MCN-2610T

Intel® Xeon® Scalable Processors CPU Sled

User's Manual



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Part No.: 50-1Z259-1000

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Leading EDGE COMPUTING

Preface

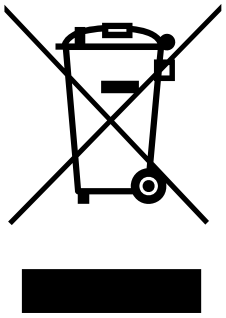
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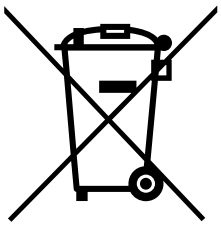
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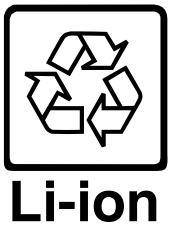
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Revision History

Revision	Release Date	Description of Change(s)
1.0	2019-04-03	Initial release

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1 Overview

1.1 Introduction

The ADLINK MCN-2610T is a high-performance CPU sled featuring dual Intel® Xeon® Scalable Processors, interconnected by dual redundant switch modules when installed in the CSA-7400 Network Appliance. It is ideally suited for building next generation high-performance firewalls and virtualized telecom elements.

The main features of the MCN-2610T are summarized as follows:

- Maximum of four MCN-2610T CPU sleds are supported in the CSA-7400
- Dual redundant switch modules provide up to 2x50G data plane links to each MCN-2610T in the CSA-7400
- Independent 1G control plane links that connect four MCN-2610T, two switch management CPUs (implemented by COMe module) and two Chassis Management Modules (CMM).
- Supports IPMI 2.0 specification, provides web-based intelligent system management via CMM on switch sleds, and supports SOL on compute nodes
- Optionally integrates Wind River® Titanium Server or OPNFV software to provide carrier grade NFV service

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1.2 Specifications

1.2.1 CPU Sled Specifications

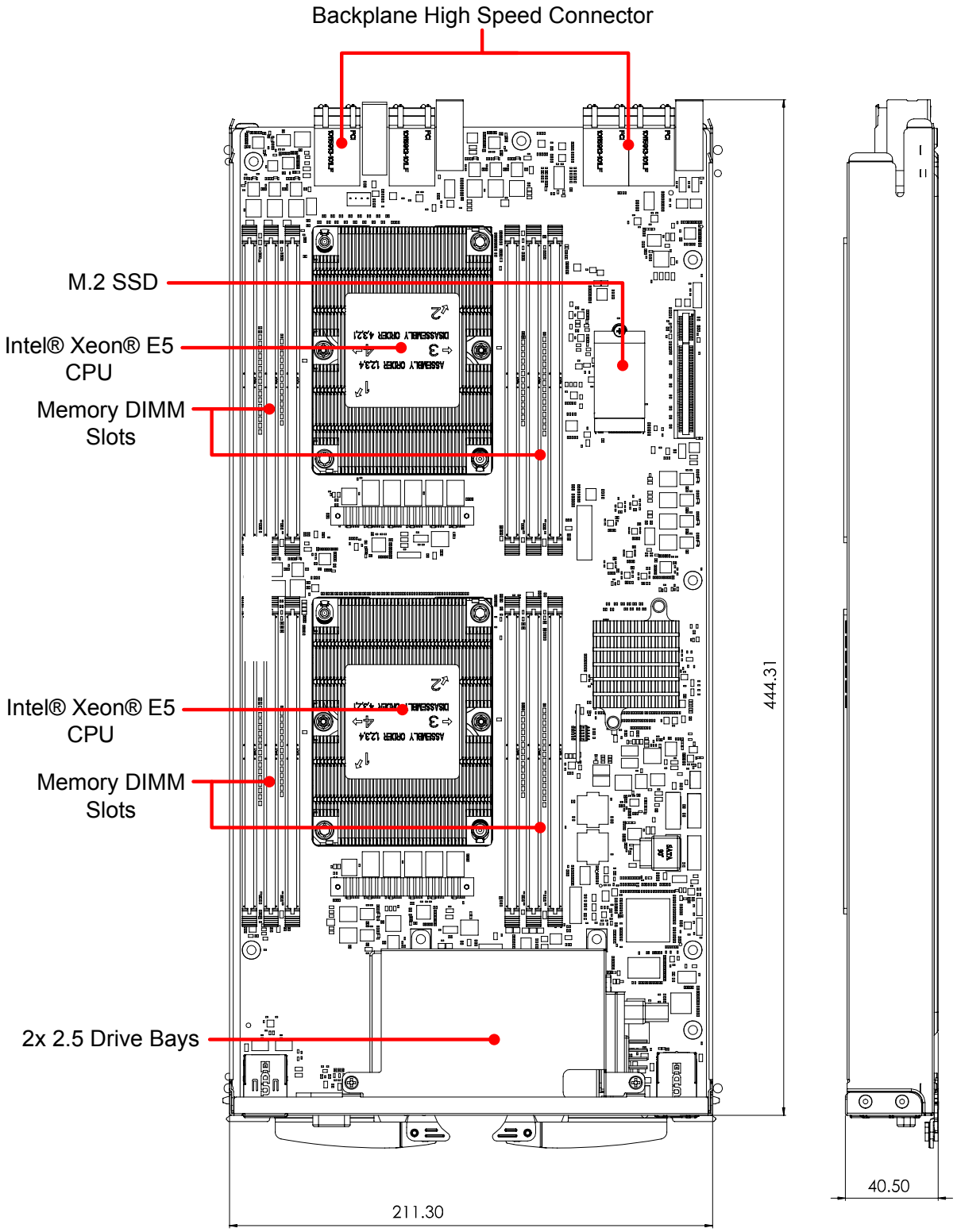
Core System	
CPU (2 per sled)	Intel® Xeon® Silver 4110 Processor 2.10Hz (8C/16T) Intel® Xeon® Silver 4114 Processor 2.20 GHz (10C/20T) Intel® Xeon® Gold 5120T Processor 2.20 GHz (14C/28T) Intel® Xeon® Gold 6130 Processor 2.10 GHz (16C/32T) Intel® Xeon® Gold 6138 Processor 2.00 GHz (20C/40T)
L2 Cache	13.75MB/19.25MB/22MB/27.5MB dependent on CPU
Chipset	Intel® C621 Chipset
Memory	12x DDR4-2133/2400/2666 DIMM sockets, ECC, up to 384GB
BIOS	AMI BIOS on SPI flash memory
Operating Systems	Window 7 64-bit, Wiindows 10 64-bit, Windows Server 2016, Linux Kernel 2.6 or above
I/O Interfaces	
Ethernet	2x RJ-45 10/100/1000BASE-T Ethernet ports on front panel 2 x 1G Ethernet ports to two switch boards via mid-plane
Console	1x RJ-45 serial port
USB	2x USB 3.0 Type A ports
Graphics	1x VGA connector
Storage	2x 2.5'' SATA drive bays (internal) 1x M.2 SSD (internal)
Backplane	2x PCIe x8 Gen3 to switch nodes
Control Buttons and LEDs	
Power	1x power button (front)
Reset	1x reset button (front)
LEDs	Status (SYS), Custom (APP), Drive Activity (HDD)

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Mechanical	
Form Factor	211.3mmx 40.5mm x 444.3mm (W x H x D)
Operating Temp.	0°C to +40°C
Storage Temp.	-40°C to +70°C
Humidity	10% to 80%, non-condensing
RoHS	RoHS compliant

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1.2.2 CPU Sled Layout



Dimensions in mm

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1.2.3 DPDK Support

The Data Plane Development Kit (DPDK) is a set of libraries and drivers for fast packet processing, and it can improve packet processing performance by up to ten times. The MCN-2610T CPU sled is fully validated with DPDK and can provide a high throughput for data plane packet processing.

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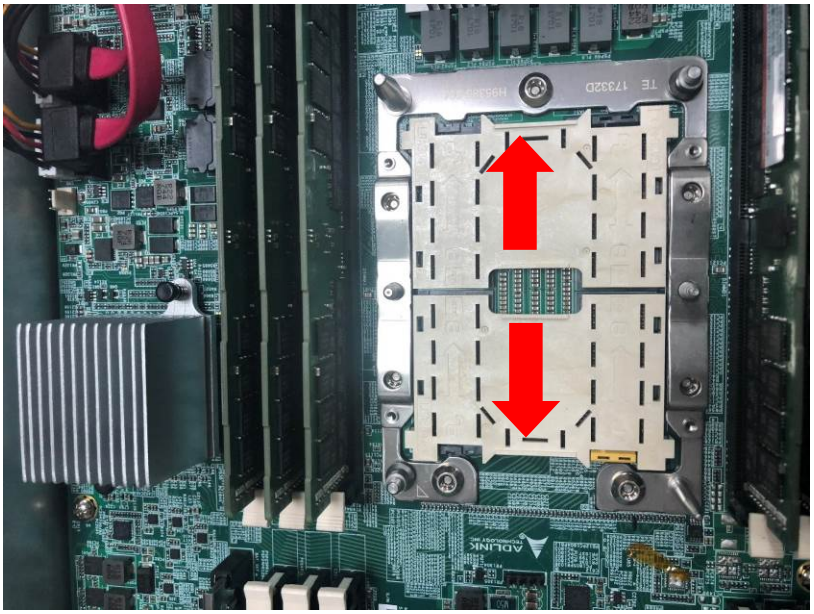
2 Getting Started

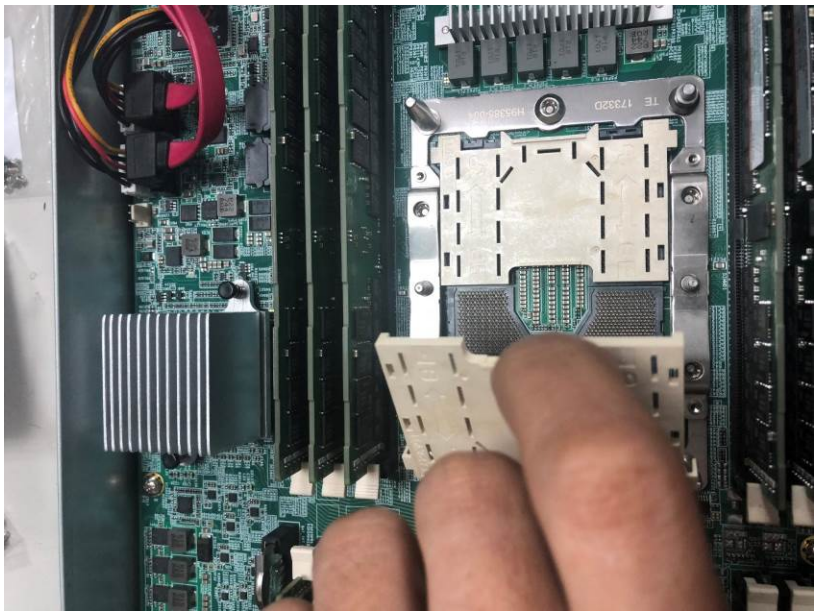
2.1 Preparing the CPU Sled

The MCN-2610T is a single-system dual Intel® Xeon® Scalable Processor compute node.

2.1.1 Installing the CPUs

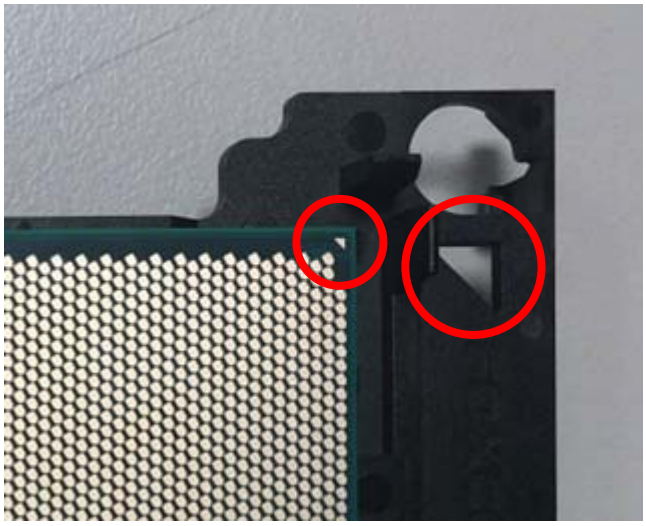
1. Remove the protective covers from the sockets.



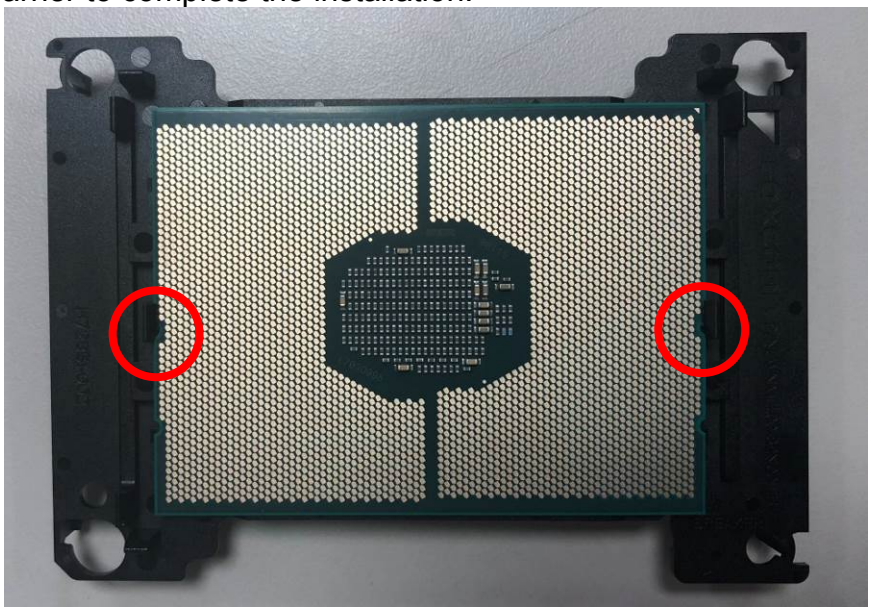


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2. Install the CPU to the CPU carrier by aligning the triangle on the CPU with the triangle on bracket.



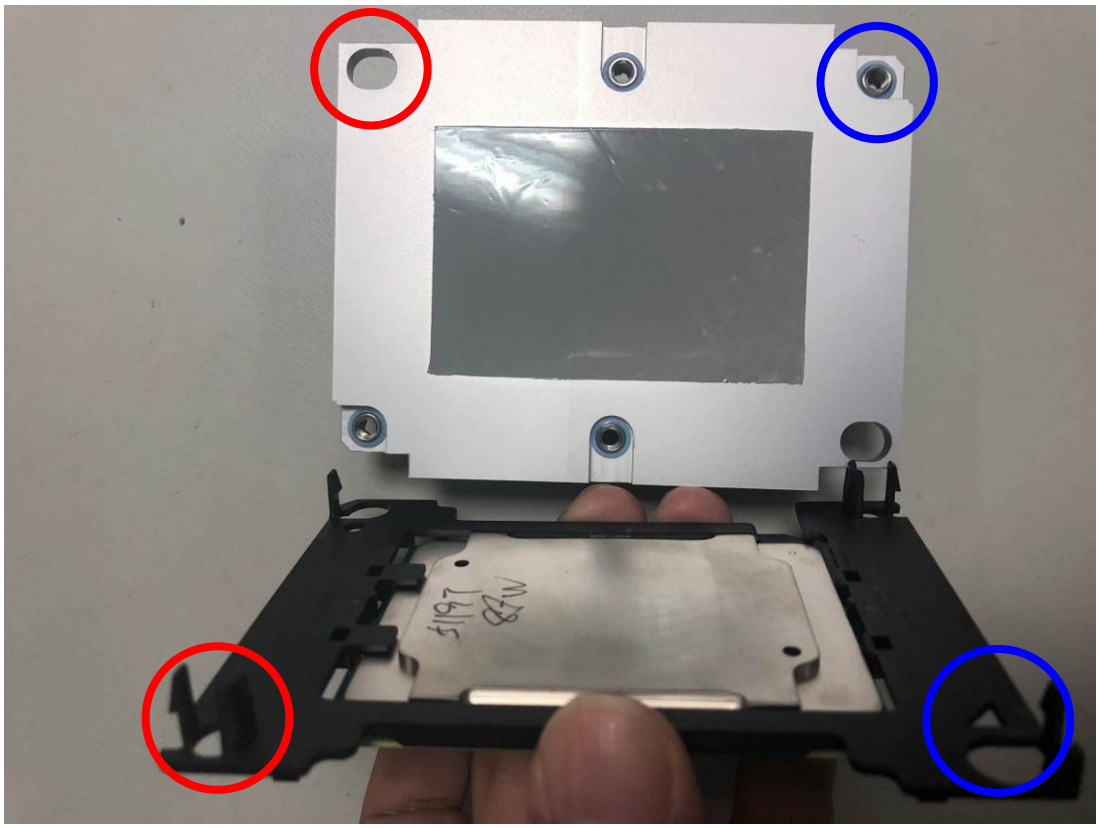
3. Insert the CPU into the carrier so that the tabs are aligned as shown. You may need to flex the carrier to complete the installation.



Note: Before continuing, record the information on the back of the CPU for warranty purposes,

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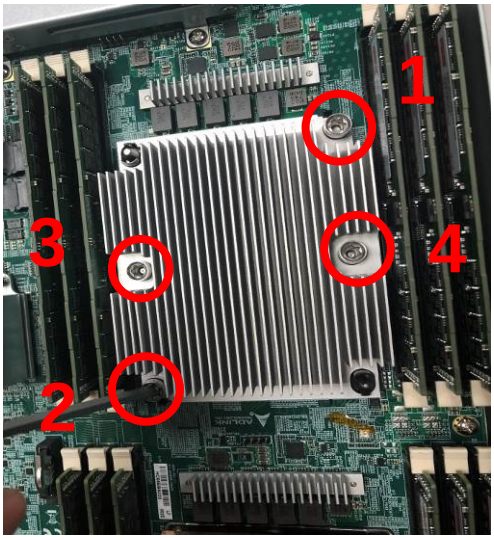
4. Install the heatsink onto the CPU carrier assembly by aligning the holes and tabs on the heatsink and bracket as marked in red and blue.

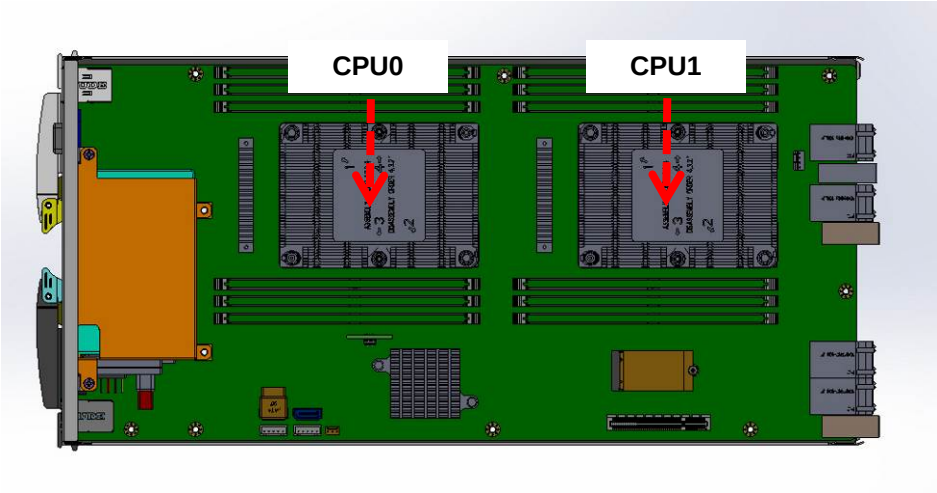


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5. Install the CPU/heatsink assembly by aligning the triangle on the CPU carrier with the triangle and beveled edge of the socket, and carefully installing the CPU/heatsink assembly. Secure it by tightening the captive screws in the order shown. Use a T30 torx screwdriver and tighten to the torque value marked on the heatsink.







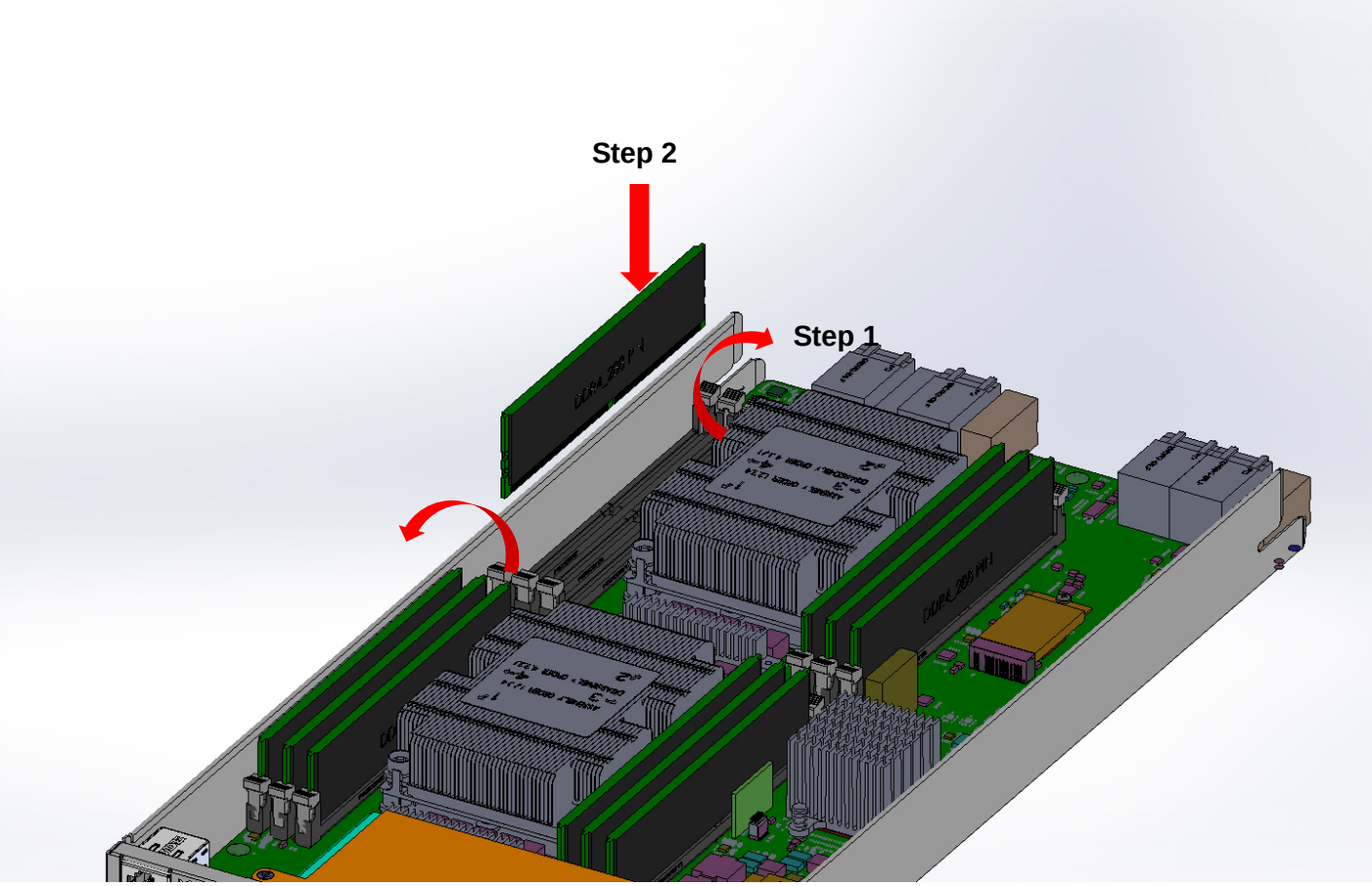
For a video of the CPU installation, go to:
https://www.intel.com/content/www/us/en/support/articles/000023869/processors/intel-xeon-processors.html

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2.1.2 Installing Memory

1. Open the locking levers on both sides of each socket.

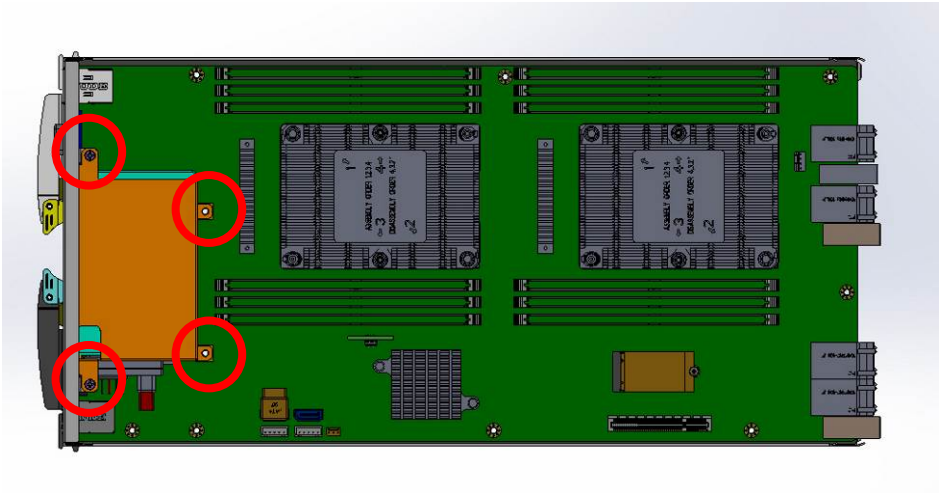
2. Align the memory module with the keys in the socket and press down firmly until both locking levers click into place.



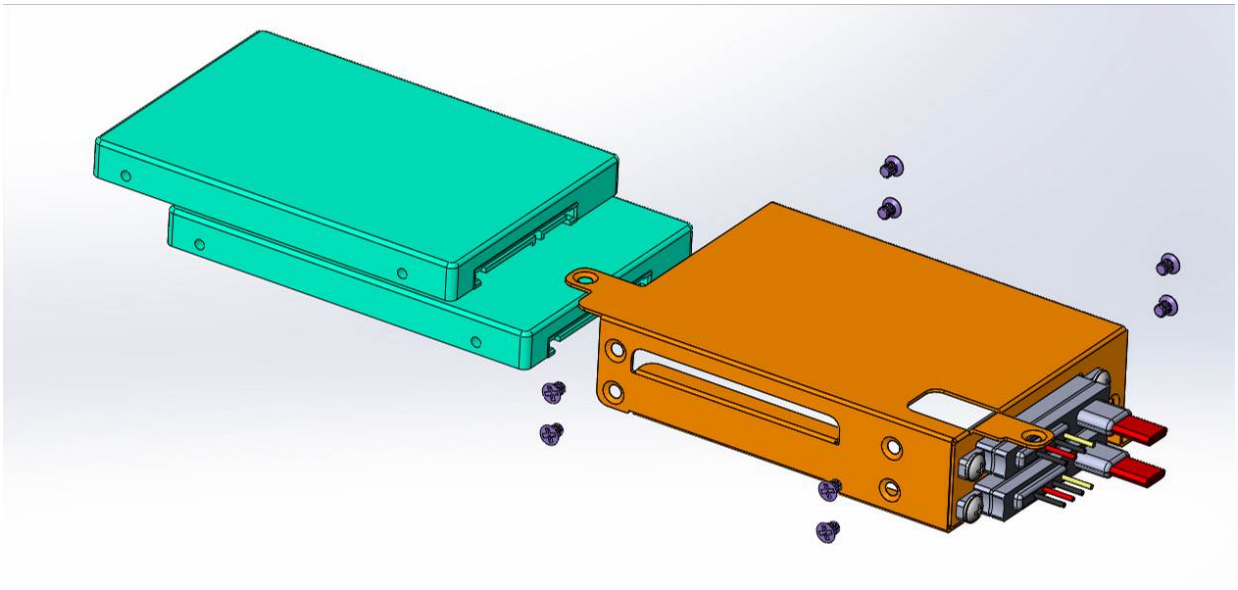
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2.1.3 Installing a SATA Drive

1. Uninstall the drive bay by removing the four screws as shown below.



2. Insert two 2.5” SATA drives into the drive tray and secure them with 4 screws as shown.

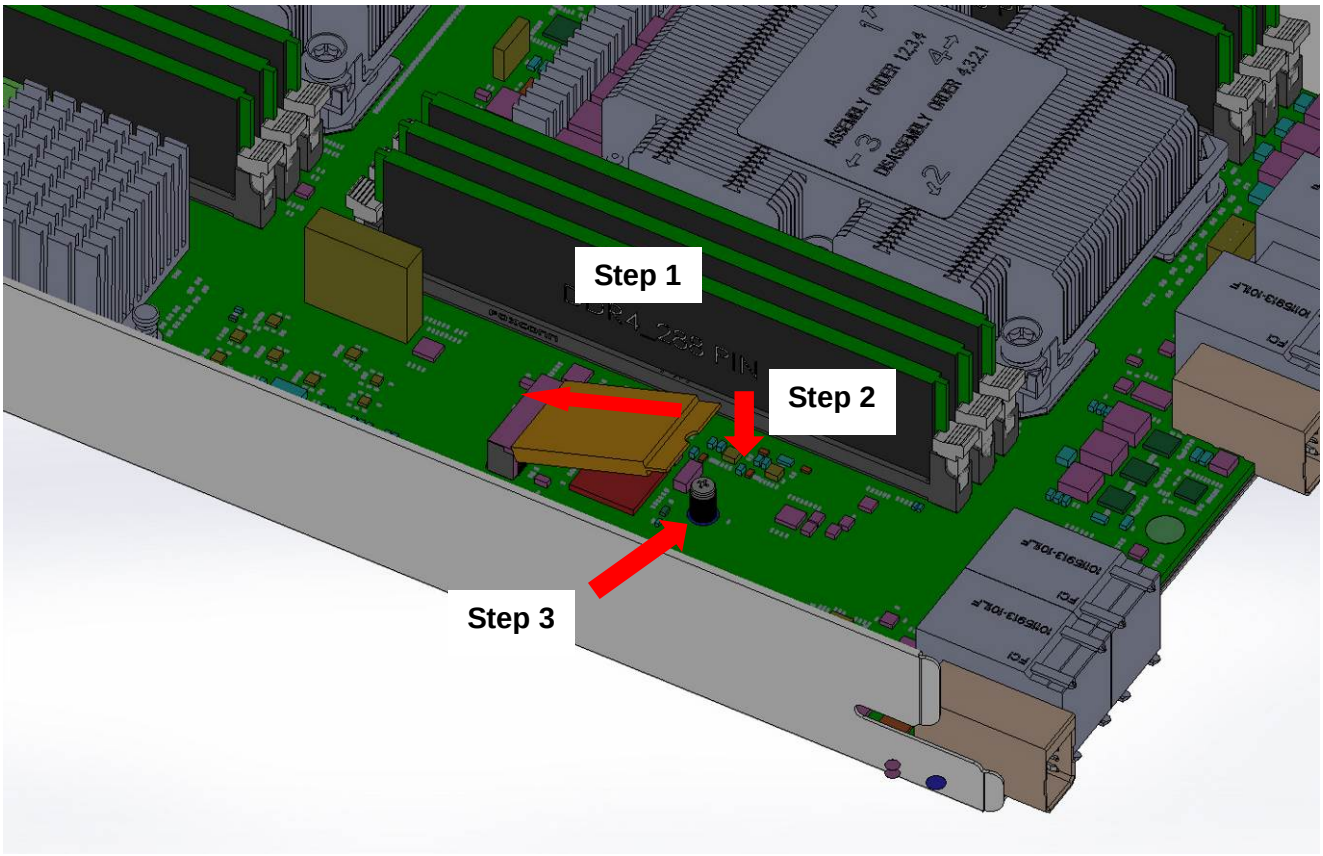


3. Re-install the drive bay by securing the four screws removed in step 1 above.

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2.1.4 Installing an M.2 SSD Module

1. Insert the M.2 SSD module into the slot at a 15 degree angle to the board.
2. Gently press down on the module.
3. Use an M2.5 screw to secure the module to the board.



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2.2 CPU Sled Front Panel

The MCN-2610T provides I/O connections from the front panel. There are two 1GbE RJ-45 LAN ports, two USB 3.0 Type A ports, one VGA connector, and one RJ-45 console port as shown below.



I/O port	Description
1	Two 10/100/1000BASE-T Ethernet ports Top: Host; Bottom: Host & BMC
2	Two USB 3.0 Type A ports
3	VGA connector
4	RJ-45 console port
5	Power button

2.3 Inserting and Removing the CPU Sled

Refer to the chapter "Assembling and Powering Up the CSA-7400" in the "CSA-7400 User's Manual" for instructions on inserting and removing the CPU Sled.

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3 Powering Up the CPU Sled

3.1 Power-Up Behavior

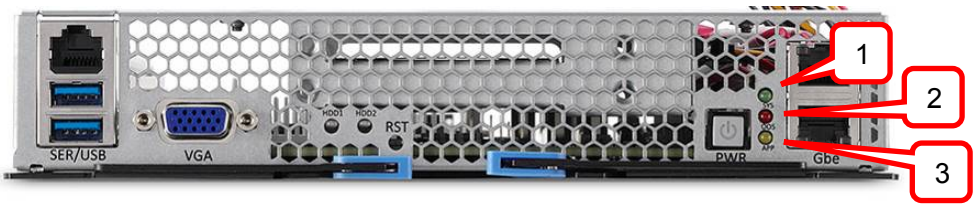
When power is supplied to the CSA-7400, all components will power up automatically. The behavior of the system when powered up is described below.

1. Cooling fans start speeding up as soon as power is applied to the system.
2. Power LEDs of both CPU and switch nodes turn ON (green).
3. CPU nodes start booting up: The status LED turns ON (red), indicating BIOS POST status. After BIOS POST is completed, the status LED changes from red to green, Indicating system status
   Note: The BMC Watchdog timeout will turn off the status LED. If the BMC watchdog is not enabled, the green status LED will stay on.
4. After a few seconds, the switch node A/S LED turns ON (steady or blinking) indicating CM Active/Standby status.

Note: See 4.1 Hot-Swapping the CPU Sled for instructions on how to power down the CPU sled.

3.2 Health/Status Indicators

This section covers all of the LEDs on MCN-2600T, as show below.



See the table below for LED descriptions.

LED #	Description	
1	Status LED • Red: BIOS POST • Green: POST completed	
2	APP LED (dependent on customer design)	
3	SATA drive activity LED	
	Drive Status	**LED (Green)**
	Read/Write	Blinking
	Idle	On
	Not Present	Off

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4 Using the CPU Sled

4.1 Hot-Swapping the CPU Sled

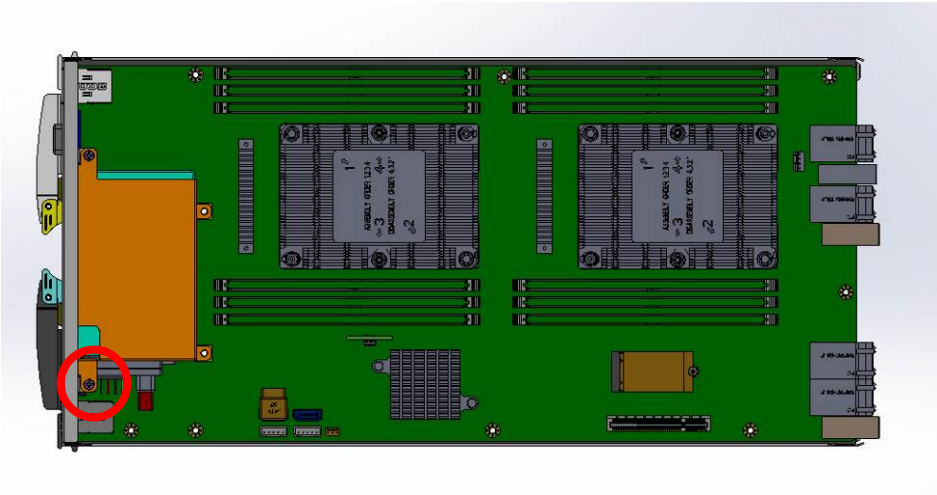
Before swapping the CPU Sled, the user must first shutdown the OS by executing a command from the OS or holding down the power button more than 4 seconds.

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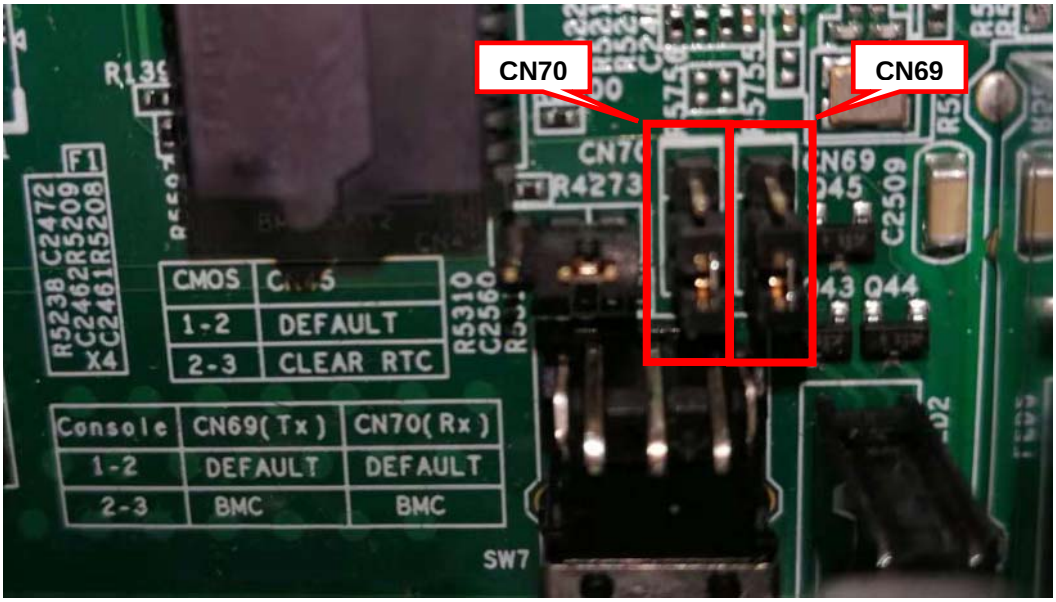
4.2 Using Serial Console

The MCN-2610T sled supports one serial console port, which is shared between the host and the BMC. Selection pins are located on jumpers CN69 & CN70 to control serial console operation.

To access the jumpers, remove the drive bay as described in 2.1.3 Installing a SATA Drive. The jumpers are located as shown below.



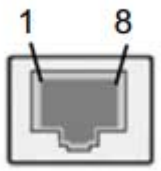
Console Setting	CN69 (Tx)	CN70 (Rx)
Host (default)	1-2 shorted	1-2 shorted
BMC	2-3 shorted	2-3 shorted



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The serial console port is RJ45 form factor, and has a standard pin definition for the console port as below.

LED #	Description
1	RTS
2	DTR
3	TXD
4	SG
5	SG
6	RXD
7	DSR
8	CTS



The serial port is set with the following parameters

Type	RS232 (COM)
Baud Rate	115200 bps
Data Bits	8
Parity	None
Stop Bits	1
Flow Control	None

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4.3 Serial Over LAN via BMC

The CPU board BMC provides a text-based Serial Over LAN (SOL) console. With SOL redirection system administrators can remotely view the text-based host console from anywhere and perform any task that doesn't require a GUI.

4.3.1 Configuring the BMC IP Address

The BMC IP address is dynamically assigned by DHCP. Users can change the IP address by using ipmitool on the host OS.

Configure BMC IP Address via Host

```
Setting LAN IP Address
# ipmitool lan set 1 ipaddr xxx.xxx.xxx.xxx

Setting LAN Subnet Mask
# ipmitool lan set 1 netmask 255.255.255.0

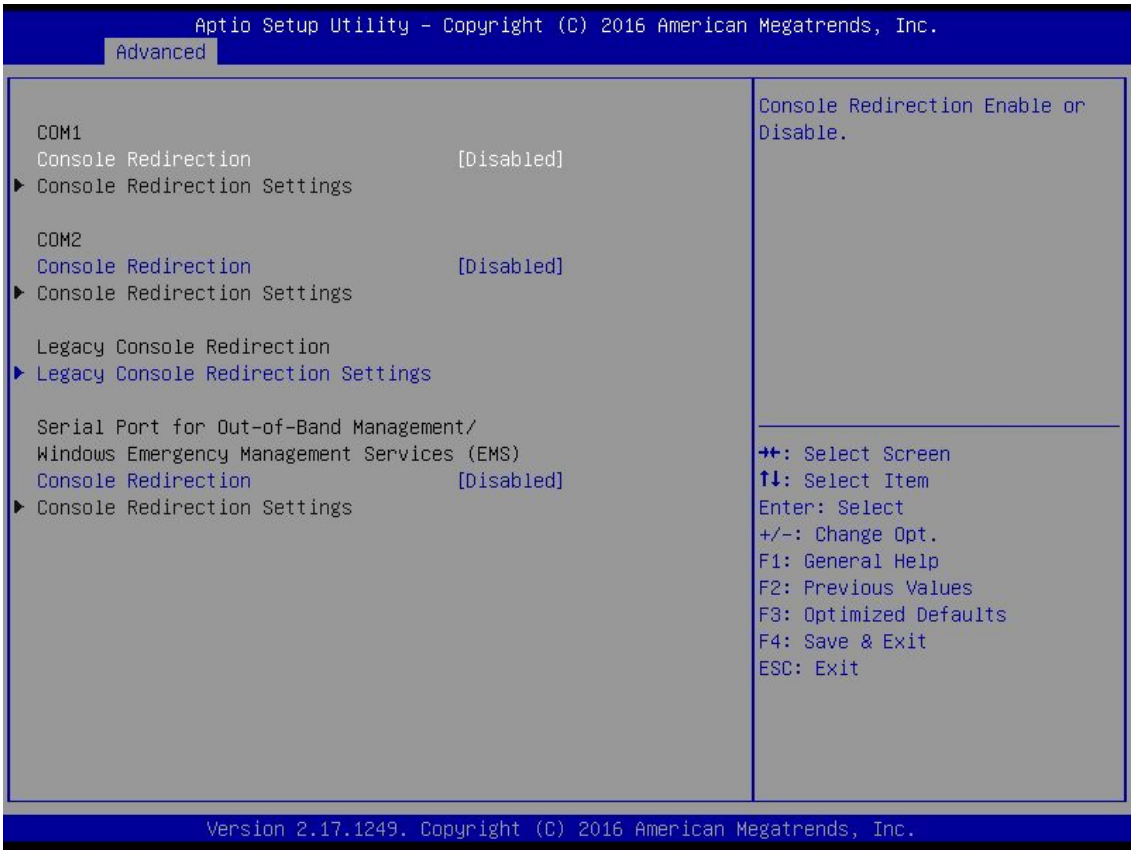
Setting LAN Default Gateway IP
# ipmitool lan set 1 defgw ipaddr xxx.xxx.xxx.xxx
```


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4.3.2 Configuring BIOS for SOL

Serial Port Console Redirection

You can use this screen to select options for the serial port console redirection settings. Use the up and down < Arrow > keys to select an item. Use the < + > and < - > keys to change the value of the selected option. The *Serial Port Console Redirection* screen is shown below.



COM2: console redirection enabled

This port is mapped to BMC vUART.

4.3.3 Configuring OS for SOL

vUART SOL with RHEL 5.6 32-bit

```
# vim /etc/securetty -> Add "ttyS2"
# strace /sbin/agetty ttyS0 115200 vt100 {Enter}
```

4.3.4 Establishing SOL

Activate SOL from client IPMItool

```
# ipmitool -H <BMC IP Address> -I lanplus -U root -P superuser sol activate
```


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4.4 Firmware Upgrade

4.4.1 Updating the BIOS

Users can update the BIOS over various interfaces (Gigabit LAN, KCS).

Updating the BIOS via Network with BMC Tool

1. Connect the BMC to the LAN, and check its IP address(Ex: 192.168.2.101);
2. Setup a Host machine (with Linux installed), and connect it to the LAN;
3. Login to the host OS with root, and check the network connection with the BMC (ping 192.168.2.101);
4. Copy the upgrade tool & BIOS FW onto the host OS.
5. Update the BIOS over network with the command below:

Example:

```
$./up_bios.sh 192.168.2.101 MCN2610_BIOS_XX.BIN
```

Updating BIOS via Host with BIOS Tool

1. Boot/Login to DOS/OS with root user permission
2. Update the BIOS over host with the command below:

Example:

```
AFUDOS.exe BIOS.ROM /x /n /b /p (If only updating BIOS part without ME)
AFUDOS.exe BIOS.BIN /x /n /b /p /me (Updating whole BIOS)
```

4.4.2 Updating the BMC

Use Yafuflash tool to update the BMC firmware.

Updating BMC via Network

1. Plug the BMC into LAN, and check its IP address (Ex: 192.168.2.101);
2. Setup a Host machine(with Linux installed), and plug into LAN;
3. Login the Host OS with root, and check the network connection with BMC (ping 192.168.2.101);
4. Copy the Yafuflash tool & BMC FW into Host OS.
5. Edit the Yafuflash config file.

```
$ vi conf.ini
   -nw             = YES
   -ip             = 192.168.2.101
# -kcs            = YES
```

6. Update the BMC over network with the command below:

```
$ ./Yafuflash -ini conf.ini rom.ima
```


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Updating BMC via Host

1. Copy the Yafuflash tool & BMC FW into Host OS.
2. Edit the Yafuflash config file.

```
$ vi conf.ini
#       -nw             = YES
        -kcs            = YES
#       -ip             = 192.168.2.101
```

3. Update the BMC via Host with the command below:

Note: Must be a root user

```
$ ./Yafuflash -ini conf.ini rom.ima
```

Use Yafuflash tool to update BMC firmware

- To upgrade bootloader, add -force-boot (recommended)
- To preserve config (/conf), add -preserve-config

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5 BIOS Setup

5.1 Entering BIOS Setup

To enter the setup screen, follow these steps:

1. Power on the motherboard
2. Press the < Delete > key on your keyboard when you see the following text prompt: < Press DEL to enter Setup >
3. After you press the < Delete > key, the main BIOS setup menu displays. You can access the other setup screens from the main BIOS setup menu, such as Chipset and Power menus.

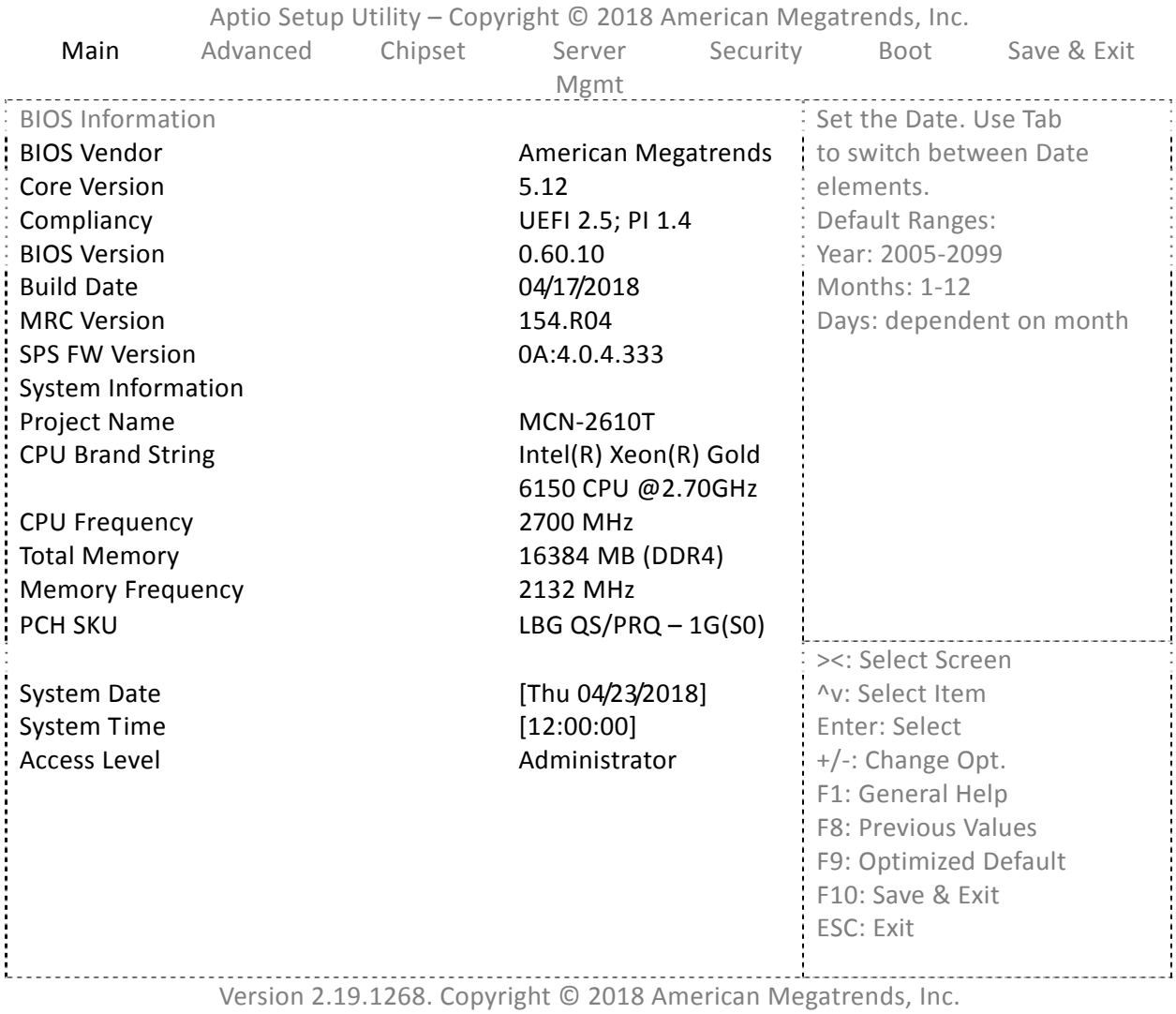


In most cases, the < Delete > key is used to invoke the setup screen. However, there are several cases that use other keys, such as < F1 >, < F2 >, and so on.

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5.2 Setup Menu

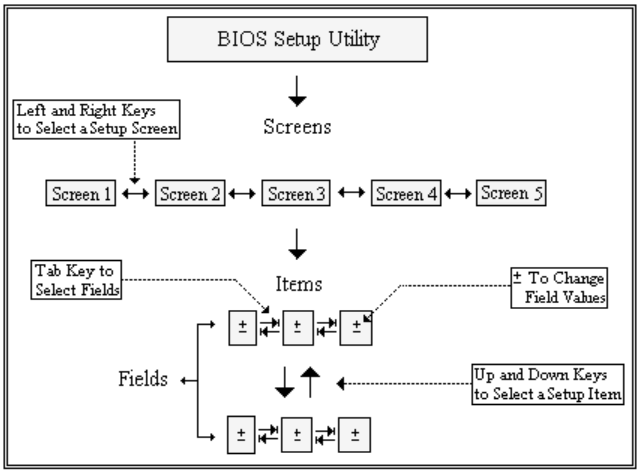
The Main BIOS setup menu is the first screen that you can navigate to. The Main BIOS setup menu screen has two main frames. The left frame displays all the options that can be configured. “Grayed” options cannot be configured, and “Blue” options can be. The right frame displays the key legend. Above the key legend is an area reserved for a text message. When an option is selected in the left frame, it is highlighted in white. Often a text message will accompany it.



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5.3 Navigation

The BIOS setup/utility uses a key-based navigation system called hot keys. Most of the BIOS setup utility hot keys can be used at any time during the setup navigation process. These keys include < F1 >, < F10 >, < Enter >, < ESC >, < Arrow > keys, and so on.



NOTE: There is a hot key legend located in the right frame on most setup screens.

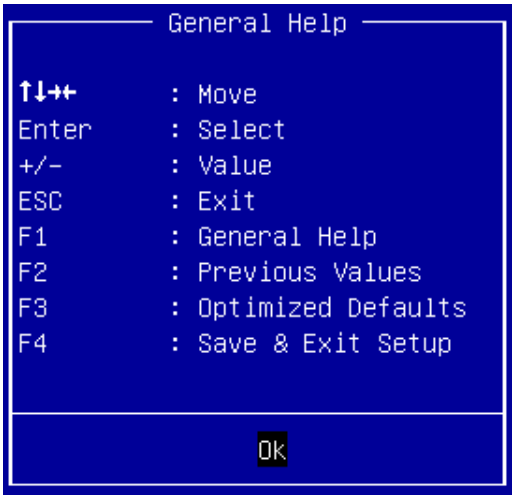
→←	Left/Right. The *Left and Right* < Arrow > keys allow you to select a setup screen. For example: Main screen, Advanced screen, Chipset screen, and so on.
↑↓	Up/Down The *Up and Down* < Arrow > keys allow you to select a setup item or sub-screen.
+-	Plus/Minus The *Plus and Minus* < Arrow > keys allow you to change the field value of a particular setup item. For example: Date and Time.
Tab	The < Tab > key allows you to select setup fields.

Hot Key	Description
Enter	The < Enter > key allows you to display or change the setup option listed for a particular setup item. The < Enter > key can also allow you to display the setup sub-screens.

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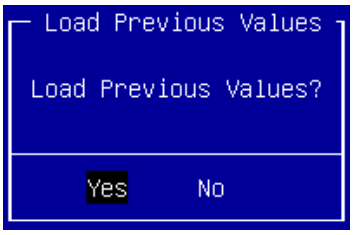
F1

The < F1 > key allows you to display the General Help screen. Press the < F1 > key to open the General Help screen.



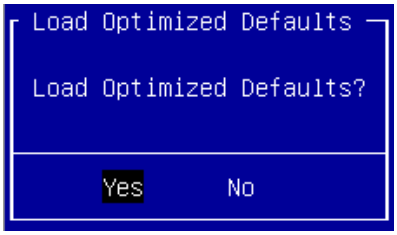
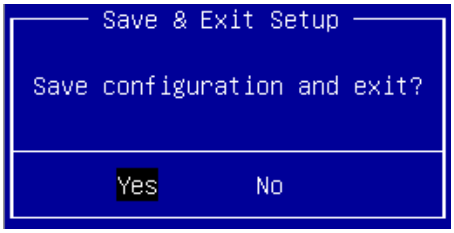
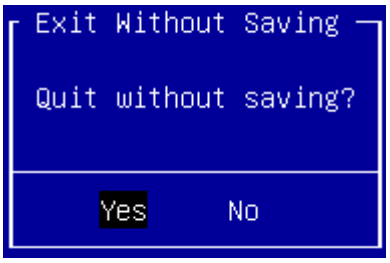
F2

The < F2 > key on your keyboard is the previous values key. It is not displayed on the key legend by default. To set the previous values settings of the BIOS, press the < F2 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The previous value settings allow the motherboard to boot up with the least amount of options set. This can lessen the probability of conflicting settings.



Press the < Enter > key to load previous values. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

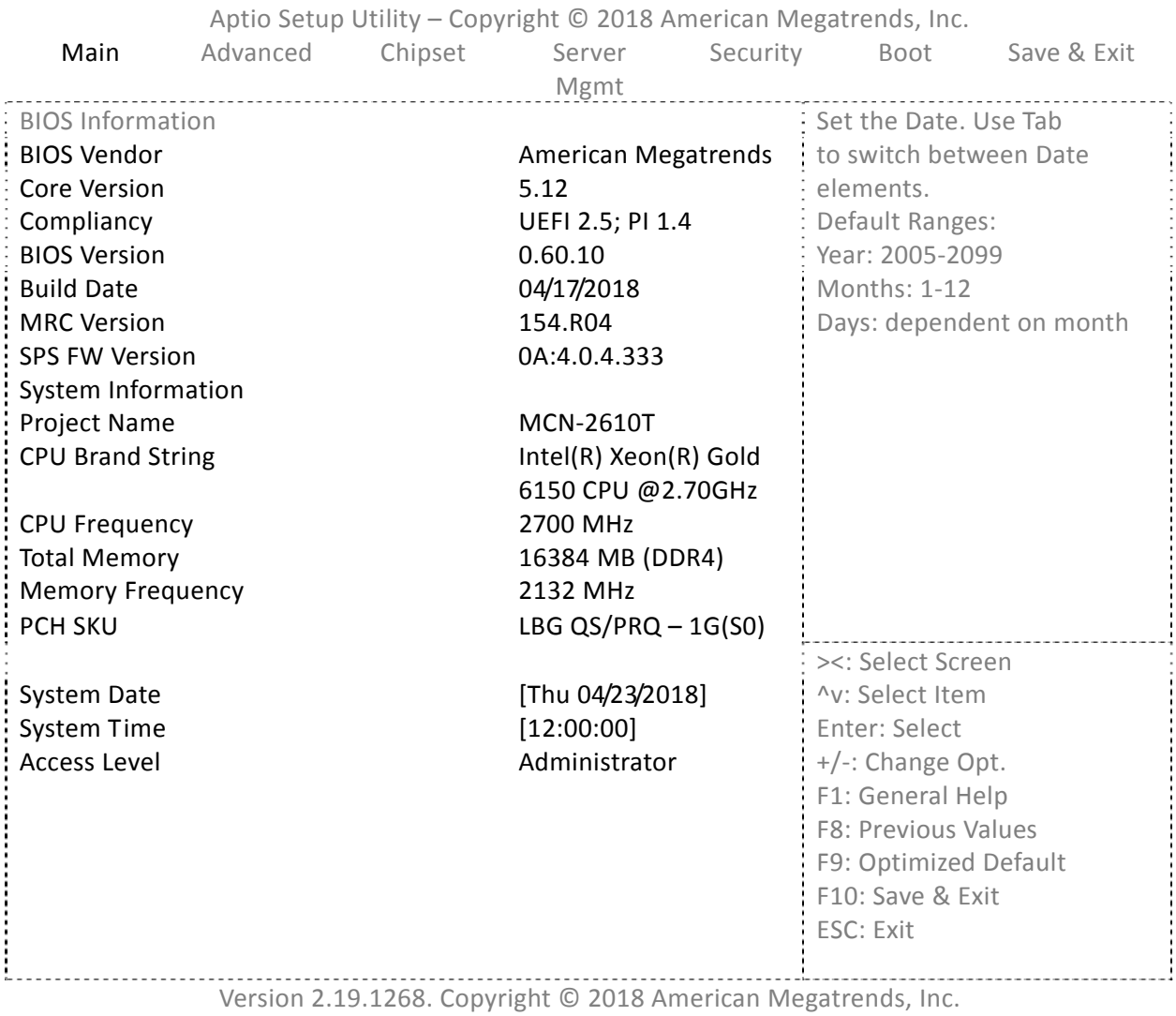
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F3	The < F3 > key on your keyboard is the optimized defaults key. To set the optimized defaults settings of the BIOS, press the < F3 > key on your keyboard. It is located on the upper row of a standard 101 keyboard. The optimized defaults settings allow the motherboard to boot up with the optimized defaults of options set. This can lessen the probability of conflicting settings.  Press the < Enter > key to load optimized defaults. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.
F4	The < F4 > key allows you to save any changes you have made and exit Setup. Press the < F4 > key to save your changes. The following screen will appear:  Press the < Enter > key to save the configuration and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.
ESC	The < Esc > key allows you to discard any changes you have made and exit the Setup. Press the < Esc > key to exit the setup without saving your changes. The following screen will appear:  Press the < Enter > key to discard changes and exit. You can also use the < Arrow > key to select Cancel and then press the < Enter > key to abort this function and return to the previous screen.

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5.4 Main Setup

The Main Menu provides read-only information about system and also allows to set system's date and time. Refer to the tables below.



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5.4.1 BIOS Information

BIOS Item	Options	Description
BIOS Vendor	**Info only.** American Megatrends	Display vendor name of system BIOS.
Core Version	**Info only.** x.yy	Displays the BIOS core version.
Compliancy	**Info only.** UEFI w.x; PI y.z	Displays the current UEFI Specification version.
BIOS Version	**Info only.** x.yy.zz	Display version of booting BIOS.
Build Date	**Info only.** MM/DD/YYYY	It shows the date that BIOS was built.
MRC Version	**Info only.** xxx.Ryy	Display the revision of MRC code which is implemented in BIOS.
SPS FW Version	**Info only.** ww:x.y.z.aaa	Display the version of Intel manageability firmware which is implemented in BIOS.

5.4.2 System Information

BIOS Item	Options	Description
Project Name	**Info only.** MCN-2610T	Displays the project name.
CPU Brand String	**Info only.** Intel(R) Xeon …	It shows what CPU is booting the system.
CPU Frequency	**Info only.** XXXX MHz	It shows CPU's frequency.
Total Memory	**Info only.** XXXX MB (DDR4)	It shows total memory size used on the motherboard and memory type.
Memory Frequency	**Info only.** XXXX MHz	It shows memory's frequency.
PCH SKU	**Info only.** LBG xxxxx	It shows what PCH SKU is designed on motherboard.

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5.4.3 System Date/System Time

Use this option to change the system time and date. Highlight *System Time* or *System Date* using the < Arrow > keys. Enter new values using the keyboard. Press the < Tab > key or the < Arrow > keys to move between fields. The date must be entered in MM/DD/YY format. The time is entered in HH:MM:SS format.

BIOS Item	Options	Description
System Date	MM/DD/YYYY	For configuring/showing system date. When setting the Date, use <Tab> key to switch between Date elements.
System Time	HH:MM:SS	For configuring/showing system time. When setting the Time, use <Tab> key to switch between Time elements.
Access Level	**Info only.** Administrator/User	It shows what access level is used to enter BIOS setup menu.

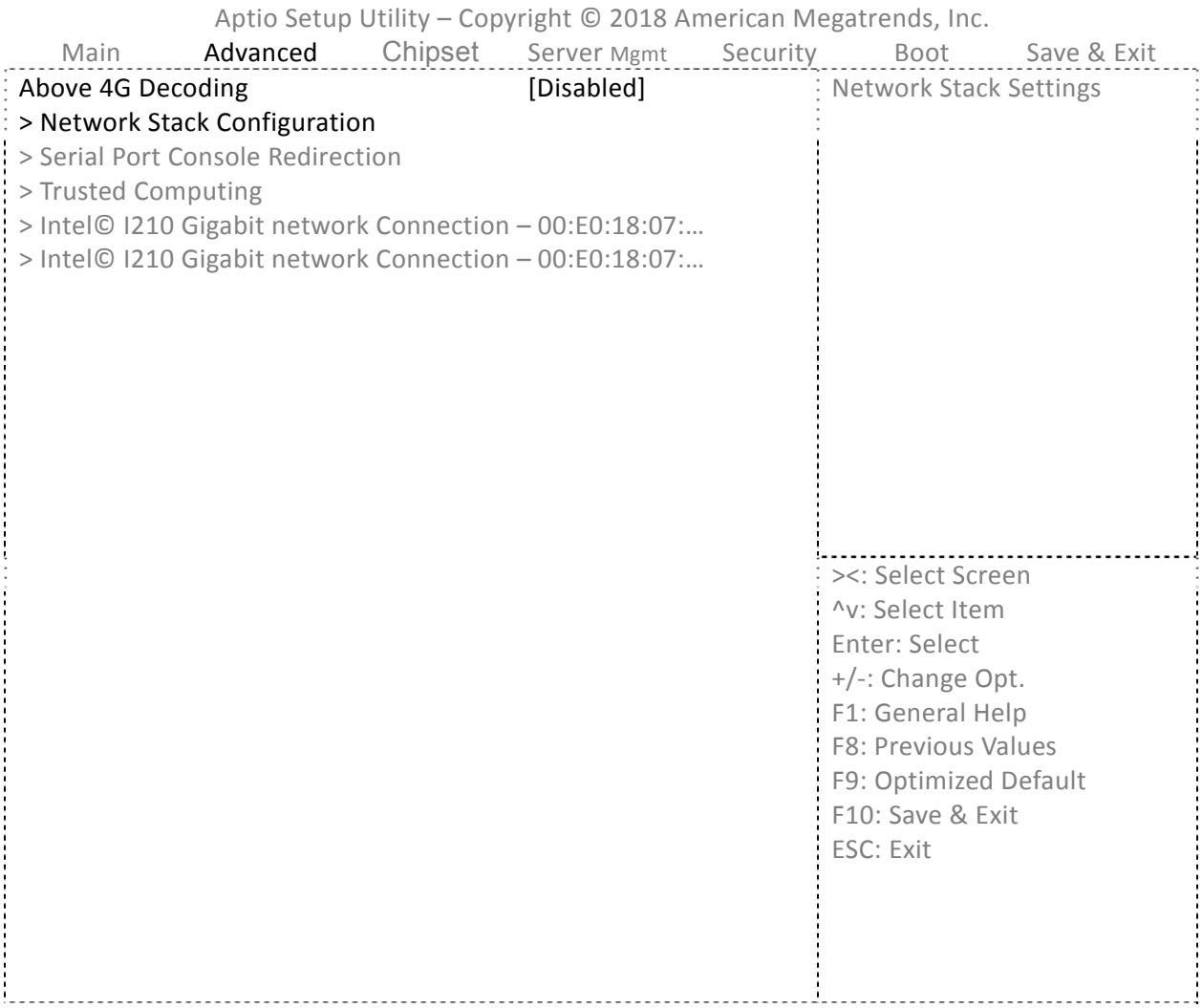


The time is in 24-hour format. For example, 5:30 A.M. appears as 05:30:00, and 5:30 P.M. as 17:30:00.

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5.5 Advanced Menu

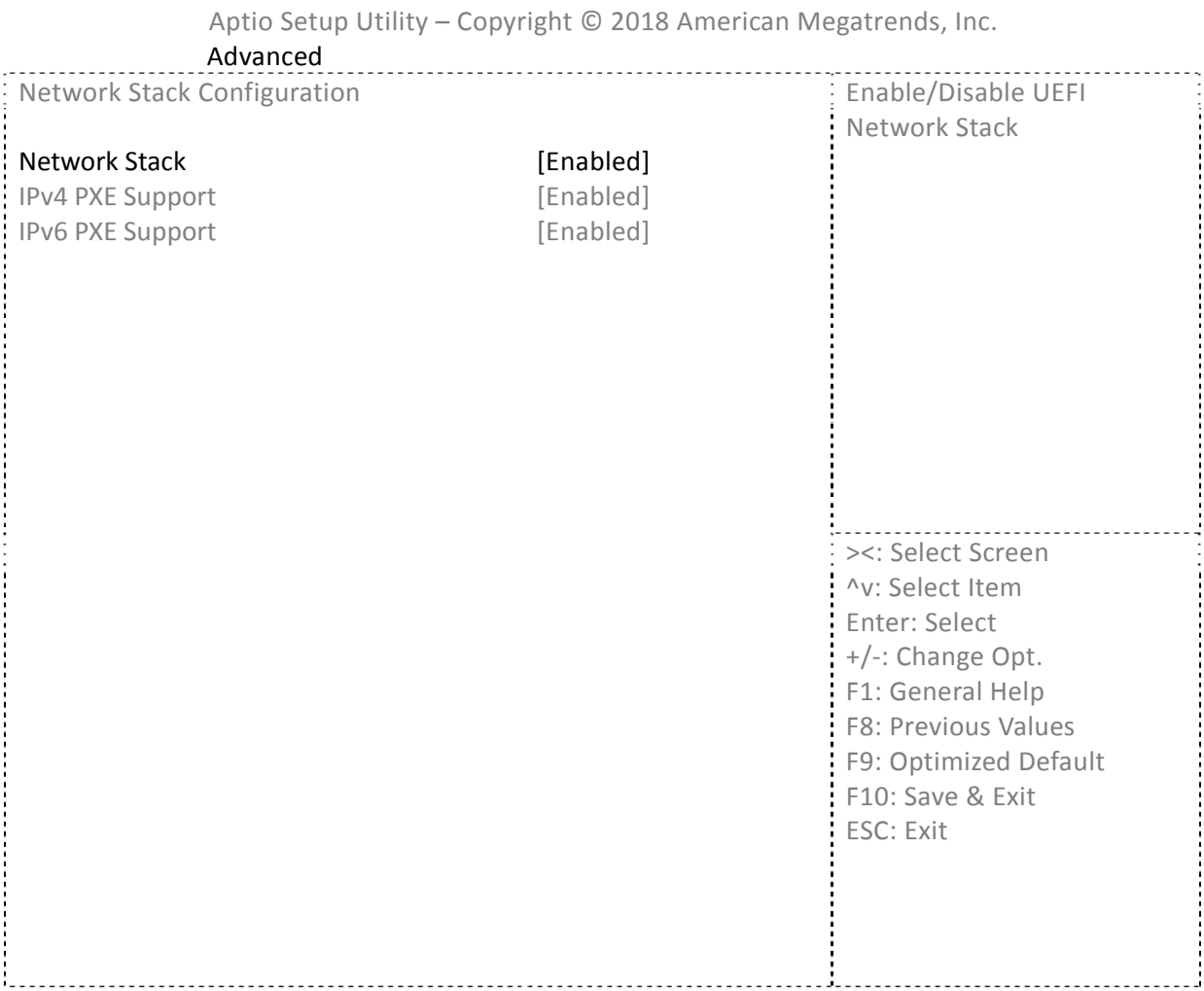
This menu contains the settings for most of the user interfaces in the system.



BIOS Item	Options	Description
Above 4G Decoding	**Disabled** Enabled	To enable or disable memory mapped I/O for a 64-bit PCIe device to 4GB or greater address space
Network Stack Configuration	**Submenu**	For configuring Network Stack.
Serial Port Console Redirection	**Submenu**	For configuring serial console.
Trusted Computing	**Submenu**	For configuring trusted computing.
iSCSI Configuration	**Submenu**	For iSCSI configuration.
Intel© I210 Gigabit Network Connection	**Submenu**	Onboard Ethernet controller configuration loaded by EFI driver. The setup page is designed by Intel. When running the Ethernet EFI driver, this page will be shown. It is related to the “Network” setting on the Boot page.

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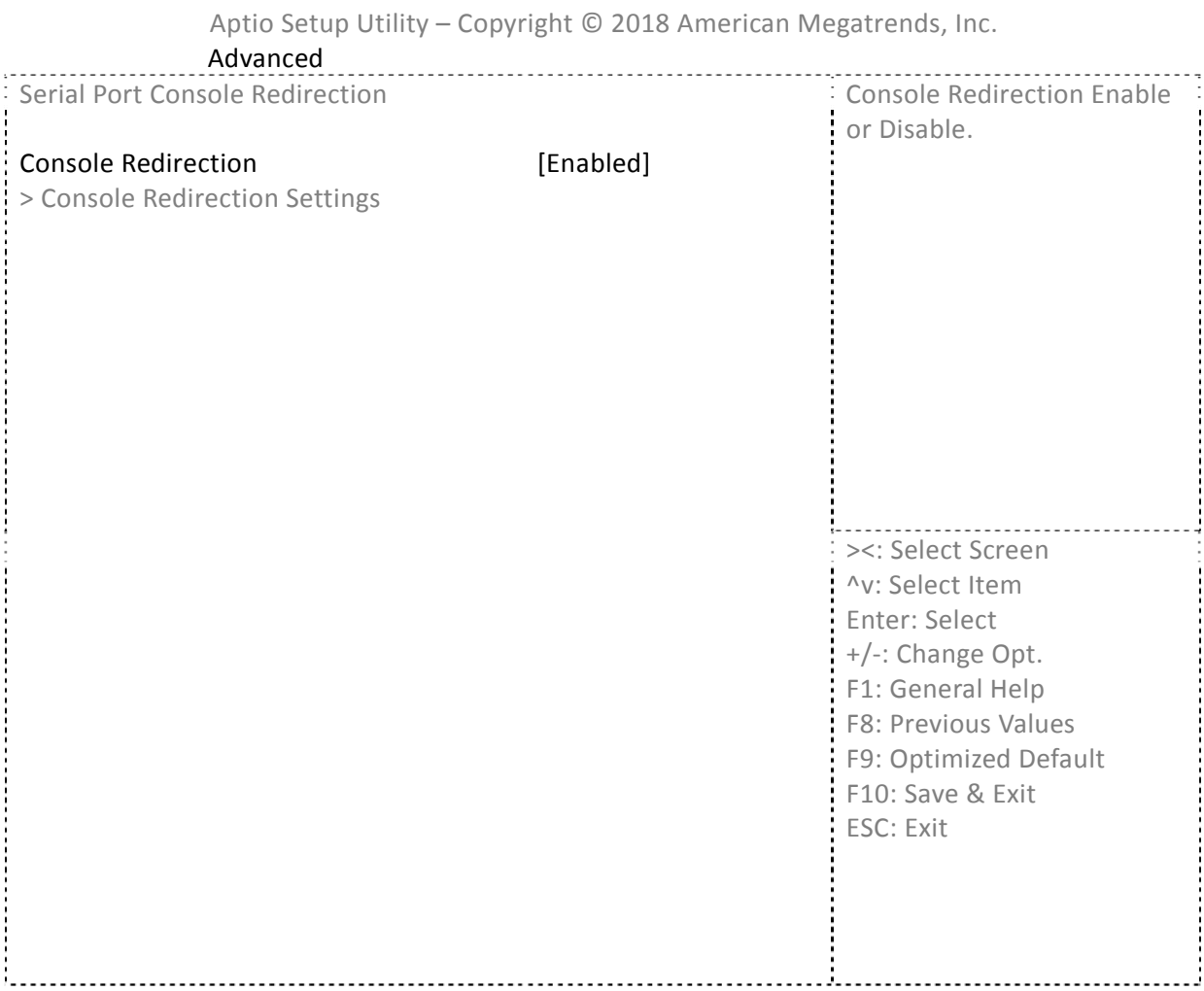
5.5.1 Network Stack Configuration



BIOS Item	Options	Description
Network Stack	Disabled **Enabled**	To enable or disable the network stack.
IPv4 PXE Support	Disabled **Enabled**	To enable or disable IPv4 PXE boot.
IPv6 PXE Support	Disabled **Enabled**	To enable or disable IPv6 PXE boot.

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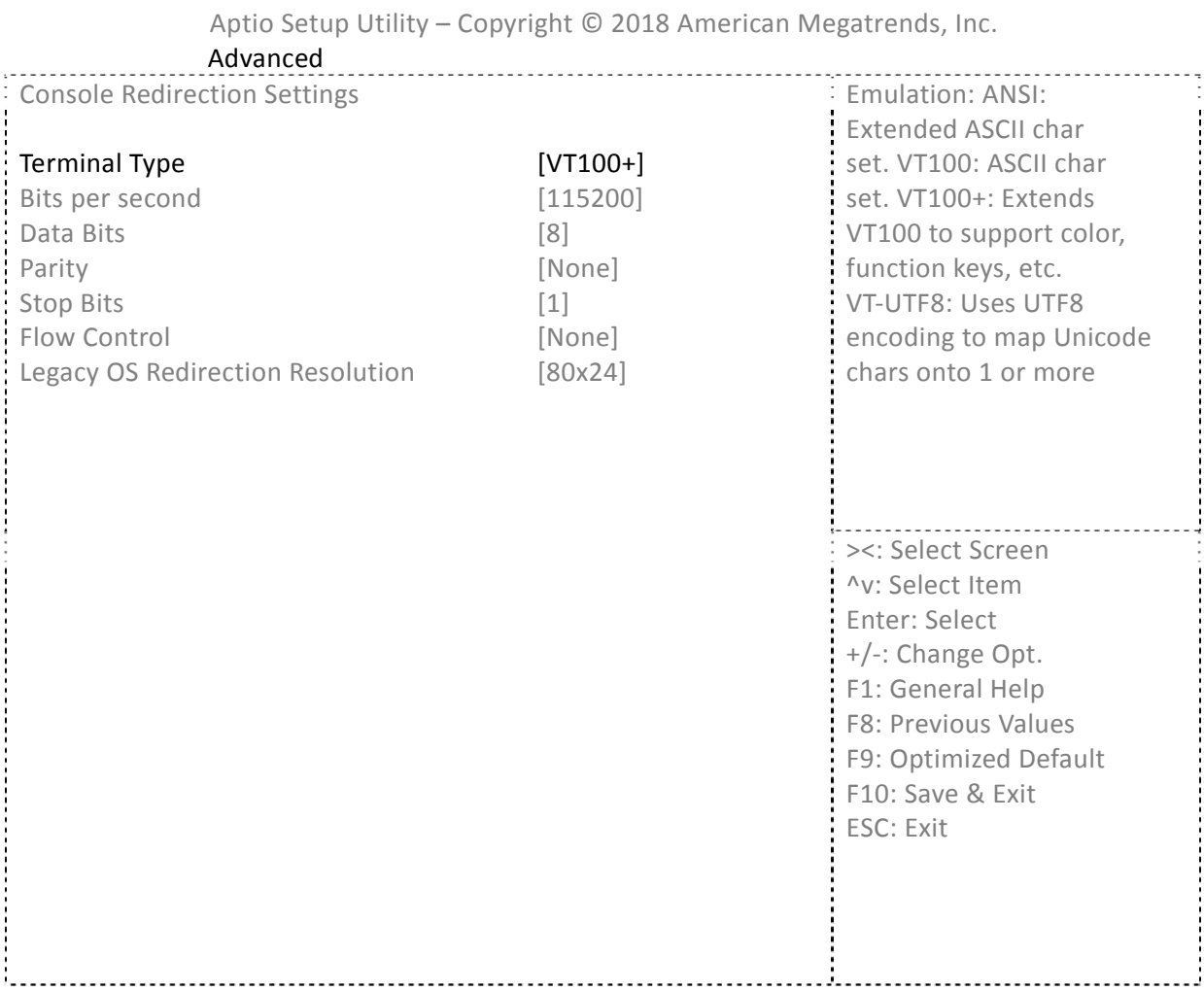
5.5.2 Serial Port Console Redirection



BIOS Item	Options	Description
Console Redirection	**Enabled** Disabled	Enable or disable serial port console redirection function.
Console Redirection Settings	**Submenu**	For configuring serial port settings when console redirection function is enabled.

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5.5.3 Console Redirection Settings



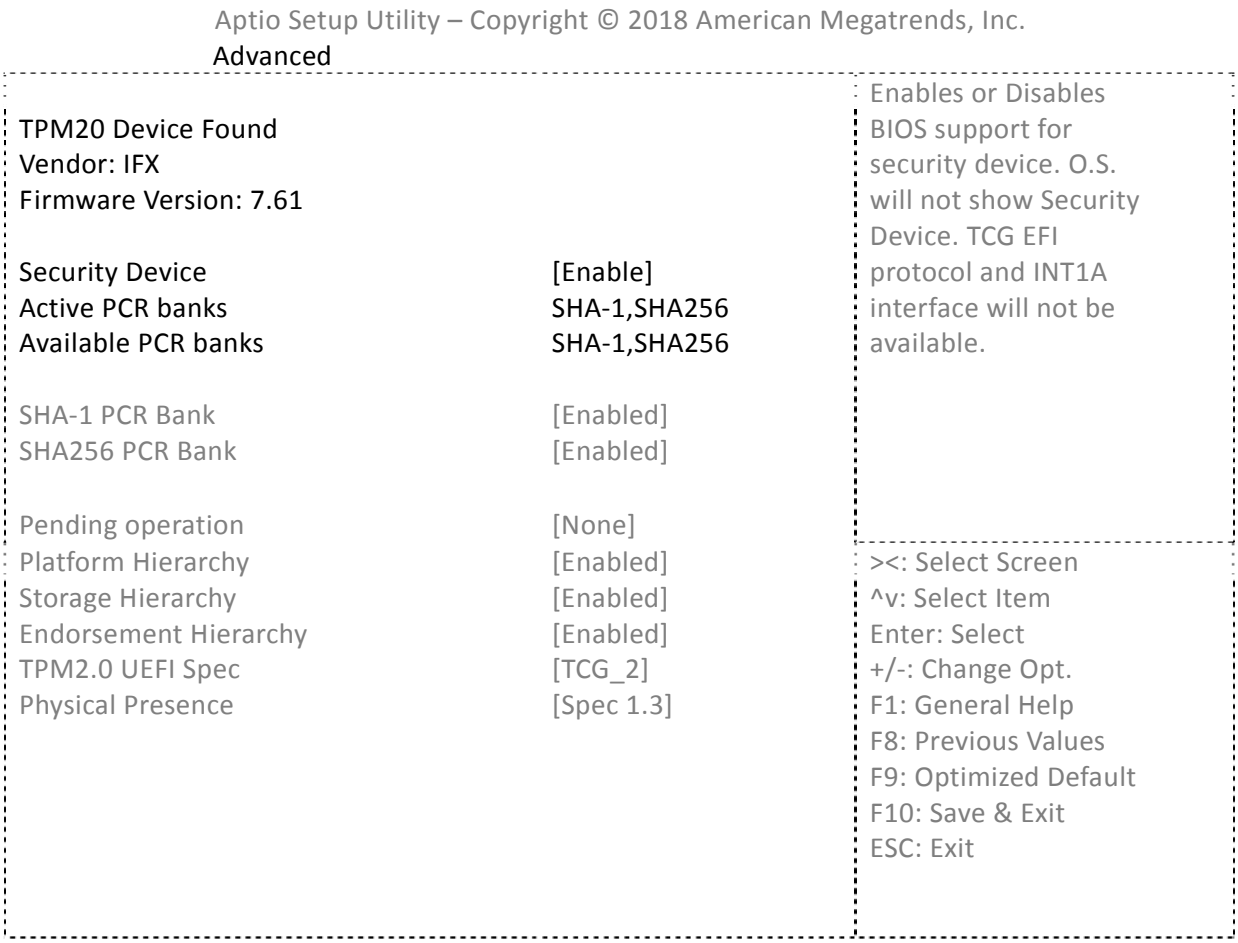
BIOS Item	Options	Description
Terminal Type	VT100 **VT100+** VT-UTF8 ANSI	Configure the type of console emulation. **ANSI:** Extended ASCII char set. **VT100:** ASCII char set. **VT100+:** Extends VT100 to support color, function keys, etc. **VT-UTF8:** Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Bits per second	9600 19200 38400 57600 **115200**	Selects serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speed.
Data Bits	7 **8**	Configures the number of data bits in each transmitted or received serial character for both serial ports.

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BIOS Item	Options	Description
Parity	**None** Even Odd Mark Space	Configures if parity bit is generated (transmit data) or checked. A parity bit can be sent with the data bits to detect some transmission errors. **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. Mark and Space Parity do not allow for error detection. They can be used as an additional data bit.
Stop Bits	**1** 2	Configures the number of stop bits transmitted and received in each serial character for both serial ports. 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.
Flow Control	**None** Hardware RTS/CTS	Configures flow control for console redirection. Hardware flow control uses RTC/CTS.
Legacy OS Redirection Resolution	**80x24** 80x25	Set console display resolution.

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5.5.4 Trusted Computing



BIOS Item	Options	Description
Security Device	Disable **Enable**	Enable or disable BIOS support for security device (TPM).
Active PCR banks	**Info only**	Information to indicate which PCR banks have been enabled by BIOS. The TCG log will be updated according to the Active PCR banks. For example, if SHA-256 and SHA-1 PCR banks are enabled. TCG2 will extend data to both SHA-256 and SHA-1 PCR banks. Furthermore the TCG log will generate a crypto agile log for both SHA-1 and SHA-256 digest data.
Available PCR banks	**Info only**	Indicates which PCR banks are supported and can be enabled in BIOS.
SHA-1 PCR bank	Disabled **Enabled**	Enables or disable the SHA-1 PCR bank. This option will only be displayed if the TPM supports SHA-1.

BIOS Item	Options	Description

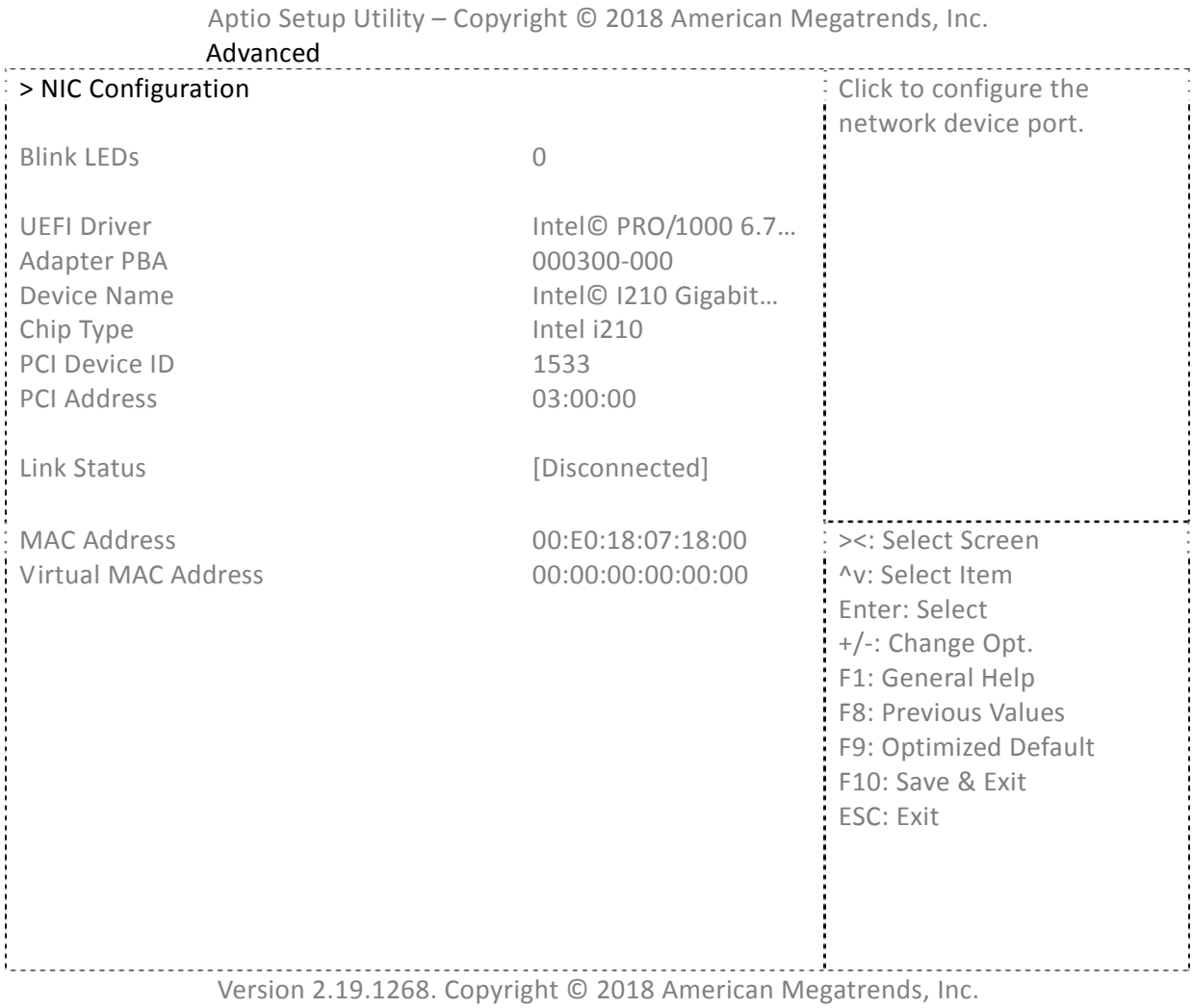
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BIOS Item	Options	Description
SHA256 PCR bank	Disabled **Enabled**	Enables or disable the SHA-256 PCR bank. This option will only be displayed if the TPM supports SHA-256. **Note:** The TPM only supports SHA-1 and SHA-256. If TPM support SHA-384, SHA-512 or SM3, BIOS option will be shown for configuration.
Pending operation	**None** TPM Clear	This item exposes the ability to clear TPM 2.0 device. Once the TPM 2.0 device is cleared, the option goes to its default state.
Platform Hierarchy	Disabled **Enabled**	Allows a user to enable or disable TPM 2.0 platform hierarchy (PH). Regardless of the TPM state, BIOS will always randomize the PH before OS handoff.
Storage Hierarchy	Disabled **Enabled**	Allows user to enable or disable TPM 2.0 storage hierarchy. Once disabled, a TPM 2.0 aware OS may not be able to take ownership of the TPM.
Endorsement Hierarchy	Disabled **Enabled**	Allows user to enable or disable TPM 2.0 endorsement hierarchy. Once disabled, the TPM aware OS may not be able use certain features of the TPM.
TPM2.0 UEFI Spec	TCG_1_2 **TCG_2**	This item allows user to choose whether BIOS supports the old TCG EFI protocol version 1.22, or the TCG EFI protocol specification for TPM family 2.0. TCG_1_2 is for the old protocol and TCG_2 is for the new protocol.
Physical Presence	Spec 1.2 **Spec 1.3**	Allows a user to select the supported PPI version reported to the OS.

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5.5.5 Intel© I210 Gigabit Network Connection

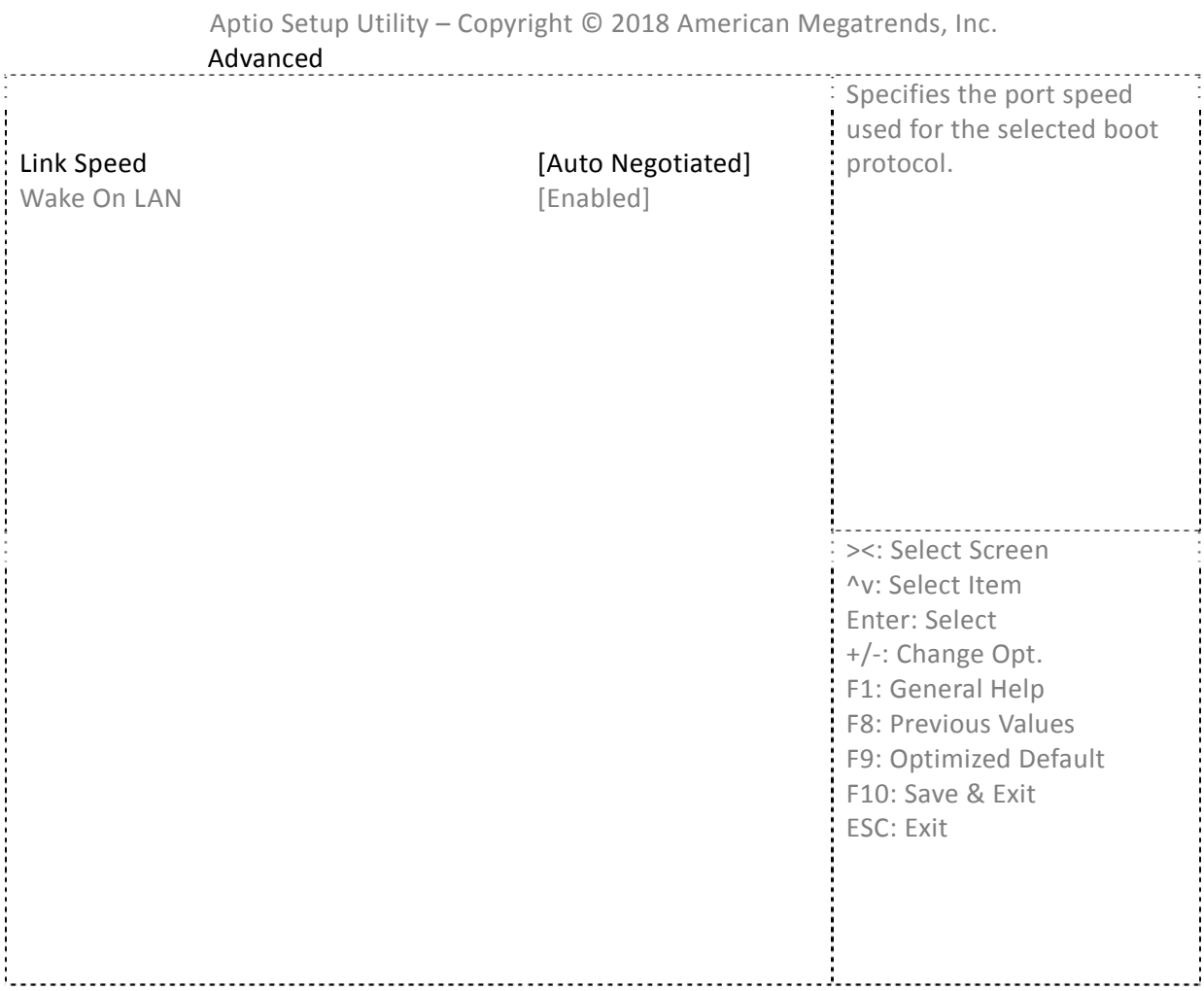
This setup page is shown when the “Network” setting on the Boot page is set to “UEFI”. When BIOS boots, it will launch the onboard Ethernet Controller I210 UEFI driver. The driver provides a setup page to configure Ethernet parameters and shows information about the Ethernet controller. When the “Network” setting is not set to UEFI and the Ethernet UEFI driver is not executed, this setup page will not be shown.



BIOS Item	Options	Description
NIC Configuration	**Submenu**	For configuring link speed and wake function.

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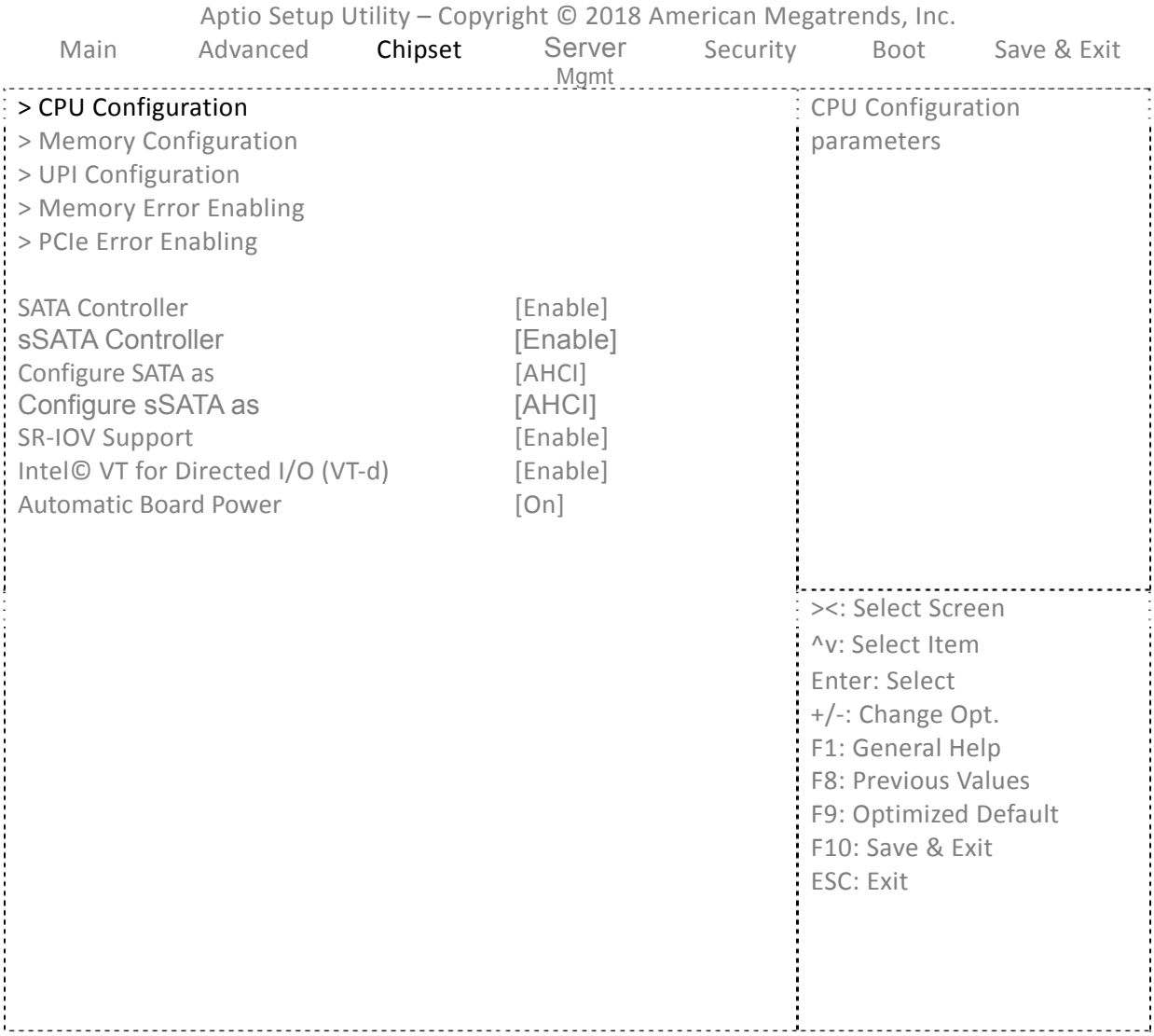
5.5.6 NIC Configuration



BIOS Item	Options	Description
Link Speed	**Auto Negotiated** 10 Mbps Half 10 Mbps Full 100 Mbps Half 100 Mbps Full	For setting link speed of Ethernet.
Wake On LAN	Enabled **Disabled**	For enabling/disabling wake on LAN function.

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5.6 Chipset Menu



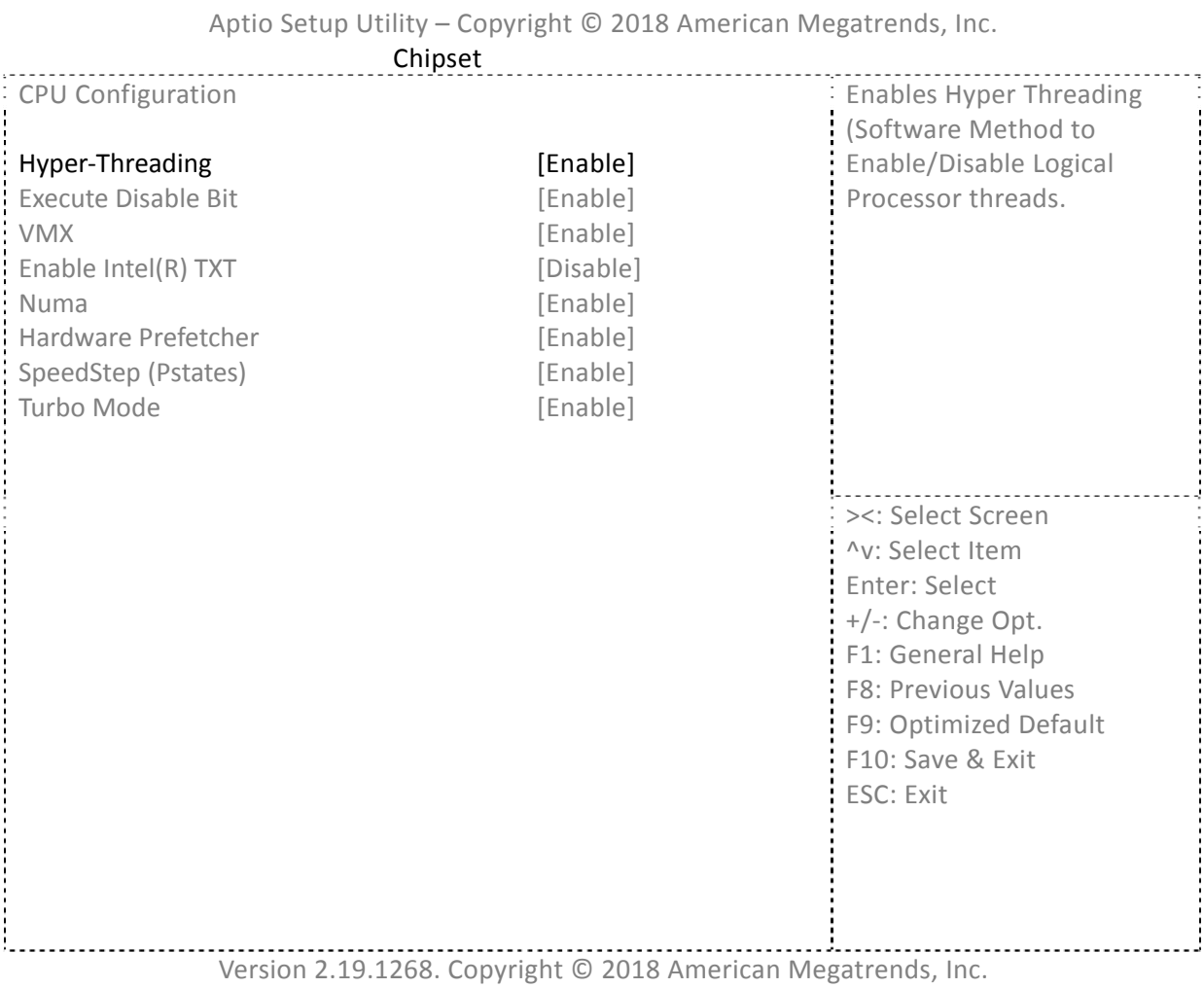
BIOS Item	Options	Description
CPU Configuration	**Submenu**	For configuring CPU features/functions.
Memory Configuration	**Submenu**	For configuring memory features and functions.
UPI Configuration	**Submenu**	For configuring UPI features and functions.
Memory Error Enabling	**Submenu**	For configuring memory error assertion settings.
PCIe Error Enabling	**Submenu**	For configuring PCIe error assertion settings.
SATA Controller	Disable **Enable**	For controlling SATA controller's enabling/disabling.
sSATA Controller	Disable **Enable**	For controlling sSATA controller's enabling/disabling.
Configure SATA as	**AHCI** RAID	For SATA operating mode setting.
Configure sSATA as	**AHCI** RAID	For sSATA operating mode setting.

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BIOS Item	Options	Description
SR-IOV Support	Disable **Enable**	For enabling/disabling SR-IOV Support.
Intel© VT for Directed I/O (VT-d)	Disable **Enable**	For enabling/disabling Intel VT-d function.
Automatic Board Power	**On** Off	If “On” option is selected, the x86 shall be powered up automatically when the whole chassis is powered up or the board sled is inserted into the chassis. If “Off” option is selected, the automatic powering up is disabled.

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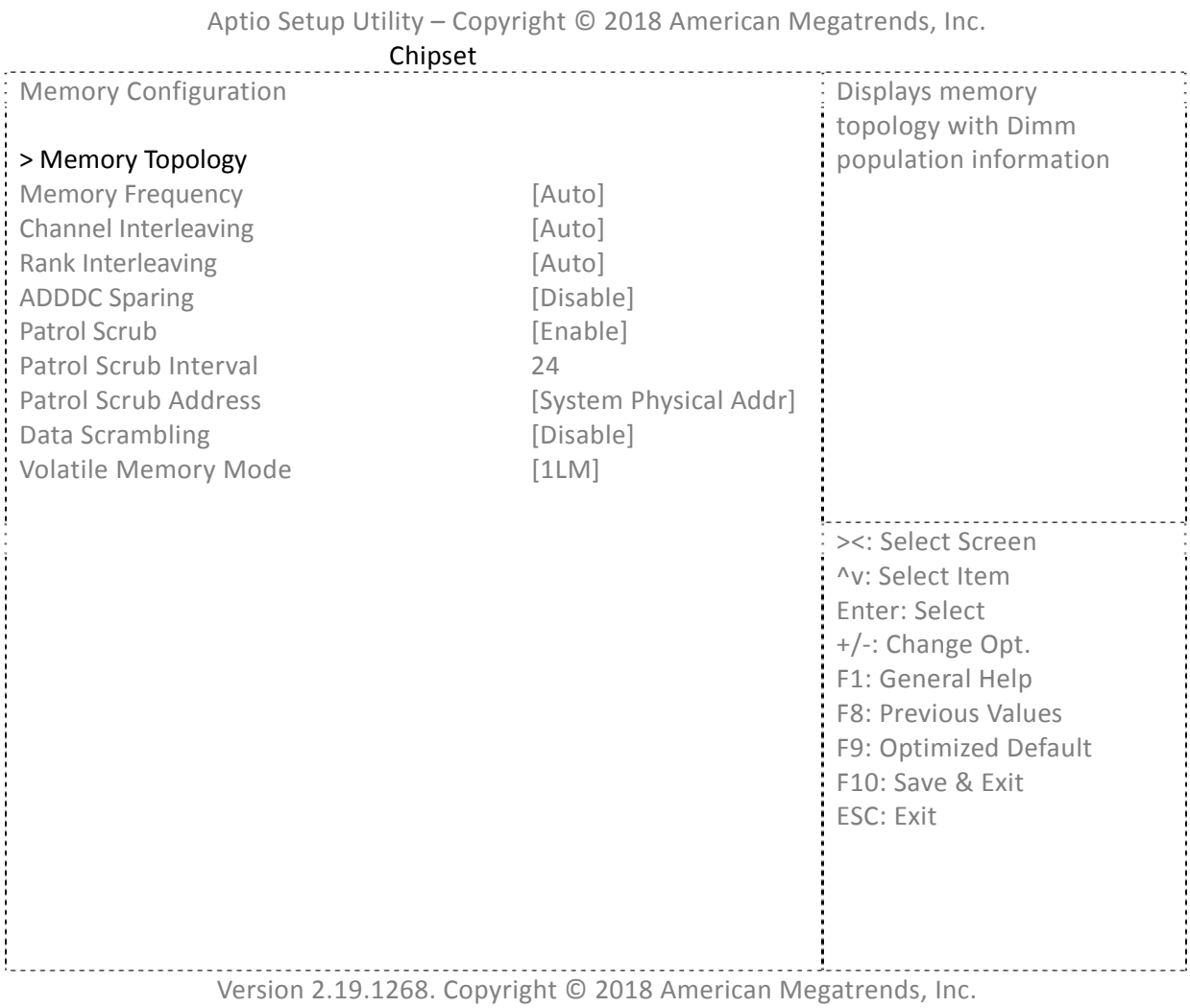
5.6.1 CPU Configuration



BIOS Item	Options	Description
Hyper-Threading	**Enable** Disable	To enable or disable hyper-threading function of CPU.
Execute Disable Bit	Disable **Enable**	Execute Disable Bit can help prevent certain classes of malicious buffer overflow attacks. OS and application installed must support this feature in order for it is enabled.
VMX	Disable **Enable**	To enable or disable Virtual-Machine Extensions of CPU.
Enable Intel(R) TXT	**Disable** Enable	Enable or disable Intel(R) TXT function.
Numa	Disable **Enable**	For enabling or disabling Numa function.
Hardware Prefetcher	Disable **Enable**	To enable or disable hardware prefetcher of CPU.
SpeedStep (P-states)	Disable **Enable**	To enable or disable Speedstep function of CPU.
Turbo Mode	Disable **Enable**	To enabled or disable Turbo Mode of CPU.

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5.6.2 Memory Configuration



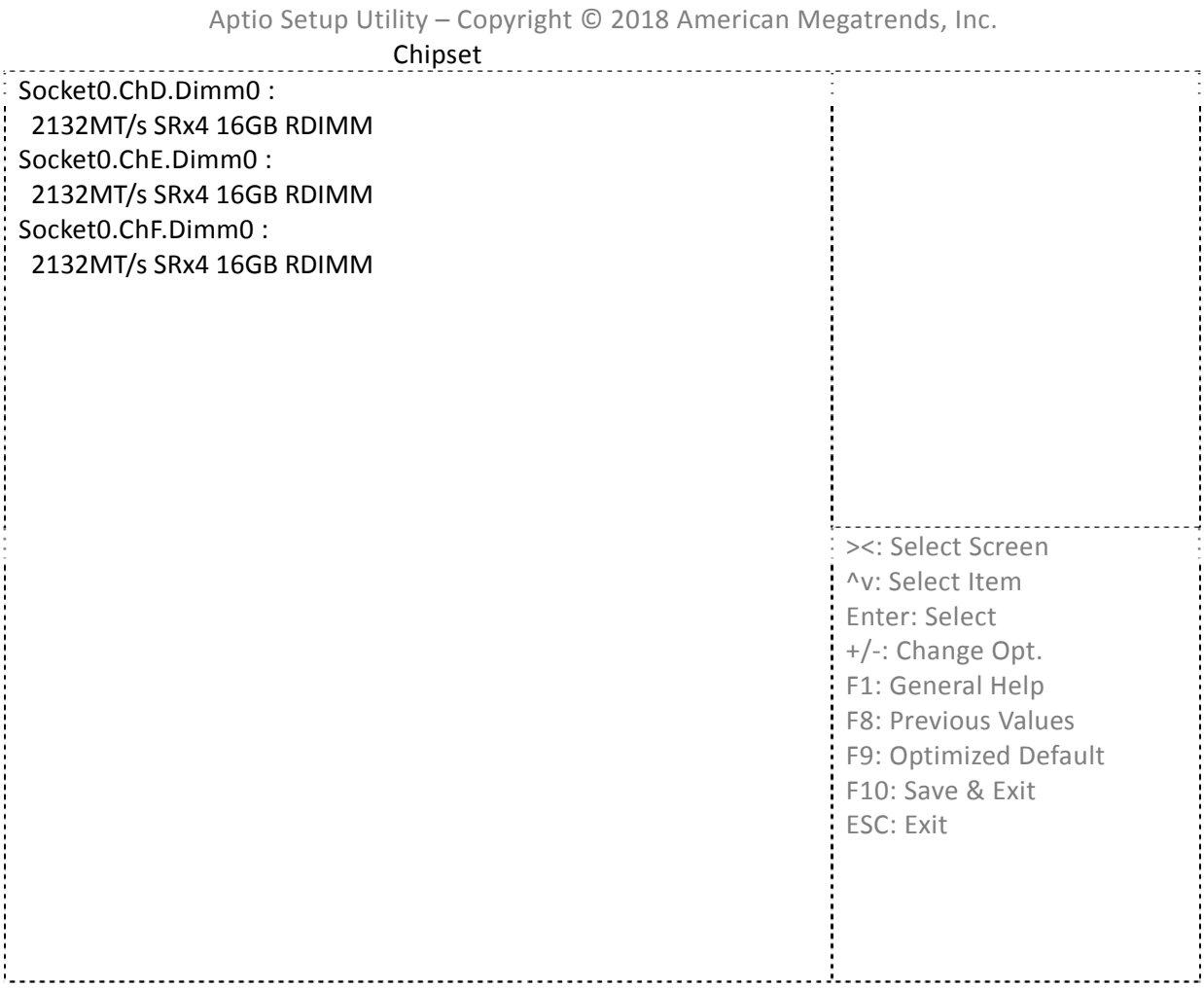
BIOS Item	Options	Description
Memory Topology	**Submenu**	To display memory topology with DIMM population information.
Memory Frequency	**Auto** 1866 2133 2400 2666	Use this item to set the maximum memory frequency for onboard memory modules.
Channel Interleaving	**Auto** 1-way Interleave 2-way Interleave 3-way Interleave	Channel interleaving divides memory blocks and spreads contiguous portions of data across interleaved channels. It increases potential read bandwidth as requests for data can be made to all interleaved channels in an overlapped manner. Enabling channel interleaving may enhance memory performance.

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BIOS Item	Options	Description
Rank Interleaving	**Auto** 1-way Interleave 2-way Interleave 4-way Interleave 8-way Interleave	Interleaving is performed on rank to have different bandwidth.
ADDDC Sparing	**Disable** Enable	This option is to enable/disable ADDDC sparing. **Note:** This option can't be enabled when mirror mode is enabled or memory sparing is enabled.
Patrol Scrub	Disable **Enable**	When set to Enable, patrol scrub is initialized to read through all of memory at an interval in hours which is set by the "Patrol Scrub interval" option. Patrol scrub will correct any correctable error correction code (ECC) errors it encounters by writing back the corrected data to memory.
Patrol Scrub Interval	**24**	Sets the number of hours for the interval of patrol scrub. **Note:** this option will be hidden when "Patrol Scrub" is disabled.
Patrol Scrub Address	Reverse Address **System Physical Address**	This is a feature for configuring the mode of patrol scrub. When "System Physical Address" is set, patrol runs in system address generation mode. If it is set to "Reverse Address", patrol will run in legacy mode. **Note:** This option will be hidden when "Patrol Scrub" is disabled.
Data Scrambling	**Disable** Enable Auto	Enable it to enhance system performance and data integrity.
Volatile Memory Mode	**1LM** 2LM Auto	Configure "volatile memory mode" to one-level memory mode or two-level memory mode.

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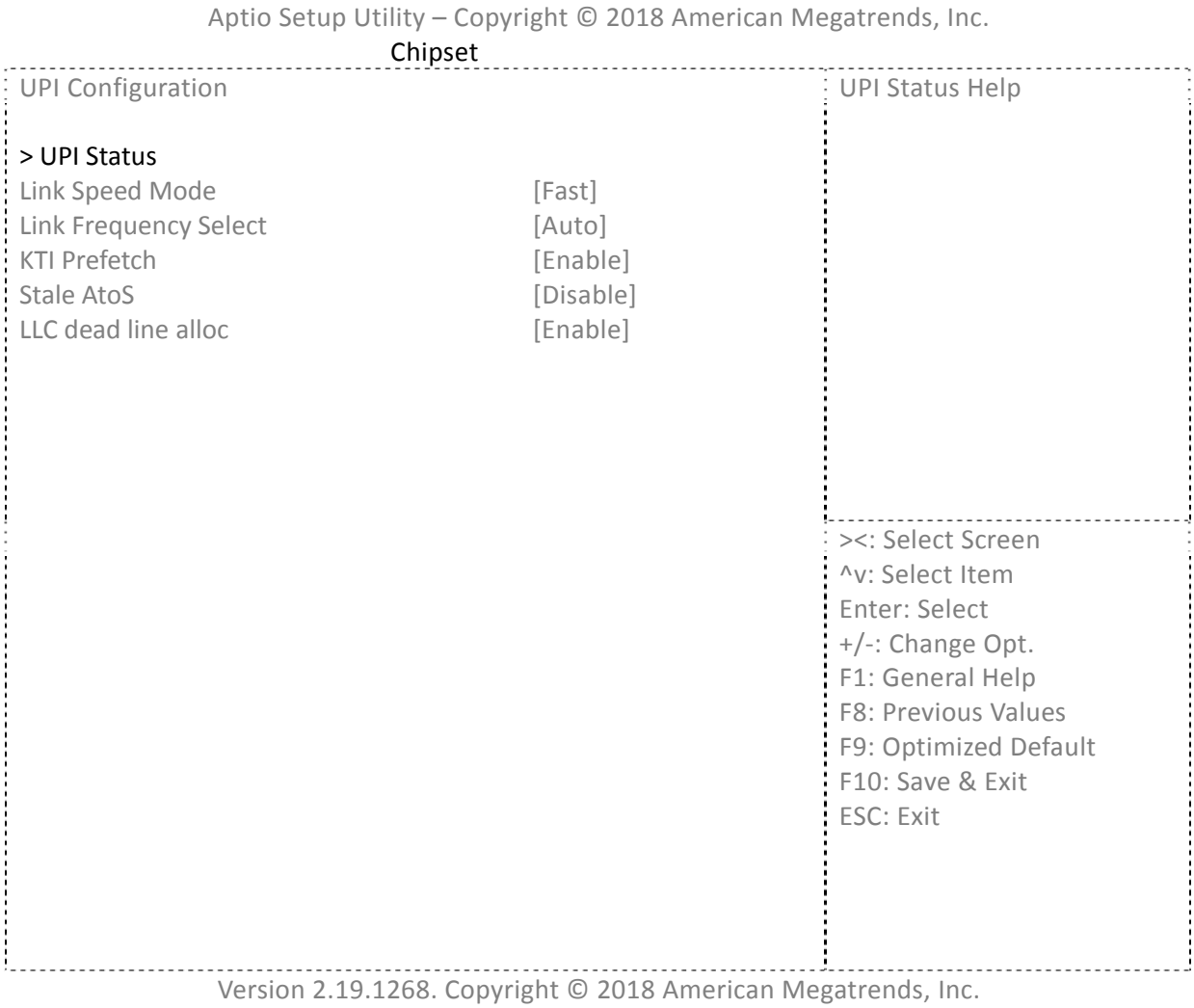
5.6.3 Memory Topology



BIOS Item	Options	Description
Socket**X**.Ch**Y**.Dimm**Z** :	**Info only**	The information is shown only when memory is present in the DIMM slot. Each populated DIMM slot location is indicated by X, Y and Z where:. **X** = 0/1 – CPU0/CPU1 **Y** = Channel A/B/C/D/E/F of CPU0 or Channel G/H/J/K/L/M of CPU1 **Z** will always be 0 because hardware design only supports one DIMM per channel.
[Memory Frequency] [Rank number] [Memory size] [Memory type]	**Info only**	This is the information of memory frequency, type and size which varies depending on the memory installed.

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5.6.4 UPI Configuration



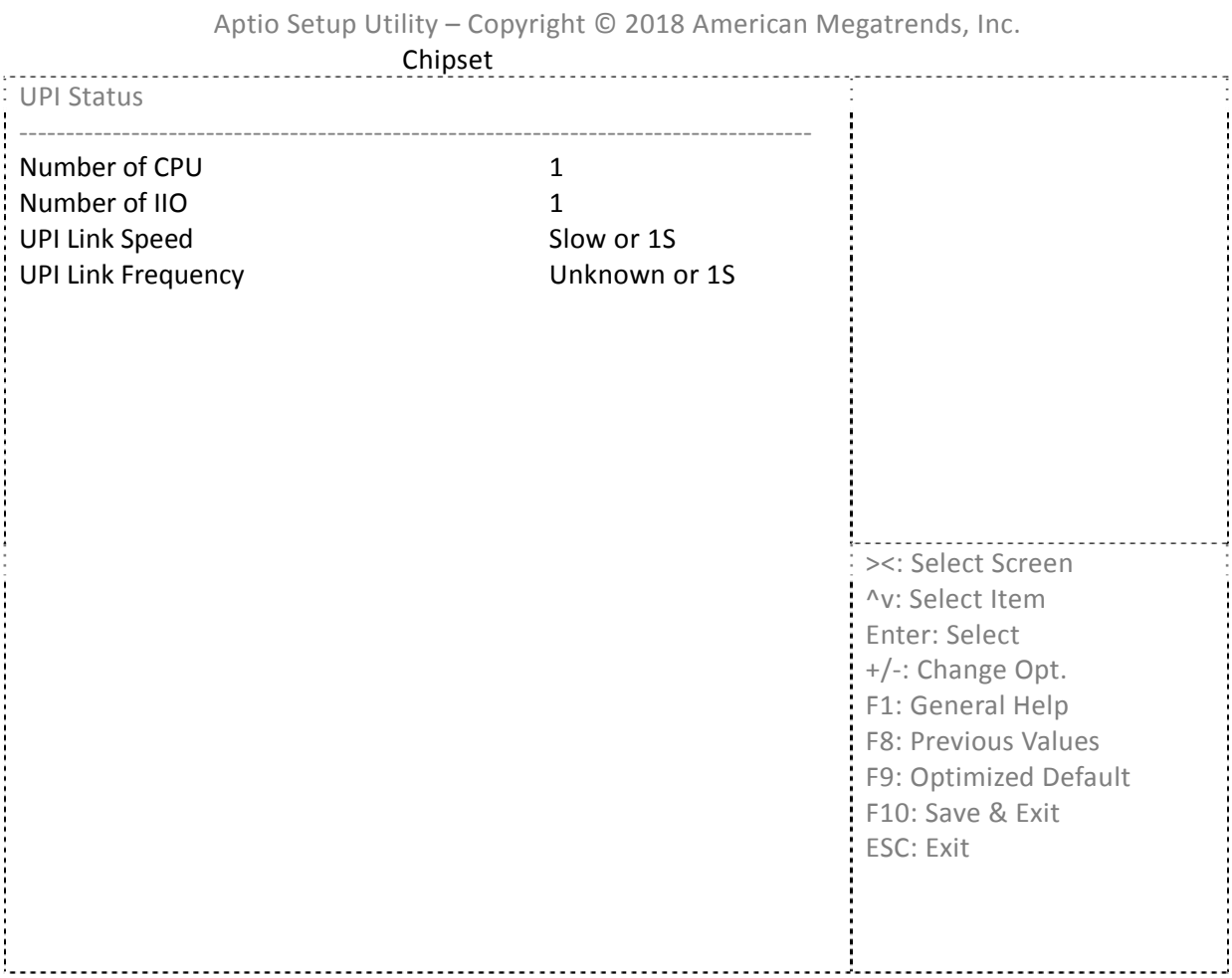
BIOS Item	Options	Description
UPI Status	**Submenu**	To show the current UPI status including number of CPU, IIO and UPI link speed and frequency.
Link Speed Mode	Slow **Fast**	For configuring UPI link speed. UPI speed mode should be 'Slow' when there only is one processor installed because UPI is not functional. Set to 'Slow' for multi-processor only when you want UPI to run at the boot speed of 50 MT/s.
Link Frequency Select	9.6GT/s 10.4GT/s **Auto** Use Per Link Setting	For selecting UPI link frequency. When there is only one processor, setting this item will not have any function and status of link frequency will be unknown or 1S configuration.
KTI Prefetch	Disable **Enable**	This is for enabling/disabling the KTI prefetch function.

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BIOS Item	Options	Description
Stale AtoS	**Disable** Enable Auto	The in-memory directory has three states: invalid (I), snoopAll (A), and Shared (S). The snoopAll (A) means the data may exist in another socket or modified state. Shared (S) state means the data may be shared across one or more socket's caches. When reading memory and directory line is in the A state, we must snoop all the other sockets because another socket may have the line in modified state. If this is the case, the snoop will return the modified data. However, it may be the case that all snoops come back a miss if another socket read the line earlier and then dropped it from its cache without modifying it. **Disable** – allows processing memory directory states as described above. **Enable** – where a line in A state returns only snoop misses, the line will be transition to S state. Subsequent reads to the line will encounter it in S state and not have to snoop, saving latency and snoop bandwidth.
LLC dead line alloc	Disable **Enable** Auto	In CPU cache scheme, mid-level cache (MLC) evictions are filled into last-level case (LLC). When lines are evicted from MLC, core can flag them as "dead". This means that lines are not likely to be read again. This option allows dropping dead lines and never fills them into LLC if the option is disabled. When it is enabled, the LLC can opportunistically fill dead lines into LLC if space is available.

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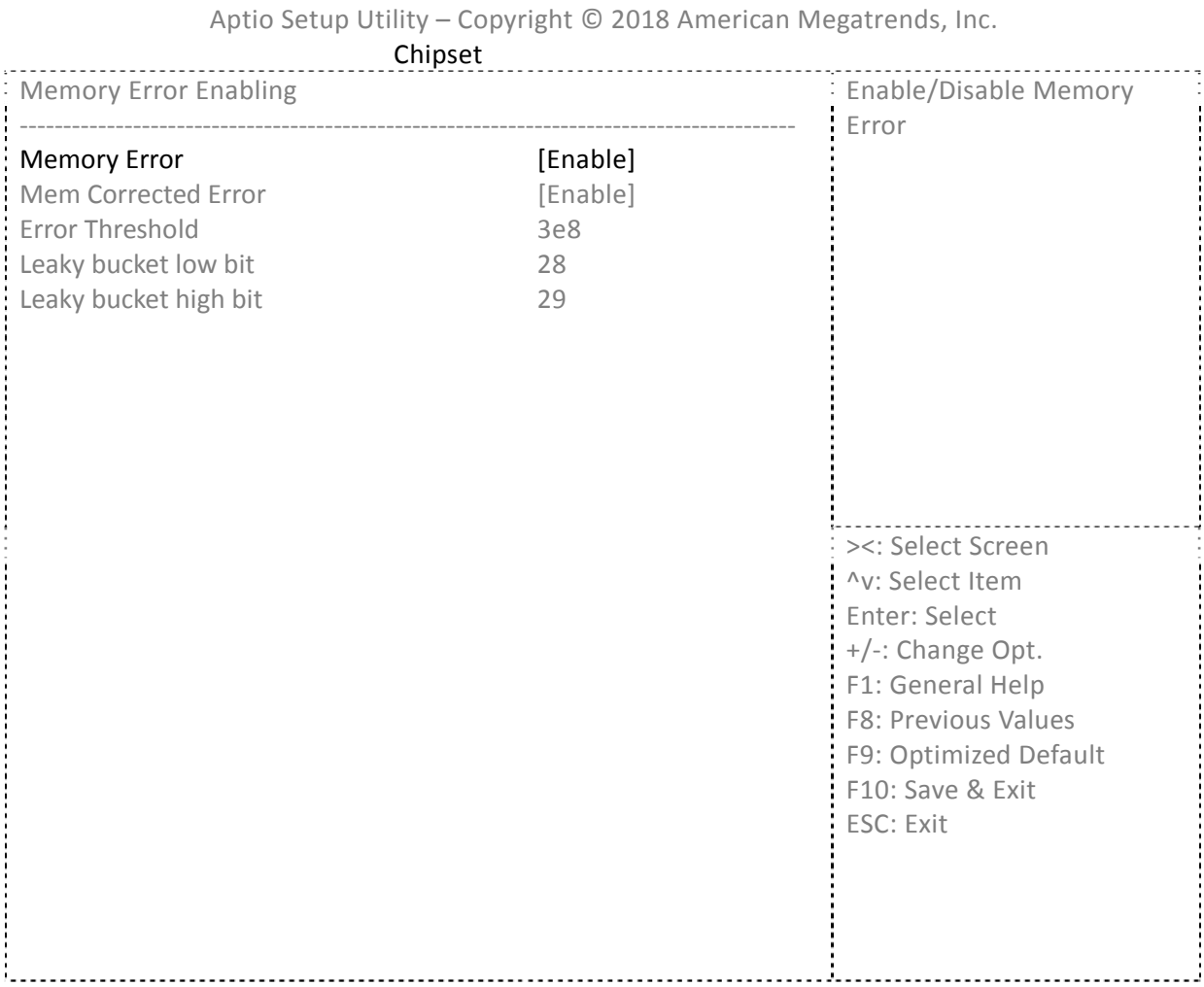
5.6.5 UPI Status



BIOS Item	Options	Description
Number of CPU	**Info only**	Shows how many CPUs are in use on the system.
Number of IIO	**Info only**	Shows how many IIOs are in use on the system.
UPI Link Speed	**Info only**	Shows current UPI speed (fast/slow).
UPI Link Frequency	**Info only**	Shows current UPI link frequency (9.6 GT/s or 10.4 GT/s).

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5.6.6 Memory Error Enabling



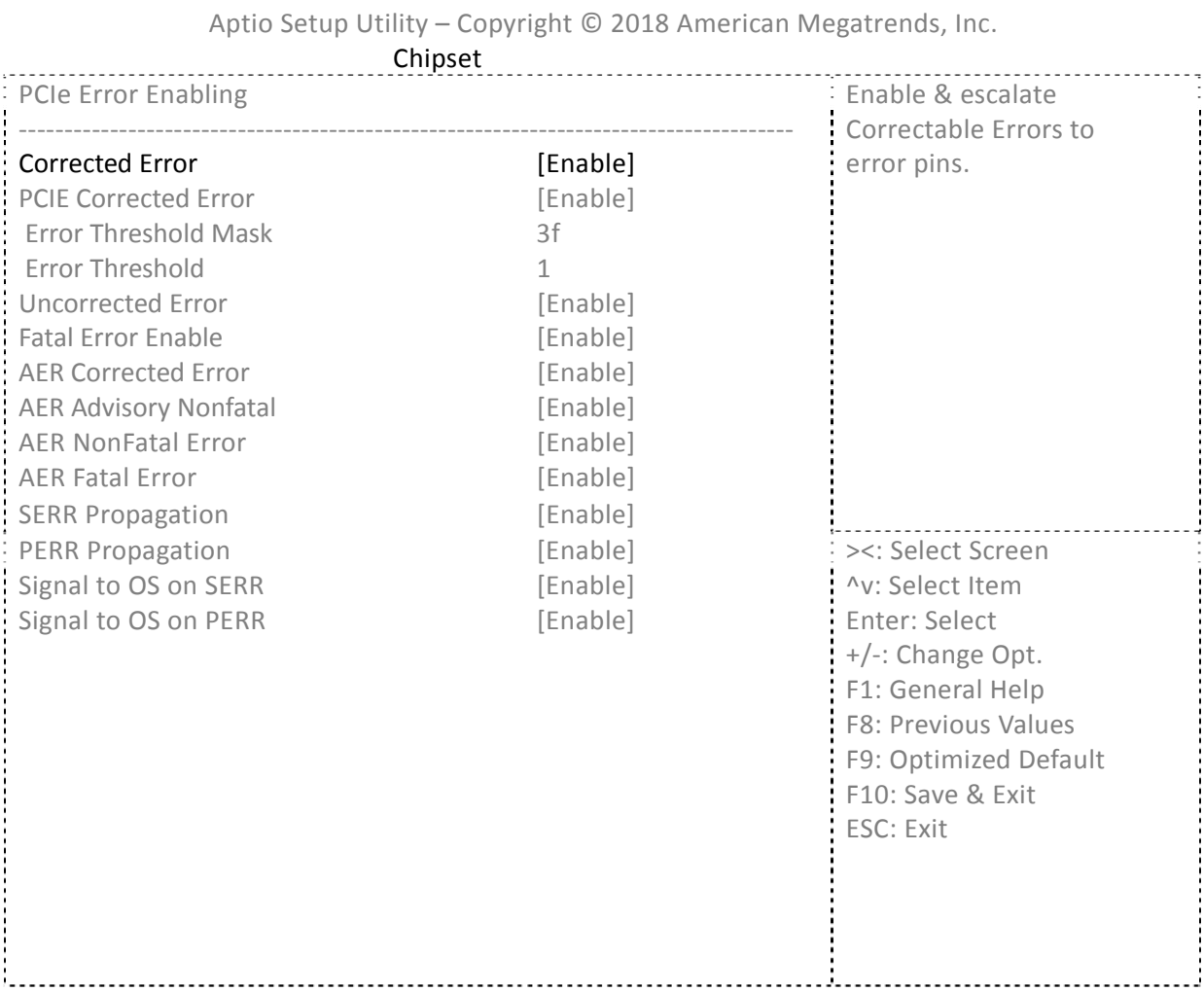
BIOS Item	Options	Description
Memory Error	**Disable** Enable	This is used to enable/disable memory error handling.
Mem Corrected Error	Disable **Enable**	This is used to enable/disable memory correctable error handling.
Error Threshold	**1000**	Rank sparing enables a failing rank to be replaced by an unused spare rank installed on the same DDR channel. The failure prediction is done via **corrected error threshold** and a **leaky bucket**, both of which are programmable to allow the platform to "judge" when the right time is to spare a failing rank. The value set in this item will be set to correctable error threshold used for error handling.

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BIOS Item	Options	Description
Leaky bucket low bit	**40**	Value range: 1 – 41 It is to set low bit for the leaky bucket algorithm which is used to check the data transmissions between CPU sockets and the memory controller.
Leaky bucket high bit	**41**	Value range: 1 – 41 It is to set high bit for the leaky bucket algorithm which is used to check the data transmissions between CPU sockets and the memory controller.

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5.6.7 PCIe Error Enabling



BIOS Item	Options	Description
Corrected Error	Disable **Enable**	It is used to enable/disable PCIe correctable error monitoring and handling.
PCIE Corrected Error	Disable **Enable**	It is used to enable/disable PCIe correctable error counter.
Error Threshold Mask	**0x3F**	This is for setting what errors will be included in error count. (Bit 0 – Bit 5) Bit 0 – receiver error Bit 1 – Bad TLP Bit 2 – Bad DLLP Bit 3 – replay num rollover Bit 4 – Replay Timer Timeout Bit 5 – Advisory non-fatal
Error Threshold	**1**	It is for setting the threshold of PCIe correctable error counter.
Uncorrected Error	Disable **Enable**	It is for enabling/disabling the escalation of uncorrectable event to error pins.

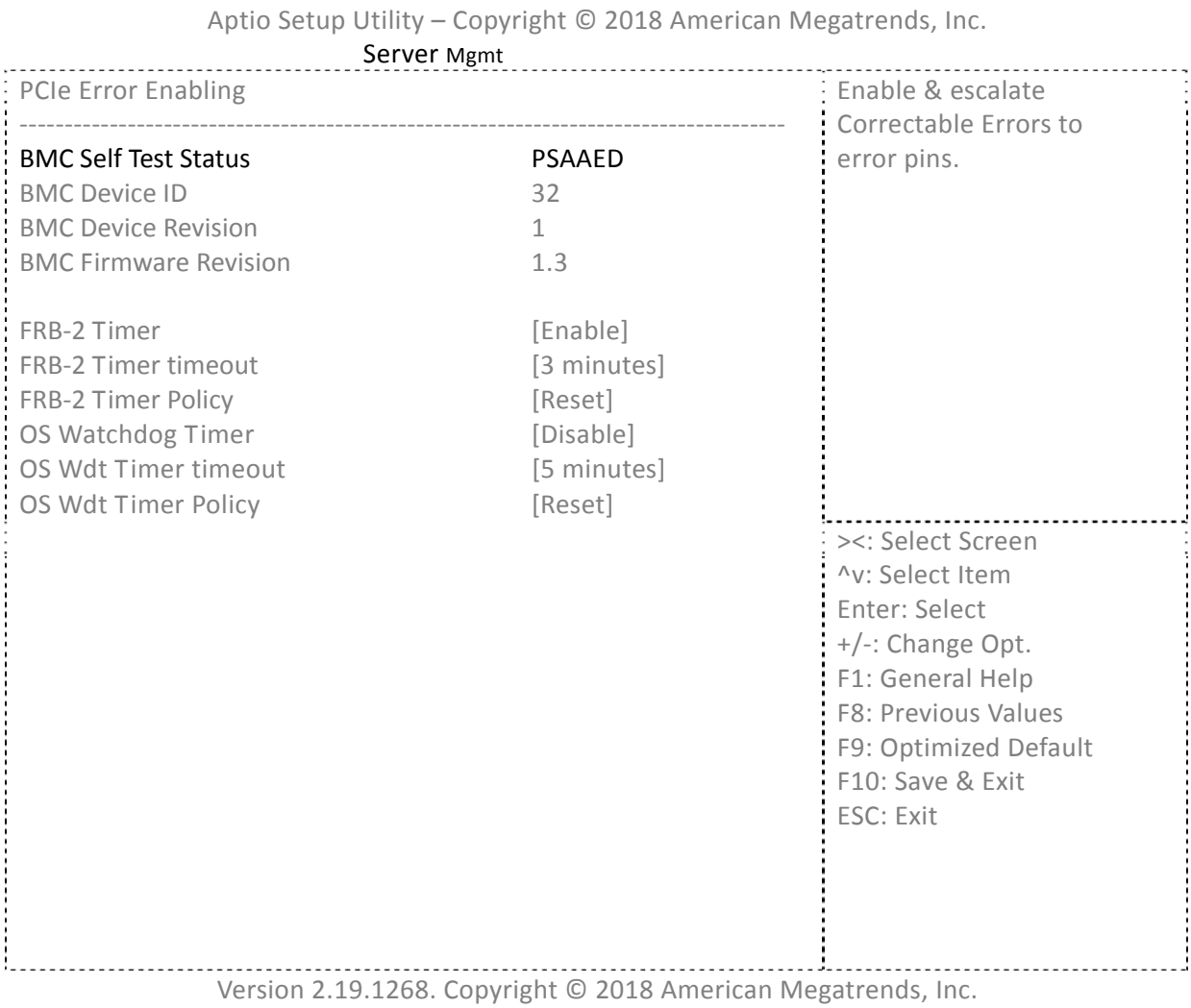
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BIOS Item	Options	Description
Fatal Error Enable	Disable **Enable**	It is for enabling/disable the escalation of PCIe fatal errors to error pins.
AER Corrected Error	Disable **Enable**	For enabling or disabling PCIE AER correctable error reporting.
AER Advisory Nonfatal	Disable **Enable**	For enabling or disabling PCIE AER Advisory Non-fatal error reporting.
AER NonFatal Error	Disable **Enable**	For enabling or disabling PCIE AER Non-fatal error reporting.
AER Fatal Error	Disable **Enable**	For enabling or disabling PCIE AER fatal error reporting.
SERR Propagation	Disable **Enable**	When PCI express root port detects an error, it will bring down the PCIe link associated with the affected root port within one cycle and then SMM handler restores the link. PCIe LER (live error recovery) prevents the transfer of associated corrupt data during process, trapping errors at a root port to prevent their propagation. This option is to enable/disable the prevention of SERR propagation.
PERR Propagation	Disable **Enable**	This option is to enable/disable the prevention of PERR propagation.
Signal to OS on SERR	Disable **Enable**	It is used for notifying OS on receiving SERR event.
Signal to OS on PERR	Disable **Enable**	It is used for notifying OS on receiving PERR event.

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5.6.8 Server Mgmt

This menu contains the settings for server management configuration in the system.



BIOS Item	Options	Description
BMC Self Test Status	**Info only**	Shows BMC Self Test status
BMC Device ID	**Info only**	Shows how many CPUs are using on system.
BMC Device Revision	**Info only**	Shows how many IIOs are using on system.
BMC Firmware Revision	**Info only**	Shows current UPI speed (fast/slow).
FRB-2 Timer	Disable **Enable**	Enable/Disable FRB-2 Watchdog Timer.
FRB-2 Timer	**3 minutes** 4 minutes 5 minutes 6 minutes	Configures FRB-2 watchdog timer's timeout value.
FRB-2 Timer Policy	Do Nothing **Reset**	Configure how the system should respond if the FRB-2 Watchdog Timer expires.
OS Watchdog Timer	**Disable** Enable	Enable/Disable OS Load watchdog timer.

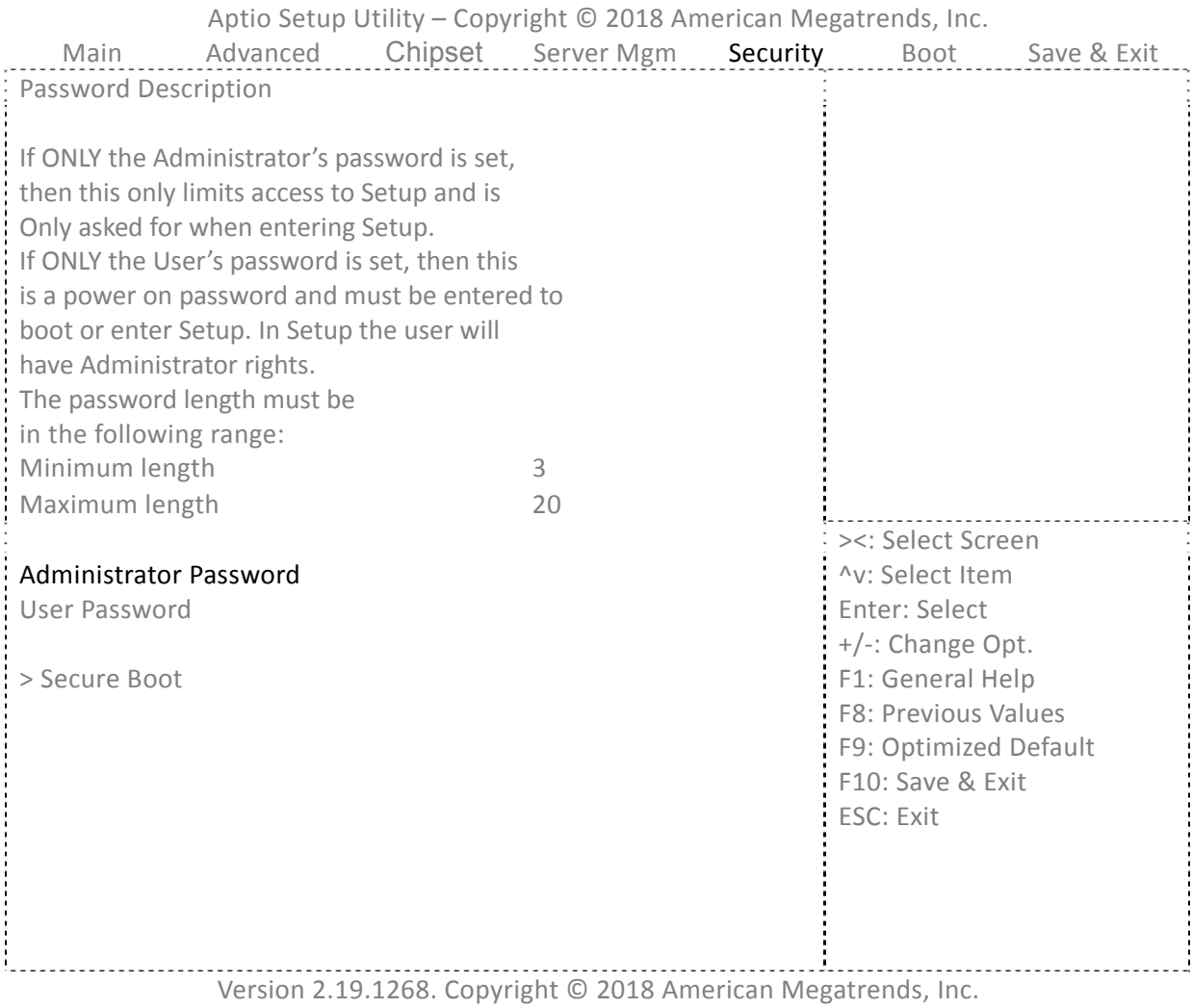
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BIOS Item	Options	Description
OS Wdt Timer timeout	**5 minutes** 10 minutes 15 minutes 20 minutes	Configures OS Load watchdog timer's timeout value.
OS Wdt Timer Policy	Do Nothing **Reset**	Configure how the system should respond if the OS Load watchdog timer expires.

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5.7 Security Menu

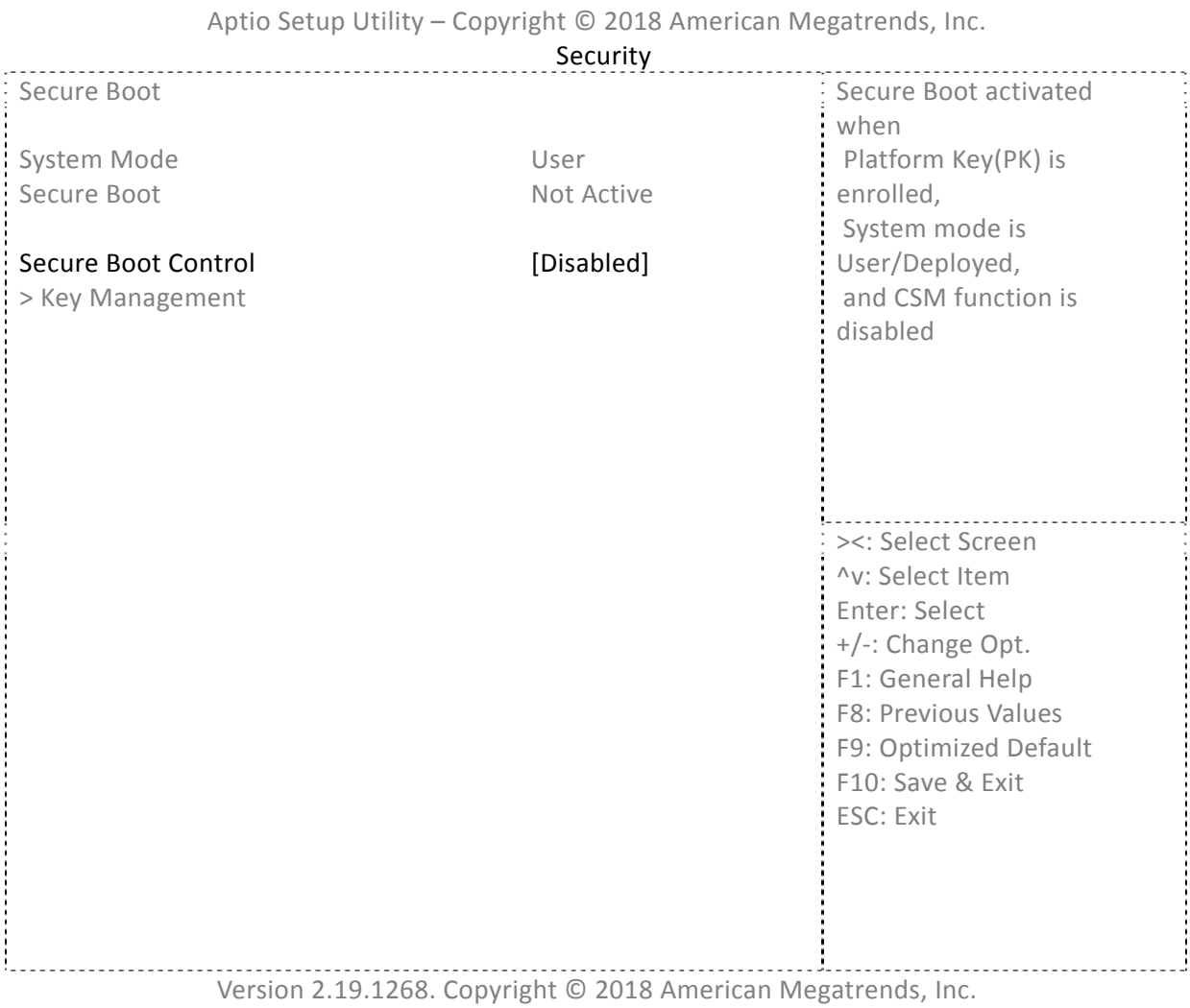
This menu contains the settings for security in the system.



BIOS Item	Options	Description
Administrator Password	**Enter to set password**	Configure/Clear Administrator Password. After pressing enter, a menu will pop up for creating a new password. When a password has been previously set, pressing enter without inputting a password, will clear the password.
User Password	**Enter to set password**	Configure/Clear User Password. After pressing enter, a menu will pop up for creating new password. When a password has been previously set, pressing enter without inputting a password, will clear the password.
Secure Boot	**Submenu**	For secure boot configuration.

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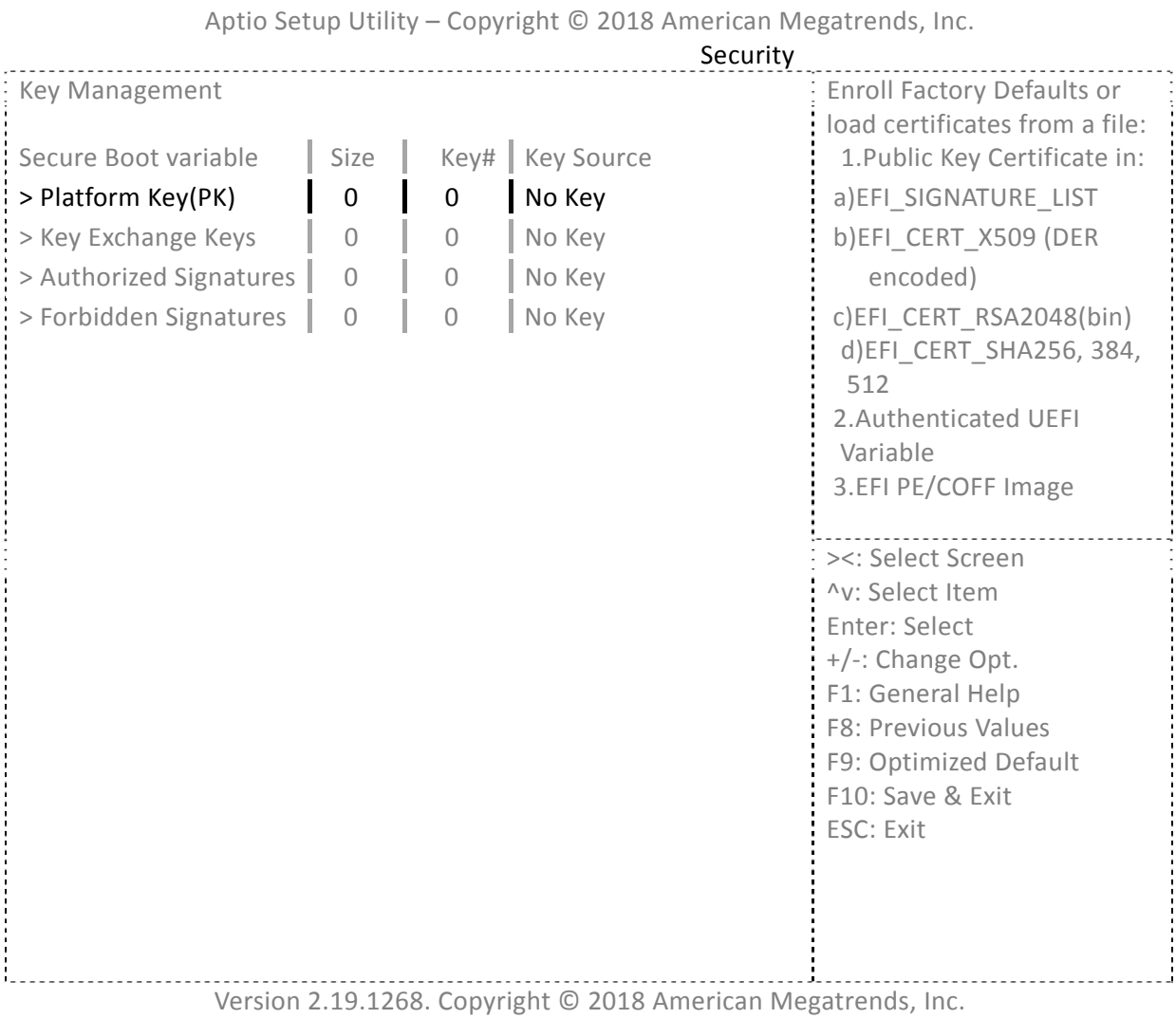
5.7.1 Secure Boot



BIOS Item	Options	Description
System Mode	**Info only**	Show current system mode.
Secure Boot	**Info only**	Show current state of secure boot function.
Secure Boot Control	**Disabled** Enabled	Secure Boot can be enabled if: 1. System running in User mode with enrolled Platform Key (PK) 2. CSM function is disabled.
Key Management	**Submenu**	For installing/appending/erasing secure boot databases and keys.

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5.7.2 Key Management

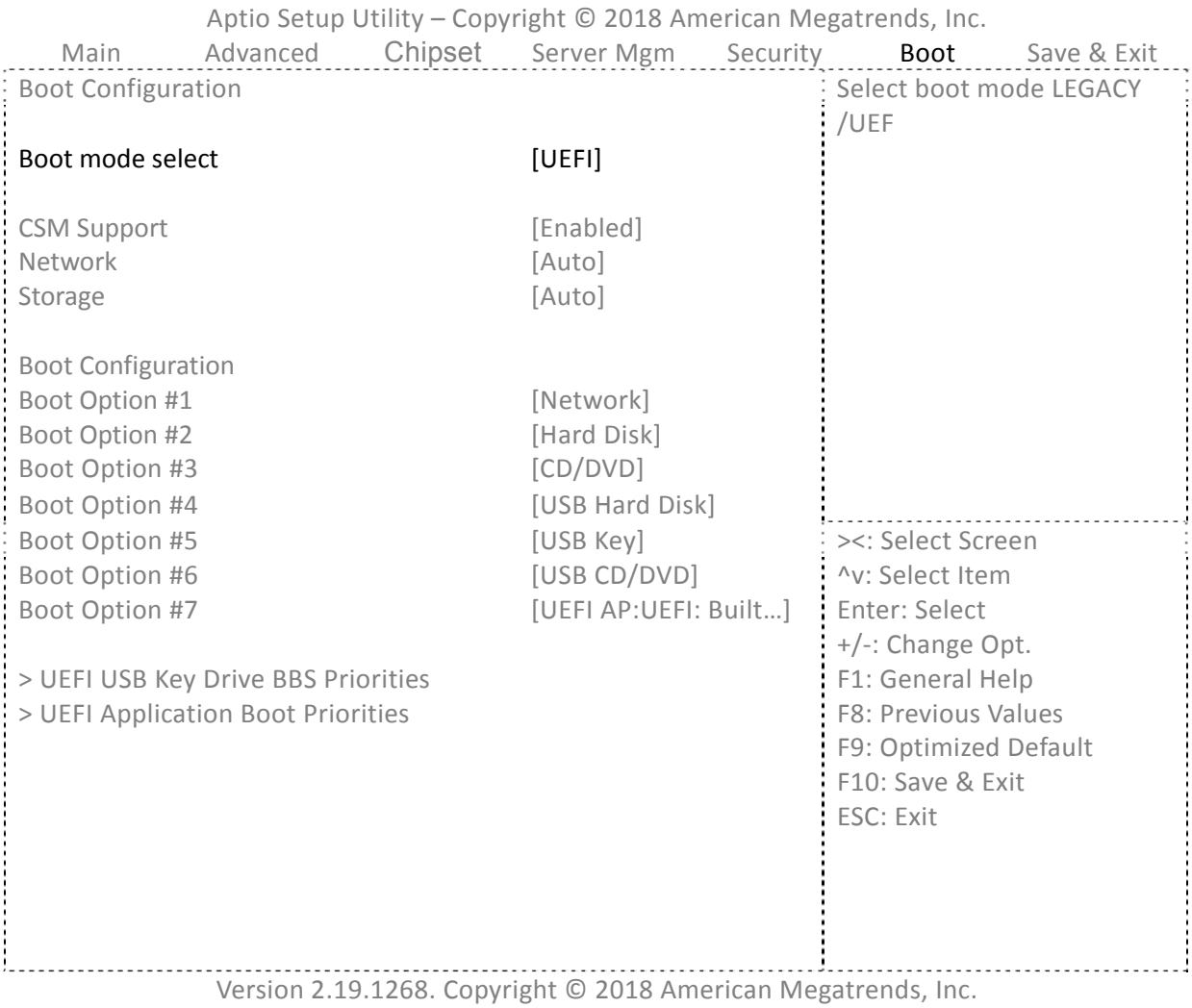


BIOS Item	Options	Description
Platform Key(PK)	**Enter**	For installing/saving/erasing PK.
Key Exchange Keys	**Enter**	For installing/saving/appending/erasing KEK.
Authorized Signatures	**Enter**	For installing/saving/appending/erasing db.
Forbidden Signatures	**Enter**	For installing/saving/appending/erasing dbx.

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5.8 Boot Menu

This menu contains the settings for bootable devices in the system.



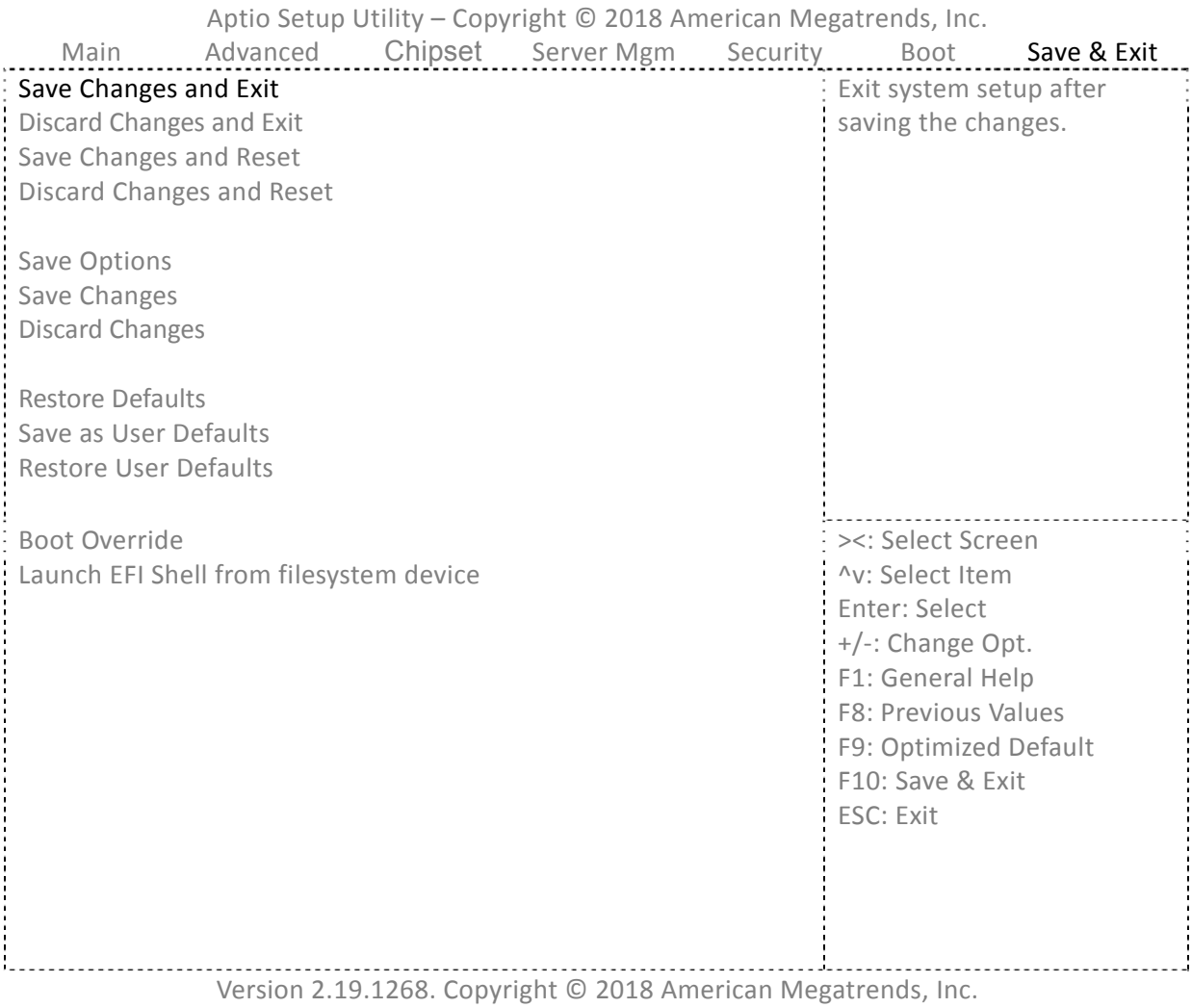
BIOS Item	Options	Description
Boot mode select	LEGACY **UEFI**	Select boot mode, LEGACY/UEFI.
CSM Support	Disabled **Enabled**	Enable to support operating system that only support legacy mode.
Network	Do not launch **Auto**	Select the method of launch option ROM of network controller. **Auto** will execute EFI driver or hook legacy option ROM according to the setting (LEGACY/UEFI) of “Boot mode select” setup item.
Storage	Do not launch **Auto**	Select the method of launch option ROM of storage controller. **Auto** will execute EFI driver or hook legacy option ROM according to the setting (LEGACY/UEFI) of “Boot mode select” setup item.

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BIOS Item	Options	Description
Boot Option #1 ~ #7	#1: Network #2: Hard Disk #3: CD/DVD #4: USB Hard Disk #5: USB Key #6: USB CD/DVD #7: Built-in EFI Shell	For boot priority setting.
XXXX Drive BBS Priorities	**Submenu**	When the bootable device is attached to system and found by BIOS, it will be listed at boot option #. If there are many devices with the same device type found, it can set priority among these devices through this Submenu.

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5.9 Save & Exit Menu



BIOS Item	Options	Description
Save Changes and Exit	**Enter**	Save changed settings and exit BIOS setup utility.
Discard Changes and Exit	**Enter**	Skip changed setting and exit BIOS setup utility.
Save Changes and Reset	**Enter**	Save all changed settings and let system do reset to boot system.
Discard Changes and Reset	**Enter**	Discard all changed settings and let system do reset to boot system.
Save Changes	**Enter**	Save all changed settings.
Discard Changes	**Enter**	Discard changes done so far to any of the setup options.
Restore Default	**Enter**	Load the default made when BIOS was built.
Save as User Default	**Enter**	Save all changed done so far as User Defaults.
Restore User Default	**Enter**	Load the default that user save as user defaults.
Boot Override	**Info only**	

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Safety Instructions

For user safety, please read and follow all **instructions**, **WARNINGS**, **CAUTIONS,** and **NOTES** marked in this manual and on the associated equipment before handling/operating the equipment.

1. Read these safety instructions carefully.
2. Keep this user's manual for future reference.
3. Read the specifications section of this manual for detailed information on the operating environment of this equipment.
4. The equipment can be operated at an ambient temperature of 40°C.
5. When installing/mounting or uninstalling/removing equipment; or when removal of the chassis lid required for user servicing (Section 3.1-3.5):
   - Turn off power and unplug any power cords/cables, and
   - Reinstall the chassis lid before restoring power.
6. To avoid electrical shock and/or damage to equipment:
   - Keep equipment away from water or liquid sources;
   - Keep equipment away from high heat or high humidity;
   - Keep equipment properly ventilated (do not block or cover ventilation openings);
   - Make sure to use recommended voltage and power source settings;
   - Always install and operate equipment near an easily accessible electrical socket-outlet;
   - Secure the power cord (do not place any object on/over the power cord);
   - Only install/attach and operate equipment on stable surfaces and/or recommended mountings;
   - If the equipment will not be used for long periods of time, turn off and unplug the equipment from its power source.
7. Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.
8. A Lithium-type battery may be provided for uninterrupted, backup or emergency power.
   CAUTION! Risk of explosion if battery is replaced with one of an incorrect type. Please dispose of used batteries appropriately.
9. Equipment must be serviced by authorized technicians when:
   - The power cord or plug is damaged;
   - Liquid has penetrated the equipment;
   - It has been exposed to high humidity/moisture;
   - It is not functioning or does not function according to the user's manual;
   - It has been dropped and/or damaged; and/or,
   - It has an obvious sign of breakage.
10. Please pay strict attention to all warnings and advisories appearing on the device, to avoid injury or damage.
11. The equipment may have more than one power supply input. To reduce the risk of electrical shock, trained personnel should disconnect all power supply inputs before servicing.
    CAUTION! Disconnect all power supply inputs before servicing.

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12. It is recommended that equipment be installed only in a server room or computer room where access is:
    - Restricted to qualified service personnel or users familiar with restrictions applied to the location, reasons therefor, and any precautions required;
    - Only afforded by the use of a tool or lock and key, or other means of security, and is controlled by the authority responsible for the location.

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Consignes de Sécurité Importantes

Pour assurer la sécurité de l'utilisateur, veuillez lire et suivre toutes les **directives**, ainsi que les **AVERTISSEMENTS**, **MISES EN GARDE** et **REMARQUES** de ce manuel et indiqués sur l'équipement associé avant de manipuler ou utiliser l'équipement.

1. Veuillez lire attentivement ces instructions de sécurité avec soin.
2. Veuillez conserver ce manuel pour référence future.
3. Veuillez lire la section des spécifications de ce manuel pour avoir des informations détaillées sur l'environnement d'exploitation de cet équipement.
4. L'équipement peut être utilisé à une température ambiante de 40 °C.
5. Lors de l'installation ou du montage et de la désinstallation ou de la dépose de l'équipement; ou lors de la dépose du couvercle du châssis pour procéder à l'entretien par l'utilisateur (Sections 3.1-3.5):
   - Coupez l'alimentation et débranchez les cordons et les câbles d'alimentation, et
   - Reposez le couvercle du châssis avant de remettre l'alimentation.
6. Pour éviter un risque d'électrocution et pour éviter d'endommager l'équipement :
   - Éloignez l'équipement de l'eau et de toute source liquide;
   - Éloignez l'équipement de toute source de chaleur ou d'humidité élevée;
   - Gardez l'équipement correctement ventilé (ne pas bloquer ou couvrir les ouvertures de ventilation);
   - Veillez à utiliser la tension recommandée et les réglages adéquats pour la source d'alimentation;
   - Veuillez toujours installer et exploiter l'équipement à proximité d'une prise de courant facilement accessible;
   - Assurez-vous que le cordon d'alimentation est acheminé de manière sécuritaire (ne déposez aucun objet dessus);
   - Installez, fixez et utilisez l'équipement sur des surfaces stables ou sur les fixations recommandées uniquement;
   - Si l'équipement n'est pas utilisé pendant une longue période, éteignez-le et débranchez-le de sa source d'alimentation.
7. N'essayez jamais de réparer l'équipement. L'équipement ne doit être réparé que par du personnel qualifié.
8. Une pile au lithium peut être installée pour assurer l'alimentation de secours ou d'urgence en continu.
   ATTENTION! Risque d'explosion si la pile est remplacée par une autre de type incorrect. Veuillez jeter les piles usagées de façon appropriée.
9. L'équipement doit être entretenu par des techniciens agréés lorsque :
   - le cordon d'alimentation est endommagé ou lorsque la fiche électrique est endommagée;
   - du liquide a pénétré à l'intérieur de l'équipement;
   - l'équipement a été exposé à un taux d'humidité élevé;
   - l'équipement ne fonctionne pas ou ne fonctionne pas conformément au manuel de l'utilisateur;
   - l'équipement est tombé ou lorsqu'il a été endommagé;
   - l'équipement présente un signe évident de défaillance.
10. Veuillez porter une attention rigoureuse à tous les avertissements et à tous les avis figurant sur l'appareil, pour éviter des blessures ou des dommages.

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11. **ATTENTION!** L’équipement peut avoir plus d’une entrée d’alimentation. Pour réduire le risque d’électrocution, le personnel qualifié devrait déconnecter toutes les entrées d’alimentation avant de procéder à l’entretien.
12. Il est recommandé que l'équipement soit installé que dans une salle de serveur ou de la salle informatique où:
    - L'accès est limité au personnel de maintenance qualifié ou utilisateurs familiers avec les restrictions appliquées à l'emplacement, motifs, et tout les précautions nécessaires, et;
    - L'accès est uniquement assurée par l'utilisation d'un outil ou clé, ou d'autres moyens de sécurité, et est contrôlé par l'autorité responsable de l'emplacement.

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Getting Service

Ask an Expert: http://askanexpert.adlinktech.com

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