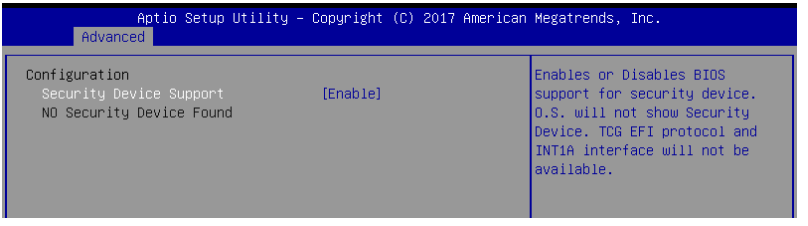
Optimized Performance Settings [Default]

This option allows you to select a recommended BIOS setting to optimize performance.

Turbo Ratio Lock (ATRL) [Disabled]

Allows you to keep the processor operating at the turbo highest frequency for maximum performance.
Configuration options: [Disabled] [Enabled]

4.4.1 Trusted Computing

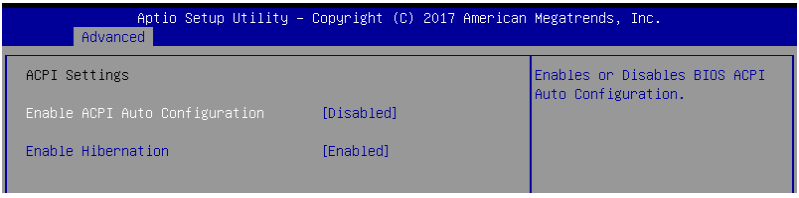


Configuration

Security Device Support [Enabled]

Allows you to enable or disable the BIOS support for security device.
Configuration options: [Disabled] [Enabled]

4.4.2 ACPI Settings



Enable ACPI Auto Configuration [Disabled]

Allows you to enable or disable the BIOS ACPI Auto Configuration.
Configuration options: [Disabled] [Enabled]

Enable Hibernation [Enabled]

Allows you to enable or disable the ability of the system to hibernate (OS/S4 Sleep State).
Configuration options: [Disabled] [Enabled]

This option may be not be effective with some OS.

4.4.3 Smart Settings

SMART Self Test [Enabled]

Allows you to run SMART Self Test on all HDDs during POST.
Configuration options: [Disabled] [Enabled]

4.4.4 Super IO Configuration

Serial Port 1 Configuration

Allows you to set the parameters of Serial Port 1.

Serial Port [Enabled]

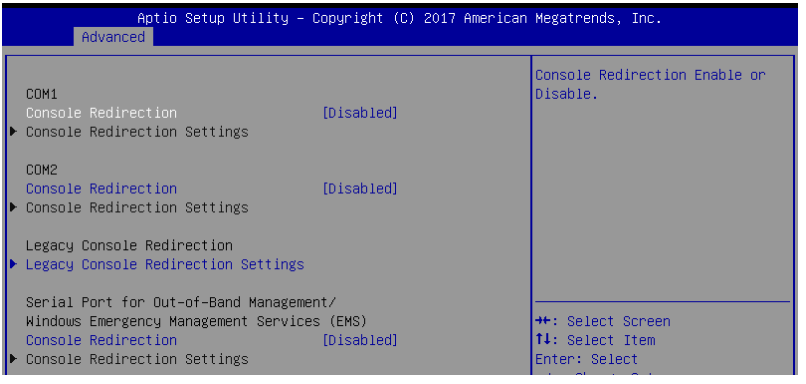
Allows you to enable or disable Serial Port.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Serial Port** to **[Enabled]**.

Change Settings [Auto]

Allows you to choose the setting for Super IO device.
Configuration options: [Auto] [IO=3F8h; IRQ=4;] [IO=3F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;] [IO=2F8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;] [IO=3E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;] [IO=2E8h; IRQ=3, 4, 5, 6, 7, 9, 10, 11, 12;]

4.4.5 Serial Port Console Redirection



COM1 / COM2

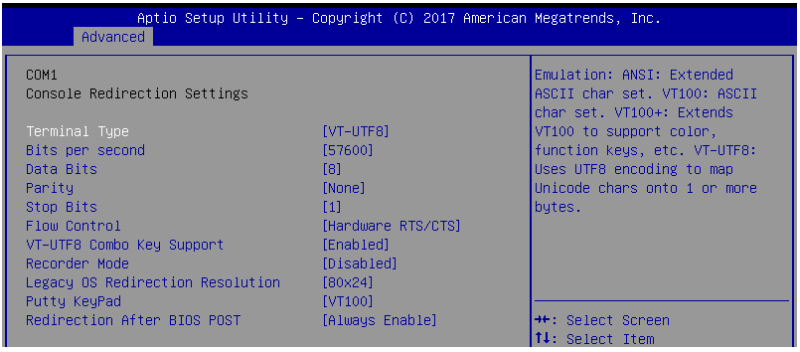
Console Redirection [Disabled]

Allows you to enable or disable the console redirection feature.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Console Redirection** to **[Enabled]**.

Console Redirection Settings

This item becomes configurable only when you enable the **Console Redirection** item. The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.



Terminal Type [VT-UTF8]

Allows you to set the terminal type.

[VT100]	ASCII char set.
[VT100+]	Extends VT100 to support color, function keys, etc.
[VT-UTF8]	Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
[ANSI]	Extended ASCII char set.

Bits per second [57600]

Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
Configuration options: [9600] [19200] [38400] [57600] [115200]

Data Bits [8]

Configuration options: [7] [8]

Parity [None]

A parity bit can be sent with the data bits to detect some transmission errors. [Mark] and [Space] parity do not allow for error detection.

[None]	None.
[Even]	parity bit is 0 if the num of 1's in the data bits is even.
[Odd]	parity bit is 0 if num of 1's in the data bits is odd.
[Mark]	parity bit is always 1.
[Space]	parity bit is always 0.

Stop Bits [1]

Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning.) The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.
Configuration options: [1] [2]

Flow Control [Hardware RTS/CTS]

Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a “stop” signal can be sent to stop the data flow. Once the buffers are empty, a “start” signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
Configuration options: [None] [Hardware RTS/CTS]

VT-UTF8 Combo Key Support [Enabled]

Allows you to enable the VT-UTF8 Combo Key Support for ANSI/VT100 terminals.
Configuration options: [Disabled] [Enabled]

Recorder Mode [Disabled]

With this mode enabled only text will be sent. This is to capture Terminal data.
Configuration options: [Disabled] [Enabled]

Legacy OS Redirection Resolution [80x24]

This allows you to set the number of rows and columns supported on the Legacy OS.
Configuration options: [80x24] [80x25]

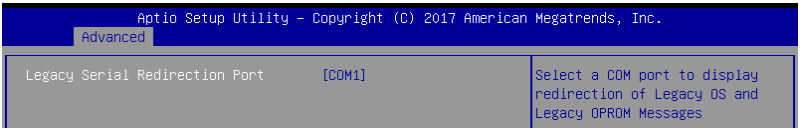
Putty Keypad [VT100]

This allows you to select the FunctionKey and Keypad on Putty.
Configuration options: [VT100] [LINUX] [XTERMR6] [SCO] [ESCN] [VT400]

Redirection After BIOS POST [Always Enable]

This setting allows you to specify if Bootloader is selected than Legacy console redirection.
Configuration options: [Always Enable] [Bootloader]

Legacy Console Redirection Settings



Legacy Serial Redirection Port [COM1]

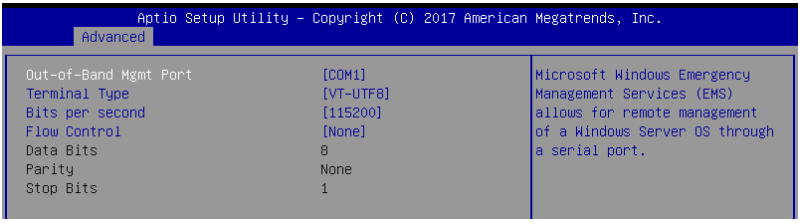
Allows you to select a COM port to display redirection of Legacy OS and Legacy OPROM Messages.
Configuration options: [COM1] [COM2]

Serial Port for Out-of-Band Management/ Windows Emergency Management Services (EMS)

Console Redirection [Disabled]

Allows you to enable or disable the console redirection feature.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Console Redirection** to **[Enabled]**.



Console Redirection Settings

Out-of-Band Mgmt Port [COM1]

Microsoft Windows Emergency Management Services (EMS) allows for remote management of a Windows Server OS through a serial port.
Configuration options: [COM1] [COM2]

Terminal Type [VT-UTF8]

Allows you to set the terminal type for out-of-band management.
Configuration options: [VT100] [VT100+] [VT-UTF8] [ANSI]

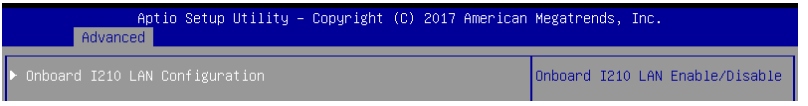
Bits per second [115200]

Allows you to set the serial port transmission speed.
Configuration options: [9600] [19200] [57600] [115200]

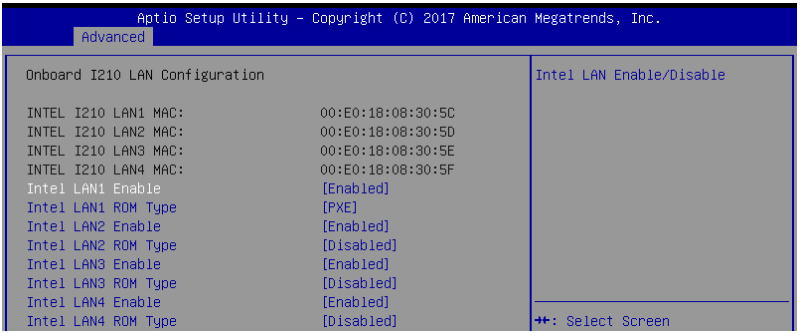
Flow Control [None]

Allows you to set the flow control to prevent data loss from buffer overflow.
Configuration options: [None] [Hardware RTS/CTS] [Software Xon/Xoff]

4.4.6 Onboard LAN



Onboard I210 LAN Configuration



Intel LAN1 Enable [Enabled]

Allows you to enable or disable the Intel LAN.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Intel LAN1 Enable** to **[Enabled]**.

Intel LAN ROM Type [PXE]

Allows you to select the Intel LAN ROM type.
Configuration options: [Disabled] [PXE] [iSCSI]

Due to Intel® limitations, both Intel LAN ROM Type options should be the same when **[PXE]** or **[iSCSI]** is selected.

Intel LAN2-4 Enable [Enabled]

Allows you to enable or disable the Intel LAN.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Intel LAN2 Enable** to **[Enabled]**.

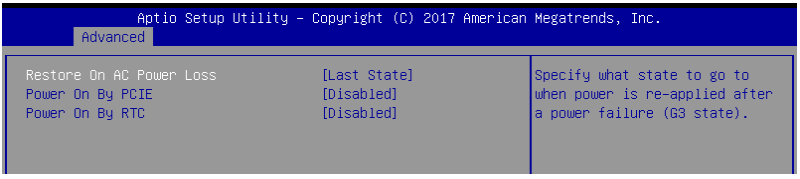
Intel LAN ROM Type [Disabled]

Allows you to select the Intel LAN ROM type.
Configuration options: [Disabled] [PXE] [iSCSI]

Due to Intel® limitations, both Intel LAN ROM Type options should be the same when **[PXE]** or **[iSCSI]** is selected.

4.4.7 APM

Allows you to configure the Advance Power Management (APM) settings.



Restore AC Power Loss [Last State]

When set to [Power Off], the system goes into off state after an AC power loss. When set to [Power On], the system will reboot after an AC power loss. When set to [Last State], the system goes into either off or on state, whatever the system state was before the AC power loss.
Configuration options: [Power Off] [Power On] [Last State]

Power On By PCIE [Disabled]

[Disabled] Disables the PCIE devices to generate a wake event.

[Enabled] Enables the PCIE devices to generate a wake event.

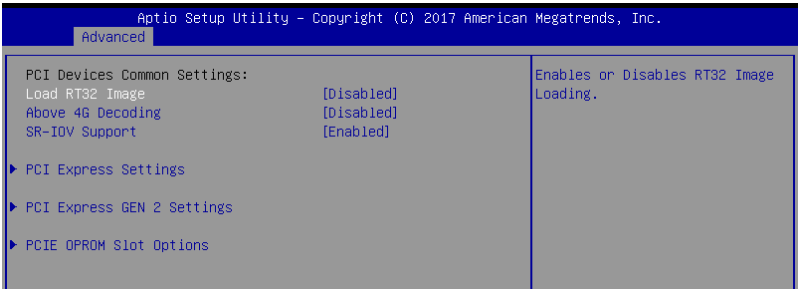
Power On By RTC [Disabled]

[Disabled] Disables RTC to generate a wake event.

[Enabled] When set to [Enabled], the items **RTC Alarm Date (Days)** and **Hour/Minute/Second** will become user-configurable with set values.

4.4.8 PCI Subsystem Settings

Allows you to configure PCI, PCI-X, and PCI Express Settings.



Load RT32 Image [Disabled]

Allows you to enable or disable RT32 Image Loading.
Configuration options: [Disabled] [Enabled]

Above 4G Decoding [Disabled]

Allows you to enable or disable 64-bit capable devices to be decoded in above 4G address space. It only works if the system supports 64-bit PCI decoding.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **Above 4G Decoding** to **[Enabled]**.

First 4G Decoding [Enabled]

This option enables or disables 64-bit capable devices to be decoded in above 4G address space (only if system supports 64-bit PCI decoding).
Configuration options: This option enables or disables

SR-IOV Support [Enabled]

This option enables or disables SIngle Root IO Virtualization Support if the system has SRIOV capable PCIe devices.
Configuration options: [Disabled] [Enabled]

PCI Express Settings

PCI Express Device Register Settings

Relaxed Ordering [Enabled]

This option allows you to enable or disable PCI Express Device Relaxed Ordering.
Configuration options: [Disabled] [Enabled]

Extended Tag [Disabled]

This option allows Device to use an 8-bit Tag field as a requester when set to **Enabled**.
Configuration options: [Disabled] [Enabled]

No Snoop [Enabled]
This option allows you to enable or disable PCI Express Device No Snoop option.
Configuration options: [Disabled] [Enabled]

Maximum Payload [Auto]
This option allows you to set the Maximum Payload of PCI Express Device or allow System BIOS to select the value.
Configuration options: [Auto] [128 Bytes] [256 Bytes] [512 Bytes] [1024 Bytes] [2048 Bytes] [4096 Bytes]

Maximum Read Request [Auto]
This option allows you to set the Maximum Read Request of PCI Express Device or allow System BIOS to select the value.
Configuration options: [Auto] [128 Bytes] [256 Bytes] [512 Bytes] [1024 Bytes] [2048 Bytes] [4096 Bytes]

PCI Express Device Link Register Settings

ASPM Support [Disabled]
This option allows you to set the ASPM level.

[Force L0s]	Force all links to L0s State.
[Auto]	BIOS auto configure.
[Disabled]	Disables ASPM.

Enabling ASPM may cause some PCI-E devices to fail.

Extended Synch [Disabled]
This option allows the generation of Extended Synchronization patterns when set to **Enabled**.
Configuration options: [Disabled] [Enabled]

Link Training Retry [5]
This option allows you to set the number of Retry Attempts software will take to retrain the link if previous training attempt was unsuccessful.
Configuration options: [Disabled] [2] [3] [5]

Link Training Timeout [1000]
This option allows you to set the number of Microseconds software will wait before polling 'Link Training' but in Link Status Register. The value ranges from 10 to 10000 uS.

Unpopulated Links [Keep Link On]
This option will disable unpopulated PCI Express links to save power when set to Disabled.
Configuration options: [Disabled] [Keep Link On]

PCI Express Gen 2 Settings

PCI Express GEN2 Device Register Settings

Completion Timeout [Default]
This option allows system software to modify the Completion Timeout value for device Functions which support Completion Timeout programmability.

[Default]	50us to 50ms.
[Shorter]	Shorter timeout ranges supported by hardware will be used.
[Longer]	Longer timeout ranges supported by hardware will be used.
[Disabled]	Disable Completion Timeout.

ARI Forwarding [Disabled]
If supported by hardware and set to **Enabled**, the Downstream Port disables its traditional Device Number filed being 0 enforcement when turning a Type1 Configuration Request into a Type0 Configuration Request, permitting access to Extended Functions in an ARI Device immediately below the Port.
Configuration options: [Disabled] [Enabled]

Atomic0p Request Enable [Disabled]
If supported by hardware and set to **Enabled**, this function initiates Atomic0p Requests only if Bus Master Enable bit is in the Command Register Set.
Configuration options: [Disabled] [Enabled]

Atomic0p Egress Blocking [Disabled]
If supported by hardware and set to **Enabled**, outbound Atomic0p Requests via Egress Ports will be blocked.
Configuration options: [Disabled] [Enabled]

IDO Request Enable [Disabled]
If supported by hardware and set to **Enabled**, this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated.
Configuration options: [Disabled] [Enabled]

IDO Completion Enable [Disabled]
If supported by hardware and set to **Enabled**, this permits setting the number of ID-Based Ordering (IDO) bit (Attribute[2]) requests to be initiated.
Configuration options: [Disabled] [Enabled]

LTR Mechanism Enable [Disabled]
If supported by hardware and set to **Enabled**, this enables the Latency Tolerance Reporting (LTR) Mechanism.
Configuration options: [Disabled] [Enabled]

End-End TLP Prefix Blocking [Disabled]
If supported by hardware and set to **Enabled**, this function will block forwarding of TLPs containing End-End TLP Prefixes.
Configuration options: [Disabled] [Enabled]

PCI Express GEN2 Device Register Settings

Target Link Speed [Auto]
If supported by hardware and set to **Force to X.X GT/s**, for Downstream Ports, this sets an upper limit on Link operational speed by restricting the values advertised by the Upstream component in its training sequences. When **Auto** is selected HW initialized data will be used.
Configuration options: [Auto] [Force to 2.5 GT/s] [Force to 5.0 GT/s] [Force to 8.0 GT/s]

Clock Power Management [Disabled]
If supported by hardware and set to **Enabled**, the device is permitted to use CLKREQ# signal for power management of Link clock in accordance to protocol defined in appropriate form factor specification.
Configuration options: [Disabled] [Enabled]

Compliance SOS [Disabled]
If supported by hardware and set to **Enabled**, this will force LTSSM to send SKP Ordered Sets between sequences when sending Compliance Pattern or Modified Compliance Pattern.
Configuration options: [Disabled] [Enabled]

Hardware Autonomous Width [Enabled]
If supported by hardware and set to **Disabled**, this will disable the hardware's ability to change link width except for width size reduction for the purpose of correcting unstable link operation.
Configuration options: [Disabled] [Enabled]

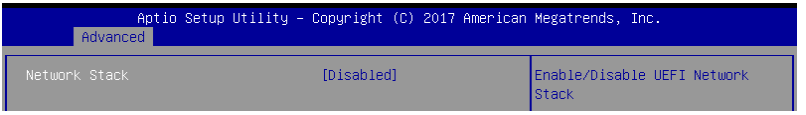
Hardware Autonomous Speed [Enabled]
If supported by hardware and set to **Disabled**, this will disable the hardware's ability to change link speed except for speed rate reduction for the purpose of correcting unstable link operation.
Configuration options: [Disabled] [Enabled]

PCIE OPROM Slot Options

PCIE1/3/5 Slot OpROM [Enabled]
This option allows you to enable or disable the OpROM of the PCIe slots.
Configuration options: [Disabled] [Enabled]

4.4.9 Network Stack Configuration

Allows you to configure the network stack configuration.



Network Stack [Disabled]

Allows you to enable or disable UEFI Network Stack.
Configuration options: [Disabled] [Enabled]

The following items appear only when you set the **Network Stack** to **[Enabled]**.

Ipv4 PXE Support [Disabled]

Enables or disables the Ipv4 PXE Boot Support. If disabled, Ipv4 PXE boot option will not be created.
Configuration options: [Disable] [Enable]

Ipv4 HTTP Support [Disabled]

Enables or disables the Ipv4 HTTP Boot Support. If disabled, Ipv4 PXE boot option will not be created.
Configuration options: [Disable] [Enable]

Ipv6 PXE Support [Disabled]

Enables or disables the Ipv6 PXE Boot Support. If disabled, Ipv6 PXE boot option will not be created.
Configuration options: [Disable] [Enable]

Ipv6 HTTP Support [Disabled]

Enables or disables the Ipv6 HTTP Boot Support. If disabled, Ipv6 PXE boot option will not be created.
Configuration options: [Disable] [Enable]

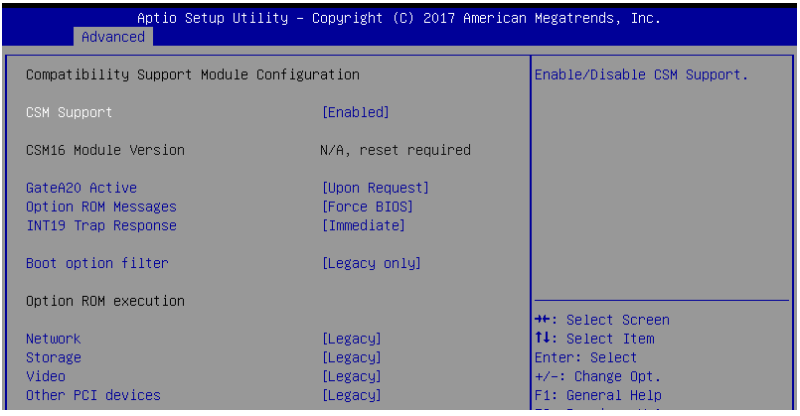
PXE boot wait time [0]

Set the wait time to press ESC key to abort the PXE boot. Use the <+> or <-> to adjust the value. The values range from 0 to 5.

Media detect count [1]

Set the number of times presence of media will be checked. Use the <+> or <-> to adjust the value. The values range from 1 to 50.

4.4.10 CSM Configuration



CSM Support [Enabled]

This option allows you to enable or disable CSM Support.
Configuration options: [Disabled] [Enabled]

The following items appear only when you set the **CSM Support** to **[Enabled]**.

GateA20 Active [Upon Request]

This allows you to set the GA20 option.

[Upon Request]	GA20 can be disabled using BIOS services.
[Always]	Do not allow disabling GA20; this option is useful when any RT code is executed above 1MB.

Option ROM Messages [Force BIOS]

This allows you to set the display mode for option ROM.
Configuration options: [Force BIOS] [Keep Current]

INT19 Trap Response [Immediate]

This option allows you to control the BIOS reaction on INT19 trapping by Option ROM.

[Immediate]	Execute the trap right away.
[Postponed]	Execute the trap during legacy boot.
[Auto]	Allow the system to determine automatically.

Boot Option filter [Legacy only]

This option allows you to control the Legacy/UEFI ROMs priority.
Configuration options: [UEFI and Legacy] [Legacy only] [UEFI only]

Network / Storage / Video [Legacy]

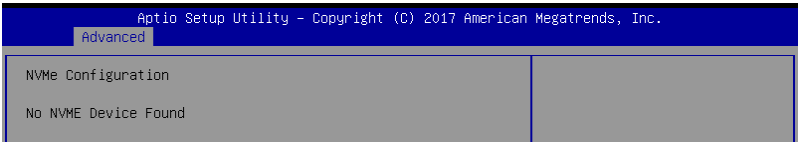
This option allows you to control the execution of UEFI and Legacy PXE/ Storage/ Video OpROM.
Configuration options: [UEFI] [Legacy]

Other PCI devices [Legacy]

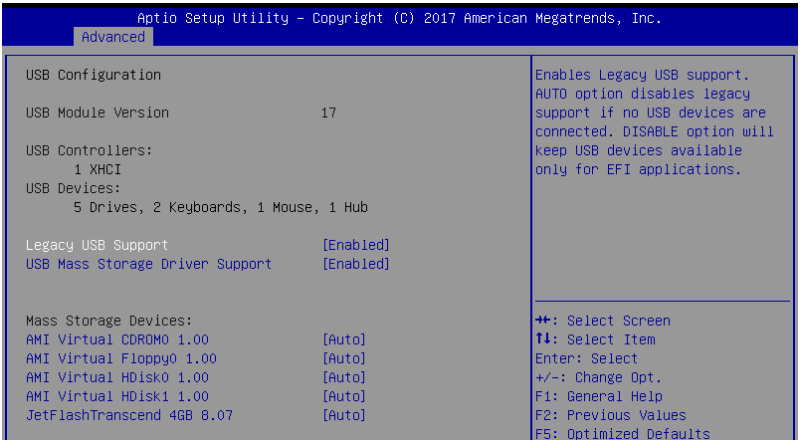
This item determines the OpROM execution policy for devices other than Network, Storage, or Video.
Configuration options: [UEFI] [Legacy]

4.4.11 NVMe Configuration

You may view the NVMe controller and Drive information if an NVMe device is connected.



4.4.12 USB Configuration



Legacy USB Support [Enabled]

[Disabled] The USB devices can be used only for the BIOS setup program. It cannot be recognized in boot devices list.

[Enabled] Enables the support for USB devices on legacy operating systems (OS).

[Auto] Allows the system to detect the presence of USB devices at startup. If detected, the USB controller legacy mode is enabled. If no USB device is detected, the legacy USB support is disabled.

USB Mass Storage Driver Support [Enabled]

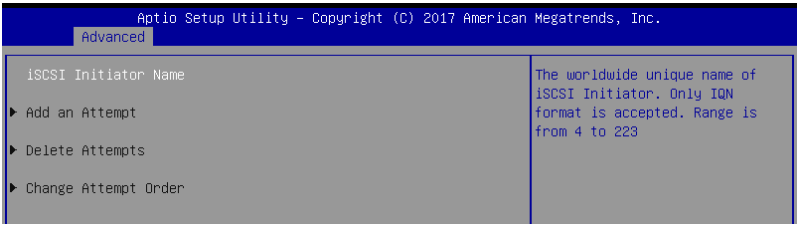
Allows you to enable or disable the USB Mass Storage driver support.
Configuration options: [Disabled] [Enabled]

Mass Storage Devices

Allows you to select the mass storage device emulation type for devices connected.
Configuration options: [Auto] [Floppy] [Forced FDD] [Hard Disk] [CD-ROM]

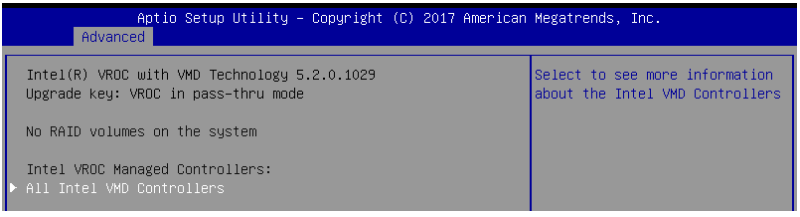
4.4.13 iSCSI Configuration

Allows you to configure the iSCSi parameters.



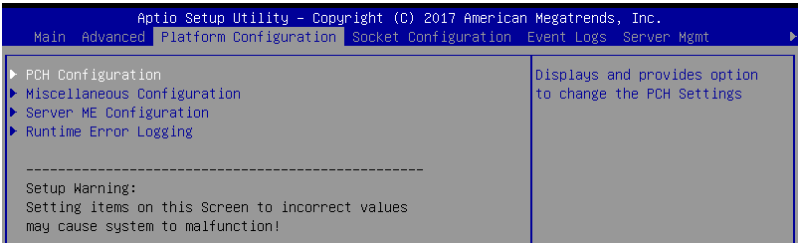
4.4.14 Intel(R) Virtual RAID on CPU

Allows you to configure the view the RAID volumes and VMD controllers on the system.



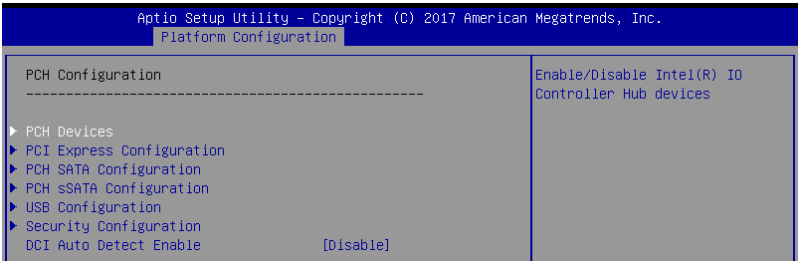
4.5 Platform Configuration menu

The IntelRCSetup menu items allow you to change the platform settings.



Take caution when changing the settings of the Platform Configuration menu items. Incorrect field values can cause the system to malfunction.

4.5.1 PCH Configuration



PCH Devices

Board Capability [DeepSx]

[SUS_PWR_DN_ACK] Send Disabled to PCH.
[DeepSx] Show DeepSx Policies.

DeepSx Power Policies [Disabled]

Allows you to configure the DeepSx Mode configuration.
Configuration options: [Disabled] [Enabled in S5] [Enabled in S4 and S5]

GP27 Wake From DeepSx [Disabled]

Allows you to enable or disable GP27 Wake From DeepSx.
Configuration options: [Disabled] [Enabled]

PCI Express Configuration

PCI-E ASPM Support (Global) [L1 Only]

Allows you to select ASPM support for all downstream devices.
Configuration options: [Per individual port] [L1 Only]

PCH DMI ASPM [Platform-POR]

Allows you to configure the PCH DMI ASPM.
Configuration options: [Platform-POR] [ASPM L1] [Disabled]

PCH SATA Configuration

SATA Controller [Enabled]

Allows you to enable or disable the SATA Controller.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set **SATA Controller** to **[Enabled]**.

Configure SATA as [AHCI]

Allows you to identify the SATA port connected to Solid State Drive or Hard Disk Drive.
Configuration options: [AHCI] [RAID]

Support Aggressive Link Power Management [Enabled]

Allows you to enable or disable the Support Aggressive Link Power (SALP) Management.
Configuration options: [Disabled] [Enabled]

SATA Port 1-8

Port 1-8
Allows you to enable or disable the SATA port.

Configuration options: [Disabled] [Enabled]

PCH sSATA Configuration

sSATA Controller [Enabled]

Allows you to enable or disable the sSATA Controller.
Configuration options: [Disabled] [Enabled]

The following item appears only when you set s**SATA Controller** to **[Enabled]**.

Configure sSATA as [AHCI]

Allows you to identify the SATA port connected to Solid State Drive or Hard Disk Drive.
Configuration options: [AHCI] [RAID]

Support Aggressive Link Power Management [Enabled]

Allows you to enable or disable the Support Aggressive Link Power (SALP) Management.
Configuration options: [Disabled] [Enabled]

sSATA Port 1-6

Port 1-6
Allows you to enable or disable the SATA port.

Configuration options: [Disabled] [Enabled]

USB Configuration

USB Precondition [Disabled]

Allows you to enable or disable precondition work on USB host controller and root ports for faster enumeration.
Configuration options: [Disabled] [Enabled]

XHCI Manual Mode [Disabled]

This option is used by validation.
Configuration options: [Disabled] [Enabled]

The following items appear only when the **XHCI Manual Mode** is set to **[Enabled]**.

Trunk Clock Gating (BTCG) [Enabled]
Allows you to enable or disable BTCG.

Configuration options: [Disabled] [Enabled]

Enable USB 3.0 pins [Disable all pins]
Allows you to enable or disable USB 3.0 pins or on a per pin basis.

Configuration options: [Select Per-Pin] [Disable all pins] [Enable all pins]

USB Per-Connector Disable [Disabled]

Allows you to enable or disable each of the USB physical connectors. Once a connector is disabled, any USB devices plugged into the connector will not be detected by BIOS or OS.
Configuration options: [Disabled] [Enabled]

The following items appear only when the **USB Per-Connector Disable** is set to **[Enabled]**.

USB_1-8 [Enabled]
Configuration options: [Disabled] [Enabled]

USB3_1-6 [Enabled]
Configuration options: [Disabled] [Enabled]

Security Configuration

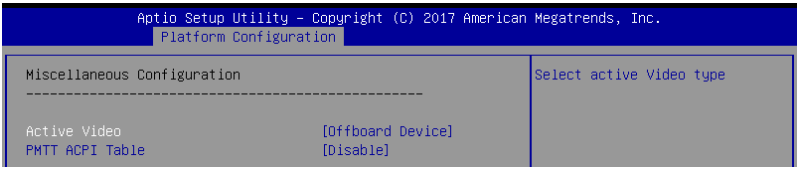
SMM BIOS Write Protect [Enabled]

Allows you to enable or disable SMM BIOS Write Protect.
Configuration options: [Disabled] [Enabled]

DCI Auto Detect Enable [Disabled]

When enabled, it detects DCI being connected during BIOS POST time and enables DCI.
Configuration options: [Disabled] [Enabled]

4.5.2 Miscellaneous Configuration



Active Video [Offboard Device]

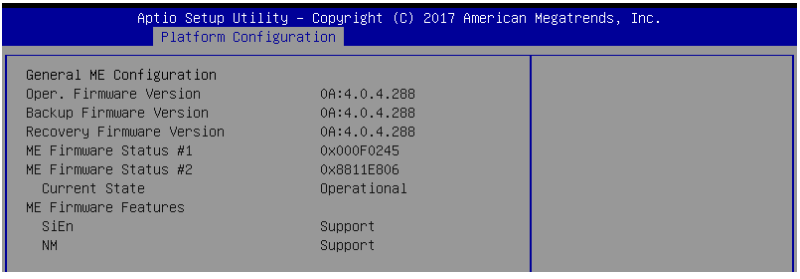
Allows you to select the video type.
Configuration options: [Onboard Device] [Offboard Device]

PMTT ACPI Table [Disabled]

Allows you to enable or disable PMTT ACPI Table for DDR4 only.
Configuration options: [Disabled] [Enabled]

4.5.3 Server ME Configuration

Displays the Server ME Technology parameters on your system.

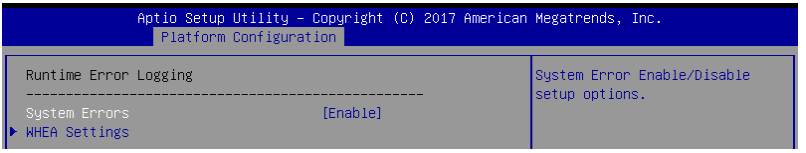


Navigate to the second page of the screen to see the rest of items in this menu by pressing the Up or Down arrow keys.

To quickly go to the last item of the second page, press the **Page Down** button. Press the **Page Up** button to go back to the first item in the first page.

4.5.4 Runtime Error Logging

Displays the Server ME Technology parameters on your system.



System Errors [Enabled]

This item allows you to enable or disable System Errors.
Configuration options: [Disabled] [Enabled]

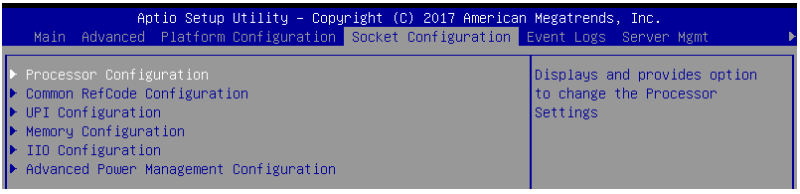
Whea Settings

Whea Support [Enabled]

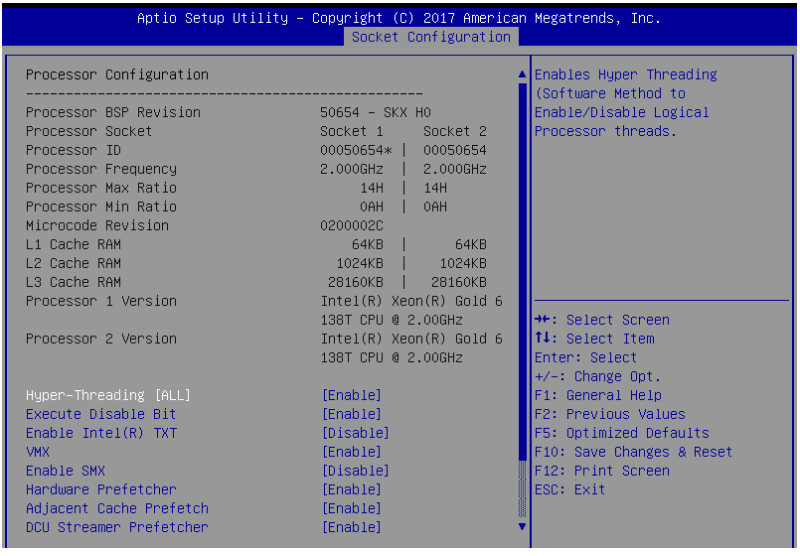
This item allows you to enable or disable the WHEA support.
Configuration options: [Disabled] [Enabled]

4.6 Socket Configuration menu

The IntelRCSetup menu items allow you to change the socket settings.



4.6.1 Processor Configuration



Navigate to the second page of the screen to see the rest of items in this menu by pressing the Up or Down arrow keys.

To quickly go to the last item of the second page, press the **Page Down** button. Press the **Page Up** button to go back to the first item in the first page.

Hyper-threading [ALL] [Enabled]

This item allows a hyper-threading processor to appear as two logical processors, allowing the operating system to schedule two threads or processors simultaneously.
Configuration options: [Disabled] [Enabled]

Execute Disable Bit [Enabled]
XD can prevent certain classes of malicious buffer overflow attacks when combined with a supporting OS (Windows Server 2003 SP1, Windows XP SP2, SuSE Linux 9.2, Redhat Enterprise 3 Update 3).
Configuration options: [Disabled] [Enabled]

Enable Intel(R) TXT [Disabled]
Forces the XD feature log to always return 0 when disabled.
Configuration options: [Disabled] [Enabled]

VMX [Enabled]
Enables the Vanderpool Technology. Takes effect after reboot.
Configuration options: [Disabled] [Enabled]

Enable SMX [Disabled]
Enables the Safer Mode Extensions.
Configuration options: [Disabled] [Enabled]

Hardware Prefetcher [Enabled]
This Item allows you to turn on/off the mid level cache(L2) streamer prefetcher.
Configuration options: [Disabled] [Enabled]

Adjacent Cache Prefetch [Enabled]
This Item allows you to turn on/off prefetching of adjacent cache lines.
Configuration options: [Disabled] [Enabled]

DCU Streamer Prefetcher [Enabled]
This Item allows you to enable or disable prefetcher of next L1 data line.
Configuration options: [Disabled] [Enabled]

DCU IP Prefetcher [Enabled]
This Item allows you to enable or disable prefetch of next L1 line based upon sequential load history.
Configuration options: [Disabled] [Enabled]

LLC Prefetch [Disabled]
This Item allows you to enable or disable LLC Prefetch on all threads.
Configuration options: [Disabled] [Enabled]

DCU Mode [32KB 8Way Without ECC]
Configuration options: [32KB 8Way Without ECC] [16KB 4Way With ECC]

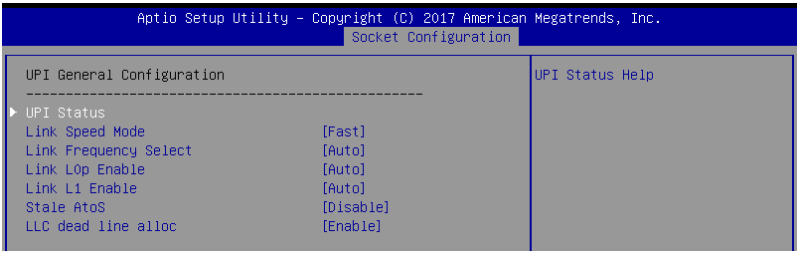
Extended APIC [Disabled]
This Item allows you to enable or disable the extended APIC support.
Configuration options: [Disabled] [Enabled]

AES-NI [Enabled]
This Item allows you to enable or disable the AES-NI support.
Configuration options: [Disabled] [Enabled]

4.6.2 Common RefCode Configuration

Numa [Enabled]
This item enables or disables the Non uniform Memory Access (NUMA).
Configuration options: [Disabled] [Enabled]

4.6.3 UPI Configuration



UPI General Configuration

UPI Status
This item displays information about the UPI status.

Link Speed Mode [Fast]
This item allows you to select the UPI link speed as either the fast mode or slow mode.
Configuration options: [Slow] [Fast]

Link Frequency Select [Auto]
This item allows for selecting the UPI link frequency.
Configuration options: [Auto] [9.6 GB/s] [10.4 GB/s] [Use Per Link Setting]

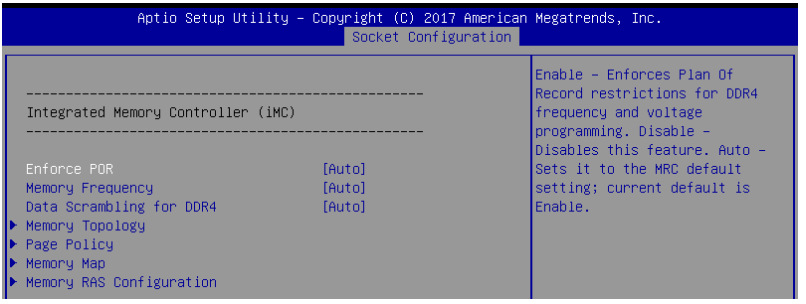
Link L0p Enable [Auto]
Configuration options: [Disabled] [Enabled] [Auto]

Link L1 Enable [Auto]
Configuration options: [Disabled] [Enabled] [Auto]

Stale AtoS [Disabled]
Configuration options: [Disabled] [Enabled] [Auto]

LLC dead line alloc [Enabled]
Configuration options: [Disabled] [Enabled] [Auto]

4.6.4 Memory Configuration



Enforce POR [Auto]
Allows you to enforce POR restrictions for DDR4 frequency and voltage programming.
Configuration options: [Auto] [POR] [Disabled]

Memory Frequency [Auto]
Allows you to select the memory frequency setting.
Configuration options: [Auto] [2133] [2400] [2666]

Data Scrambling for DDR4 [Auto]
Allows you to enable or disable data scrambling.
Configuration options: [Auto] [Disabled] [Enabled]

Memory Topology
Displays memory topology with DIMM population information.

Page Policy
Allows you to configure Page Policy settings.

Page Policy [Auto]
Configuration options: [Auto] [Closed] [Adaptive]

Memory Map

IMC Interleaving [Auto]
Select different IMC interleaving setting.
Configuration options: [Auto] [1-way Interleave] [2-way Interleave]

Channel Interleaving [Auto]
Select different channel interleaving setting.
Configuration options: [Auto] [1-way Interleave] [2-way Interleave] [3-way Interleave]

Rank Interleaving [Auto]
Select different rank interleaving setting.
Configuration options: [Auto] [1-way Interleave] [2-way Interleave][way Interleave] [8-way Interleave]

Memory RAS Configuration

Mirror mode [Disabled]
Allows you to select Mirror modes. Mirror mode will set entire 1LM/2LM memory in system to be mirrored, consequently reducing the memory capacity by half. Enabling Mirror mode will disable XPT Prefetch.
Configuration options: [Disabled] [Mirror Mode 1LM] [Mirror Mode 2LM]

Mirror TAD0 [Disabled]
Allows you to enable or disable Mirror on entire memory for TAD0.
Configuration options: [Disabled] [Enabled]

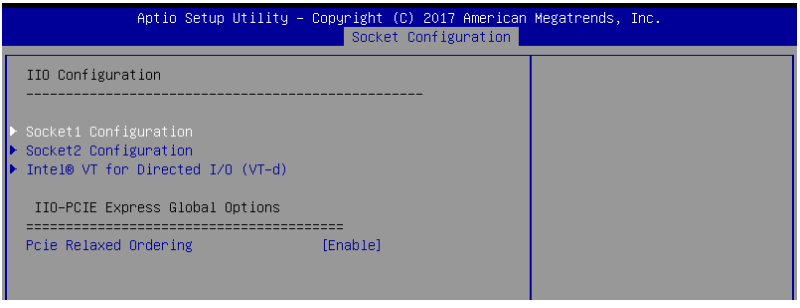
Enable Partial Mirror [Disabled]
Partial mirror mode will enable the required size of memory to be mirrored. If rank sparing is enabled, partial mirroring will not take effect. Mirror Enable will disable XPT Prefetch.
Configuration options: [Disabled] [Enabled]

UEFI ARM Mirror [Disabled]
Allows you to enable or disable UEFI ARM Mirror.
Configuration options: [Disabled] [Enabled]

Memory Rank Sparing [Disabled]
Allows you to enable or disable Memory Rank Sparing
Configuration options: [Disabled] [Enabled]

Patrol Scrub [Enabled]
Allows you to enable or disable Patrol Scrub.
Configuration options: [Disabled] [Enabled]

4.6.5 IIO Configuration



Socket1-2 Configuration
This option allows you to change the settings related to the PCI Express Ports.

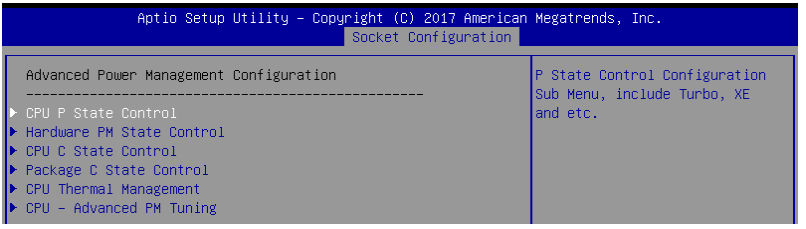
Intel® VT for Directed I/O (VT-d)

Intel® VT for Directed I/O (VT-d) [Enabled]
Allows you to enable or disable the Intel Virtualization Technology for Directed I/O.
Configuration options: [Disabled] [Enabled]

IIO-PCIE Express Global Options

PCIE relaxed Ordering [Enabled]
Allows you to enable or disable PCIE relaxed Ordering.
Configuration options: [Disabled] [Enabled]

4.6.6 Advanced Power Management Configuration



CPU P State Control

Boot performance mode [Max Performance]
Allows you to switch between Boot performance mode.
Configuration options: [Max Performance] [Max Efficient] [Set by Intel Node Manager]

Energy Efficient Turbo [Enabled]
Allows you to enable or disable Energy Efficient Turbo.
Configuration options: [Disabled] [Enabled]

Turbo Mode [Enabled]
Allows you to enable or disable Turbo Mode.
Configuration options: [Disabled] [Enabled]

Hardware PM State Control

Hardware P-States [Native Mode]
Allows you to switch between Hardware P-States mode.
Configuration options: [Disabled] [Native Mode] [Out of Band Mode] [Native Mode with no Legacy Support]

CPU C State Control

Autonomous Core C-State [Disabled]
Allows you to enable or disable Autonomous Core C-State Report.
Configuration options: [Disabled] [Enabled]

CPU C6 Report [Auto]
Allows you to select CPU C6 Report.
Configuration options: [Disabled] [Enabled] [Auto]

OS ACPI Cx [ACPI C2]
Allows you to select OS ACPI Cx Report.
Configuration options: [ACPI C2] [ACPI C3]

Package C State Control

Package C State [Auto]
Allows you to select Package C State.
Configuration options: [C0/C1 state] [C2 state] [C6(non Retention state)] [C6(Retention state)] [No Limit] [Auto]

CPU Thermal Control

CPU T State Control

Software Controlled T-States [Disabled]
Allows you to enable or disable Software Controlled T-States.
Configuration options: [Disabled] [Enabled]

CPU - Advanced PM Tuning

Energy Perf BIAS

Power Performance Tuning [OS Controls EPB]

Configuration options: [OS Controls EPB] [BIOS Controls EPB]

The following item appears only when you set **Power Performance Tuning** to **[OS Controls EPB]**.

PECI PCS EPB [OS Controls EPB]

This option controls whether PECI has control over EPB.
Configuration options: [OS Controls EPB] [PECI Controls EPB using PCS]

The following item appears only when you set **Power Performance Tuning** to **[BIOS Controls EPB]**.

ENERGY_PERF_BIAS_CFG Mode [Balanced Performance]

Configuration options: [Performance] [Balanced Performance] [Balanced Power] [Power]

Dynamic Loadline Switch [Enabled]

Configuration options: [Disabled] [Enabled]

Workload Configuration [UMA]

This option allows optimization for the workload characterization.
Configuration options: [UMA] [NUMA]

Averaging Time Window [17]

This option is used to control the effective window of the average C0 an P0 time.
Configuration options: [0] - [99]

P0 TotalTimeThreshold Low [23]

The HW switching mechanism DISABLES the performance setting (0) when the total P0 time is less than the threshold set.
Configuration options: [0] - [99]

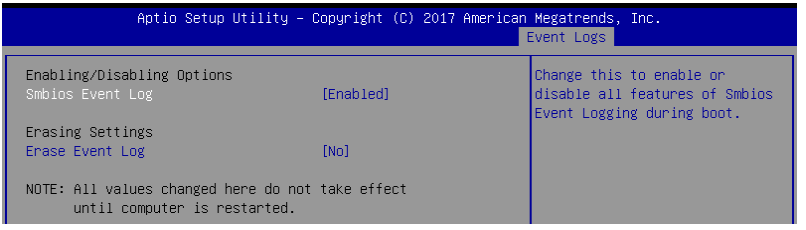
P0 TotalTimeThreshold High [3a]

The HW switching mechanism Enables the performance setting (0) when the total P0 time is greater than the threshold set.
Configuration options: [0] - [99]

4.7 Event Logs menu

4.7.1 Change Smbios Event Log Settings

Press <Enter> to change the Smbios Event Log configuration.



All values changed here do not take effect until computer is restarted.

Enabling/Disabling Options

Smbios Event Log [Enabled]

Change this to enable or disable all features of Smbios Event Logging during boot.
Configuration options: [Disabled] [Enabled]

Erasing Settings

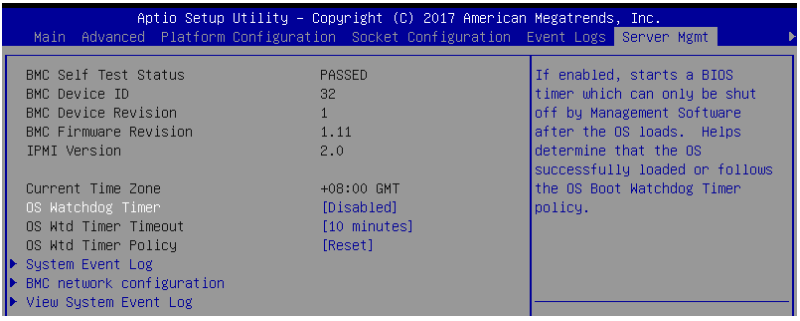
Erase Event Log [No]

Choose options for erasing Smbios Event Log. Erasing is done prior to any logging activation during reset.
Configuration options: [No] [Yes, Next reset] [Yes, Every reset]

4.8.2 View Smbios Event Log

Press <Enter> to view all smbios event logs.

4.8 Server Mgmt menu



OS Watchdog Timer [Disabled]

This item allows you to start a BIOS timer which can only be shut off by Intel Management Software after the OS loads.
Configuration options: [Disabled] [Enabled]

The following items are configurable only when the **OS Watchdog Timer** is set to **[Enabled]**.

OS Wtd Timer Timeout [10 minutes]

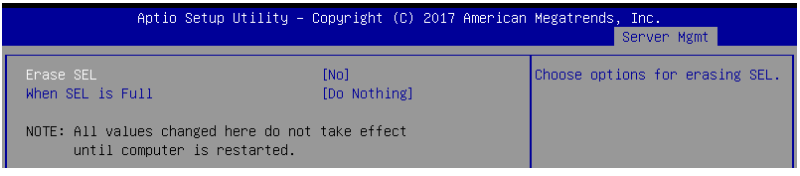
Allows you to configure the length for the OS Boot Watchdog Timer.
Configuration options: [5 minutes] [10 minutes] [15 minutes] [20 minutes]

OS Wtd Timer Policy [Reset]

This item allows you to configure the how the system should respond if the OS Boot Watch Timer expires.
Configuration options: [Do Nothing] [Reset] [Power Down]

4.8.1 System Event Log

Allows you to change the SEL event log configuration.



All values changed here do not take effect until computer is restarted.

Erase SEL [No]

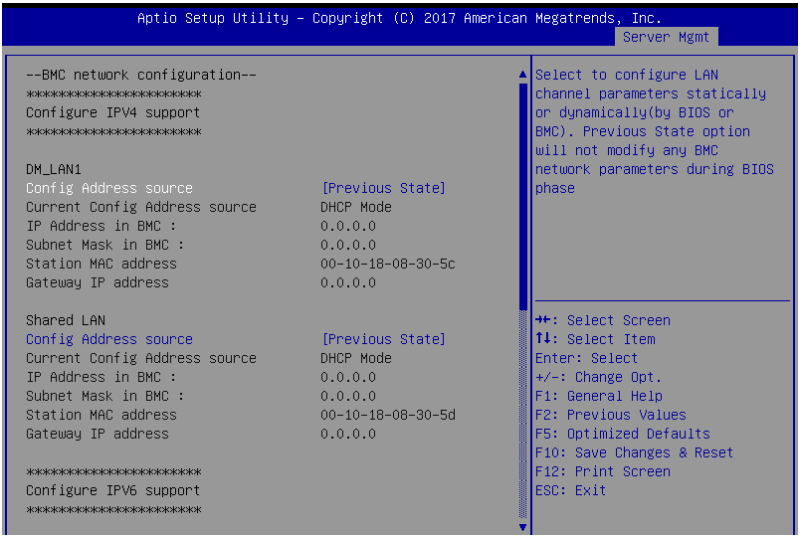
Allows you to choose options for erasing SEL.
Configuration options: [No] [Yes, On next reset] [Yes, On every reset]

When SEL is Full [Do Nothing]

Allows you to choose options for reactions to a full SEL.
Configuration options: [Do Nothing] [Erase Immediately]

4.8.2 BMC network configuration

The sub-items in this configuration allow you to configure the BMC network parameters.



Navigate to the second page of the screen to see the rest of items in this menu by pressing the Up or Down arrow keys.

To quickly go to the last item of the second page, press the **Page Down** button. Press the **Page Up** button to go back to the first item in the first page.

IPV4

DM_LAN1/ Shared LAN

Config Address source [Previous State]

This item allows you to configure LAN channel parameters statistically or dynamically (by BIOS or BMC). Unspecified option will not modify any BMC network parameters during BIOS phase.
Configuration options: [Previous State] [Static] [DynamicBmcDhcp] [DynamicBmcNonDhcp]

IPV6

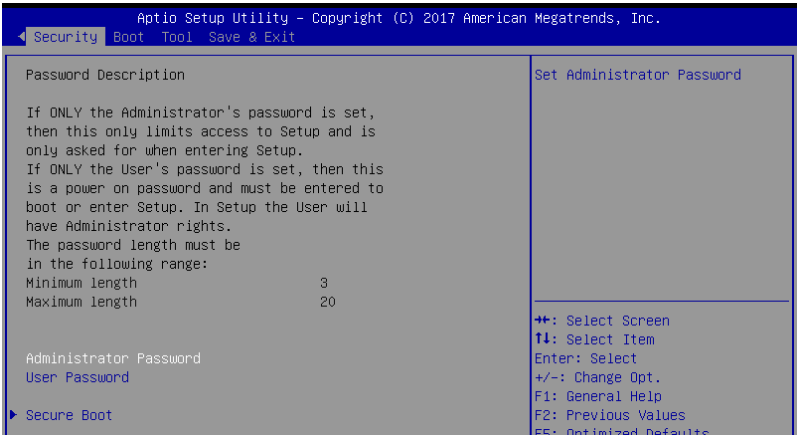
DM_LAN1/ Shared LAN

IPV6 Support [Enabled]

Allows you to enable or disable LAN1 IPV6 Support.
Configuration options: [Disabled] [Enabled]

4.9 Security menu

This menu allows a new password to be created or a current password to be changed. The menu also enables or disables the Secure Boot state and lets the user configure the System Mode state.



Administrator Password

To set an administrator password:

1. Select the Administrator Password item and press <Enter>.
2. From the Create New Password box, key in a password, then press <Enter>.
3. Confirm the password when prompted.

To change an administrator password:

1. Select the Administrator Password item and press <Enter>.
2. From the Enter Current Password box, key in the current password, then press <Enter>.
3. From the Create New Password box, key in a new password, then press <Enter>.
4. Confirm the password when prompted.

To clear the administrator password, follow the same steps as in changing an administrator password, but press <Enter> when prompted to create/confirm the password.

User Password

To set a user password:

1. Select the User Password item and press <Enter>.
2. From the Create New Password box, key in a password, then press <Enter>.
3. Confirm the password when prompted.

To change a user password:

1. Select the User Password item and press <Enter>.
2. From the Enter Current Password box, key in the current password, then press <Enter>.
3. From the Create New Password box, key in a new password, then press <Enter>.
4. Confirm the password when prompted.

To clear a user password:

1. Select the Clear User Password item and press <Enter>.
2. Select Yes from the Warning message window then press <Enter>.

Secure Boot

This item allows you to customize the Secure Boot settings.

Attempt Secure Boot [Disabled]

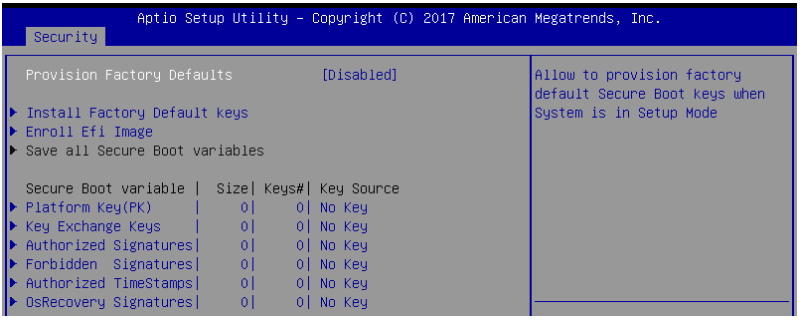
Secure Boot can be enabled if the system is running in User mode with enrolled platform Key (EPK) or if the CSM function is disabled.
Configuration options: [Disabled] [Enabled]

Secure Boot Mode [Custom]

Allows you to set the Secure Boot selector.
Configuration options: [Custom] [Standard]

Key Management

This item only appears when the item Secure Boot Mode is set to [Custom]. The Key Management item allows you to modify Secure Boot variables and set Key Management page.



Provision Factory Defaults [Disabled]
Allows you to provision factory default Secure Boot keys when the system is in Setup Mode.
Configuration options: [Disabled] [Enabled]

Install Factory Default keys
This item will install all Factory Default keys.

Reset to Setup Mode
This item appears only when you load the default Secure Boot keys. This item allows you to clear all default Secure Boot keys.

Enroll Efi Image
This item will allow the image to run in Secure Boot mode.

Save All Secure Boot Variables
This item will ask you if you want to save all secure boot variables. Select Yes if you want to save all secure boot variables, otherwise select No.

Platform Key (PK)
Configuration options: [Save to File] [Set New] [Erase]

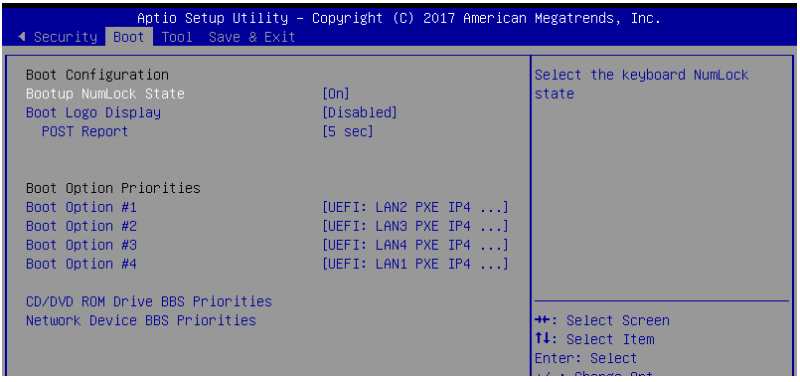
Key Exchange Keys / Authorized Signatures / Forbidden Signatures
Configuration options: [Save to File] [Set New] [Append] [Erase]

Authorized TimeStamps
Configuration options: [Set New] [Append]

OsRecovery Signatures
Configuration options: [Set New] [Append]

4.10 Boot menu

The Boot menu items allow you to change the system boot options.



Bootup NumLock State [On]

Allows you to select the power-on state for the NumLock.
Configuration options: [Off] [On]

Boot Logo Display [Disabled]

Allows you to enable or disable the full screen logo display feature.
Configuration options: [Auto] [Full Screen] [Disabled]

The following item appears only when you set the **Boot Logo Display** to **[Disabled]**.

POST Report [5 sec]

Allows you to set the desired POST Report waiting time from 1 to 10 seconds.
Configuration options: [1 sec] ~ [10 sec] [Until Press ESC]

Boot Option Priorities

These items specify the boot device priority sequence from the available devices. The number of device items that appears on the screen depends on the number of devices installed in the system.

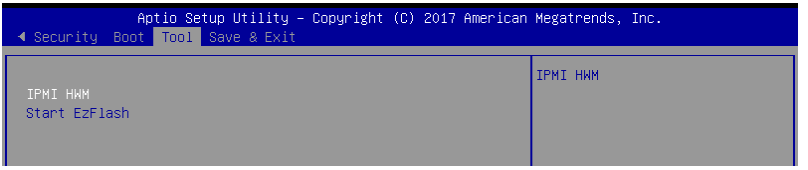
- To select the boot device during system startup, press <F8> when Logo appears.
- To access Windows OS in Safe Mode, please press <F8> after POST.

CD/DVD ROM Drive BBS Priorities / Network Device BBS Priorities

These items allow you to set the booting order of the devices.

4.11 Tool menu

The Tool menu items allow you to configure options for special functions. Select an item then press <Enter> to display the submenu.



IPMI HWM

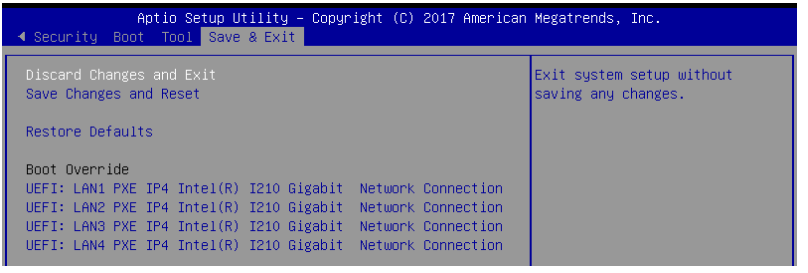
Allows you to run the IPMI hardware monitor.

Start EzFlash

Allows you to run EzFlash BIOS ROM Utility when you press <Enter>. Refer to the EzFlash Utility section for details.

4.12 Save & Exit menu

The Exit menu items allow you to save or discard your changes to the BIOS items.



Pressing <Esc> does not immediately exit this menu. Select one of the options from this menu or <F10> from the legend bar to exit.

Discard Changes and Exit

Exit System setup without saving any changes.

Save Changes and Reset

Exit System setup after saving the changes.

Restore Defaults

Restore/load default values for all the setup options.

Boot Override

These items displays the available devices. The device items that appears on the screen depends on the number of devices installed in the system. Click an item to start booting from the selected device.

Launch EFI Shell from filesystem device

This item allows you to attempt to launch the EFI Shell application (shellx64.efi) from one of the available filesystem devices.