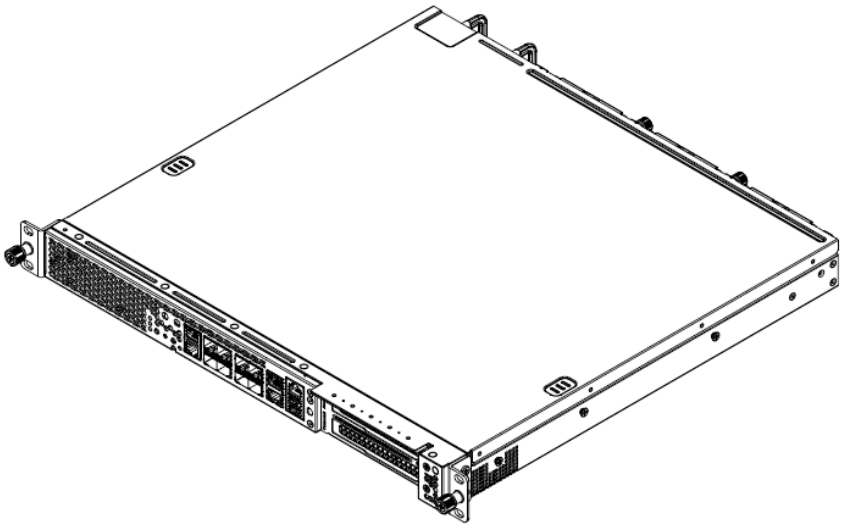
# AXE-6120IL

## 1U Edge Server
## with Intel® Xeon® D-1700 Processor

# User's Manual



| | |
|---|---|
| Manual Rev.: | 1.1 Preliminary |
| Revision Date: | May 14, 2026 |
| Part No.: | 50M-22807-2010 |

LEADING EDGE AI COMPUTING

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# Preface

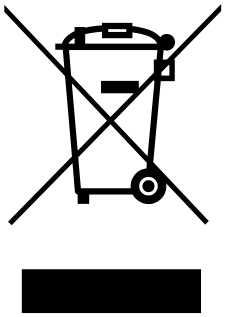
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### Revision History

| Revision | Release Date | Description of Change(s) |
|---|---|---|
| 1.0 | 2025-05-28 | Initial release |
| 1.1 | 2026-05-14 | Mechanical overview updated |



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## Conventions




Information to prevent minor physical injury, component damage, data loss, and/or program corruption when trying to complete a task.

*Informations destinées à prévenir les blessures corporelles mineures, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche.*




Information to prevent serious physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

*Informations destinées à prévenir les blessures corporelles graves, les dommages aux composants, la perte de données et/ou la corruption de programme lors de l'exécution d'une tâche spécifique.*



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# 1 Overview

## 1.1 Introduction

The ADLINK AXE-6120IL is a 1U 19" rackmount edge computing server with Intel® Xeon ® D processor system-on-chip. The AXE-6120IL features an IO intensive architecture with up to 1x PCIe x16 Gen3 & 1x PCIe x 8 Gen3 FHFL interfaces, 2x 2.5'' SATA drive bays, 8x SFP+ ports. It also features IEEE 1588v2 Precision Time Protocol (PTP) and is an ideal platform for 5G mobile edge computing infrastructure deployment.

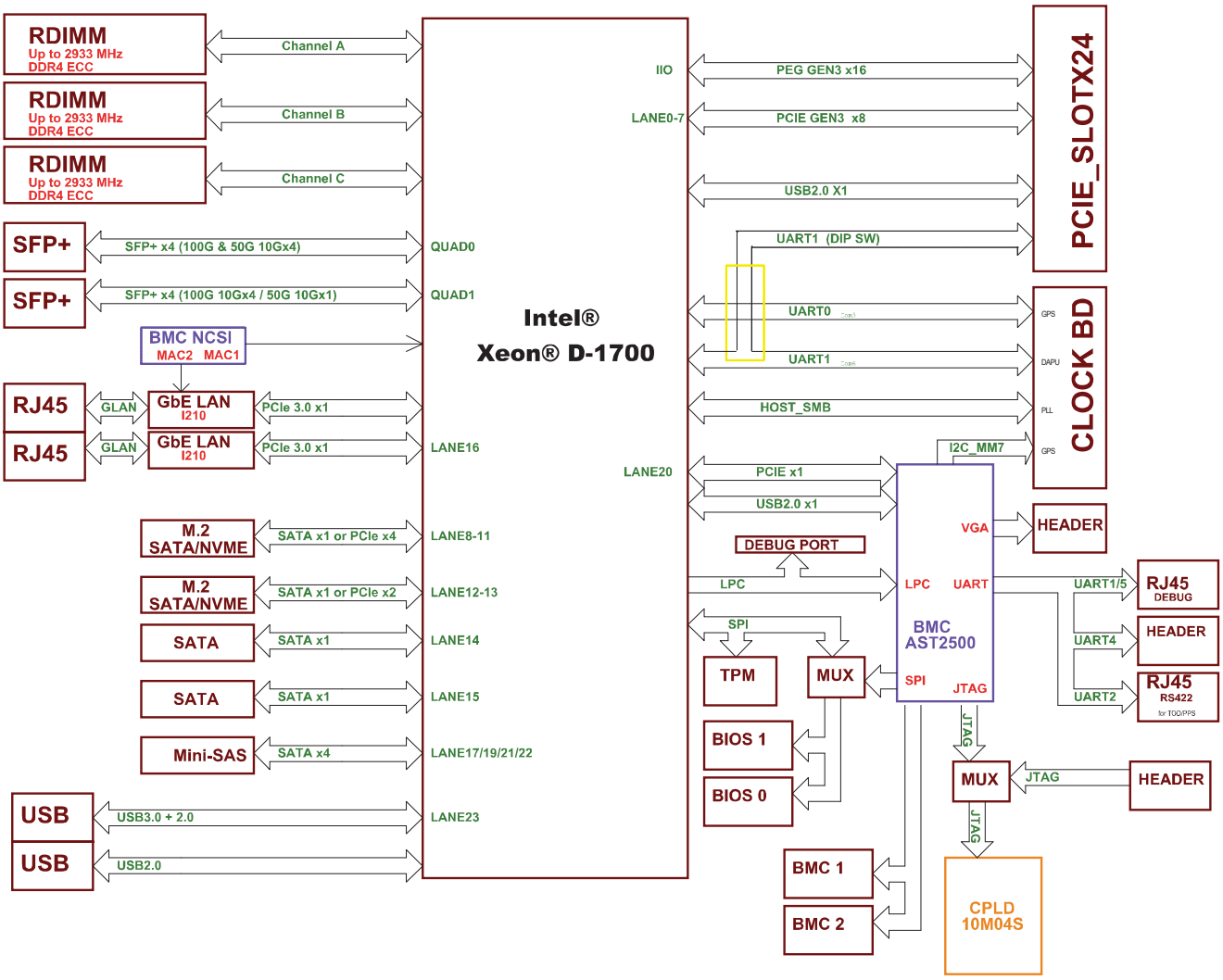
The main features of the AXE-6120IL as follows:

- 1x Intel® Xeon® D-1700 family processor
- 3x DDR4-2667 RDIMM ECC REG up to 192GB
- 2x 2.5" SATA bays (only for AXE-6120IL) and 2x M.2 M Key interfaces
- 1x PCIe x16 Gen3 and 1x PCIe x8 Gen3 single-slot FHFL interfaces or 1x PCIe x16 Gen3 dual-slot FHFL interface
- 420mm depth 1U 19" rackmount form factor
- Built-in Intel® QuickAssist Technology (QAT) support
- TPM 1.2/2.0 module
- Supports IEEE 1588v2, 2x RS-422 clock sync ports, and optional GPS clock module
- EMC grade: Class B



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# 1.2 Block Diagram

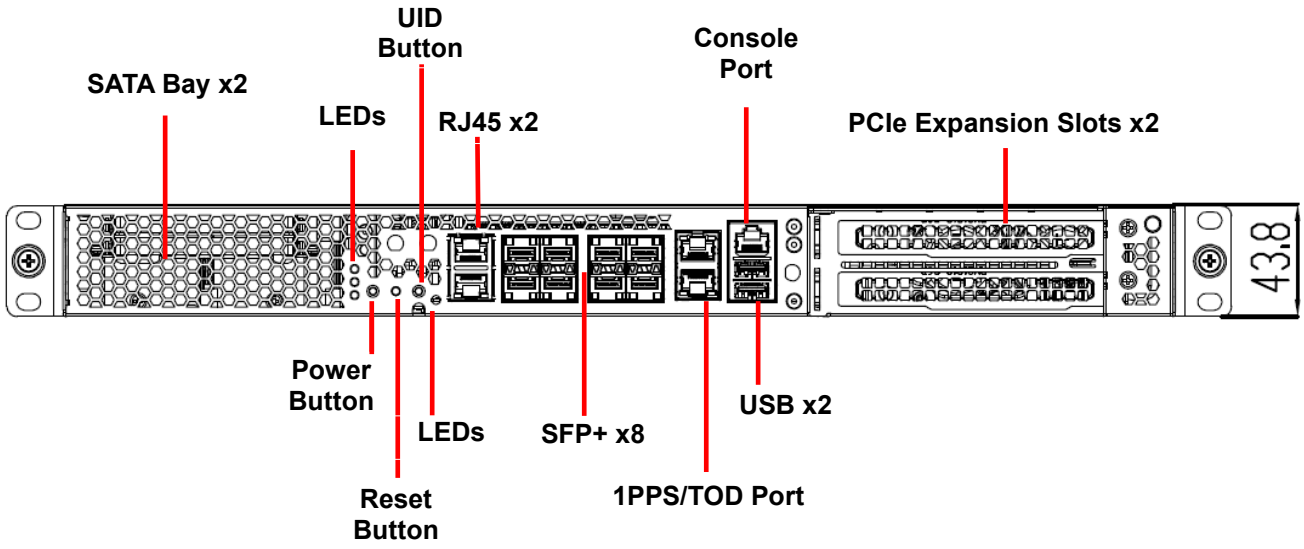




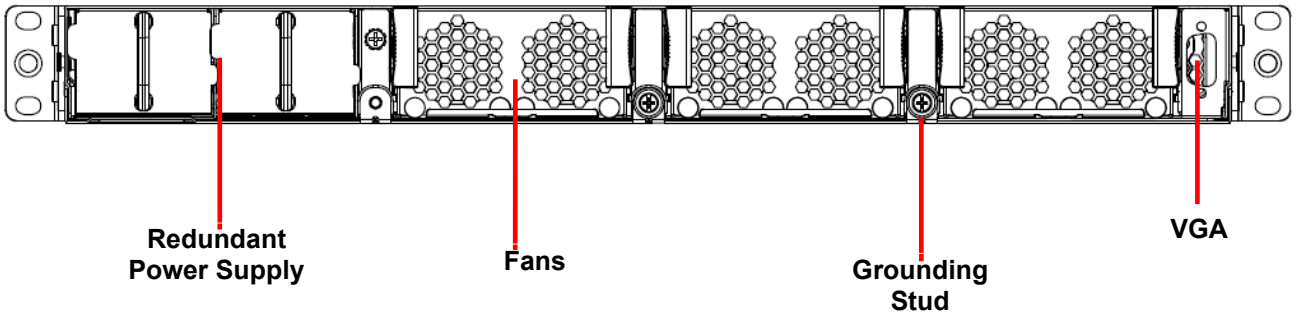

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# 1.3 Mechanical Overview

## 1.3.1 AXE-6120IL Front Panel



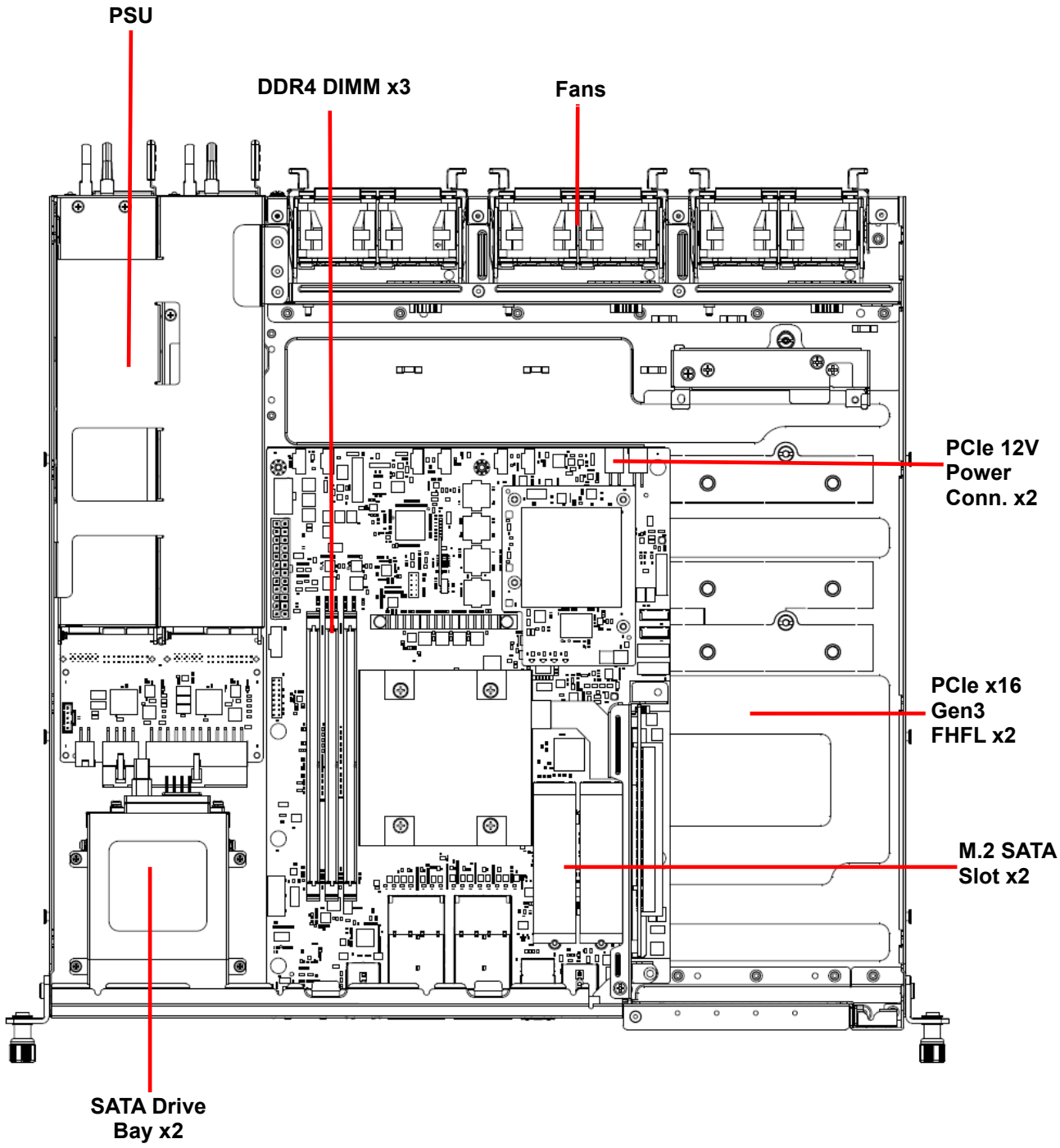

## 1.3.2 AXE-6120IL Rear Panel






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### 1.3.3 AXE-6120IL Internal Layout



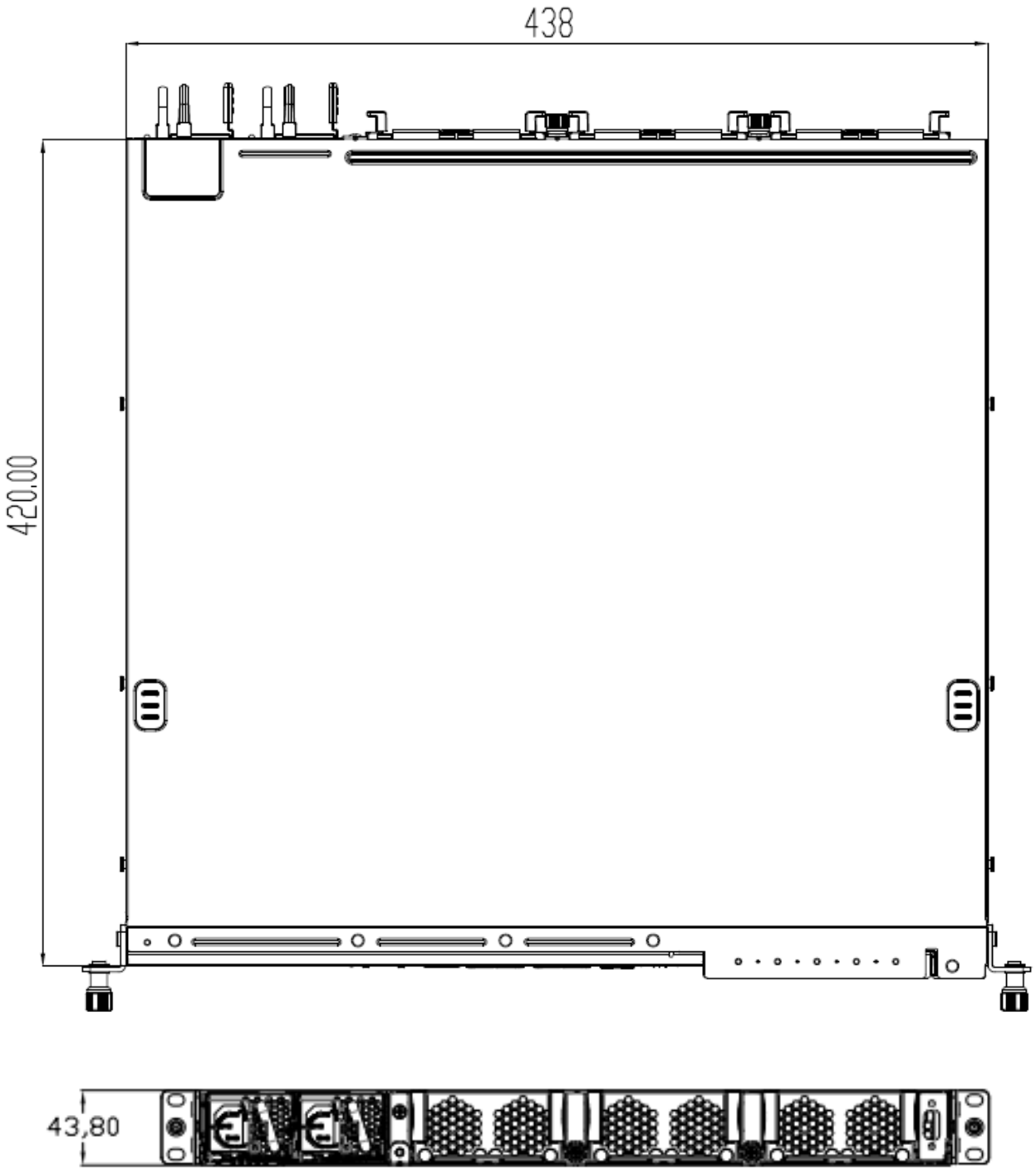

See *3.1 Removing the Chassis Cover* on page 13 for instructions on removing the cover.



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# 1.4 Mechanical Dimensions

Units: mm






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# 2 Specifications

## 2.1 AXE-6120IL Specifications

### Main System

| | |
|---|---|
| **CPU** | Intel® Xeon® D Processor SoC FC-BGA (formerly Ice Lake)<br>・ Intel® Xeon® D-1746TER, 10c 15MB cache, 67W<br>・ Intel® Xeon® D-1747NTE, 10c 15MB cache, 80W<br>・ Intel® Xeon® D-1749NT, 10c 15MB cache, 90W |
| **Chipset** | Integrated on Intel® Xeon® D SoC |
| **Memory** | 3x DDR4 RDIMM memory sockets, up to 2667 MHz, max. 192GB |
| **BIOS** | AMI BIOS on SPI flash memory |
| **Operating System** | Microsoft Windows Server 2012/2016<br>CentOS 8.2, Ubuntu 20.04<br>Note: No OS installed by default |
| **Hardware Acceleration** | Built-in Intel® QAT: SSL (20G), Compression (15G)<br>Intel® eASIC on expansion card (PCIe x16 Gen3) |
| **Trusted Platform Module** | TPM 1.2/2.0 internal header |
| **Chassis Management** | IPMI v2.0 compliant with iKVM and SOL support |
| **Clock Sync** | GPS/Beidou and clock retaining modules (optional)<br>IEEE 1588 v2 slave and master |

### Interfaces

| | |
|---|---|
| **Expansion**<br>(SKU dependent) | 1x PCIe x16 Gen3 single slot FHFL via riser card and<br>1x PCIe x8 Gen3 single slot FHFL via riser card<br>or<br>1x PCIe x16 Gen3 dual-slot FHFL interface |
| **Ethernet** | 8x 10G SFP+ Ethernet ports<br>2x RJ-45 100/1000BASE-T Ethernet ports |
| **Remote Console** | 1x RJ-45 serial port |
| **USB** | 1x USB 3.0/2.0 + 1x USB 2.0 |
| **Other** | 2x RJ-45 1PPS+TOD port<br>1x SMA port for GPS/Beidou signal |
| **LEDs** | Power, Alert, Drive Activity, Health Behavior, UID |
| **Control Buttons** | Power, reset, UID (front access) |
| **Internal** | 1x COM port<br>1x VGA header<br>3x 1PPS SMA header<br>1x 10M SMA header |



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## Storage

| | |
|---|---|
| **Drive Bays** | 2x 2.5” SATA 6Gb/s |
| **Internal** | 2x onboard M.2 NVME/SATA socket, 2242/2280 M-Key |

## Mechanical & Environmental

| | |
|---|---|
| **Form Factor** | 1U 19” rackmount 438mm x 43.8mm x 420mm (WxHxD) |
| **Fans** | 6 fans, adaptive speed |
| **Power** | 450W 1+1 redundant PSUs<br>AC: 100V to 240V AC @50-60Hz<br>DC: -48V to -60V DC, 12A min., Tma = 55°C |
| **Temperature** | Operating temp.: -5°C 55°C<br>Storage temp.: -40°C to 70°C<br>**Note:** Not including SATA drives and PCIe cards. |
| **Humidity** | Operating: 10% to 95% RH @40°C, non-condensing<br>Storage: 5% to 90% RH, non-condensing |
| **Shock** | Operating: half-sine 2G, 11ms pulse, 100 pulses on each of three axes |
| | Non-operating: trapezoidal, 25G, 170 inches/sec delta V, three drops on each of three axes |
| **Vibration** | Non-operating: 2.2Grms, 10 minutes per axis on all three axes |
| **Acoustic** | Sound pressure < 75 dBA @1m with all fans maximum speed |
| **Certifications (TBC)** | FCC, CE, CCC Class B, UL, CB and RoHS compliant<br>**Note:** Certifications were passed with 450W PSU installed. |
| **MTBF** | 150,000 hours |



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# 3 Getting Started

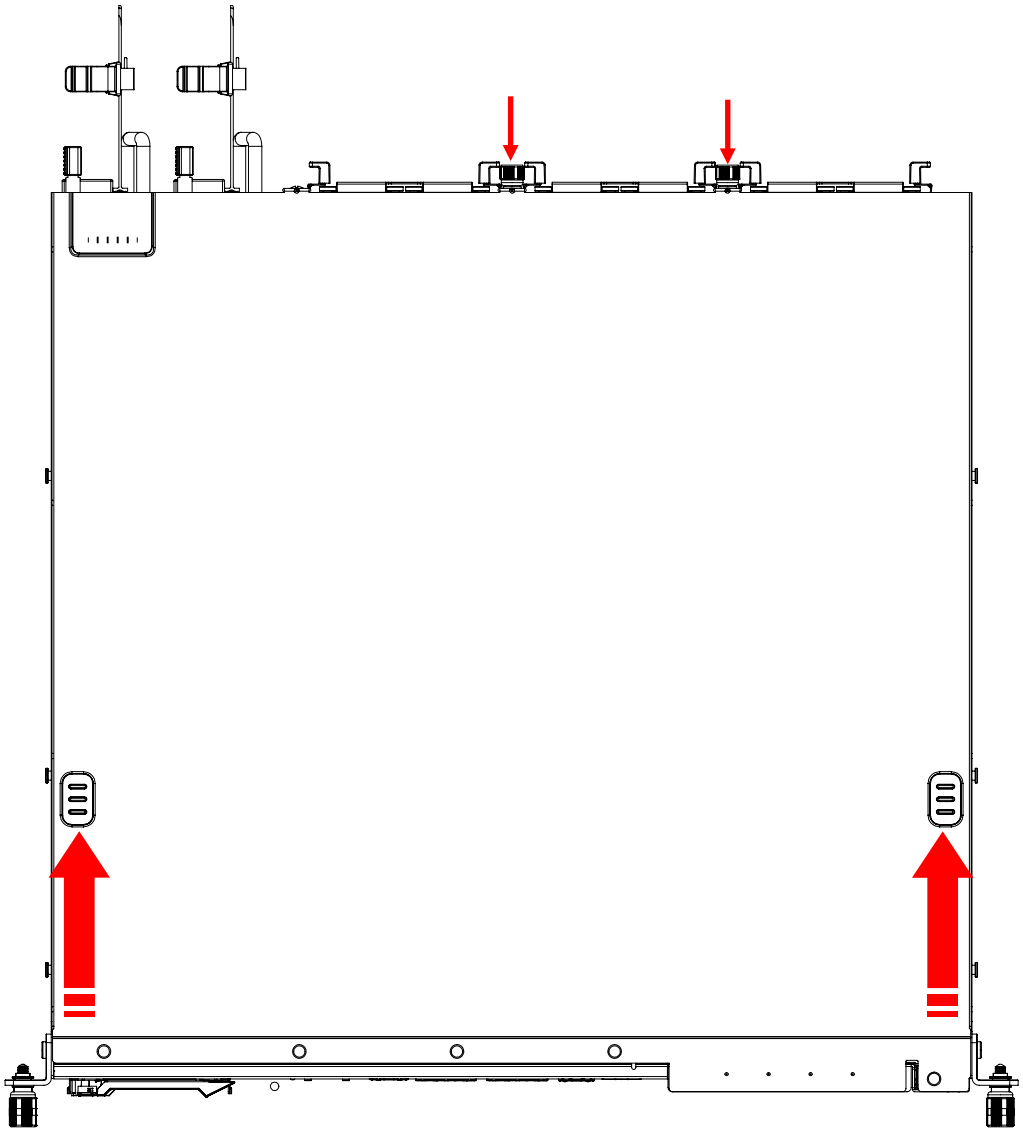
## 3.1 Removing the Chassis Cover

Follow the instructions below to remove the chassis top cover.

CAUTION:
*mise en garde*

All installation procedures are restricted to skilled personnel.
*Toutes les procédures d'installation sont réservées au personnel qualifié.*

1. Loosen the two captive screws at the rear of the cover (arrows).
2. Press down on the two depressions with your thumbs and slide the cover towards the rear of the chassis and remove the cover.



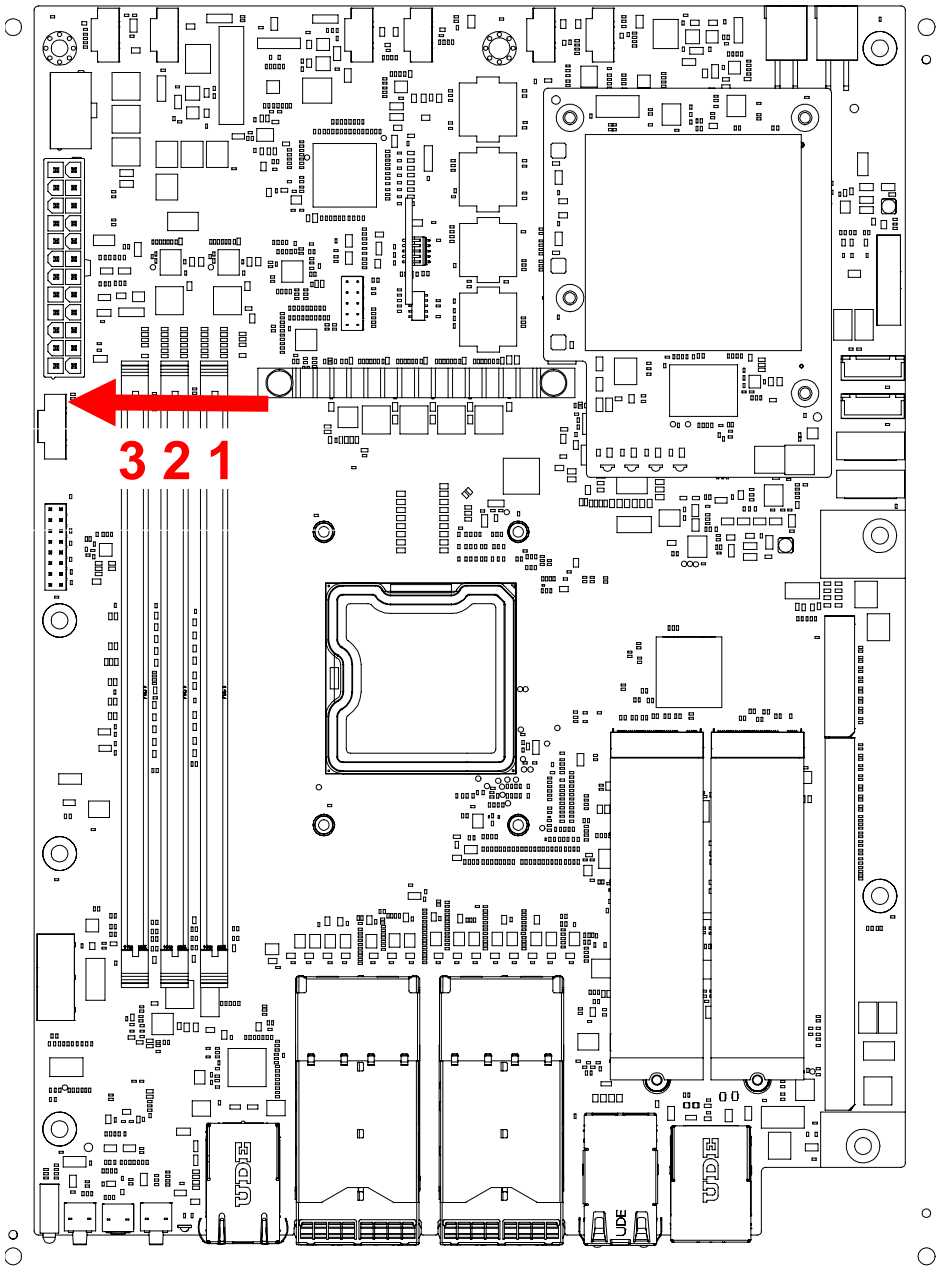
To reinstall the cover, slide it towards the front of the chassis, then tighten the screws loosened in Step 1.



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## 3.2 Installing Memory Modules

Memory modules must be populated from the right side as shown (slots 1 > 2 > 3).




CAUTION:
*mise en garde*

All installation procedures are restricted to skilled personnel.
*Toutes les procédures d'installation sont réservées au personnel qualifié.*



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## 3.3 PCIe Card Installation

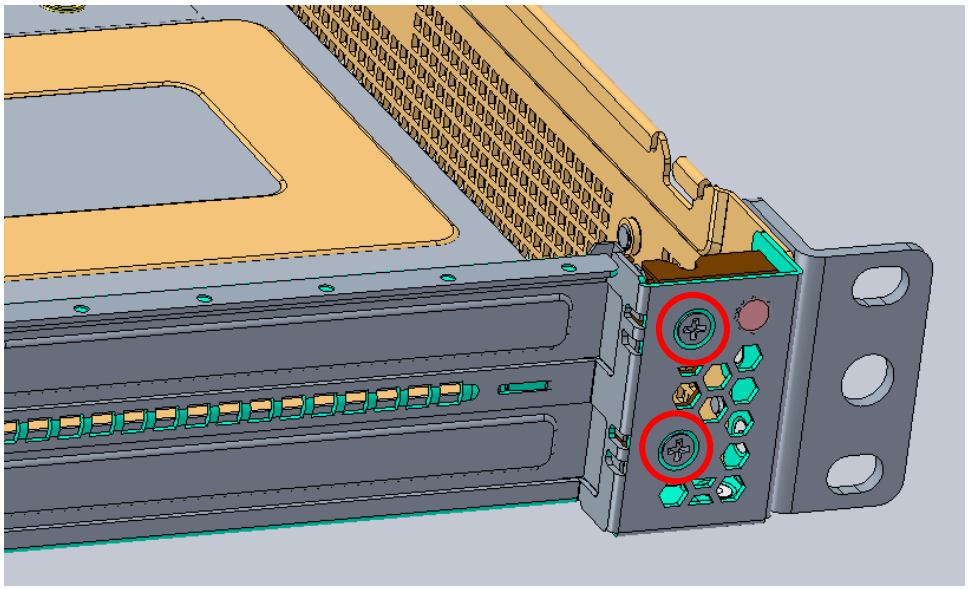
Sample installation instructions for FHFL PCIe expansion cards are described below. For detailed information on the specific installation procedures for your cards, please contact your ADLINK representative.

CAUTION:
*mise en garde*

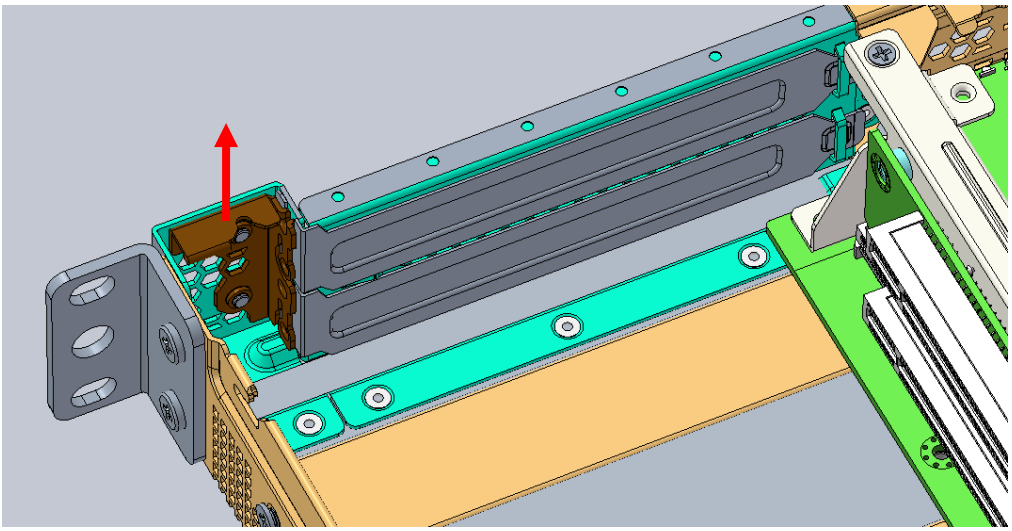
All installation procedures are restricted to skilled personnel. Only UL listed PCIe expansion cards or PCIe cards with openings less than 5 mm in any dimension are recommended

*Toutes les procédures d'installation sont réservées au personnel qualifié. Seules les cartes d'extension PCIe répertoriées UL ou les cartes PCIe avec des ouvertures inférieures à 5 mm dans n'importe quelle dimension sont recommandées.*

1. Remove the two screws from the front panel as shown.



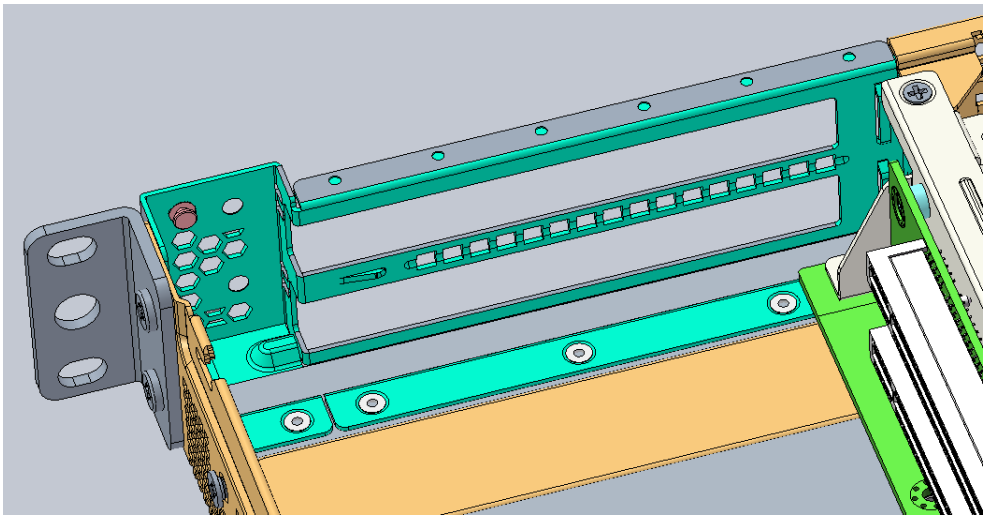
2. Remove the bracket securing the PCIe bracket blanking plates.



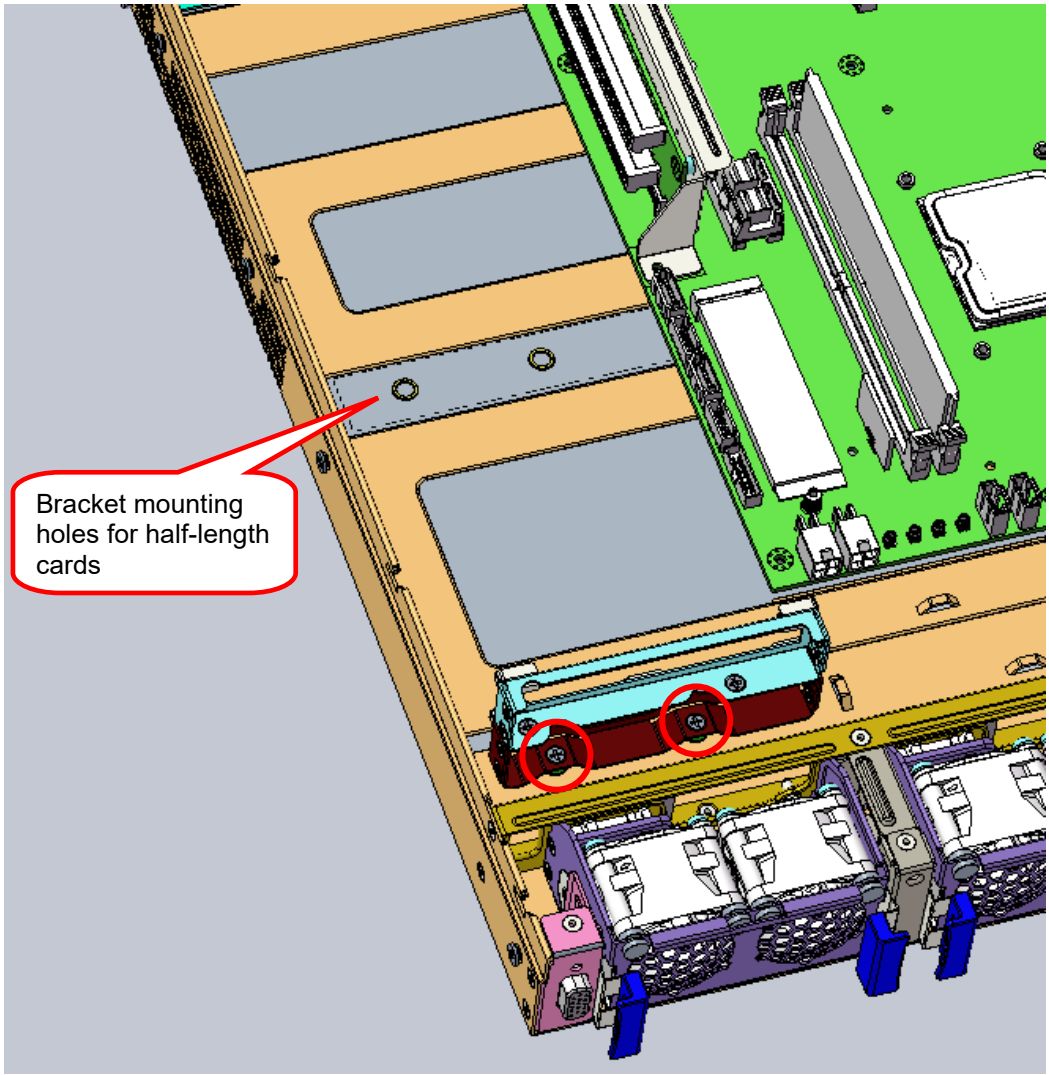


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3. Remove the PCIe bracket blanking plates.



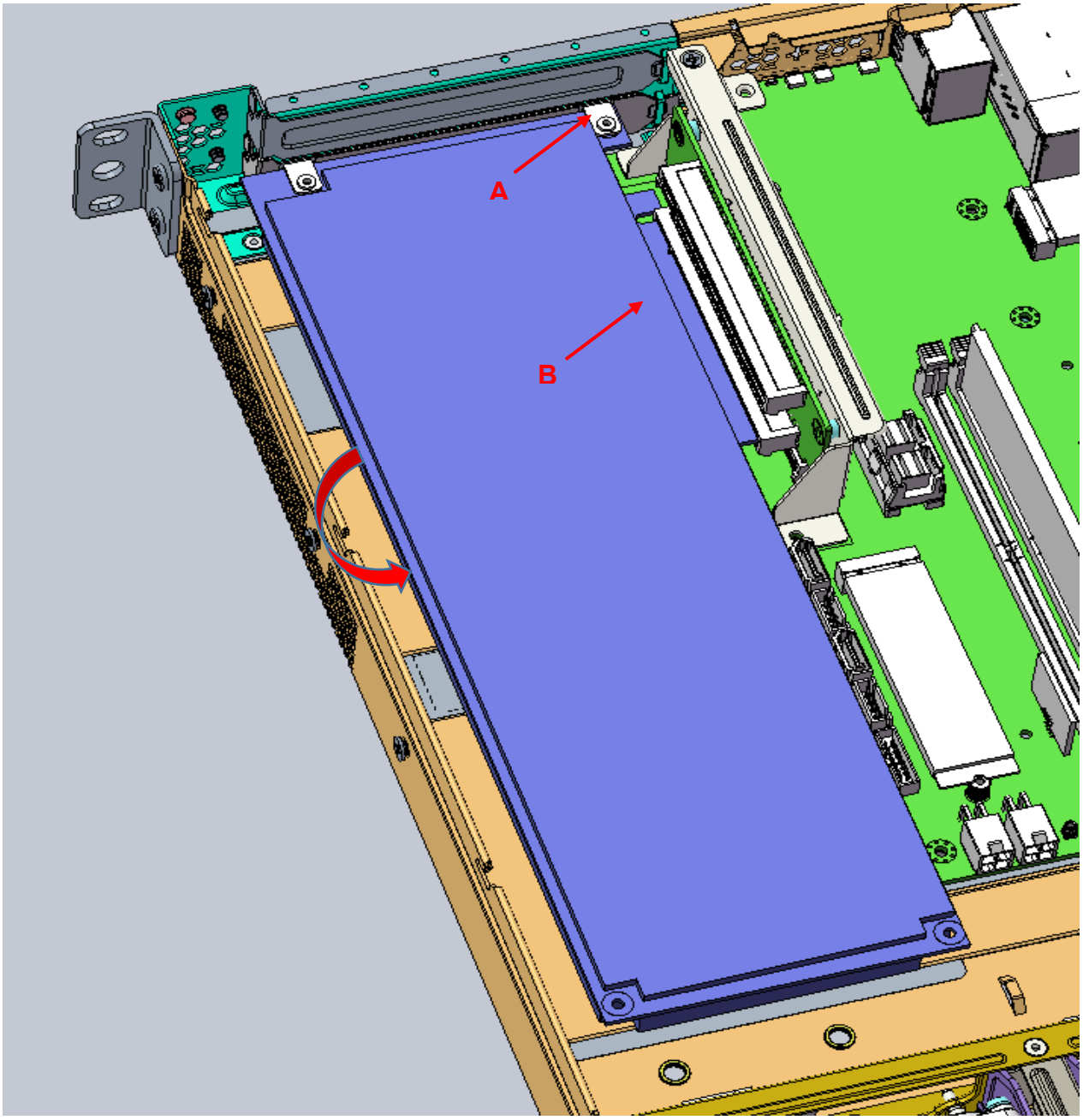
4. Loosen the two screws to remove the internal PCIe bracket used to secure the PCIe cards inside the chassis. The diagram shows the position of the bracket for full-length cards.






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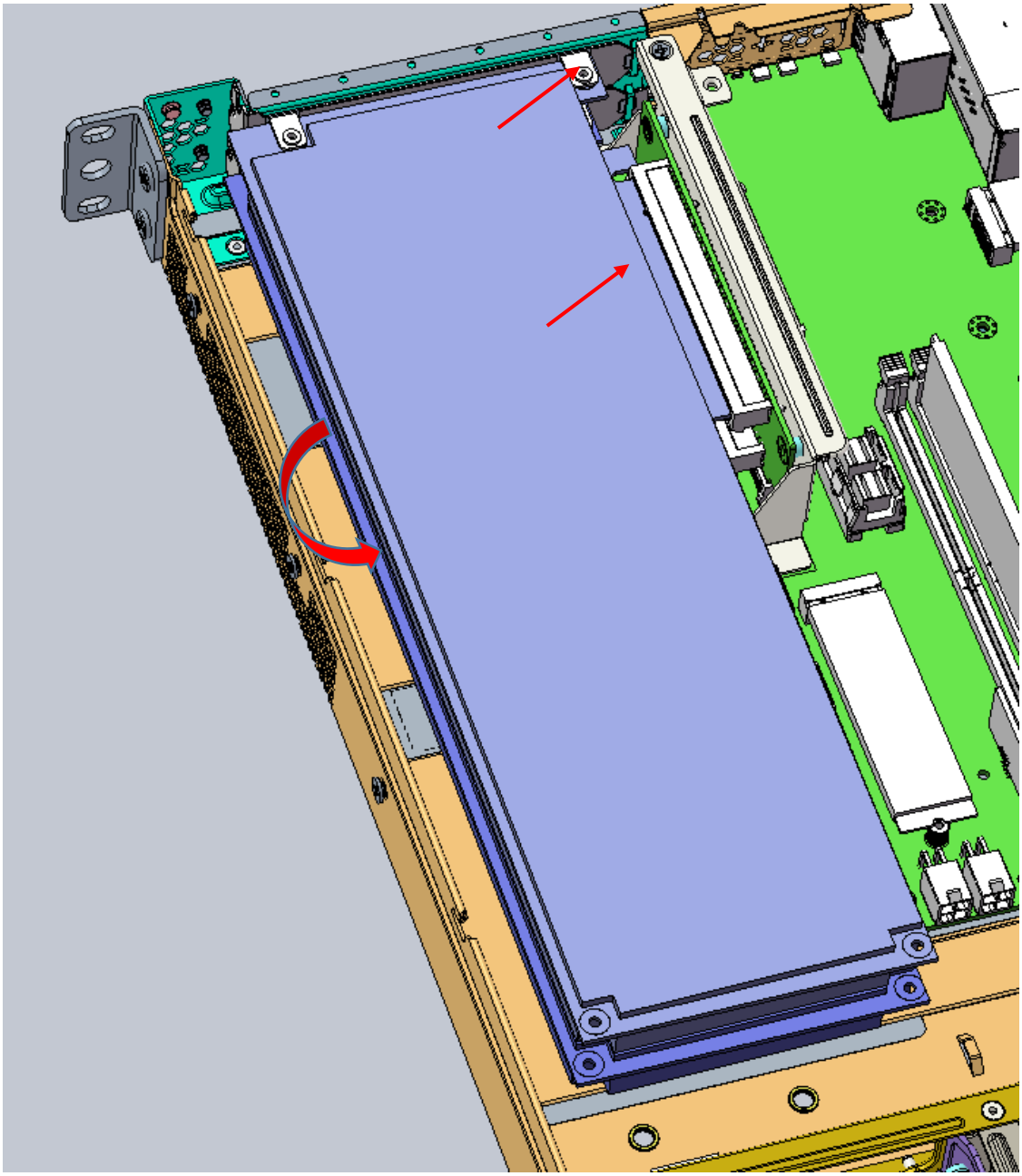
5. First install the lower PCIe expansion card. Align the tab on the bracket with the opening on the rear I/O panel (A), and insert the PCIe connector into the slot on the riser card (B). Make sure the connector is fully inserted into the PCIe slot.






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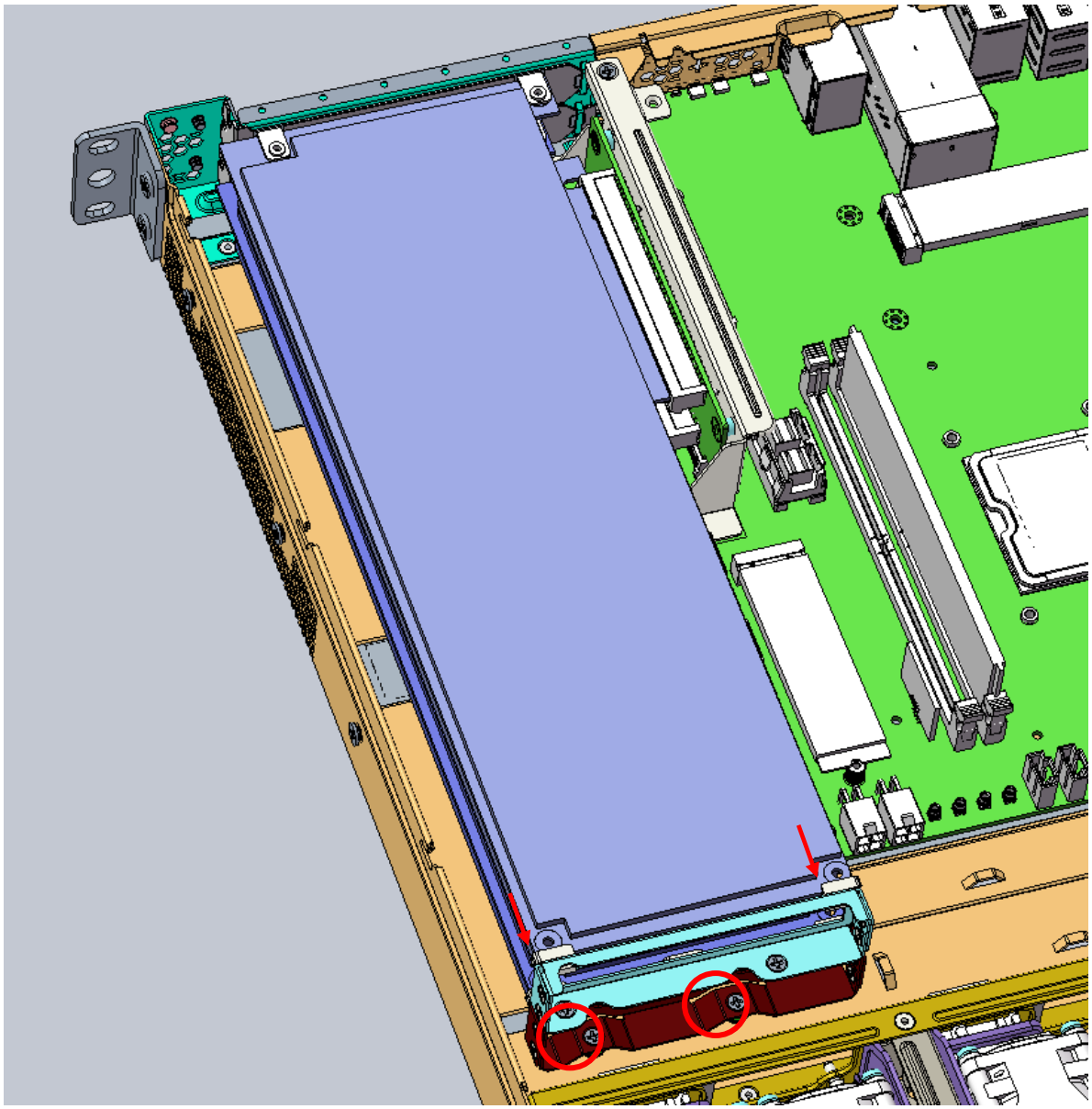
6. Then install the upper PCIe expansion card, if required





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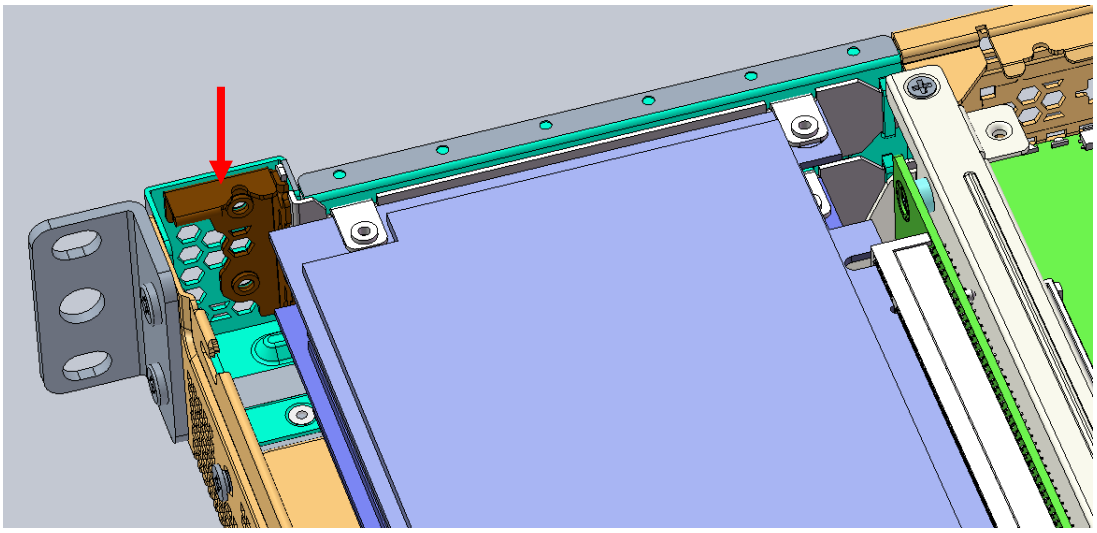
7. Replace the internal PCIe bracket, insert the PCIe cards into the slots (arrows), and tighten the two screws (circles) to secure the cards inside the chassis.



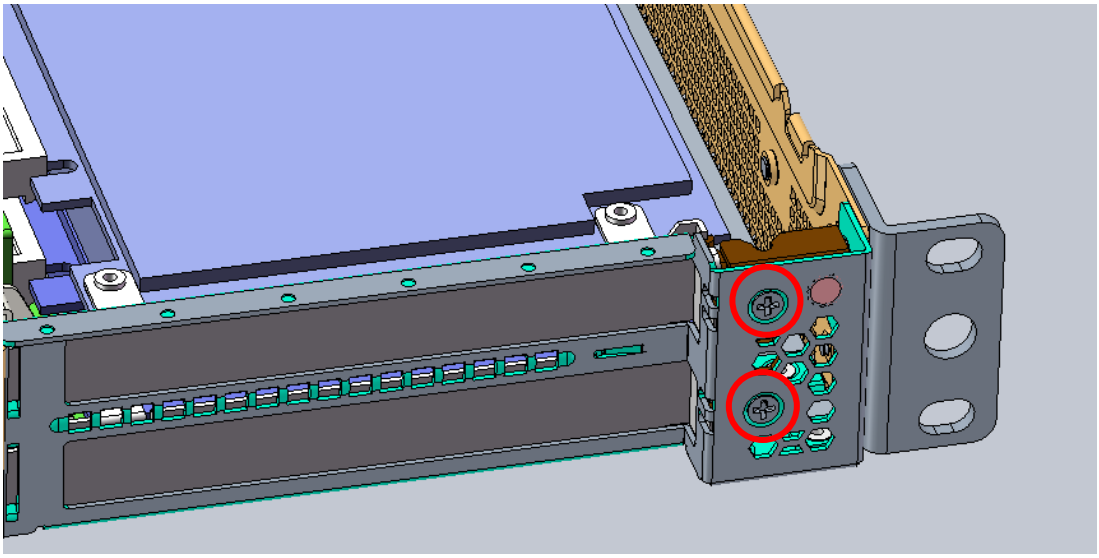


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8. Replace the bracket to secure the PCIe I/O brackets to the chassis.



9. Secure the bracket with two screws as shown.





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# 3.4 PCIe Slot Secondary Power Supply

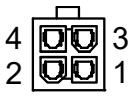
The AXE-6120IL is equipped with two 4-pin ATX-type 12V power connectors on the mainboard (see *1.3.5 AXE-6120IL Internal Layout* on page 9) to provide secondary power for PCIe expansion cards if required. Two adapter cables are included. The pin definitions of the connectors and cables are described below.

CAUTION:
*mise en garde*

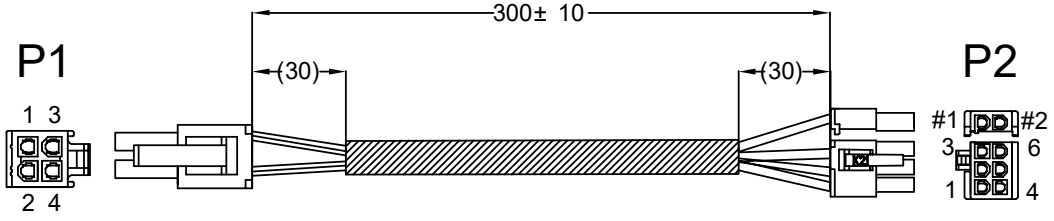
All installation procedures are restricted to skilled personnel.
*Toutes les procédures d'installation sont réservées au personnel qualifié.*

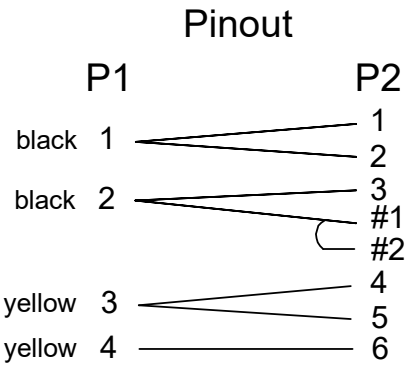
### 4-pin ATX-type 12V Power Connector Pinout

| Pin # | Signal | Color |
|---|---|---|
| 1 | GND | black |
| 2 | GND | black |
| 3 | P12V | yellow |
| 4 | P12V | yellow |




### Adapter Cable Connector Pinout



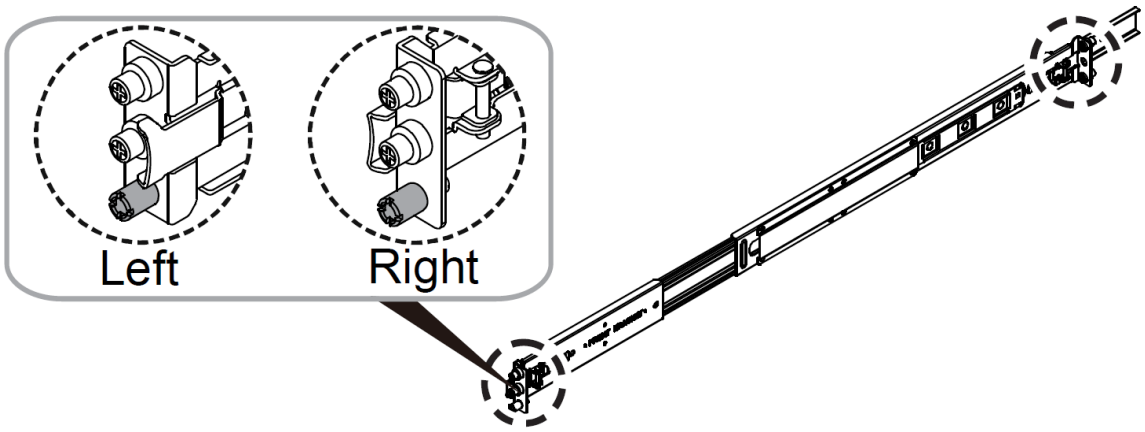





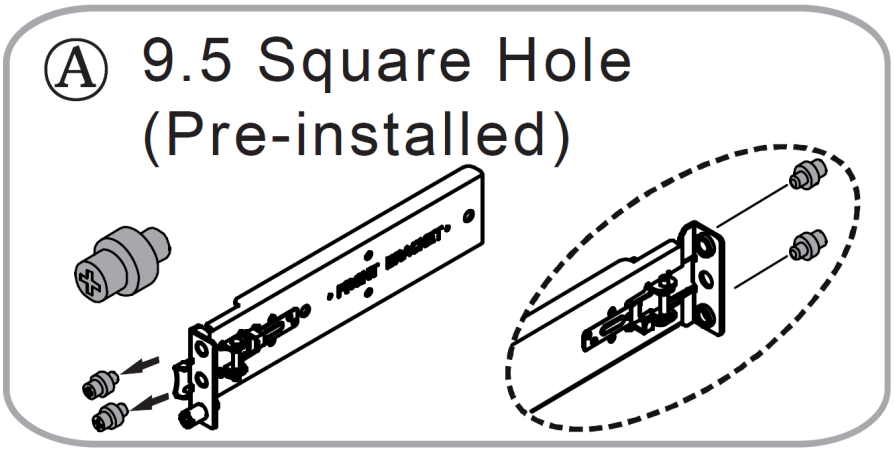

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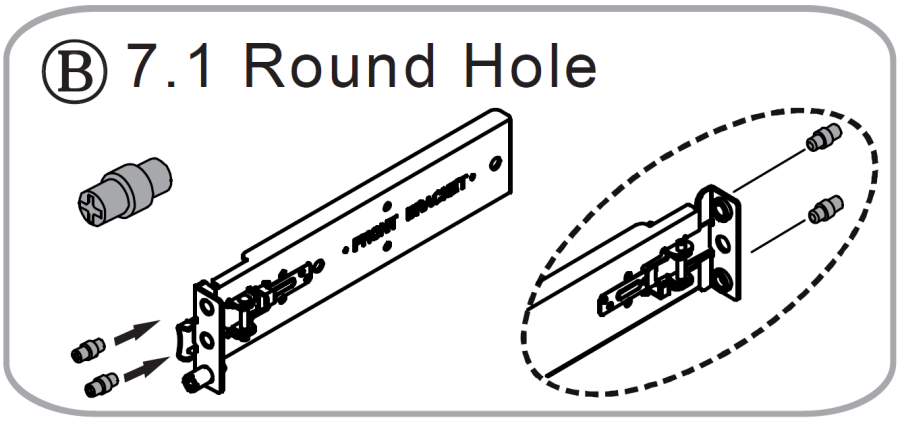
# 3.5 Rails Assembly and Rack Installation

**Note:** Please check rack post type before proceeding. The pre-installed rail type is for square hole posts. If the rack post has round holes, please switch to the appropriate screws as shown below.




To switch from round hole to square hole, remove the “A” type screws (pre-installed) and switch to “B” type screws.

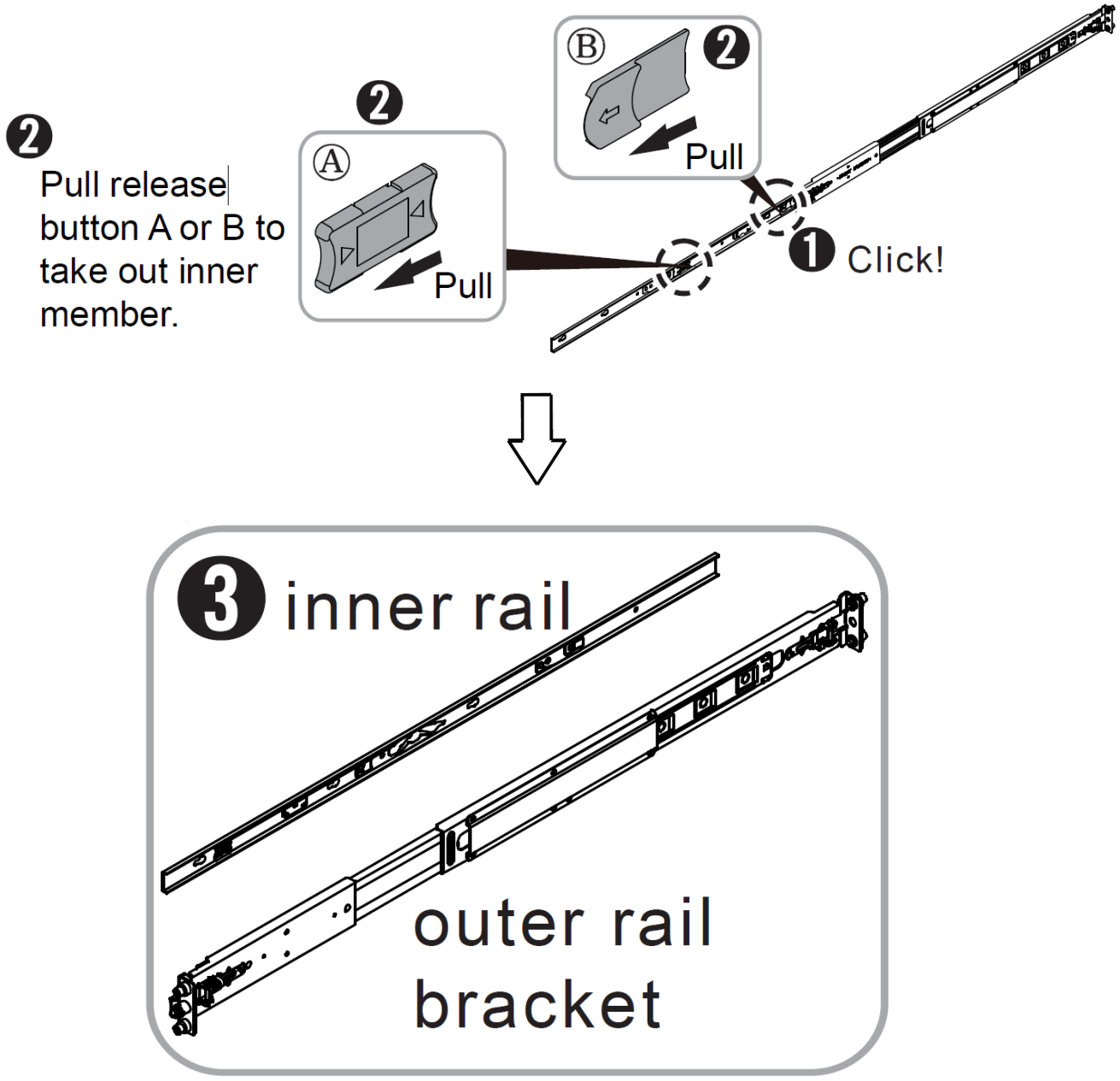





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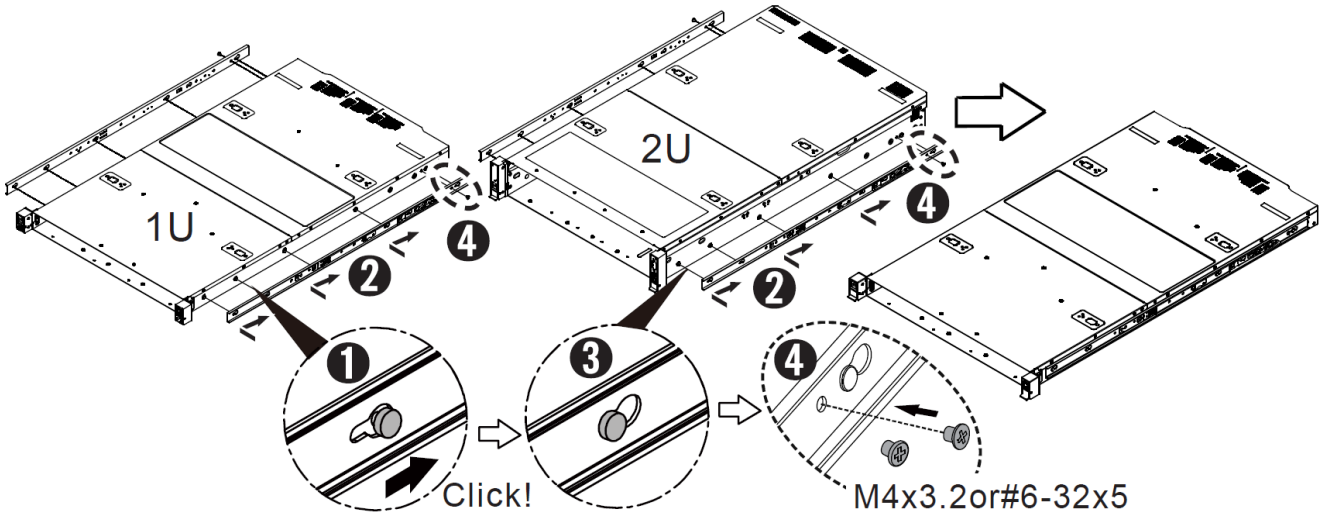
1. Remove the inner rail.



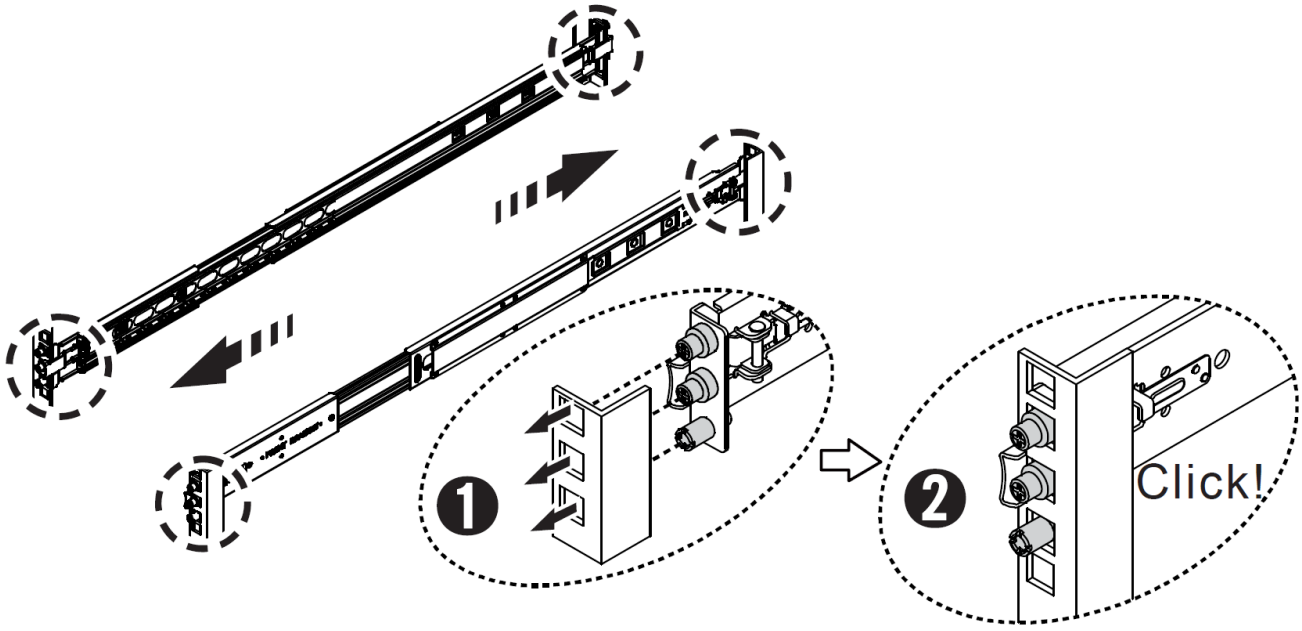



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2. Install the inner rail onto the chassis.




3. Attach the outer rail/bracket assembly to the rack.



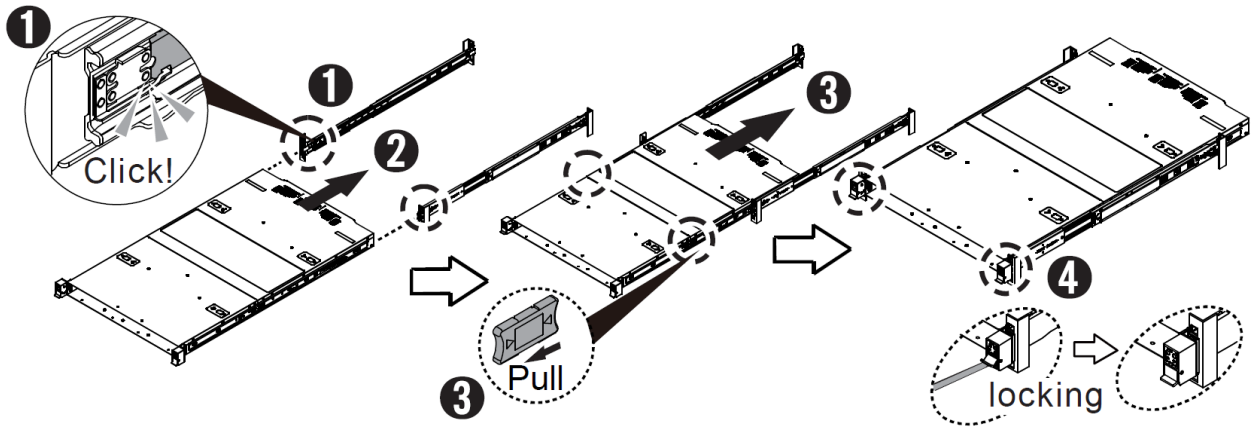

**Note:** Front and rear bracket installation procedures are the same. The left and right sides of the rail are symmetrical. Repeat the installation steps for the other side.



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4. Insert chassis with mounted inner rails to complete the installation.

❶ Ensure the ball bearing retainer is located at the front of the rail.
❷ Insert the chassis into the outer rails.
❸ When the chassis is fully inserted, pull/push the release tab on the inner rails.
❹ Secure the system to the rack using the captive screws located on the rack handles of the system.

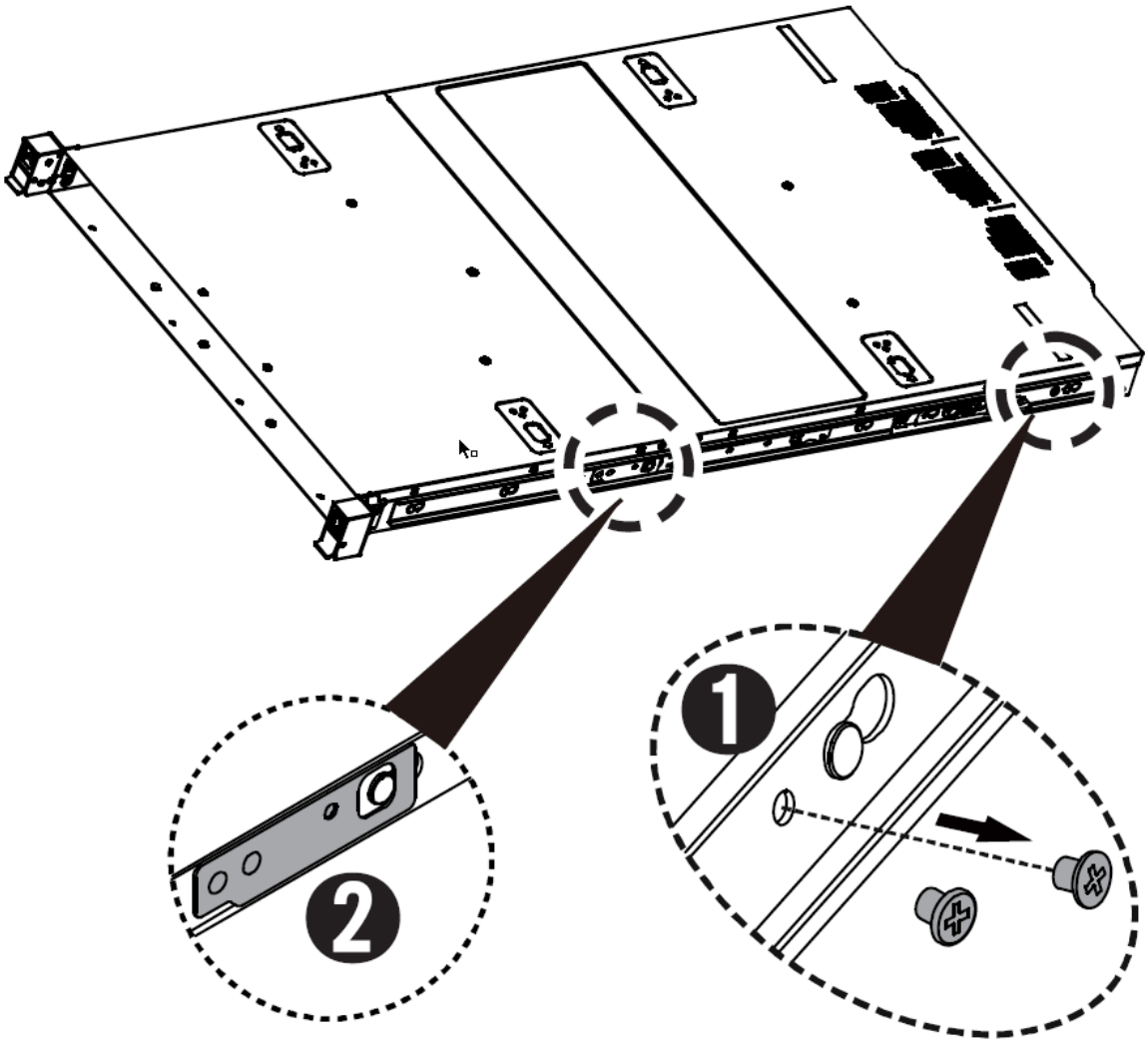





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# 3.6 Uninstalling the Rails from the Chassis

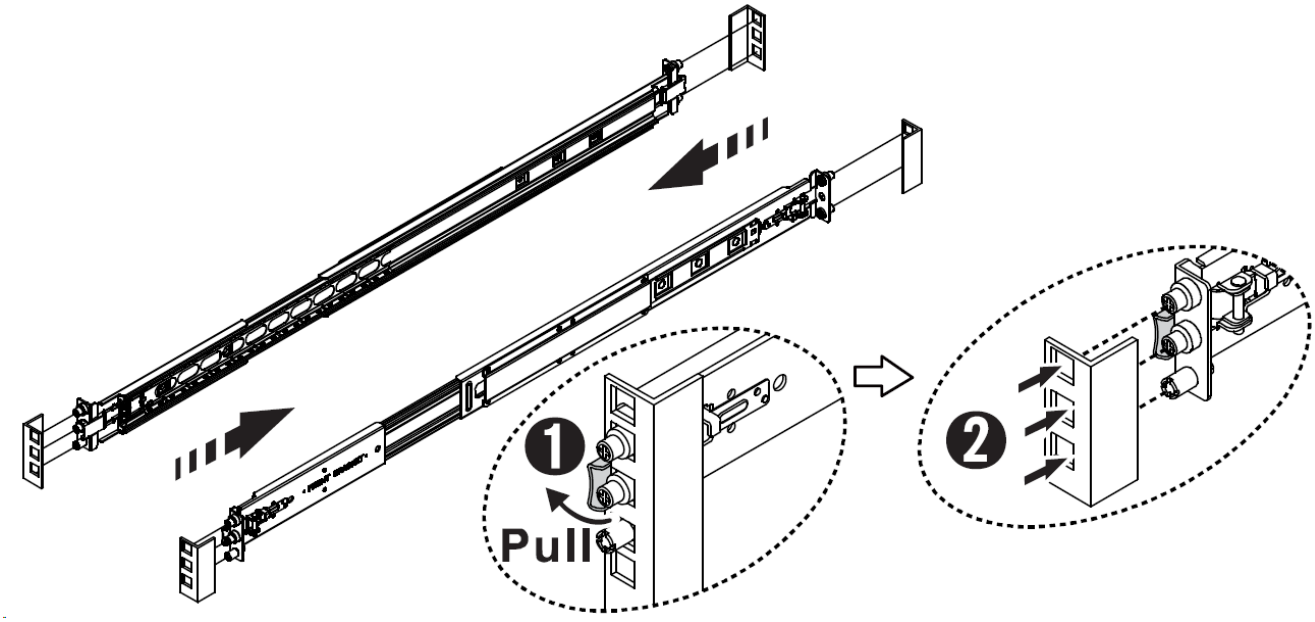
❶ M4 x3.2 or #6-32 x5
❷ Release the latch to detach the inner rail.






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Detach the outer rail/bracket assembly from the rack.

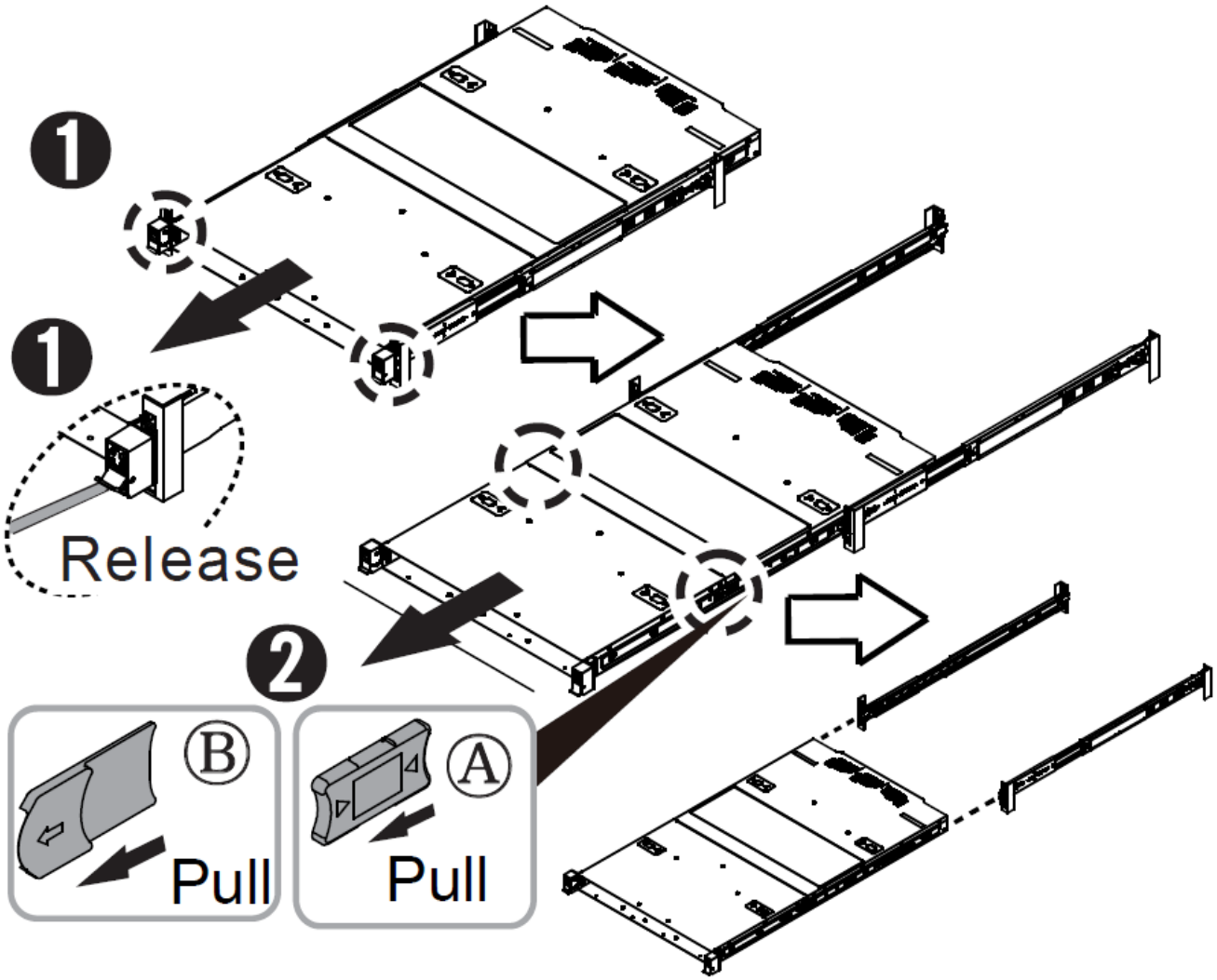



**Note:** Front and rear bracket detachment procedures are the same. The left and right sides of the rail are symmetrical. Repeat the steps for the other side.



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❶ Loosen the captive screws and then pull out the chassis.
❷ Pull release button A or B to remove the chassis.





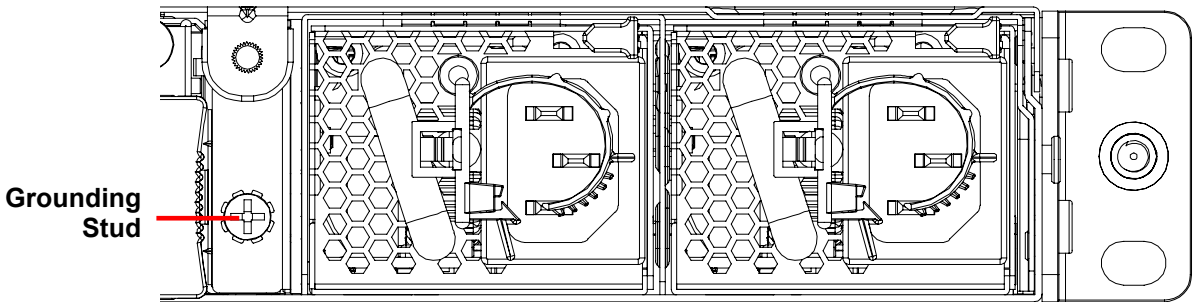

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# 3.7 Connecting the System to Ground

### AC Version

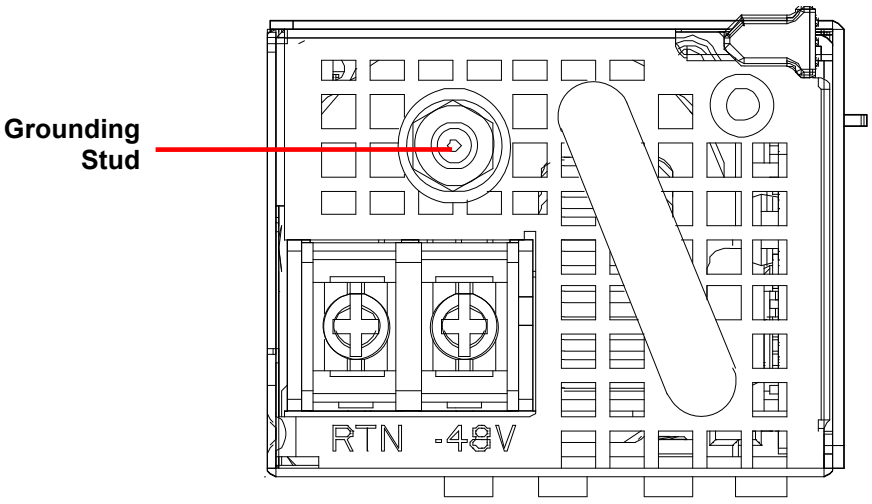
The AXE-6120IL is connected to ground by the ground pin of the 3-prong IEC power cord. Please use the power cord provided with the system for your region.

A grounding stud (M4 size) is provided on the rear of the chassis for additional connection to ground. The bonding wire shall be minimum 18 AWG and with green-and yellow insulation jacket.




### DC Version

A grounding stud (M3.5, steel zinc plated) is provided on the rear of the chassis for connection to ground. The bonding wire shall be minimum 14 AWG and with green-and yellow insulation jacket.



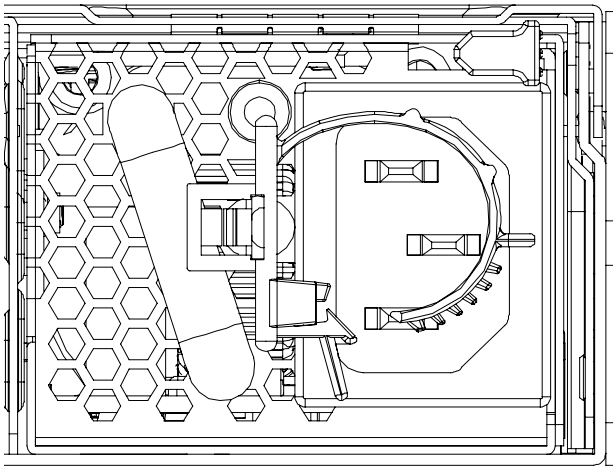



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# 3.8 System Power Cable Installation

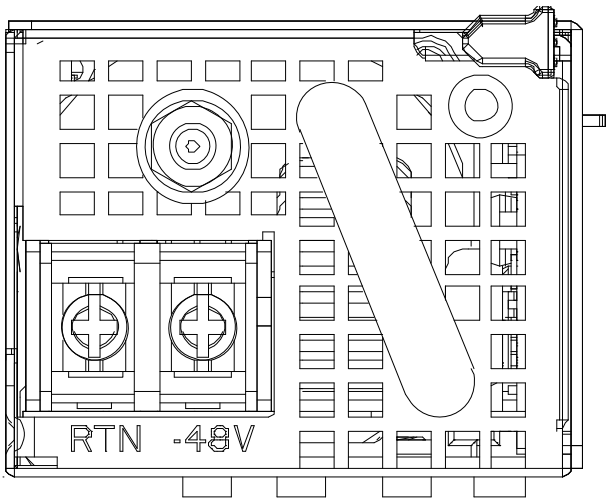
### AC PSU Input

3-prong IEC power cord



### DC PSU Input

DC Negative: connect to -48V
DC Positive: connect to RTN




CAUTION:
*mise en garde*

All installation procedures are restricted to skilled personnel.

The terminal block is suitable for a minimum 14 AWG, minimum 60V, minimum 105 °C, VW-1 power cord. Torque value is 1.2 N·m.

*Toutes les procédures d'installation sont réservées au personnel qualifié. Le bornier est adapté à un cordon d'alimentation VW-1 minimum de 14 AWG, minimum 60 V, minimum 105 °C. La valeur de couple est de 1,2 N·m.*



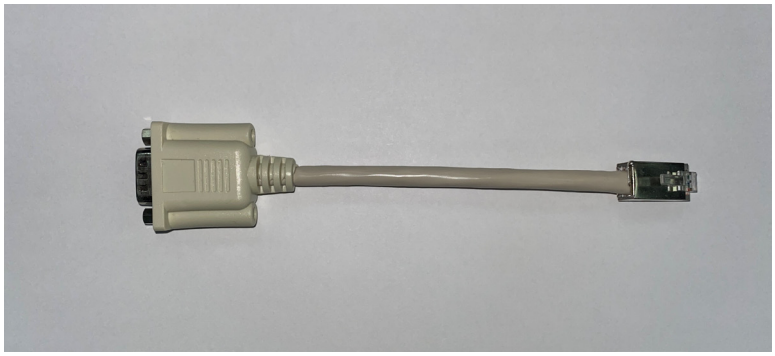
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# 3.9 Login to the BMC via Console Port

**Step 1**
Set the Console Port to BMC mode using the 4-pole DIP Console Port Mode Switch (SW1) on the mother board inside the chassis (see *4.8 Board Layout* on page 535).

| Pin | Default | BMC Debug |
|---|---|---|
| 1 | On | Off |
| 2 | On | Off |
| 3 | Off | On |
| 4 | Off | On |

**Step 2**
Use the included RJ-45 to DB-9 console port adapter cable to connect the PC to the RJ-45 console port of the AXE-6120IL (see *1.3.1 AXE-6120IL Front Panel* on page 8). See *4.4 Dual USB 3.0 and RJ-45 Console Port* on page 48 for the adapter cable pin definition.

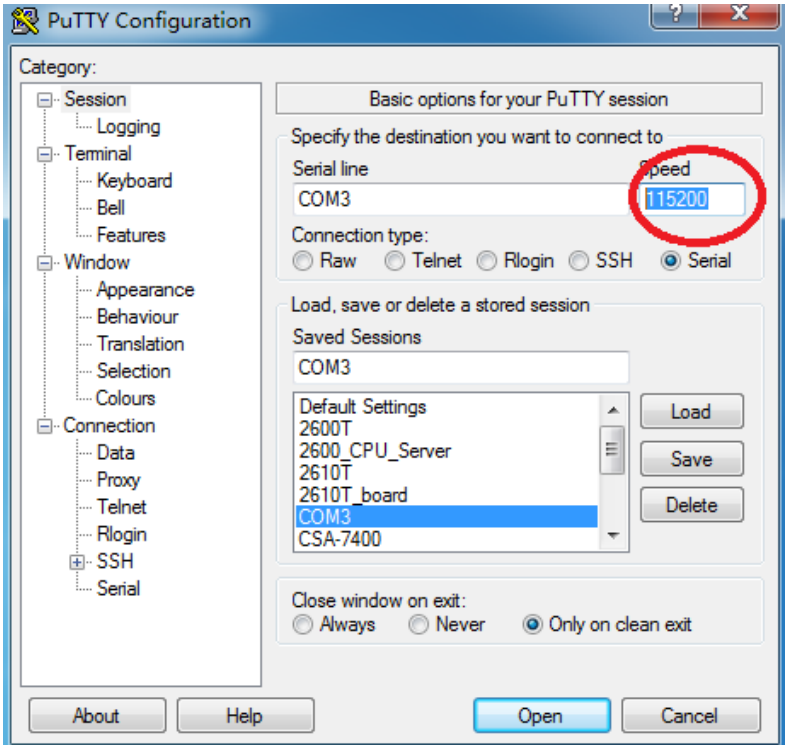




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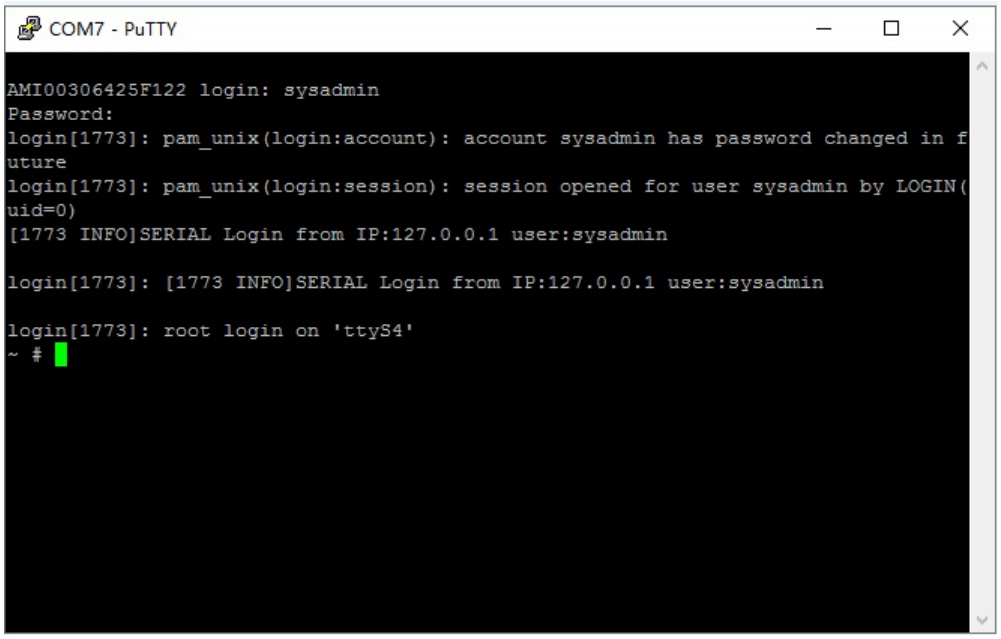
**Step 3**

Open a serial port console tool (such as PuTTY), choose the higher COM port (it may be different depending on the computer), then set the baud rate to 115200.




**Step 3**

Input the user name “sysadmin” and password “superuser” to login to the system.

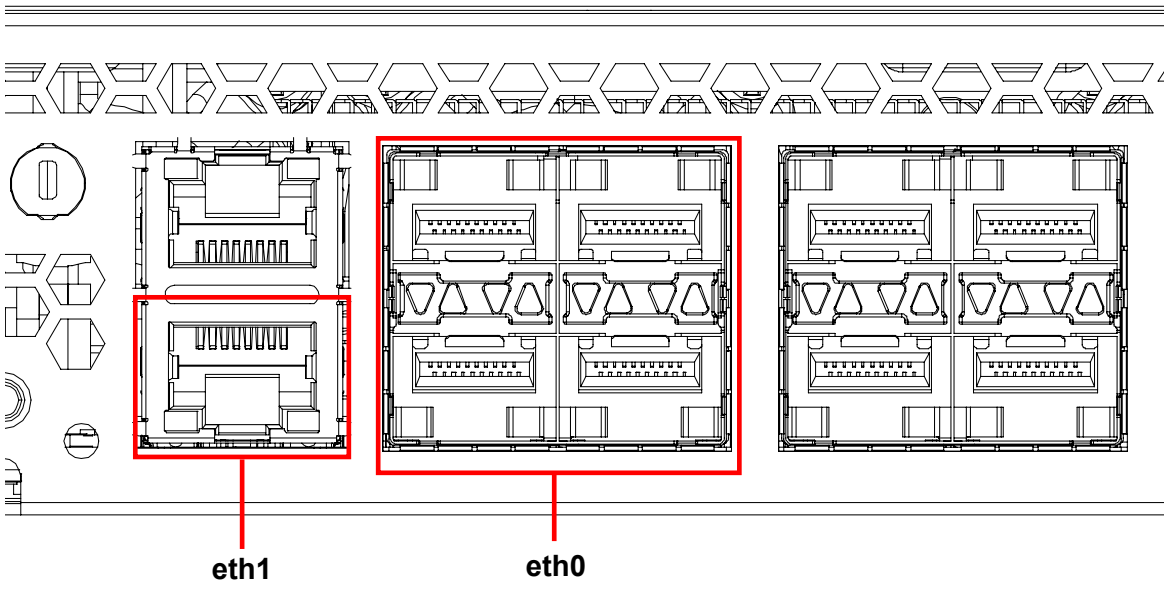




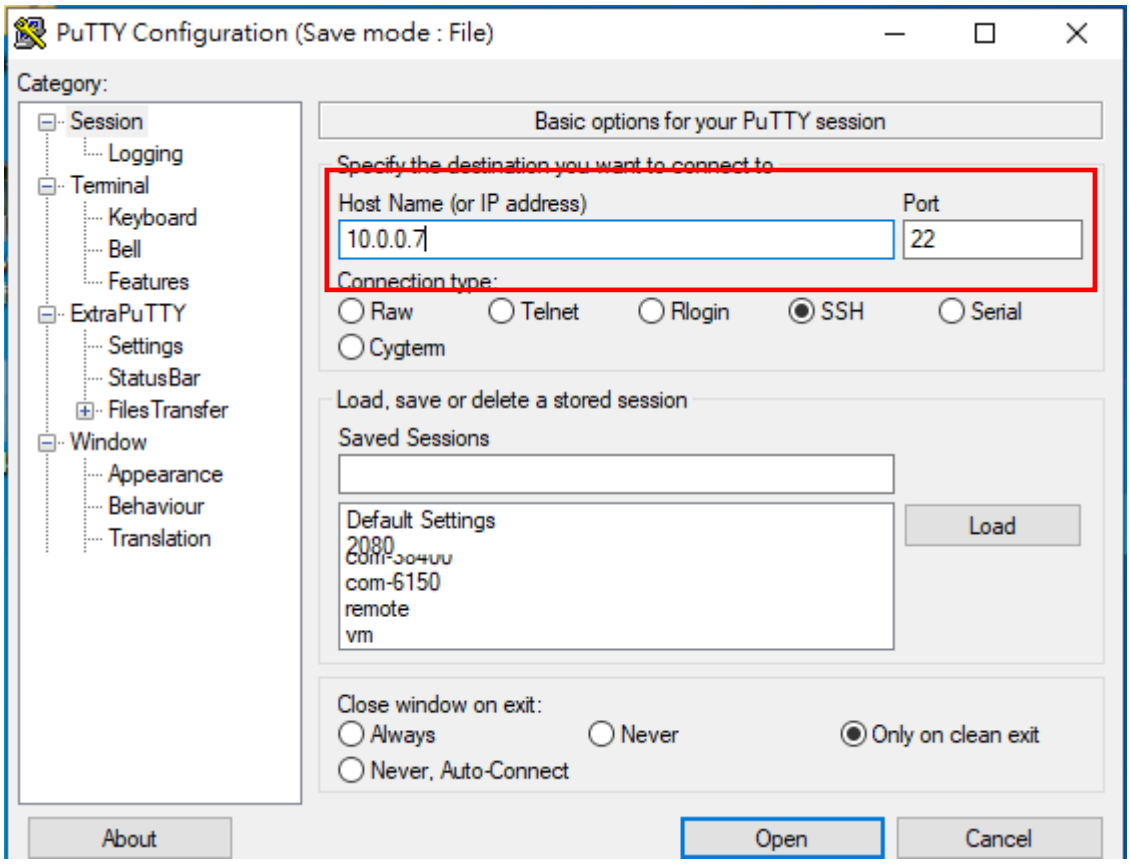

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# 3.10 Login to the BMC via Network

**Step 1**
Use a LAN cable to connect eth1 of the AXE-6120IL to the PC;




**Step 2**
Open a serial port console tool (such as PuTTY) enter the IP address, and open a connection to the BMC (login using serial console first to check the IP address).

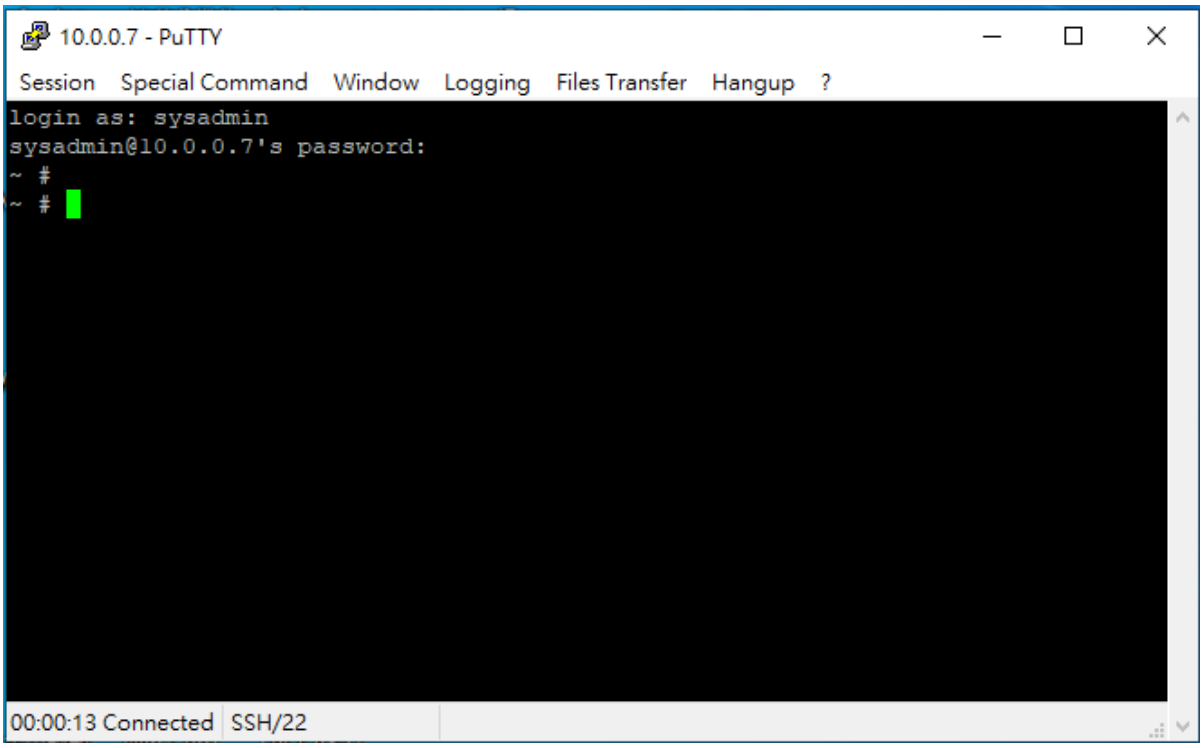





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**Step 3**

Input the user name “sysadmin” and password “superuser” to login to the system.






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# 3.11 BMC eth0 Default and Static IP Settings

The default IP setting is DHCP. Users can login to the BMC to modify the IP.

**Static IP Settings:**

Show the current LAN setting
☐ ipmitool lan print 1

Set the IP source to static
☐ ipmitool lan set 1 ipsrc static

Set the IP address
☐ ipmitool lan set 1 ipaddr xxx.xxx.xxx.xxx

Set the netmask address
☐ ipmitool lan set 1 netmask xxx.xxx.xxx.xxx

Set the gateway address
☐ ipmitool lan set 1 defgw ipaddr xxx.xxx.xxx.xxx

**Restore Default:**

Set IP source to DHCP
☐ ipmitool lan set 1 ipsrc dhcp

**Note**: BMC IP can be set in the BIOS. See *5.6.1 BMC Network Configuration* on page 92.



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# 3.12 BMC eth1 Default and Static IP Settings

The default IP setting is DHCP. Users can login to the BMC to modify the IP.

**Static IP Settings:**

Show the current LAN setting
☐ ipmitool lan print 8

Set the IP source to static
☐ ipmitool lan set 8 ipsrc static

Set the IP address
☐ ipmitool lan set 8 ipaddr xxx.xxx.xxx.xxx

Set the netmask address
☐ ipmitool lan set 8 netmask xxx.xxx.xxx.xxx

Set the gateway address
☐ ipmitool lan set 8 defgw ipaddr xxx.xxx.xxx.xxx

**Restore Default:**

Set IP source to DHCP
☐ ipmitool lan set 8 ipsrc dhcp

**Note**: BMC IP can be set in the BIOS. See *5.6.1 BMC Network Configuration* on page 92.



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# 3.13 BIOS Update

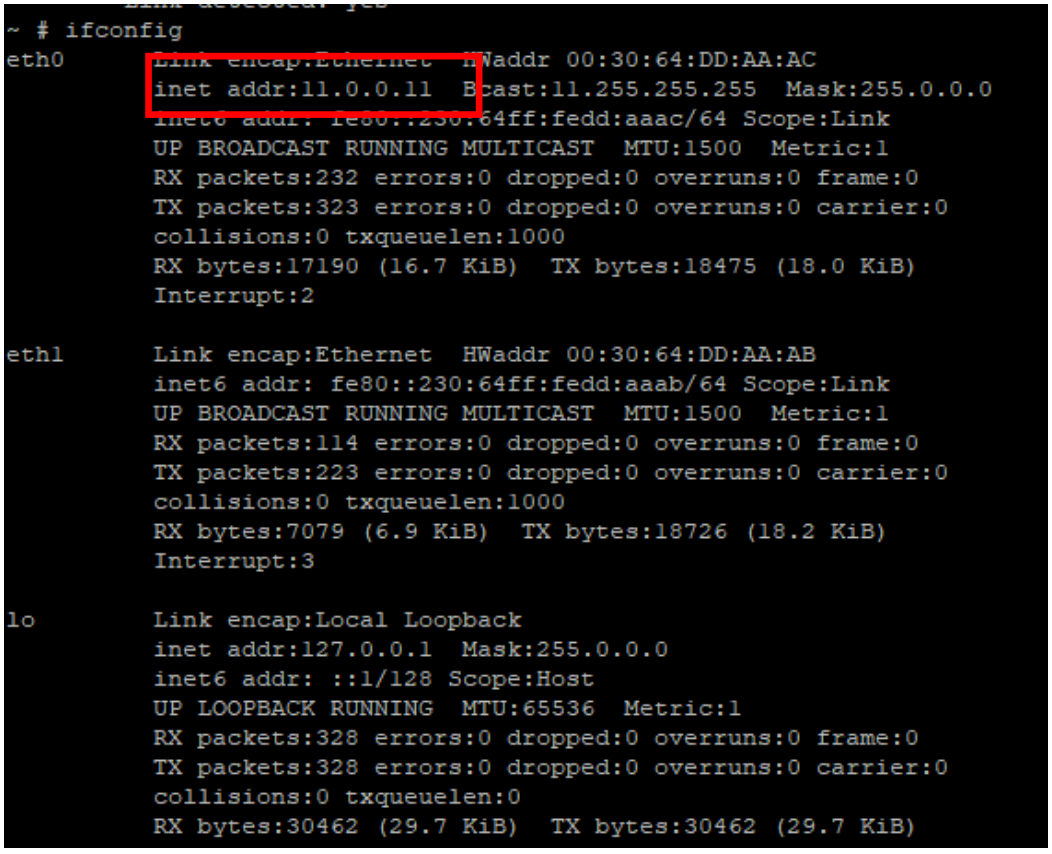
Users can update the AXE-6120IL system BIOS over various interfaces (Gigabit LAN, KCS, console port).

## 3.13.1 Updating the BIOS via Network with BMC Tool

1. Install a Linux distribution, such as Ubuntu 14, to the debug PC.
2. Install “expect” to your debug PC (ex: sudo apt-get install expect).
3. Copy the BMC FW package “BMC_ AXE-6120IL_Release_Vx.xx” to the debug PC;

**Upgrade Procedure:**

1. Check the IP of the BMC of AXE-6120IL. Power on the AXE-6120IL, boot the BMC to Linux (username: sysadmin; Passwd: superuser), and type “ifconfig” check its IP address.




2. On the debug PC, execute the following commands to perform the upgrade.

```
cd BMC_ AXE-6120IL_Release_Vx.xx
cd BIOS
./adlinktool.sh upgradebios1 BIOS_xxxx.bin 11.0.0.11
```

**Note:** Only “bin” files are supported when updating the BIOS via Network.



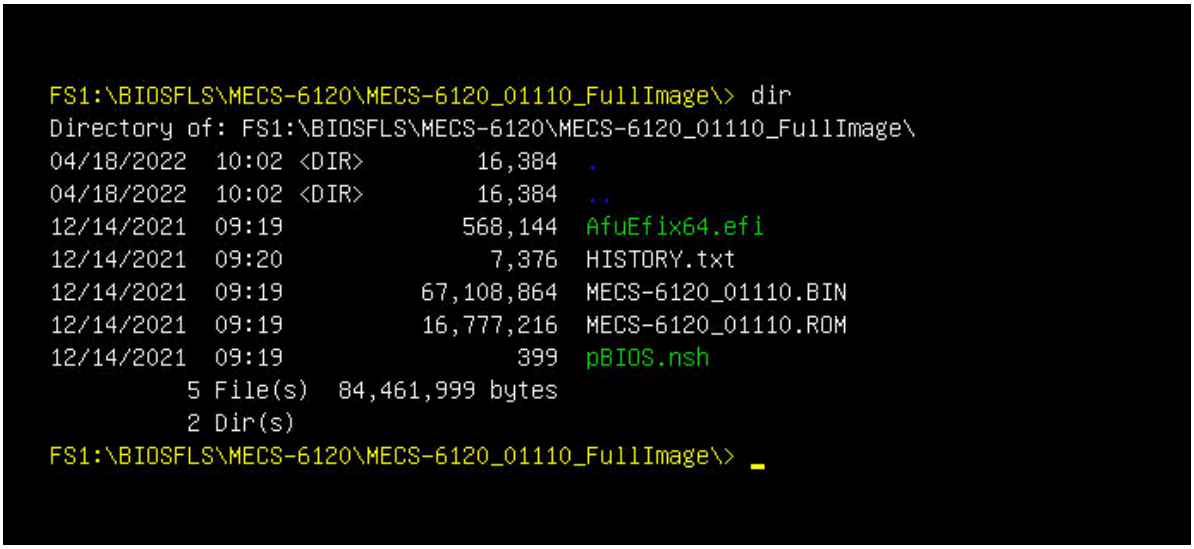
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## 3.13.2 Updating BIOS via Host with BIOS Tool

1. Boot/Login to Shell
2. Update the BIOS over host with the following commands.

Example:

AfuEfix64 BIOS.ROM /p /b /n /x (to update BIOS without ME)




**Note:** Only “ROM” files are supported when updating the BIOS via Host.



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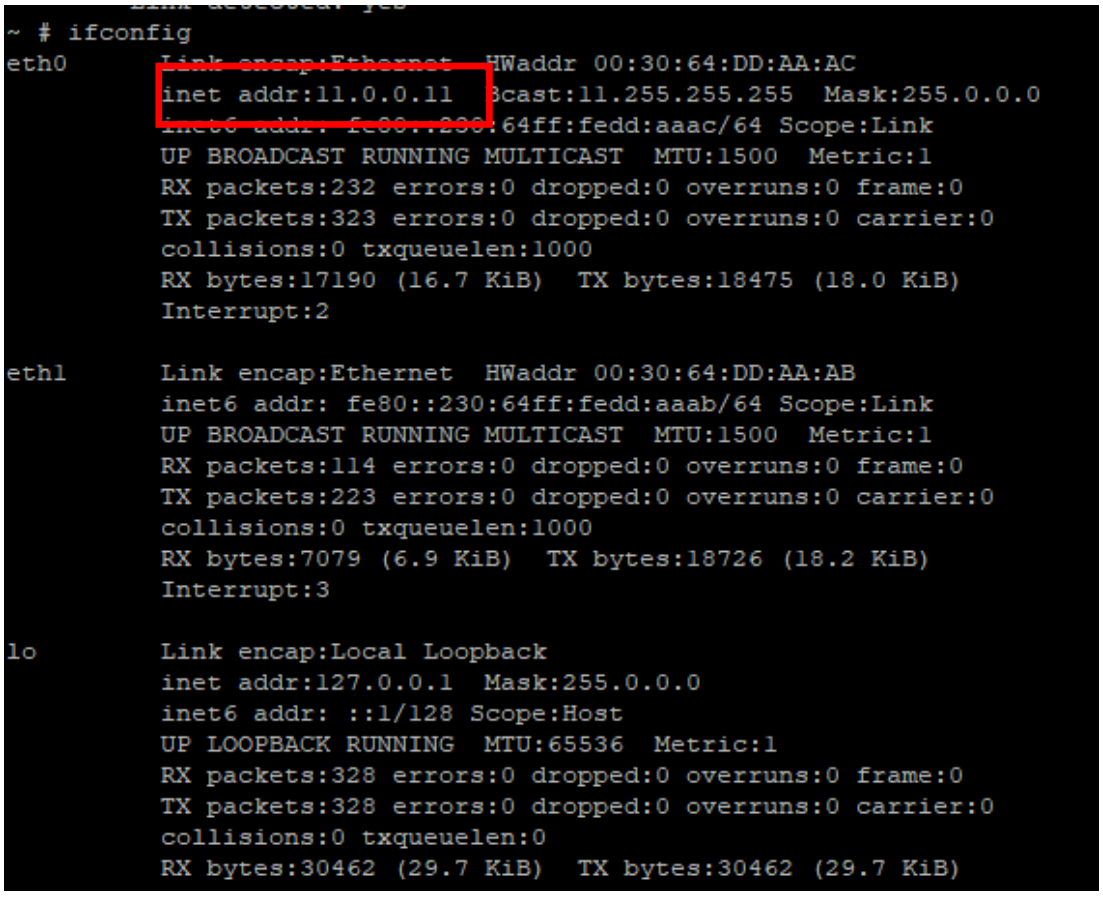
# 3.14 BMC Firmware Update via Network

The AXE-6120IL supports a BMC Chassis Management firmware, IPMI v2.0 compliant. To update the BMC firmware via network, perform the following steps.

1. Install a Linux distribution, such as Ubuntu 14, to the debug PC.
2. Install “expect” to your debug PC (ex: sudo apt-get install expect).
3. Copy the BMC FW package “BMC_ AXE-6120IL_Release_Vx.xx” to the debug PC;

**Upgrade Procedure:**

1. Check the IP of the BMC of AXE-6120IL. Power on the AXE-6120IL, boot the BMC to Linux (username: sysadmin; Passwd: superuser), and type “ifconfig” check its IP address.




2. On the debug PC, execute the following commands to perform the upgrade.

   cd BMC_ AXE-6120IL_Release_Vx.xx

   cd FW

   ./adlinktool.sh bmc1 rom.ima 11.0.0.11



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# 3.15 BMC Firmware Update via Host with Yafuflash

The AXE-6120IL supports a BMC Chassis Management firmware, IPMI v2.0 compliant. To update the BMC firmware via host with Yafuflash, perform the following steps.

1. Login to the OS with root user permission.
2. Update the BMC over host using the commands below:

Example:

```
$ sudo ./Yafuflash -kcs rom.ima

YAFUFlash - Firmware Upgrade Utility (Version 4.117.7)
-----------------------------------------------
(C)Copyright 2016, American Megatrends Inc.
The Module root allocated size is different from the one in the Image
So,Type (Y/y) to do Full Firmware Upgrade or (N/n) to exit
Enter your Option : Y

*********************************************************************************
 WARNING!
        FIRMWARE UPGRADE MUST NOT BE INTERRUPTED ONCE IT IS STARTED.
        PLEASE DO NOT USE THIS FLASH TOOL FROM THE REDIRECTION CONSOLE.
*********************************************************************************
Uploading Firmware Image : 100%... done
Skipping [boot] Module ....
Flashing [conf] Module ....
Flashing  Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [root] Module ....
Flashing  Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [osimage] Module ....
Flashing  Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [www] Module ....
Flashing  Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [testapps] Module ....
Flashing  Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Flashing [ast2500e] Module ....
Flashing  Firmware Image : 100%... done
Verifying Firmware Image : 100%... done
Resetting the firmware..........
-----------------------------------------------
Open IPMI Drivers
-----------------------------------------------
Loading Open IPMI Driver:ipmi_devintf
BMC is booting up, Please load ipmi_si Open IPMI Driver after the BMC
Boots up!!!!
Loading Open IPMI Driver:ipmi_msghandler
```



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# 3.16 Enter BIOS Setup

To enter the BIOS setup screen, follow these steps:

1. Power on the AXE-6120IL.
2. Press the <Delete> or <ESC> key on your keyboard when you see the following text prompt: “Press DEL or ESC to enter Setup”.
   (Note: If Quick Boot is enabled, the screen below will not display, but pressing the <Delete> or <ESC> key will still allow you to enter the BIOS setup screen.)




3. After pressing the <Delete> or <ESC> key, the main BIOS setup menu will display. You can access the other setup screens from the main BIOS setup menu, such as Chipset and Power menus.

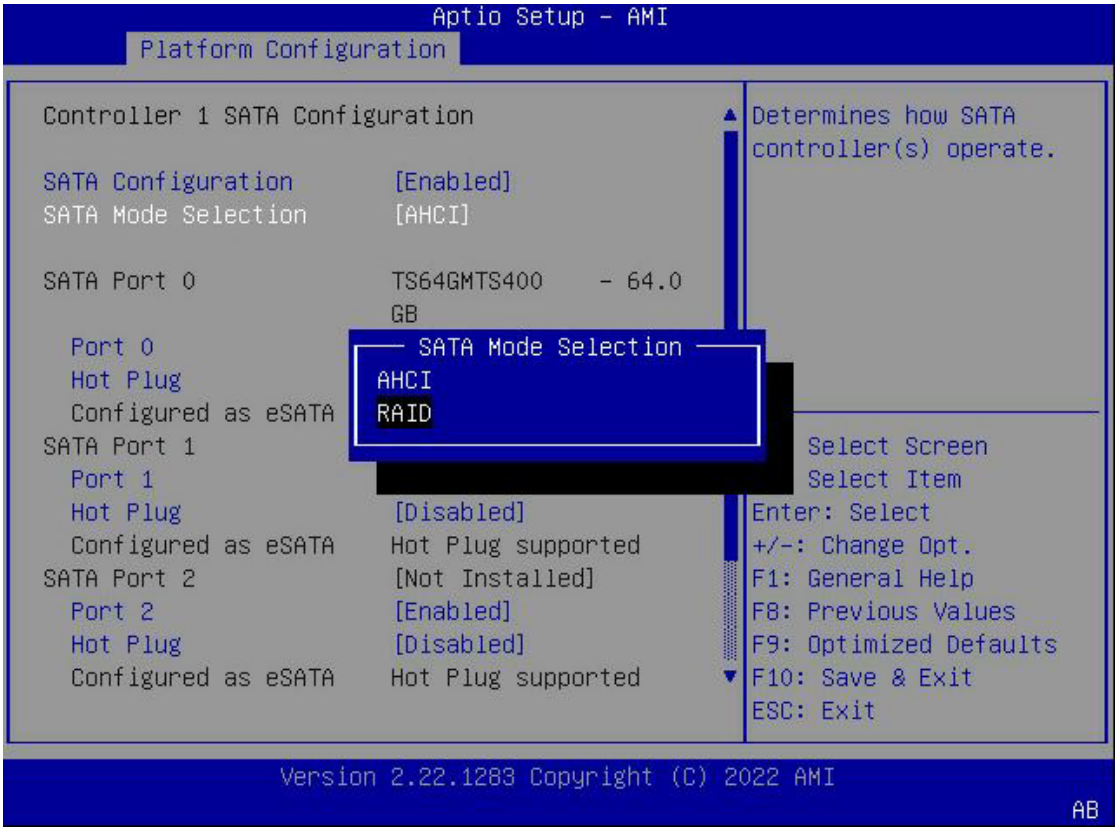


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# 3.17 Create a RAID Volume

To create a RAID volume, the RAID option must be enabled in the BIOS so that the system loads the RAID option ROM code (see *5.3.1.2 SATA Configuration* on page 61).

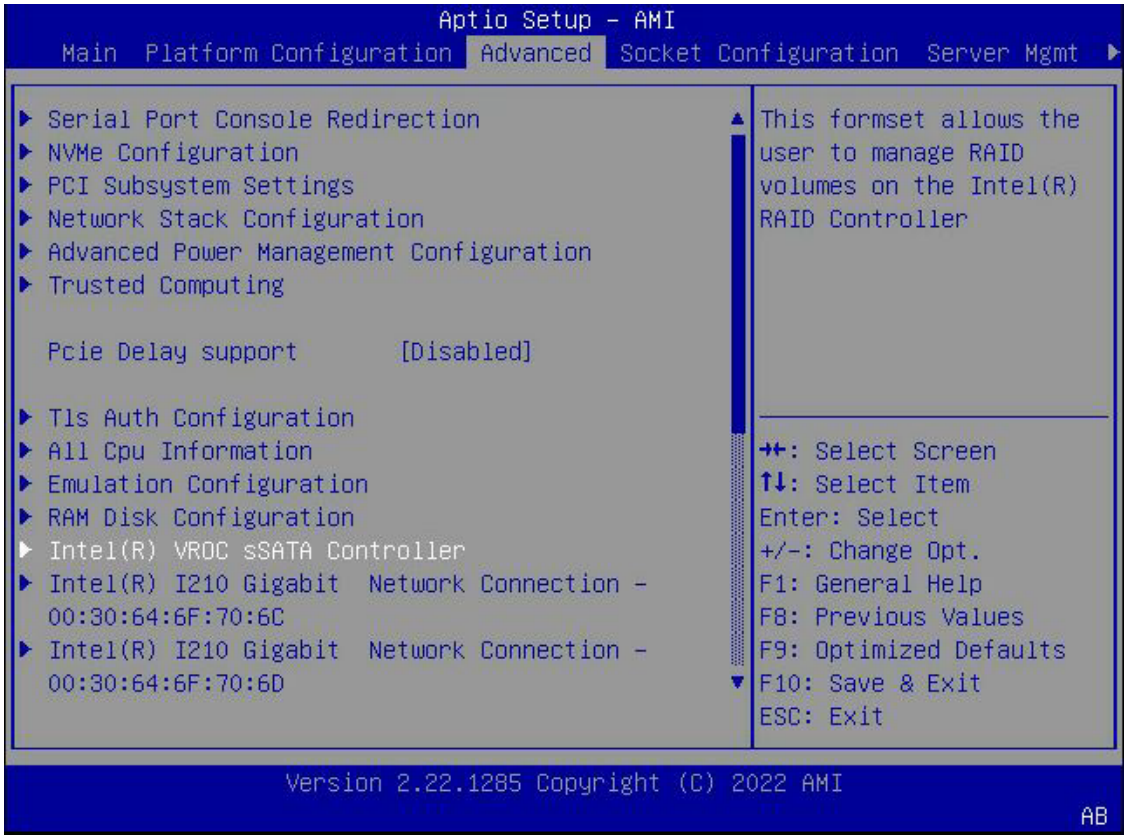
1. Go to **Platform Configuration** > **PCH-IO Configuration** > **SATA Configuration** > **Controller 1 SATA Configuration**.
2. Set **SATA Mode Selection** to **RAID**, save changes, and reboot the system**.**



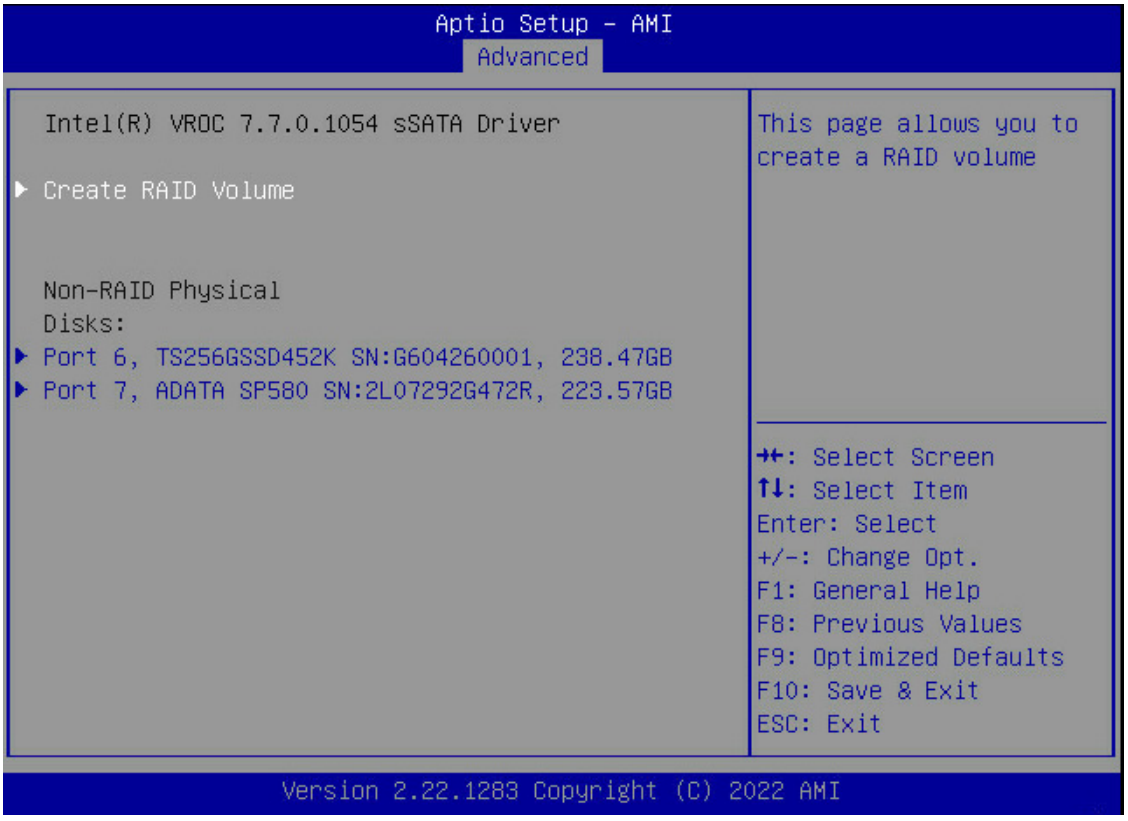



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To create a RAID volume, go to the **Advanced** menu




Enter the **Intel(R) VROC sSATA Controller** submenu and click on **Create RAID Volume**.






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# 3.18 Clear CMOS

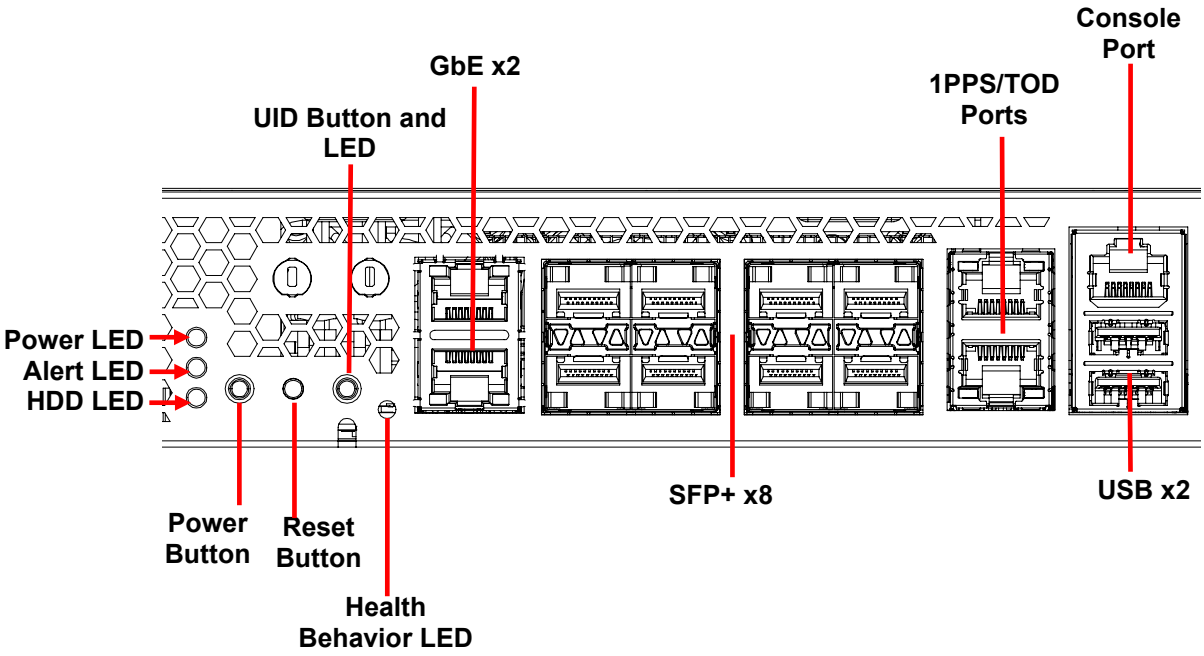
See *4.8 Board Layout* on page 53 for the location of the Clear CMOS jumper (J1).

| J1 | Setting |
|---|---|
| 1-2 | default |
| 2-3 | Clear CMOS |



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# 4 System Interfaces




## 4.1 Status LEDs

### Power LED (green)
The Power LED will light when the system is booted up (S0 state).

### Alert LED (red)
Off: Indicates normal system operation. On: Indicates a critical alarm.

### Drive Activity (HDD) LED (yellow)
The Drive Activity (HDD) LED is controlled by SATALED# from the chipset. When SATA storage is active (read/write), the LED will blink.
**Note:** This LED can also be user defined. See *4.6 HDD/User LED Jumper* and *4.7 User LED Commands* on pages 50 and 53.

### UID Button and LED (blue)
The UID button/indicator is used to conveniently locate the server. The LED can be turned off or on manually by pressing the UID button or remotely controlled by management command.

### Health Behavior LED (green/red)
The Health Behavior LED has the following behavior.

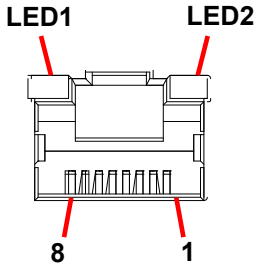
- Default: Green (blinking) indicates healthy BMC status.
- Override: User can use the OEM LED command (LED1/LED2) to override the LED status to reflect the system health status.



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## 4.2 LAN Ports

| Pin # | Signal |
|---|---|
| 1 | TX1+ |
| 2 | TX1- |
| 3 | TX2+ |
| 4 | TX2- |
| 5 | TX3+ |
| 6 | TX3- |
| 7 | TX4+ |
| 8 | TX4- |




**LAN LED Behaviour**

The LAN LEDs are integrated into the RJ-45 connector. Their behavior is as follows:

The LED1 (Speed) indicates the speed of the LAN connection.

| LED1 (Speed) | |
|---|---|
| 10 Mbps | Off |
| 100 Mbps | Green |
| 1000 Mbps | Orange |

The LED2 (Link/Activity) indicates that a link has been established by lighting orange. When data is transmitted the LED blinks orange.

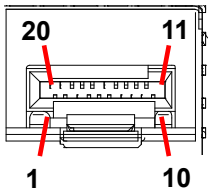
| LED2 (Link/Activity) | |
|---|---|
| Link with no activity | Steady |
| Link with activity | Blinking |



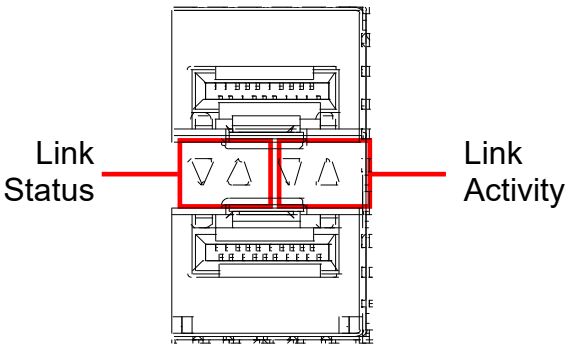
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# 4.3 SFP+ Ports

| Pin | Signal Name |
|---|---|
| 1 | GND |
| 2 | TX_FAULT |
| 3 | TX_DSBL |
| 4 | SDA |
| 5 | SCL |
| 6 | MOD_ABS |
| 7 | RS0 |
| 8 | RX_,OS |
| 9 | RS1 |
| 10 | GND |
| 11 | GND |
| 12 | RD- |
| 13 | RD+ |
| 14 | GND |
| 15 | VCCR |
| 16 | VCCT |
| 17 | GND |
| 18 | TX+ |
| 19 | TX- |
| 20 | GND |




**SFP+ LED Behaviour**




The LEDs point to the respective port.

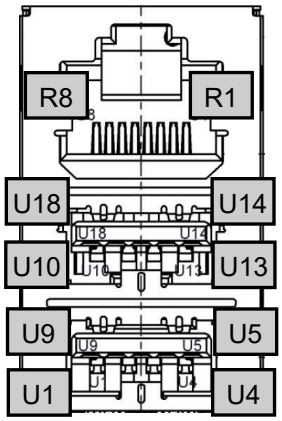
| LED | Status | Behavior |
|---|---|---|
| Link Status | Link up | Green (steady) |
| | Link down | Off |
| Link Activity | Active | Green 1G / Orange 10G (blinking) |
| | Not active | Off |



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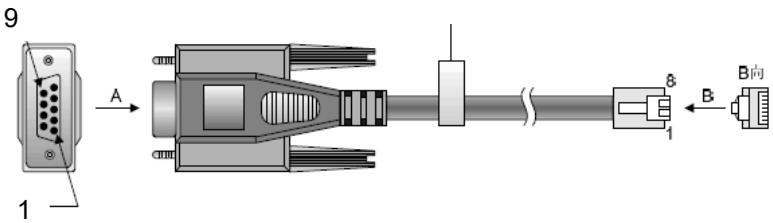
# 4.4 Dual USB 3.0 and RJ-45 Console Port

| Pin | Signal Name |
|---|---|
| R1 | N/C |
| R2 | N/C |
| R3 | COM_TXD |
| R4 | GND |
| R5 | GND |
| R6 | COM_RXD |
| R7 | N/C |
| R8 | N/C |
| U1 | 5V |
| U2 | USB2_N |
| U3 | USB2_P |
| U4 | GND |
| U5 | SSRX_N |
| U6 | SSRX_P |
| U7 | GND |
| U8 | SSTX_N |
| U9 | SSTX_P |
| U10 | 5V |
| U11 | USB2_N |
| U12 | USB2_P |
| U13 | GND |
| U14 | SSRX_N |
| U15 | SSRX_P |
| U16 | GND |
| U17 | SSTX_N |
| U18 | SSTX_P |




The AXE-6120IL comes with an RJ-45 to DB-9 console port adapter cable.

| DB-9 Pin | Signal |
|---|---|
| 1 | — |
| 2 | RXD |
| 3 | TXD |
| 4 | DTR |
| 5 | SG |
| 6 | DSR |
| 7 | RTS |
| 8 | CTS |
| 9 | — |

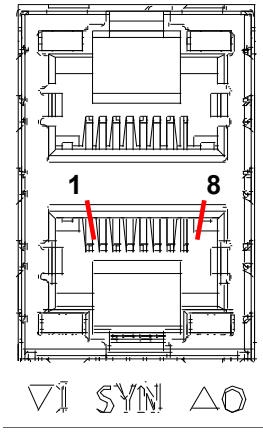





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# 4.5 1PPS/TOD Connector

| Pin # | Signal (Upper) | Signal (Lower) |
|---|---|---|
| 1 | NC | NC |
| 2 | NC | NC |
| 3 | 1PPS_TXD_N | 1PPS_RXD_N |
| 4 | GND | GND |
| 5 | GND | GND |
| 6 | 1PPS_TXD_P | 1PPS_RXD_P |
| 7 | TOD_TXD_N | TOD_RXD_N |
| 8 | TOD_TXD_P | TOD_RXD_P |

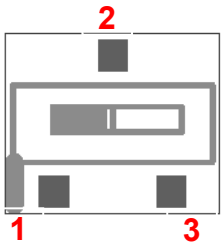





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# 4.6 HDD/User LED Jumper

The HDD/User LED Jumper (SW5, see *4.8 Board Layout* on page 535) can be used to set the function of the Drive Activity LED (default is Drive Activity).




| SW5 | Setting |
|---|---|
| 1-2 | SATA Drive Activity (default) |
| 2-3 | User Defined |



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# 4.7 User LED Commands

## 4.7.1 OEM ADLINK Set LED Status

NetFn=2Eh, Cmd=10h

| Byte | Data Field |
|---|---|
| 1-3 | ADLINK Manufacturer ID – 005F13h, LS byte first. |
| 4 | LED ID:<br>01h= UID LED (blue)<br>02h = USR LED (yellow, HDD shared)<br>03h = Alert LED (red)<br>04h = LED1 (green)<br>05h = LED2 (red)<br>Other values: reserved |
| 5 | LED Function:<br>00h = LED OFF override.<br>01h - 1Eh = LED BLINKING override. The off duration is specified by the value of this byte, and the on duration is specified by the value of byte 5. Both values specify the time in hundreds of milliseconds (100 ms-3 s).<br>1Fh = LED state is restored to Local Control state<br>20h-FEh Reserved<br>FF = LED ON override |
| 6 | On-duration:<br>The LED on-time in hundreds of milliseconds if (01h < = Byte 6 < = 1Eh) and ignored otherwise.<br>Otherwise, this field is ignored and is set to 0h. |
| | **Response Field** |
| 1 | Completion Code |
| 2-4 | ADLINK Manufacturer ID – 005F13h, LS byte first. |



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### 4.7.2 OEM ADLINK Get LED Status

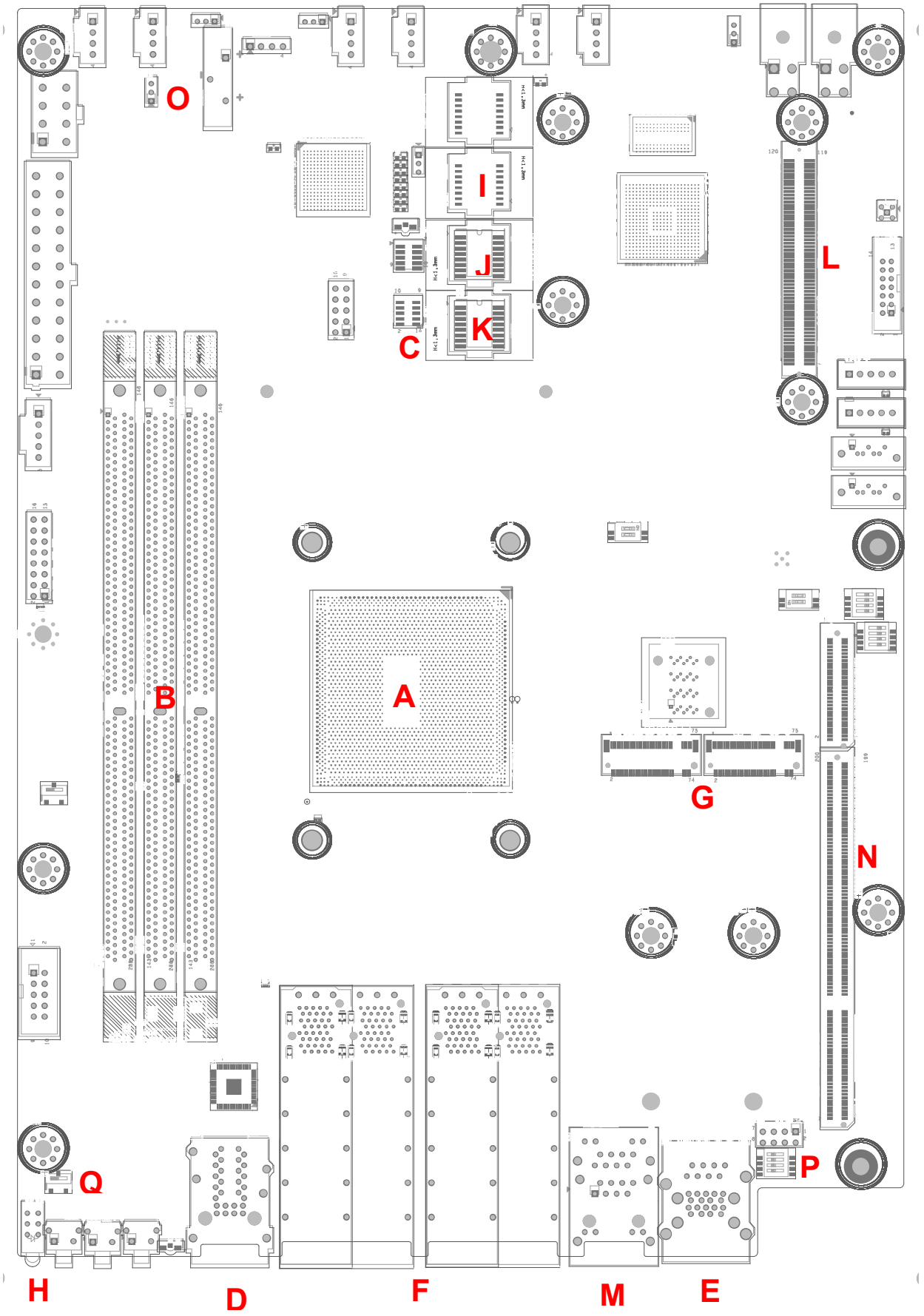
NetFn=2Eh, Cmd=11h

| Byte | Data Field |
|---|---|
| 1-3 | ADLINK Manufacturer ID – 005F13h, LS byte first. |
| 4 | LED ID:<br>01h= UID LED (blue, UID led)<br>02h = USR LED (yellow, HDD shared)<br>03h = Alert LED (red)<br>04h = LED1 (green, default blink)<br>05h = LED2 (red, default off)<br>Other values: reserved |
| | **Response Field** |
| 1 | Completion Code |
| 2-4 | ADLINK Manufacturer ID D of ran, LS byte first. |
| 5 | LED ID:<br>01h= UID LED (blue)<br>02h = USR LED (yellow, HDD shared)<br>03h = Alert LED (red)<br>04h = LED1 (green, default blink)<br>05h = LED2 (red)<br>Other values: reserved |
| 6 | LED Function:<br>00h = LED OFF override.<br>01h - 1Eh = LED BLINKING override. The off duration is specified by the value of this byte, and the on duration is specified by the value of byte 7. Both values specify the time in hundreds of milliseconds (100 ms-3 s).<br>1Fh = LED is in Local Control state<br>20h-FEh Reserved<br>FF = LED ON override |
| 7 | On-duration :<br>The LED on-time in hundreds of milliseconds if (01h Byte 6 1Eh) and ignored otherwise set to 0h. |



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# 4.8 Board Layout






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| | | | |
|---|---|---|---|
| **A** | Intel® Xeon® D Processor | **J** | Primary BIOS SPI Flash |
| **B** | DDR4 Socket | **K** | Secondary BIOS SPI Flash |
| **C** | Debug Port (Port 80) | **L** | OCP Connector |
| **D** | BMC/ AXE-6120IL LAN RJ-45 | **M** | 1PPS+TOD Ports |
| **E** | Console Port RJ-45 + USB 3.0 | **N** | PCIe x32 Connector |
| **F** | SFP+ Connectors | **O** | Clear CMOS Jumper (J1) |
| **G** | M.2 Slot | **P** | BMC Mode Switch (SW1) |
| **H** | Status LEDs | **Q** | HDD/User LED Switch (SW5) |
| **I** | BMC SPI Flash | | |



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# 5 BIOS Setup

## 5.1 BIOS Setup Menu

The BIOS setup utility is invoked by pressing <ESC> or <DEL> keys. User can change BIOS settings during setup utility runs. A system reset is required for new settings to take effect.

In the BIOS setup utility, there are several hot keys are designed for specific purposes, as listed below.

- <F1>: General help in setup menu
- <F8>: Load previous BIOS values
- <F9>: Load BIOS default in setup utility
- <F10>: Save & Exit setup utility

To navigate through the BIOS setup menu, use the following.

| | |
|---|---|
| →← | Left/Right. The *Left and Right* < Arrow > keys allow you to select a setup screen.<br>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.<br>For example: Date and Time. |
| Tab | The < Tab > key allows you to select setup fields. |

### 5.1.1 Menu Selection Bar

The Menu Selection Bar is located at the top of the screen. It displays the top level available menus to the user:

- Main Menu
- Advanced Menu
- Platform Configuration Menu
- Server Mgmt
- Security Menu
- Boot Menu
- Save & Exit Menu



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### 5.1.2 Menu Conventions

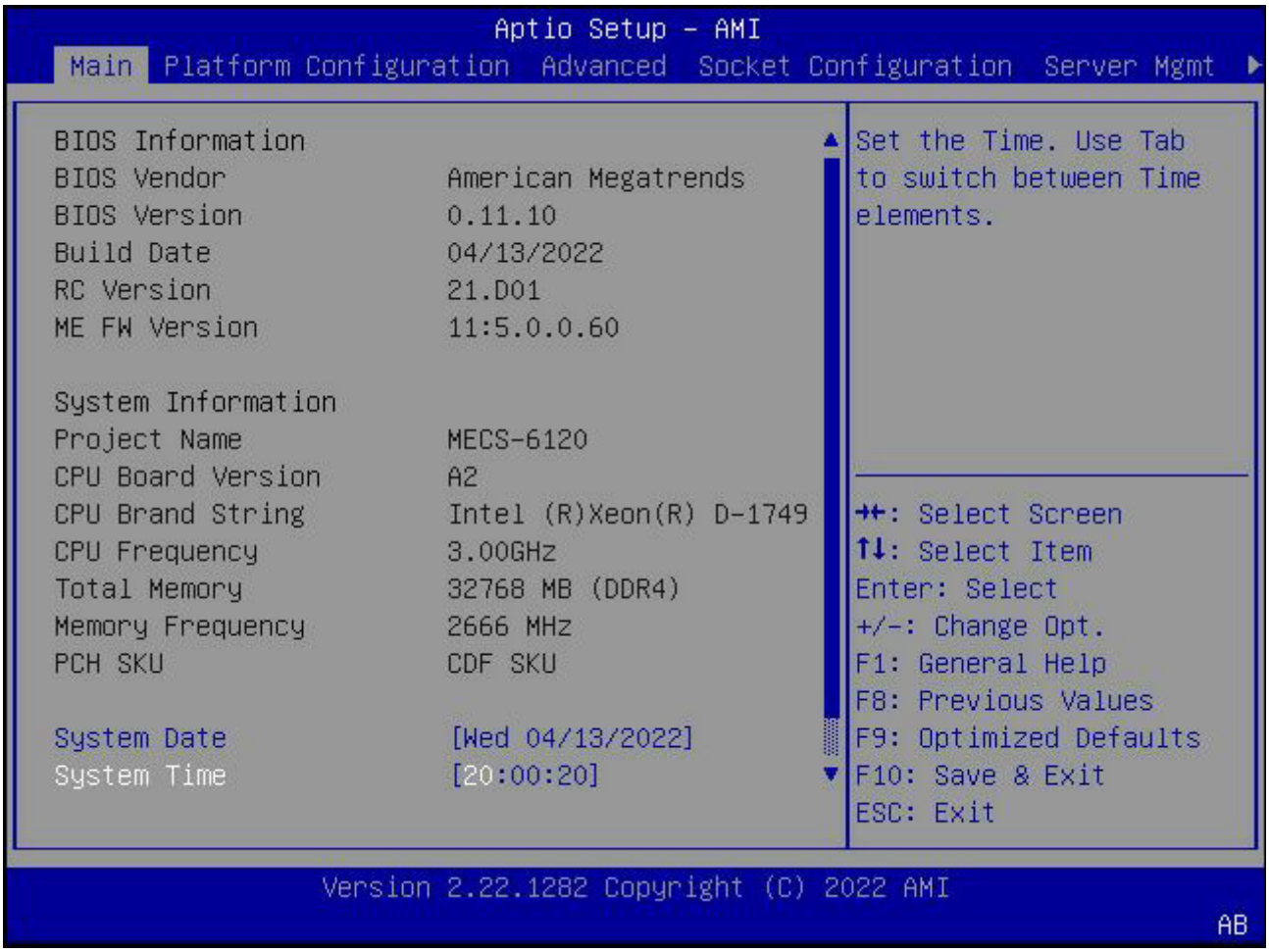
The appearance of the setup menu listed in this chapter is a sample to describe the item list. It is shown on a VT100 terminal via serial console. The menu conventions are as follows.

**Using color**
The mandatory BIOS setup fields are in black. The BIOS setup fields currently not used are in grey. The display only strings are in black.

**Using brackets**
Editable menu options are marketed with squares '[' and ']' to distinguish them from display only fields that can't be modified.

## 5.2 Main Menu

The Main Menu provides read-only information about the system and also allows you to set the system date and time. The tables below show screen shots of the Main menu details, submenus and settings.






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### 5.2.1 BIOS Information

| BIOS Item | Options | Description |
|---|---|---|
| BIOS Vendor | **Info-only.**<br>American Megatrends | Display vendor name of system BIOS. |
| BIOS Version | **Info-only.**<br>x.yy.zz | Display version of booting BIOS. |
| Build Date | **Info-only.**<br>MM/DD/YYYY | It shows the date that BIOS was built. |
| MRC Version | **Info-only.**<br>xxx.Ryy | Display the revision of MRC code which is implemented in BIOS. |
| ME FW Version | **Info-only.**<br>ww:x.y.z.aaa | Display the version of Intel manageability firmware which is implemented in BIOS. |

### 5.2.2 System Information

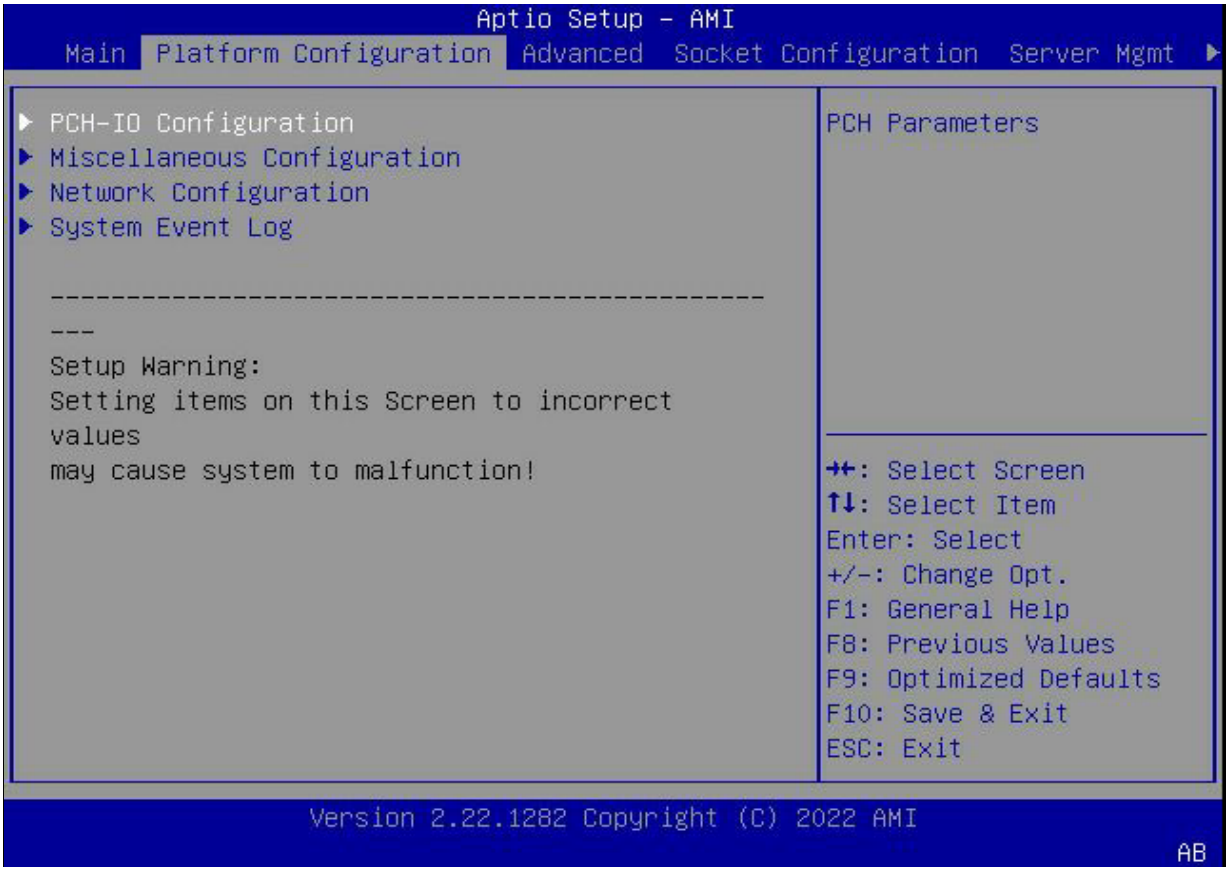
| BIOS Item | Options | Description |
|---|---|---|
| Project Name | **Info-only.** | Shows Project Name |
| CPU Board Version | **Info-only.** | Shows Main Board Version |
| CPU Brand String | **Info-only.**<br>Intel(R) Core, … | Shows what CPU is booting the system. |
| CPU Frequency | **Info-only.**<br>XXXX MHz | Shows CPU frequency. |
| Total Memory | **Info-only.**<br>XXXX MB (DDR4) | Shows total memory size used on the motherboard and memory type. |
| Memory Frequency | **Info-only.**<br>XXXX MHz | Shows memory frequency. |
| 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.**<br>Administrator/User | It shows what access level is used to enter BIOS setup menu. |



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# 5.3 Platform Configuration Menu

This menu contains the Platform Configuration settings.




| BIOS Item | Options | Description |
|---|---|---|
| PCH-IO Configuration | **Sub-Menu** | For PCH-IO setting |
| Miscellaneous Configuration | **Sub-Menu** | For Miscellaneous Configuration |
| Network Configuration | **Sub-Menu** | For configuring Network. |
| System Event Log | **Sub-Menu** | System Event Log |



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### 5.3.1 PCH-IO Configuration




| BIOS Item | Options | Description |
|---|---|---|
| PCI Express Configuration | **Sub-Menu** | PCI Express Configuration |
| SATA Configuration | **Sub-Menu** | SATA Configuration |
| Serial IRQ Mode | Quiet<br>**Continuous** | Configure Serial IRQ Mode. |
| State After G3 | **S0 State**<br>S5 State | Specify what state to go to when power is re-applied after a power failure |



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### 5.3.1.1. PCI Express Configuration



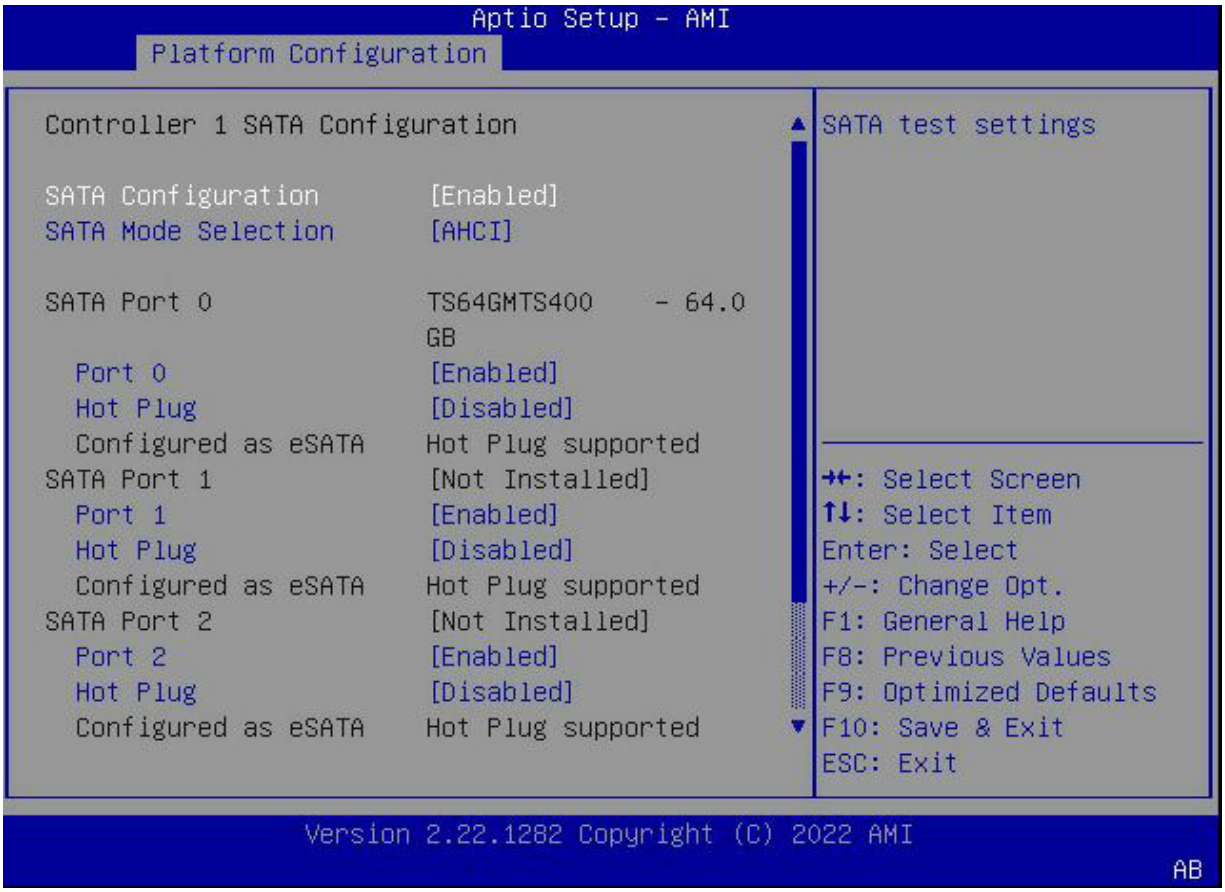

| BIOS Item | Options | Description |
|---|---|---|
| PCI Express Configuration | **Sub-Menu** | To enable or disable PCI-E Port. |



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### 5.3.1.2. SATA Configuration



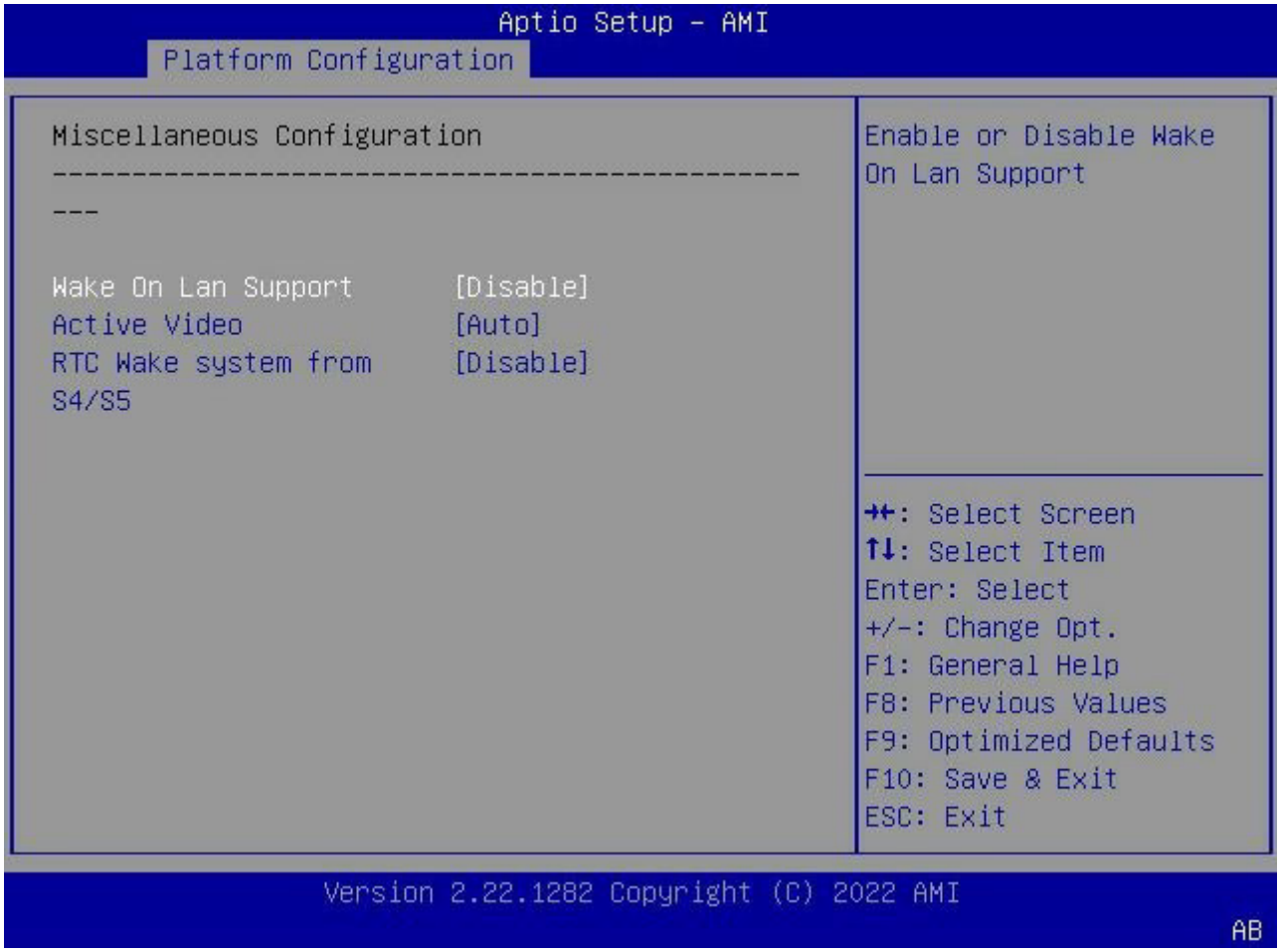




| BIOS Item | Options | Description |
|---|---|---|
| SATA Configuration | Disabled<br>**Enabled** | To enable or disable SATA Controller. |
| SATA Mode Selection | **AHCI**<br>RAID | For SATA operating mode setting. |
| SATA Port X | **Info Only** | To show installed SATA info |
| Port X | **Enable**<br>Disable | To enable or disable this SATA port |
| Hot Plug | Enable<br>**Disable** | To enable or disable this port as Hot Pluggable |



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## 5.3.2 Miscellaneous Configuration

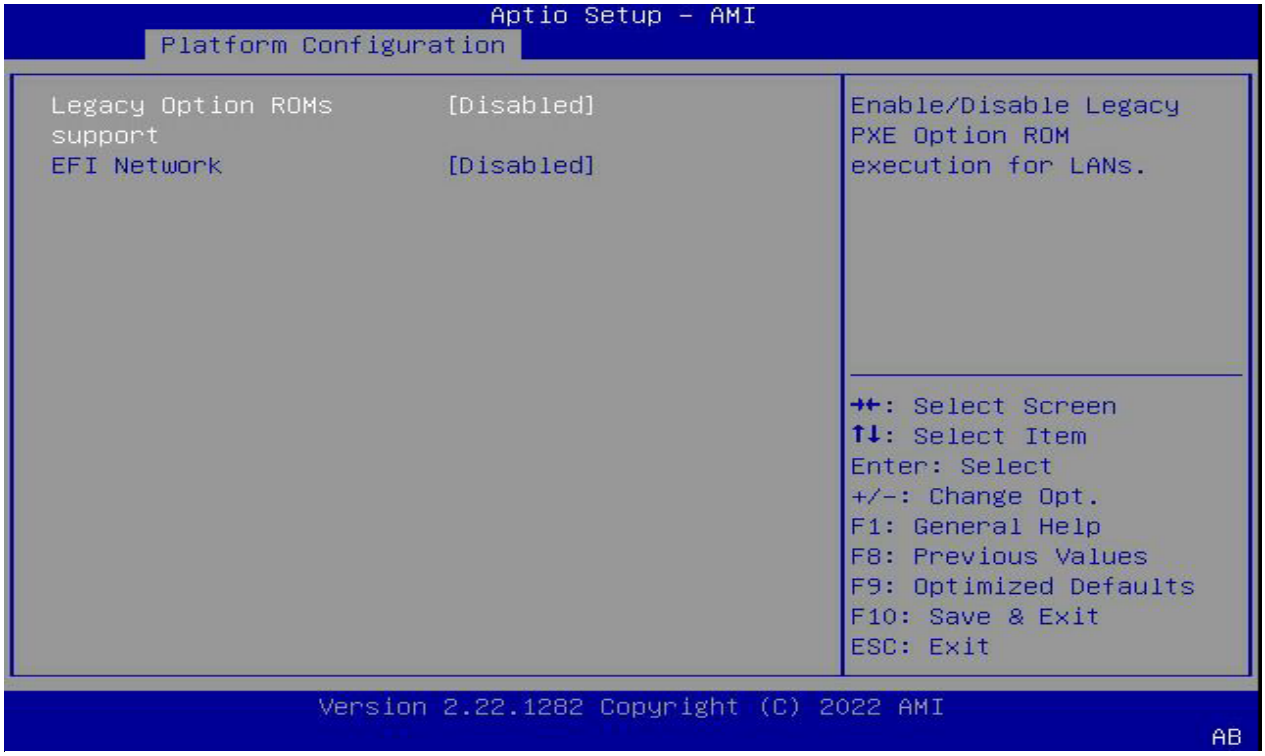



| BIOS Item | Options | Description |
|---|---|---|
| Wake On LAN Support | **Disabled**<br>Enabled | To enable or disable WOL |
| Active Video | **Auto**<br>Onboard Device<br>PCIE Device | Select BIOS display device |
| RTC Wake system from S4/S5 | **Disabled**<br>Enabled | System will wake on the day::hr::min::sec specified |



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### 5.3.3 Network Configuration

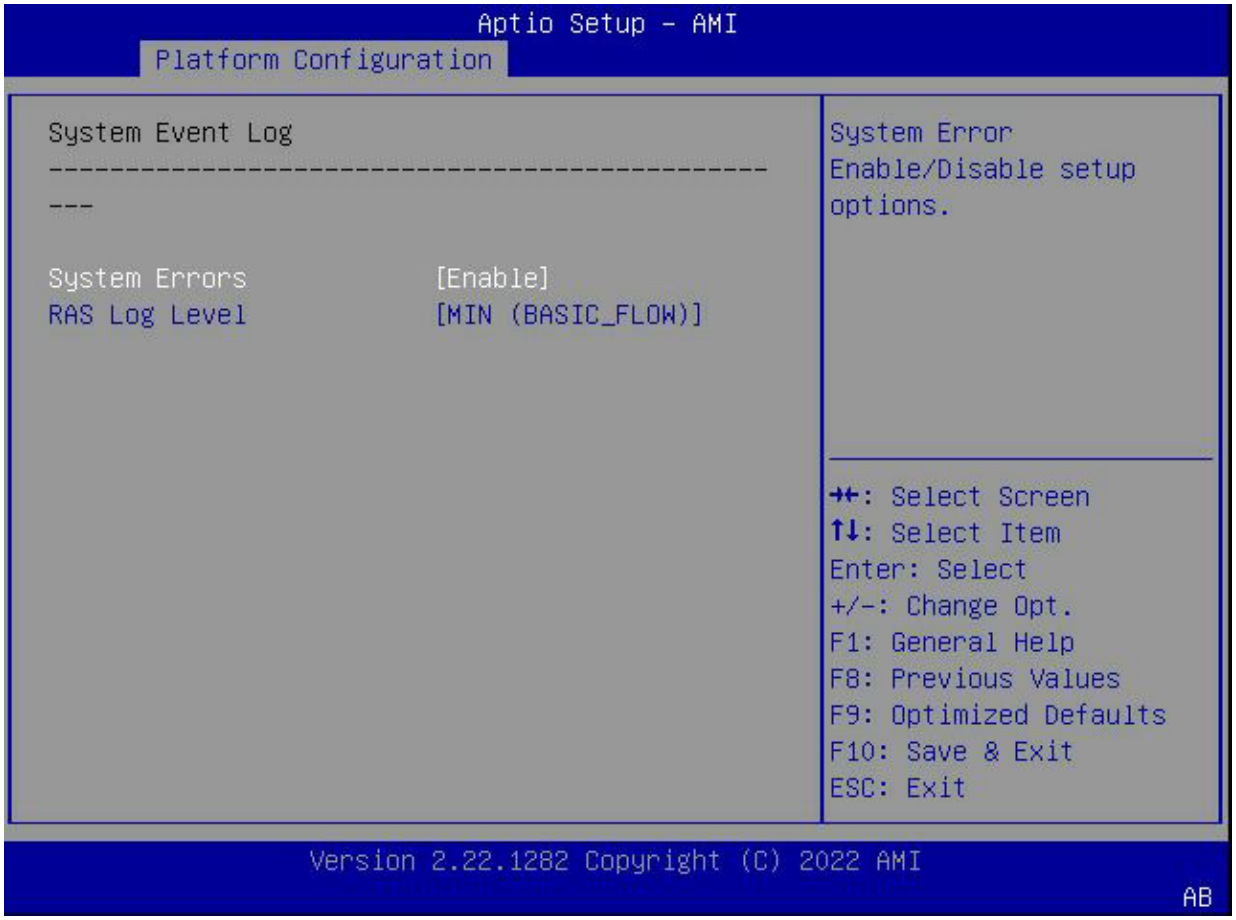



| BIOS Item | Options | Description |
|---|---|---|
| Legacy Option ROMs support | Enabled<br>**Disabled** | Enable or disable Legacy PXE Option ROM |
| EFI Network | Enabled<br>**Disabled** | Enable or disable EFI Network Driver |



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## 5.3.4 System Event Log



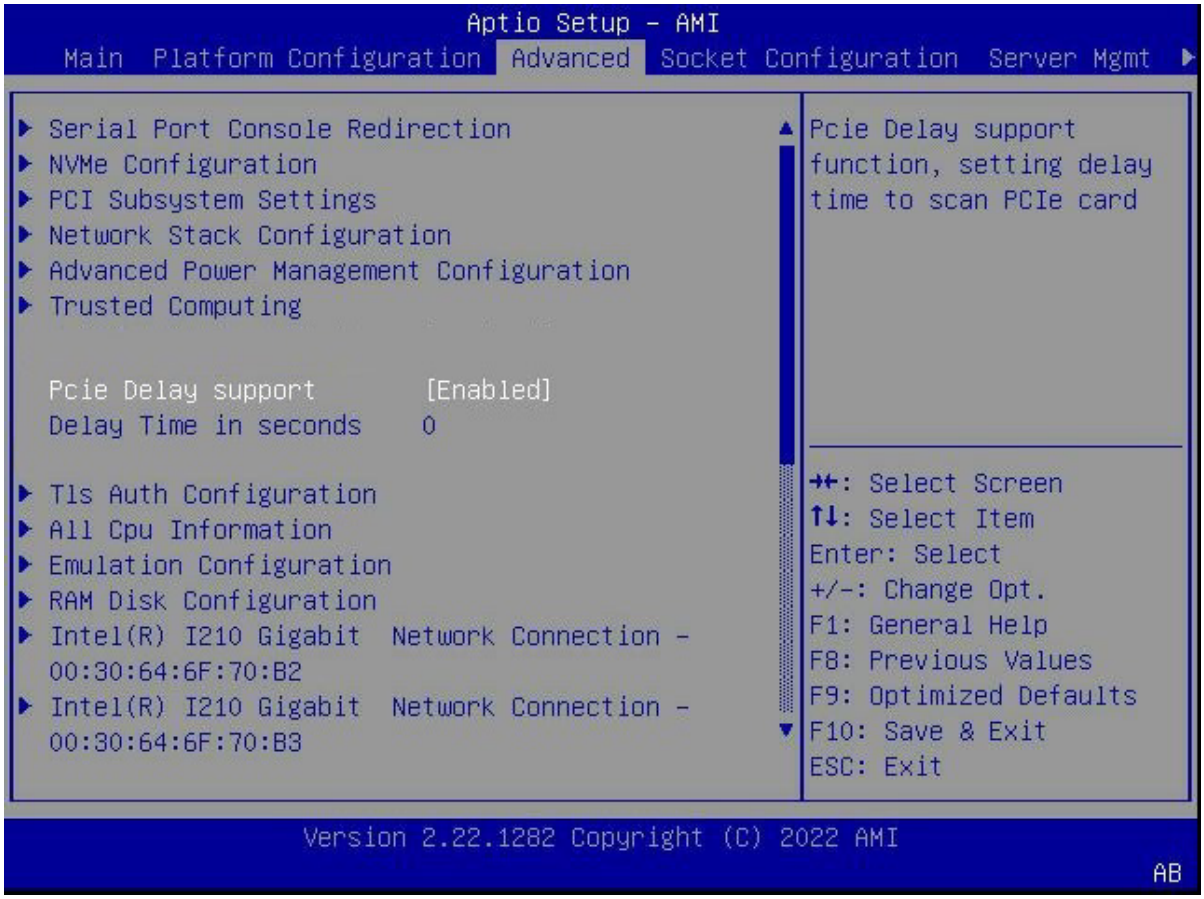

| BIOS Item | Options | Description |
|---|---|---|
| System Errors | Disabled<br>**Enabled** | To enable or disable system error log |
| RAS Log Level | **MIN (BASIC_FLOW)**<br>MID (BASIC_FLOW, FUNC_FLOW)<br>MAX(BASIC_FLOW, FUNC_FLOW, REG) | RAS Log setup options. |



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# 5.4 Advanced Menu

This menu contains the Advanced settings.

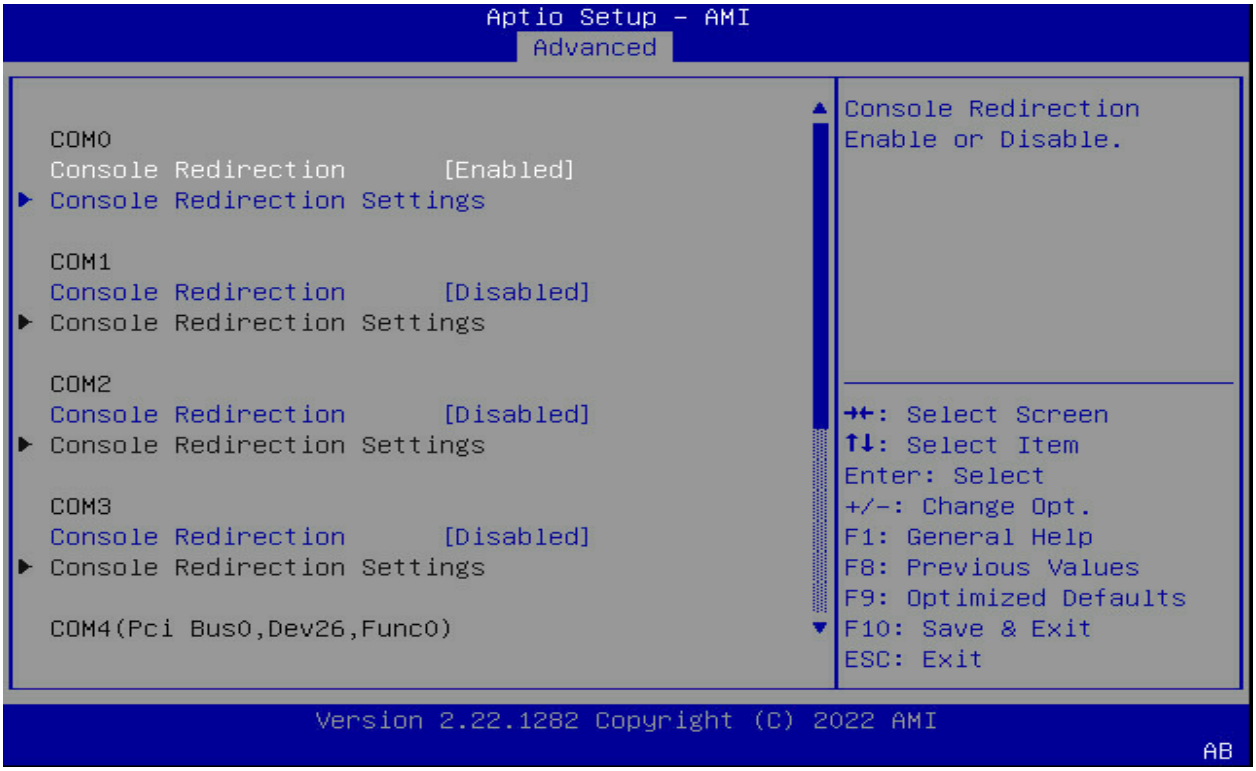



| BIOS Item | Options | Description |
|---|---|---|
| Serial Port Console Redirection | **Sub-Menu** | For configuring serial console. |
| NVME Configuration | **Sub-Menu** | For NVME devices |
| PCI Subsystem Settings | **Sub-Menu** | PCI settings |
| Network Stack Configuration | **Sub-Menu** | For configuring Network Stack. |
| Advanced Power Management Configuration | **Sub-Menu** | For Advanced Power Management |
| Trusted Computing | **Sub-Menu** | For TPM settings |
| PCIe Delay support | **Disabled**<br>Enabled | PCIe Delay support function, setting delay time to scan PCIe card default is 0s,max is 10s |
| Tls Auth Configuration<br>All CPU Information<br>Emulation Configuration | **No Detail** | Dynamic page |
| Intel(R) I210 Gigabit Network Connection - …<br>Intel(R) Ethernet Connection E823-L 10GbE SFP+ … | **Sub-Menu** | Onboard Ethernet controller configuration loaded by EFI driver. The setup page is designed by Intel and is shown when running the Ethernet EFI driver. It is related to the “Network” settings on the Boot setup page. |



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### 5.4.1 Serial Port Console Redirection

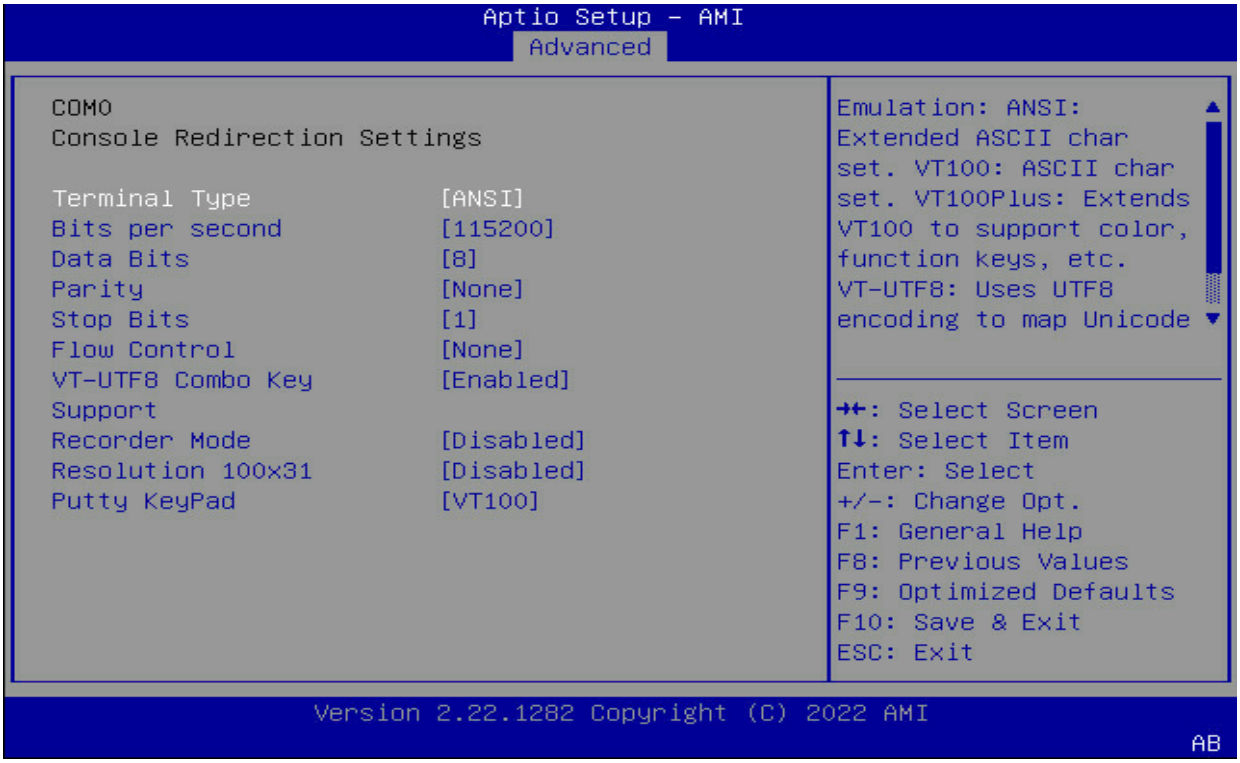



| BIOS Item | Options | Description |
|---|---|---|
| Console Redirection | **Enabled**<br>Disabled | Enable or disable serial port console redirection function. |
| Console Redirection Settings | **Sub-Menu** | For configuring serial port settings when console redirection function is enabled. |



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### 5.4.1.1. Serial Port Console Redirection > COM0




| BIOS Item | Options | Description |
|---|---|---|
| Terminal Type | VT100<br>VT100+<br>VT-UTF8<br>**ANSI** | Configure type of console emulation.<br>Emulation:<br>**ANSI:** Extended ASCII char set.<br>**VT100:** ASCII char set.<br>**VT100+:** Extends VT100 to support color, function keys, etc.<br>**VT-UTF8:** Uses UTF8 encoding to map Unicode chars onto 1 or more bytes. |
| Bits per second | 9600<br>19200<br>38400<br>57600<br>**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<br>**8** | Configure the number of data bits in each transmitted or received serial character for both serial ports. |
| Parity | **None**<br>Even<br>Odd<br>Mark<br>Space | Configures if parity bit is generated (transmit data) or checked.<br>A parity bit can be sent with the data bits to detect some transmission errors.<br>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.<br>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 |



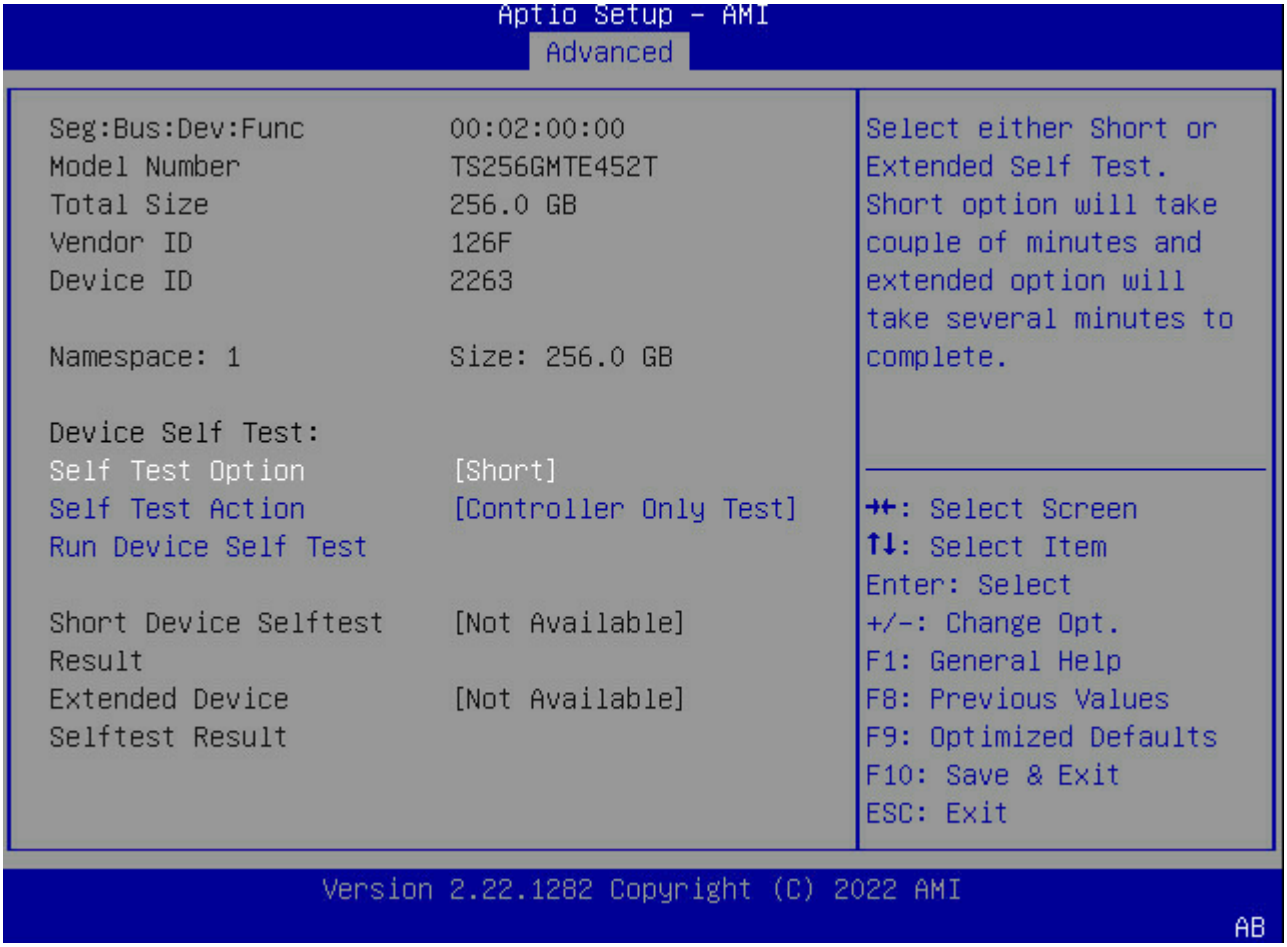
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| BIOS Item | Options | Description |
|---|---|---|
| | | bit. |
| Stop Bits | **1**<br>2 | Configures the number of stop bits transmitted and received in each serial character for both serial ports.<br>Stop bits indicate the end of a serial data packet. (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**<br>Hardware RTS/CTS | Configures flow control for console redirection. Hardware flow control uses RTC/CTS. |
| VT-UTF8 Combo Key Support | Disabled<br>**Enabled** | Enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals |
| Recorder Mode | **Disabled**<br>Enabled | This mode only text wil be sent |
| Resolution 100x31 | **Disabled**<br>Enabled | To enable or disable extended terminal resolution |
| Putty Keypad | **VT100** | Select Function Key and keypad on Putty |



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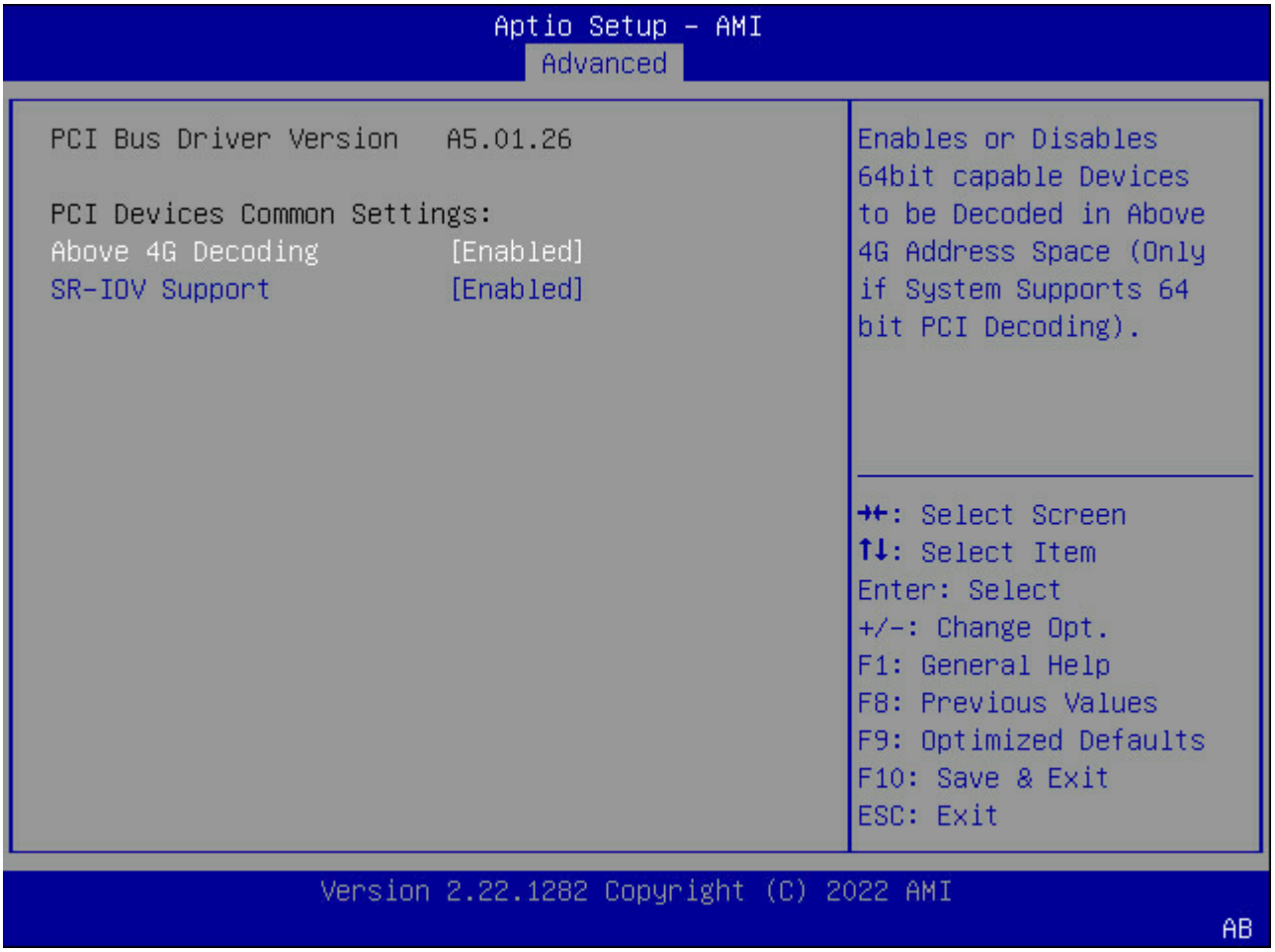
## 5.4.2 NVMe Configuration






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### 5.4.3 PCI Subsystem Settings

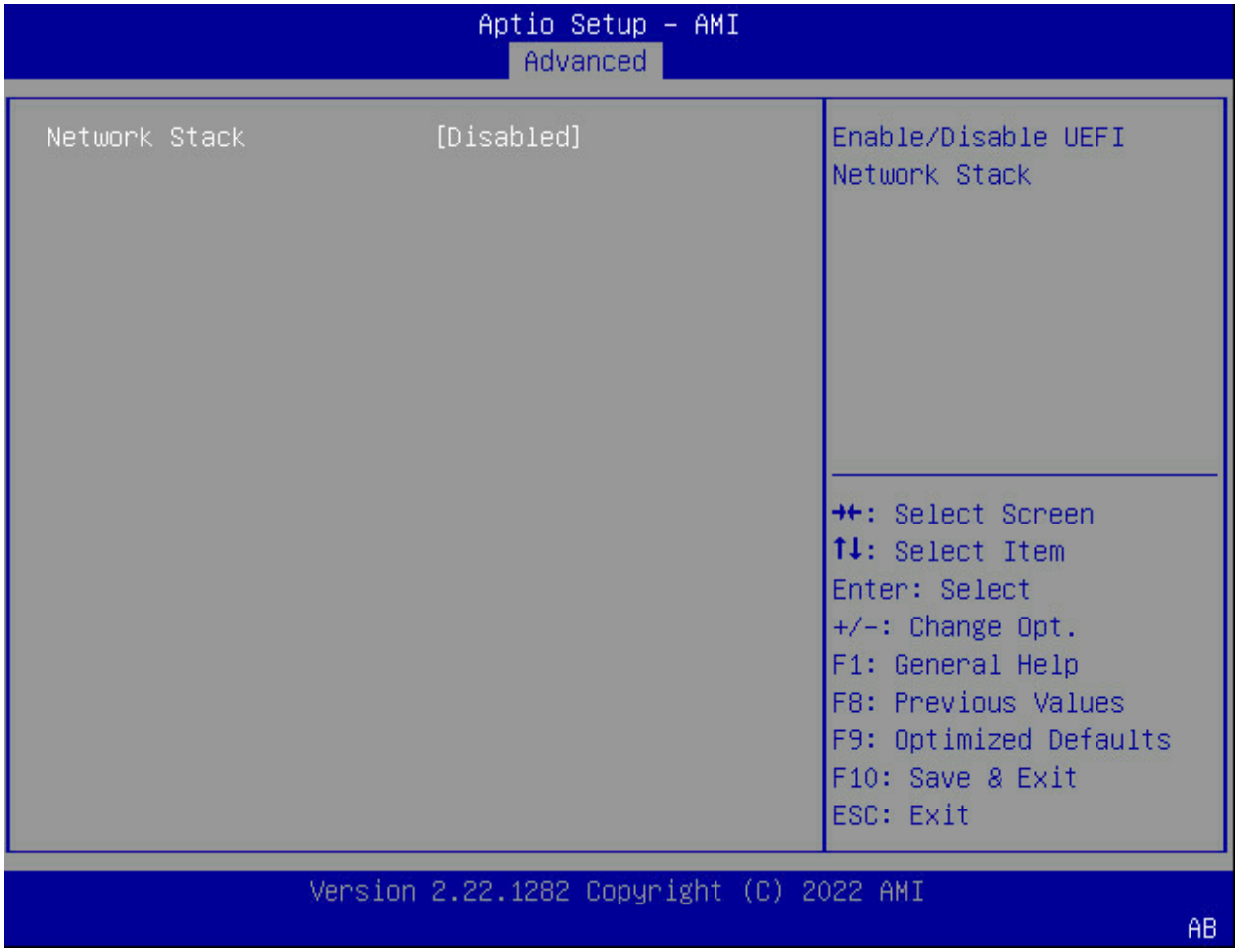



| BIOS Item | Options | Description |
|---|---|---|
| Above 4G Decoding | Disabled<br>**Enabled** | To enable or disable decoded in above 4G address space. |
| SR-IOV Support | **Disabled**<br>Enabled | Enable or disable Single Root IO virtualization support |



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## 5.4.4 Network Stack Configuration

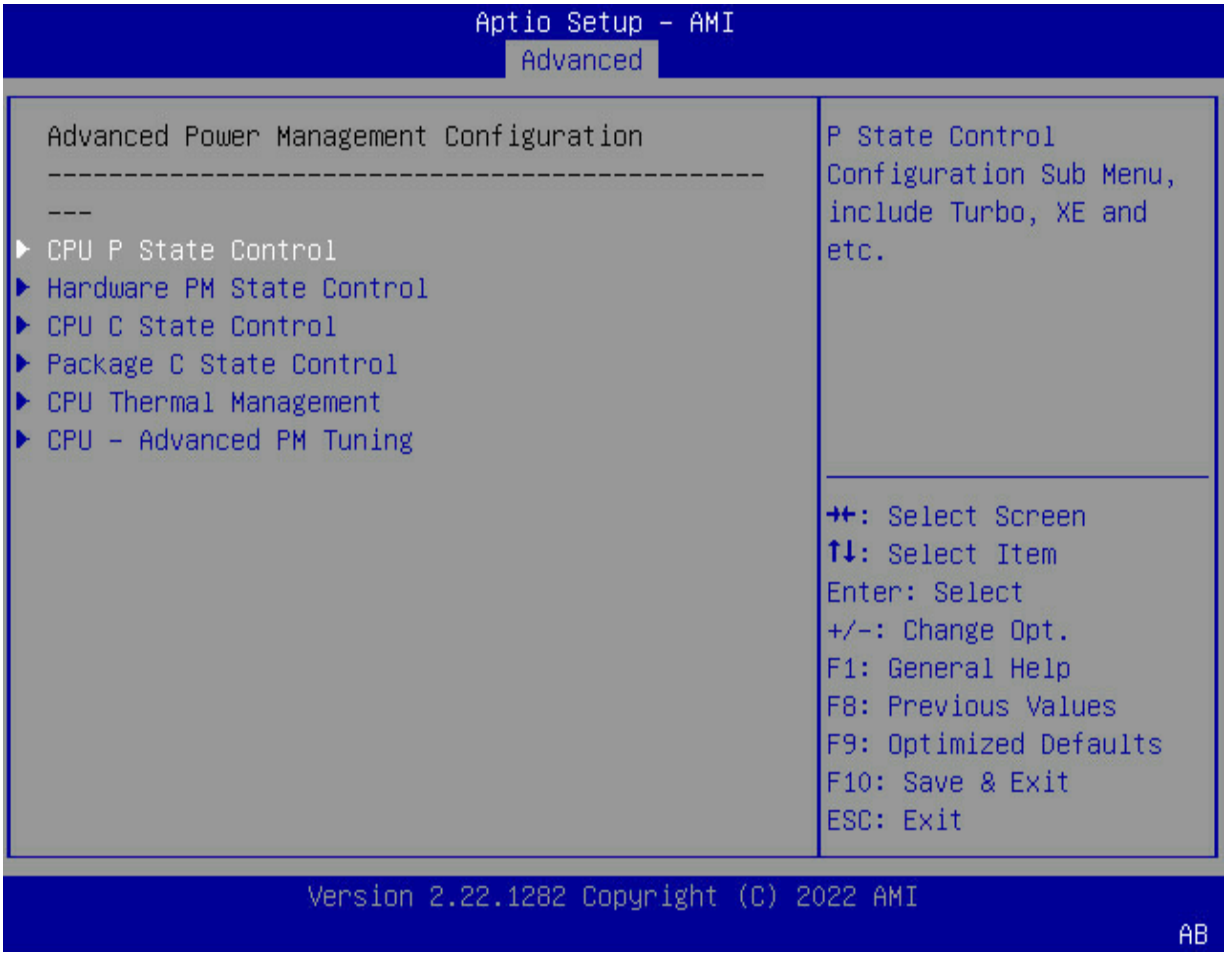



| BIOS Item | Options | Description |
|---|---|---|
| Network Stack | **Disabled**<br>Enabled | To enable or disable network stack. |



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## 5.4.5 Advanced Power Management

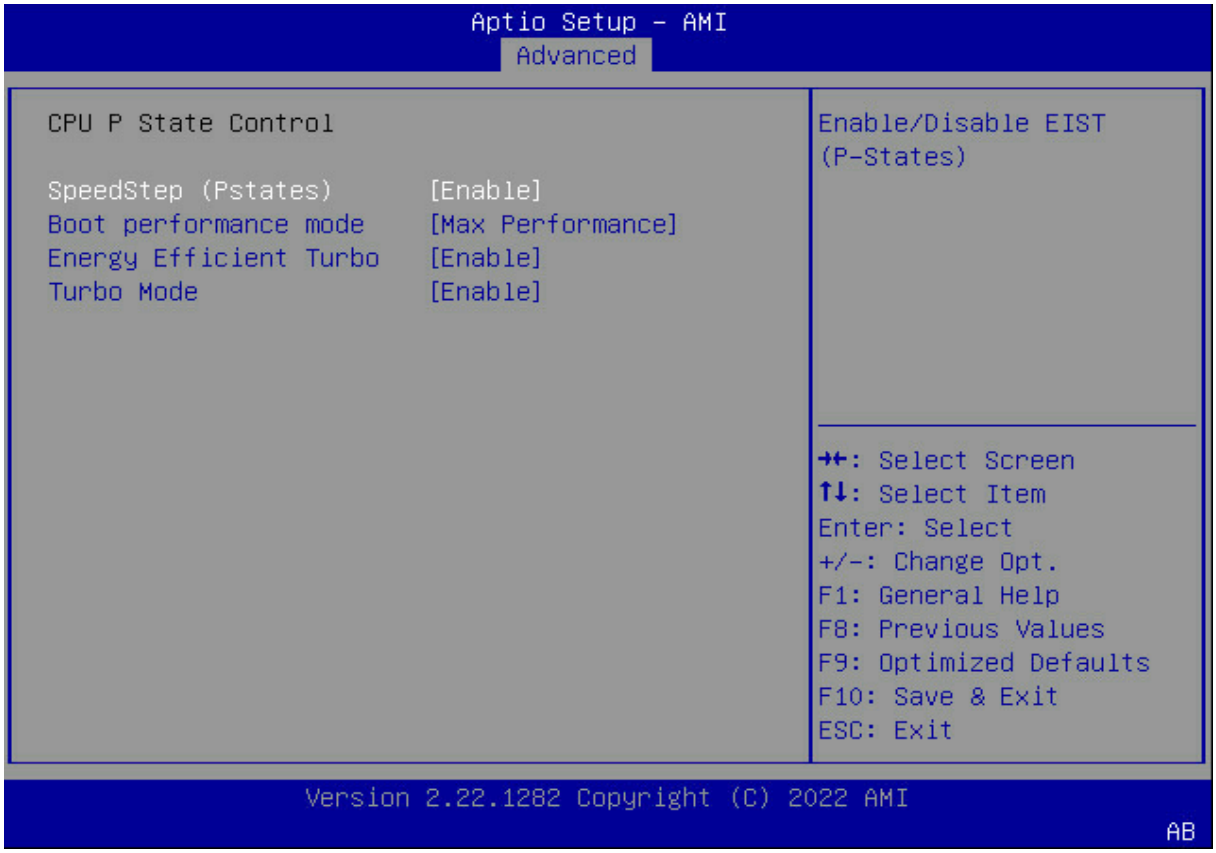



| BIOS Item | Options | Description |
|---|---|---|
| CPU P State Control | **Sub-Menu** | P State Control (Turbo, EIST and ETC.) |
| Hardware PM State Control | **Sub-Menu** | Hardware P-State settings |
| CPU C State Control | **Sub-Menu** | CPU C State settings |
| Package C State Control | **Sub-Menu** | Package C State settings |
| CPU Thermal Management | **Sub-Menu** | CPU Thermal related settings |
| CPU – Advanced PM Tuning | **Sub-Menu** | Advanced PM Tuning settings |



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### 5.4.5.1. CPU P State Control

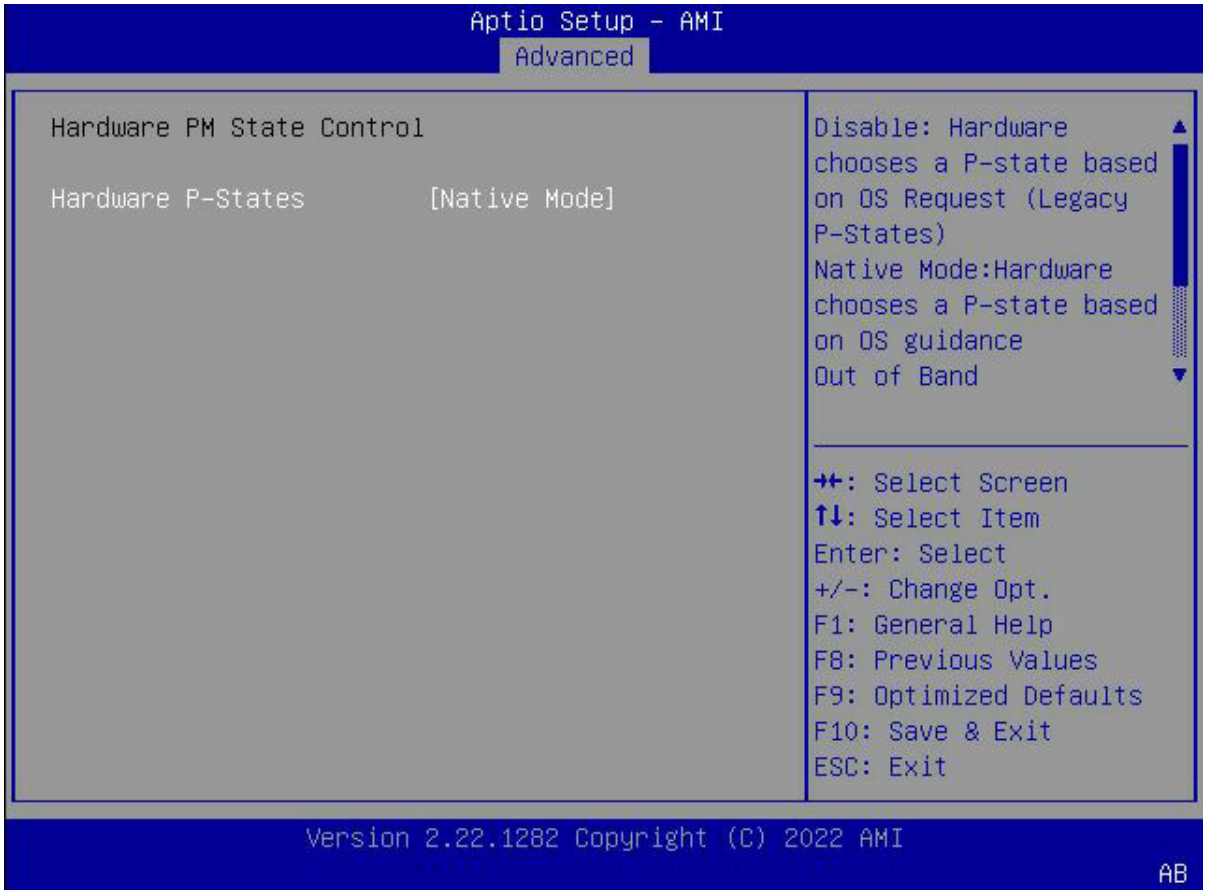



| BIOS Item | Options | Description |
|---|---|---|
| SpeedStep (Pstates) | Disable<br>**Enable** | Enhanced Intel SpeedStep Technology |
| Boot performance mode | **Max Performance**<br>Max Efficient<br>Set by Intel Node Manager | Select the performance state that the BIOS will set before OS hand off. |
| Energy Efficient Turbo | Disable<br>**Enable** | Energy Efficient Turbo Disable, MSR 0x1FC [19] |
| Turbo Mode | Disable<br>**Enable** | Enable/Disable processor Turbo Mode |



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### 5.4.5.2. Hardware PM State Control

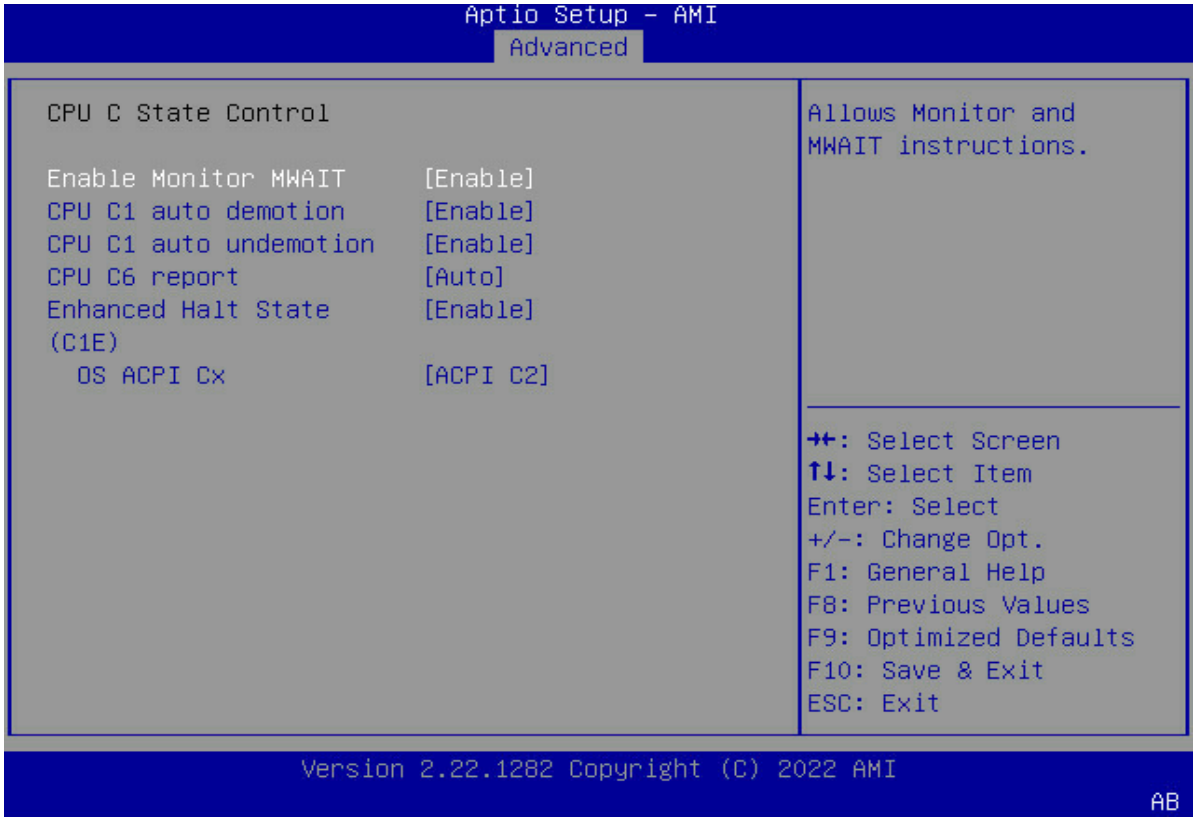



| BIOS Item | Options | Description |
|---|---|---|
| Hardware P-States | Disable<br>**Native Mode**<br>Native Mode with No Legacy Support | Disable: Legacy P-States.<br>Native Mode: Hardware chooses a P-state based on OS guidance.<br>Native Mode with No Legacy Support: Hardware autonomously chooses a P-state. |



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### 5.4.5.3. CPU C State Control

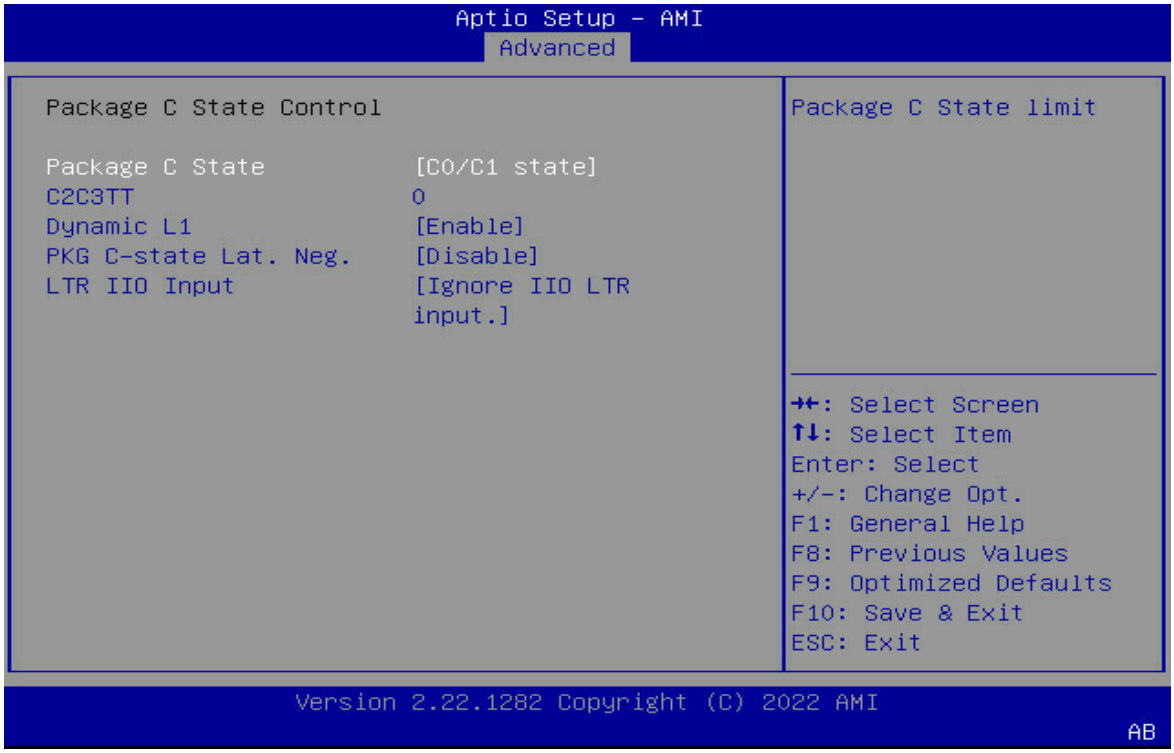



| BIOS Item | Options | Description |
|---|---|---|
| Enable Monitor MWAIT | Disable<br>**Enable** | Allows Monitor and MWAIT instructions |
| CPU C1 auto demotion | Disable<br>**Enable** | Allows CPU to automatically demote to C1. Takes effect after reboot |
| CPU C1 auto undemotion | Disable<br>**Enable** | Allows CPU to automatically undemote from C1 |
| CPU C6 report | Disable/Enable/**Auto** | Enable/Disable CPU C6(ACPI C3) report to OS |
| Enhanced Halt State (C1E) | Disable/**Enable** | Core C1E auto promotion Control. |
| OS ACPI Cx | **ACPI C2**<br>ACPI C3 | Report CC3/CC6 to OS ACPI C2 or ACPI C3 |



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### 5.4.5.4. Package C State Control




| BIOS Item | Options | Description |
|---|---|---|
| Package C State Control | **C0/C1 state**<br>C2 state<br>C6 (non-retention) state<br>Auto | Package C State limit |
| C2C3TT | 0 | Default = 0, means [AUTO] |
| Dynamic L1 | Disable<br>**Enable** | PCU_MISC_CONFIG Bit[21] = dynamic L1 enable |
| PKG C-state Lat. Neg. | **Disable**/Enable | MSR 1FCh Bit[30] PCH_NEG_DISABLE |
| LTR IIO Input | Take IIO LTR input.<br>**Ignore IIO LTR input** | MSR 1FCh Bit[29] = LTR_IIO_DISABLE.<br>Disable = Ignore IIO LTR input |

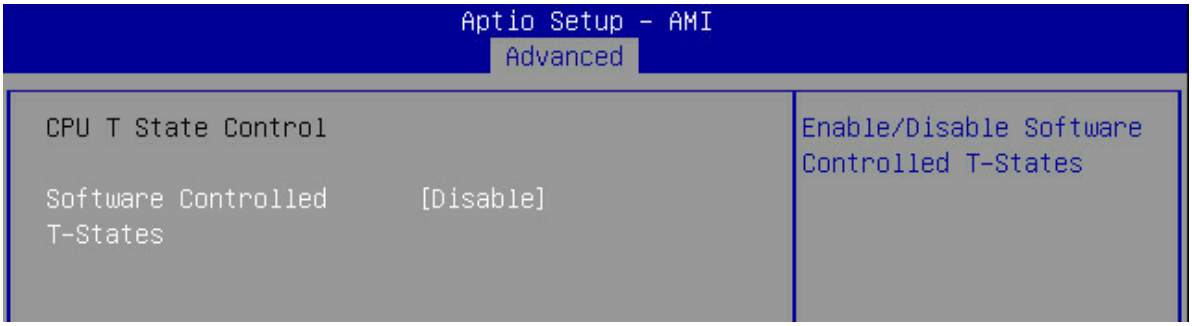


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### 5.4.5.5. CPU Thermal Management

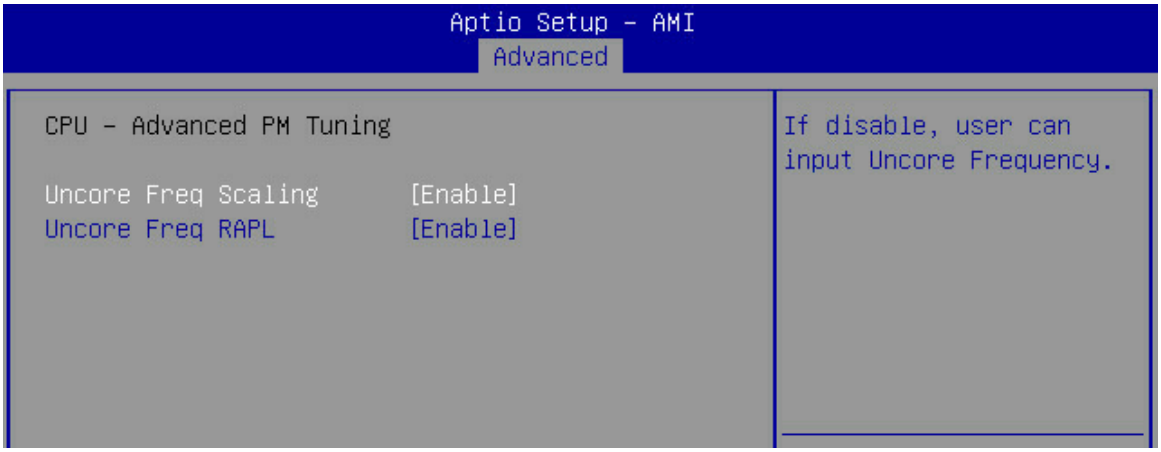



| BIOS Item | Options | Description |
|---|---|---|
| CPU T State Control | **Sub-menu** | CPU T State settings |




| BIOS Item | Options | Description |
|---|---|---|
| Software Controlled T-States | **Disable**<br>Enable | Software Controlled T State setting |

### 5.4.5.6. CPU-Advanced PM Tuning




| BIOS Item | Options | Description |
|---|---|---|
| Uncore Freq Scaling | Disable<br>**Enable** | If disable, user can input Uncore Frequency |



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## 5.4.6 Trusted Computing



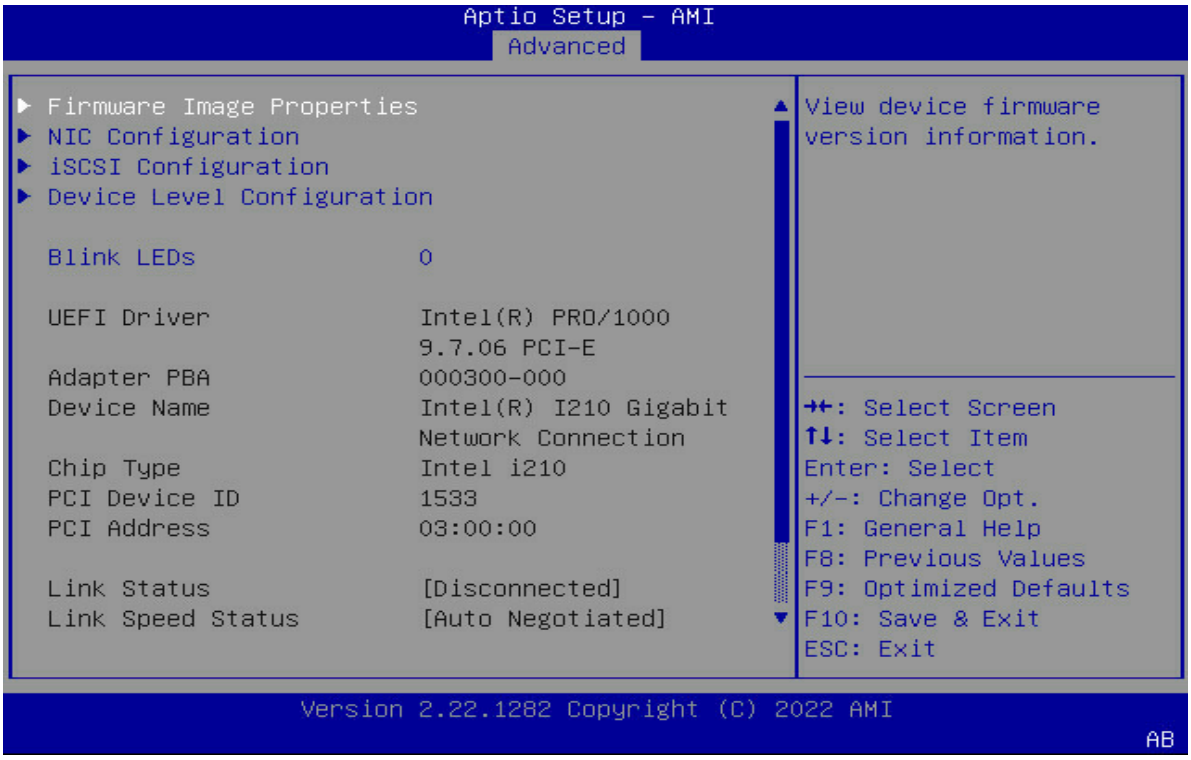

| BIOS Item | Options | Description |
|---|---|---|
| Security Device | Disabled<br>**Enabled** | Enable or Disable security device, such as TPM |



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## 5.4.7 Intel(R) I210 Gigabit Network Connection

When the BIOS boots the system, it will launch the onboard Intel® Ethernet I210 controller's UEFI driver. The driver provides a setup page for configuring Ethernet parameters and shows information about Ethernet controller. When EFI Network is disabled, the Ethernet UEFI driver is not executed and this setup page will not be shown (see *5.3.3 Network Configuration* on page 635).



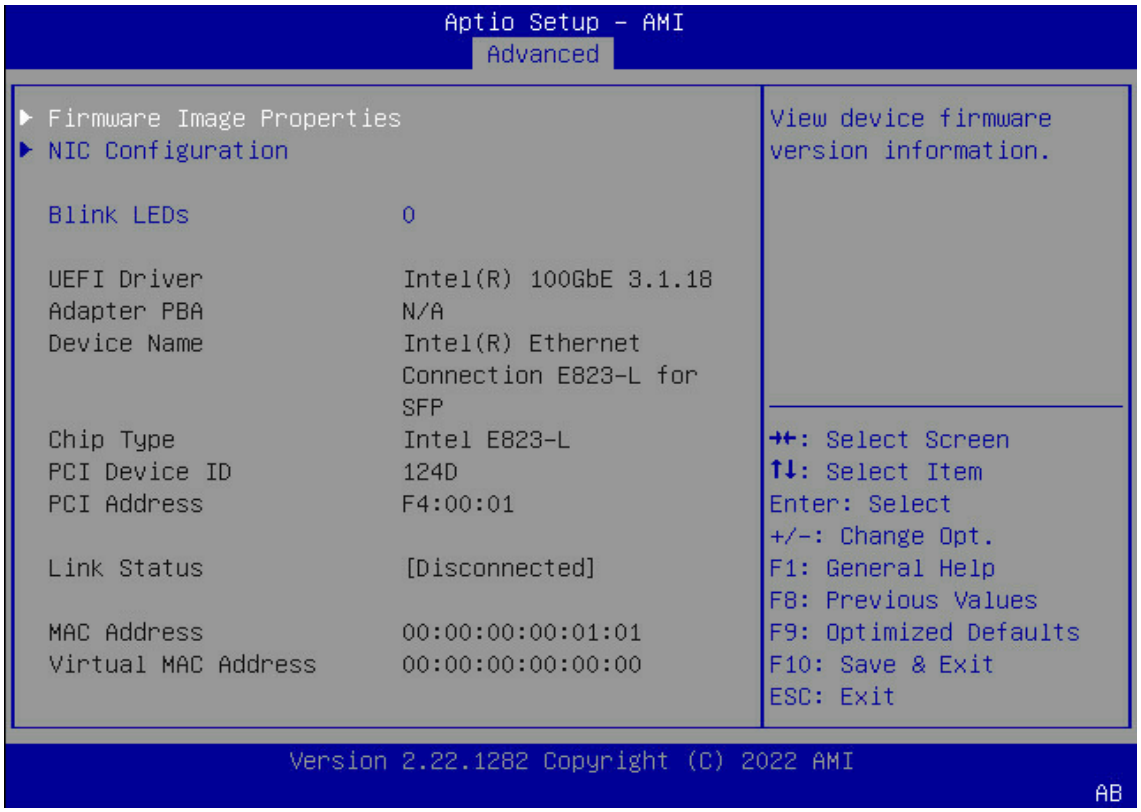

| BIOS Item | Options | Description |
|---|---|---|
| NIC Configuration | | For configuring link speed and wake function. |



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## 5.4.8 Intel(R) Ethernet Connection E823-L for 10GbE

When the BIOS boots the system, it will launch the onboard Intel® Ethernet E823-L controller's UEFI driver. The driver provides a setup page for configuring Ethernet parameters and shows information about Ethernet controller. When EFI Network is disabled, the Ethernet UEFI driver is not executed and this setup page will not be shown (see *5.3.3 Network Configuration* on page 635).



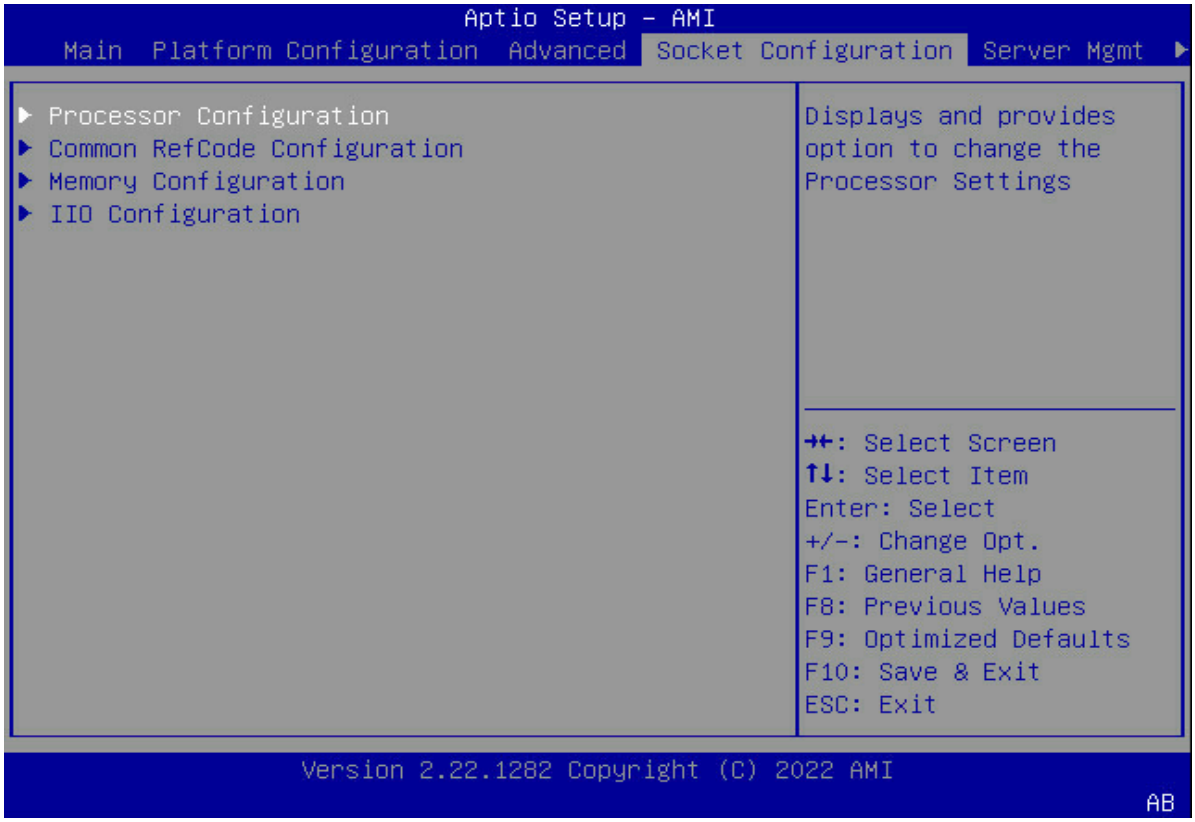

| BIOS Item | Options | Description |
|---|---|---|
| NIC Configuration | | For configuring link speed and wake function. |



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# 5.5 Socket Configuration Menu

This menu contains the settings for Socket Configuration.

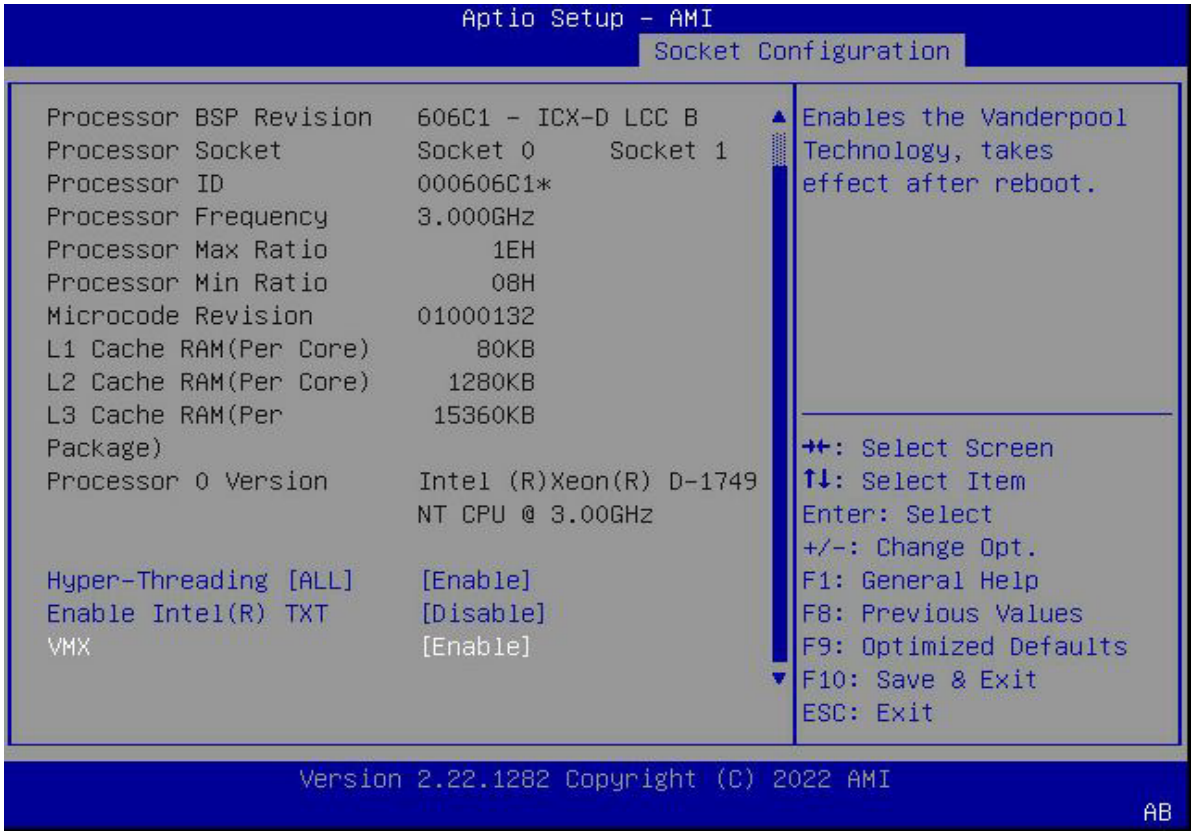



| BIOS Item | Options | Description |
|---|---|---|
| Processor Configuration | Sub-Menu | For CPU settings |
| Common RefCode Configuration | Sub-Menu | For RC settings |
| Memory Configuration | Sub-Menu | PCU_MISC_CONFIG Bit[21] = dynamic L1 enable |
| IIO Configuration | Sub-Menu | MSR 1FCh Bit[30] PCH_NEG_DISABLE |



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### 5.5.1 Processor Configuration

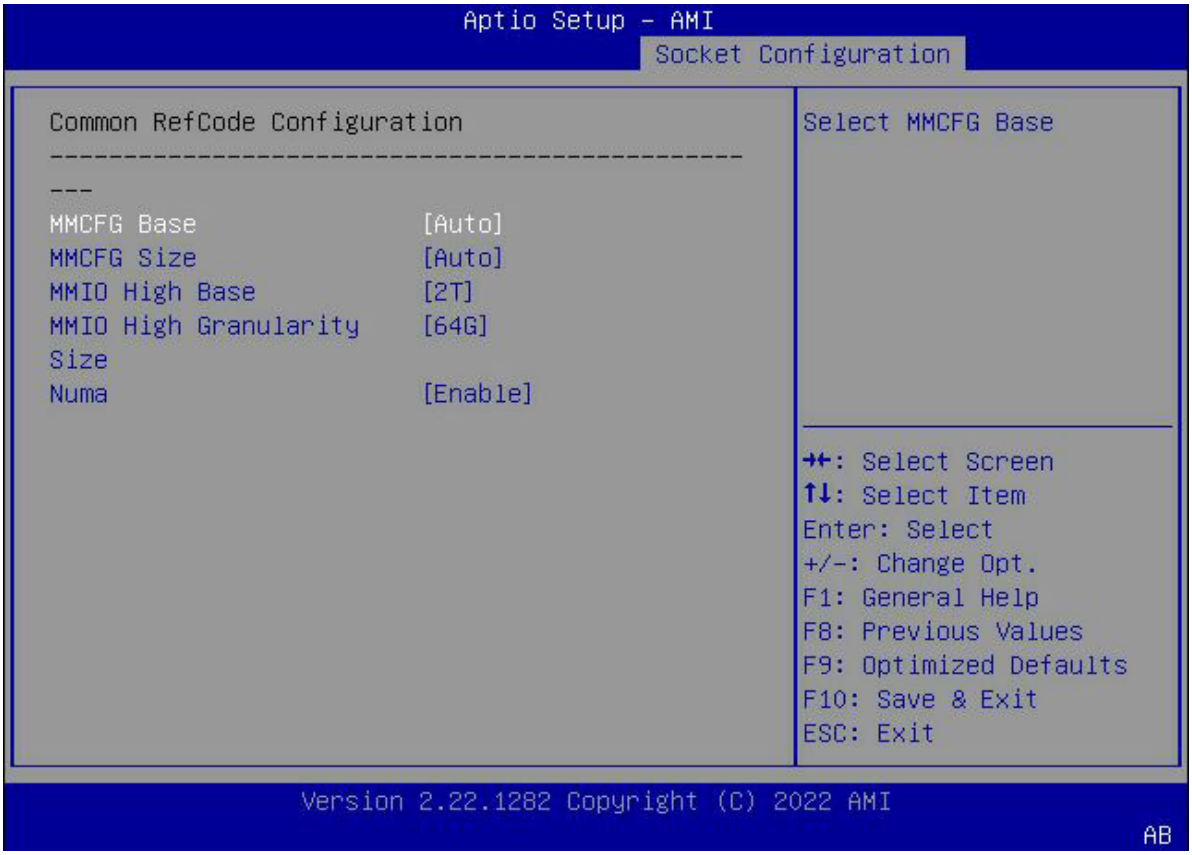



| BIOS Item | Options | Description |
|---|---|---|
| CPU string | **Info only** | To show CPU info |
| Hyper-Threading [ALL] | Disable<br>**Enable** | To enable or disable logical processor threads |
| Enable Intel(R) TXT | **Disable**<br>Enable | Enables Intel(R) TXT |
| VMX | **Enable**<br>Disable | To enable or disable the Vanderpool Technology(VTx) |



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## 5.5.2 Common RefCode Configuration

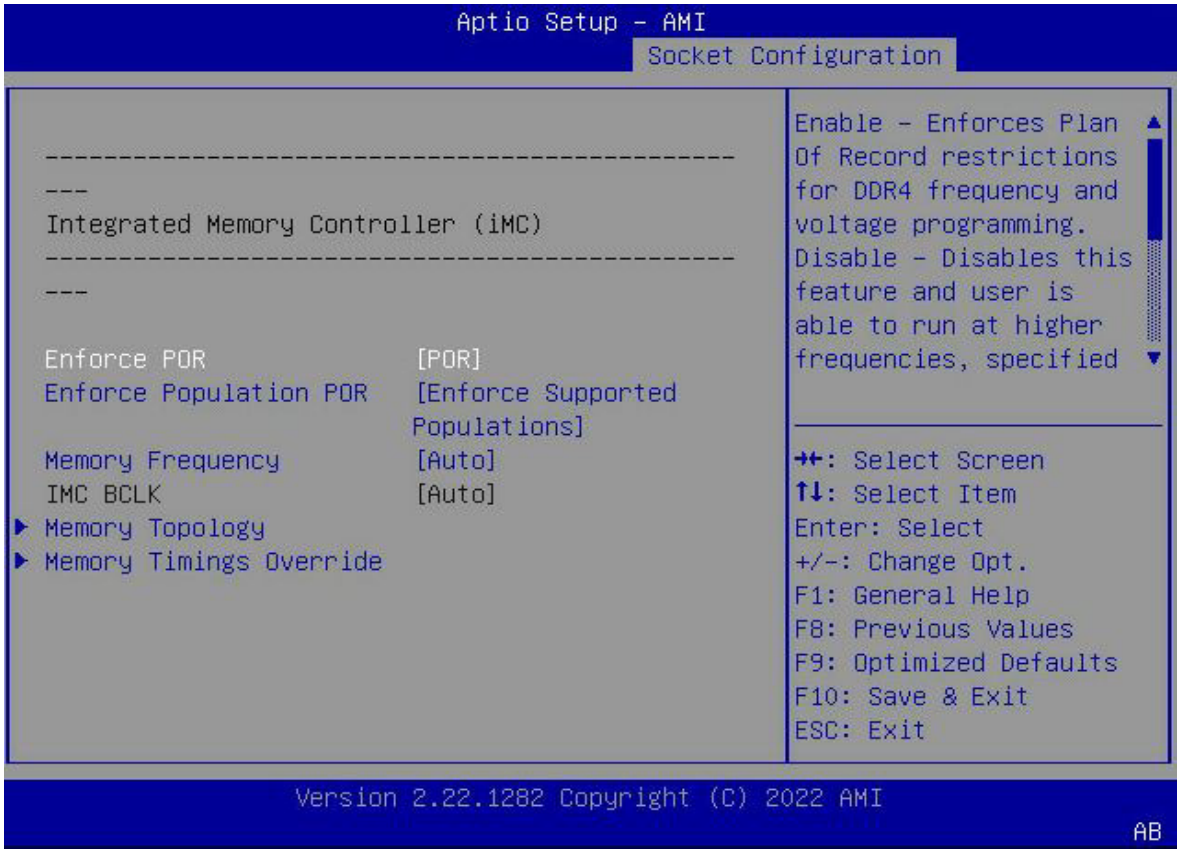



| BIOS Item | Options | Description |
|---|---|---|
| MMCFG Base | 1G/1.5G/1.75G<br>…<br>**Auto** | Select MMCFG Base |
| MMCFG Size | 1G/2G<br>...<br>**Auto** | Select MMCFG Size |
| MMIO High Base | **2T**/1T/512G | Select MMIO High Base |
| MMIO High Granularity Size | 16G/**64G**/256G | Selects the allocation size used to assign mmioh resources |
| Numa | Disable<br>**Enable** | Enable or Disable Non uniform Memory Access |



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## 5.5.3 Memory Configuration

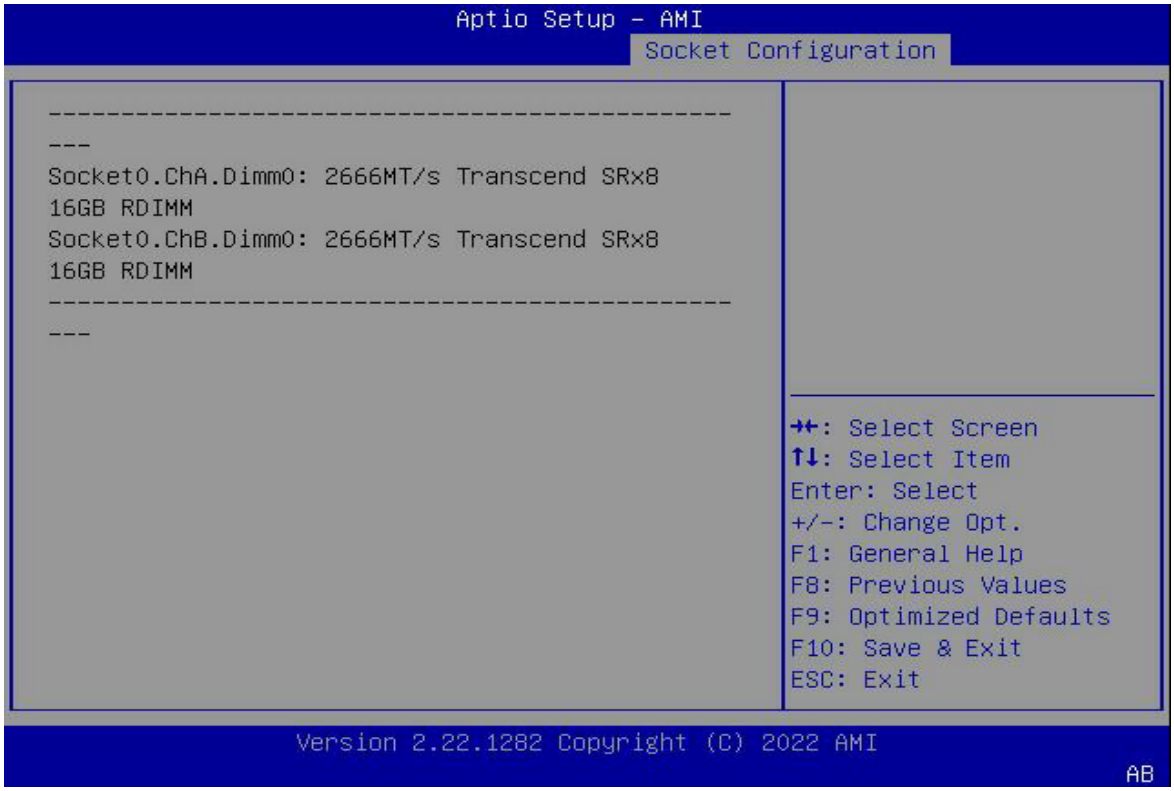



| BIOS Item | Options | Description |
|---|---|---|
| Enforce POR | | |
| Enforce Population POR | | |
| Memory Frequency | **Auto**<br>800<br>1000<br>1066<br>1200<br>..... | To select maximum memory frequency |
| Attempt Fast Boot | **Auto**<br>Disable<br>Enable | To enable or disable skip memory reference code on warm boots, Auto is Enable now |
| Attempt Fast Cold Boot | **Auto**<br>Disable<br>Enable | To enable or disable skip memory reference code on cold boots, Auto is Enable now |



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### 5.5.3.1. Memory Topology




| BIOS Item | Options | Description |
|---|---|---|
| SocketX.ChX.DimmX | **Info only** | To show channel /dimm spd info |

### 5.5.3.2. Memory Timings Override

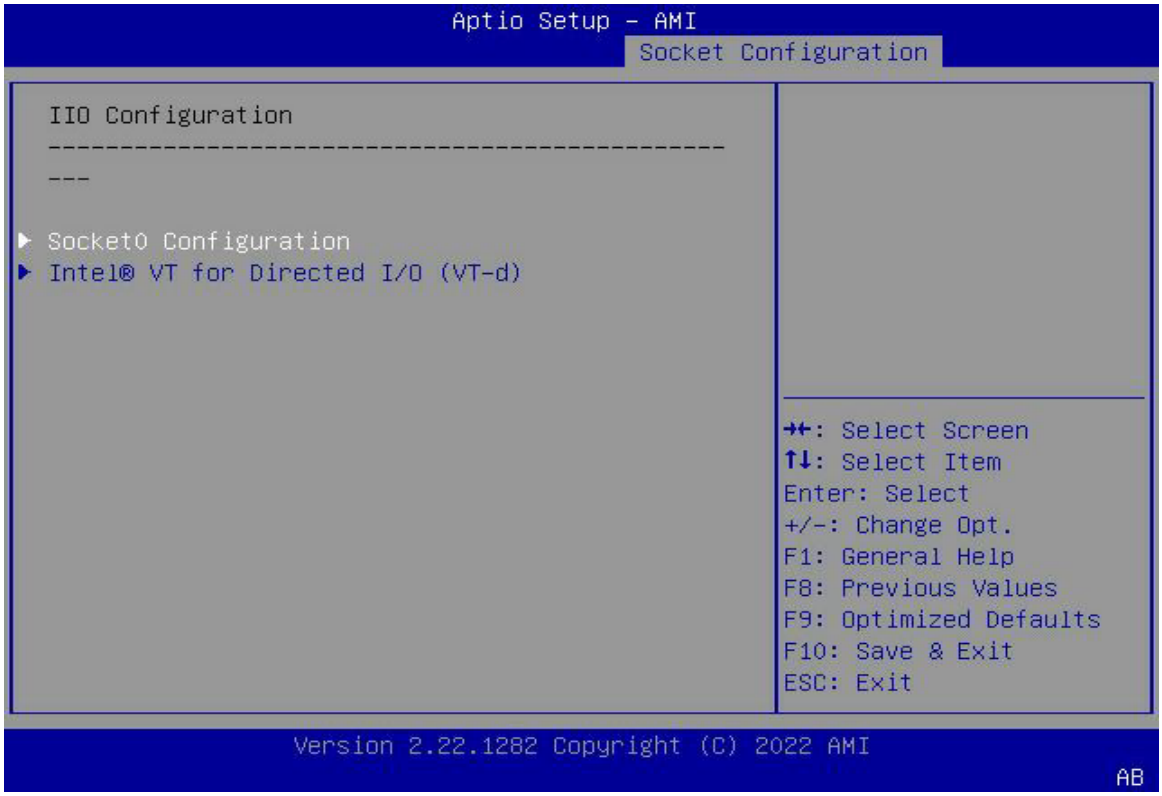



| BIOS Item | Options | Description |
|---|---|---|
| XMP Profile | **Disable**<br>Enable | To enable or disable Intel Extreme Memory Profiles to support memory over-clock |

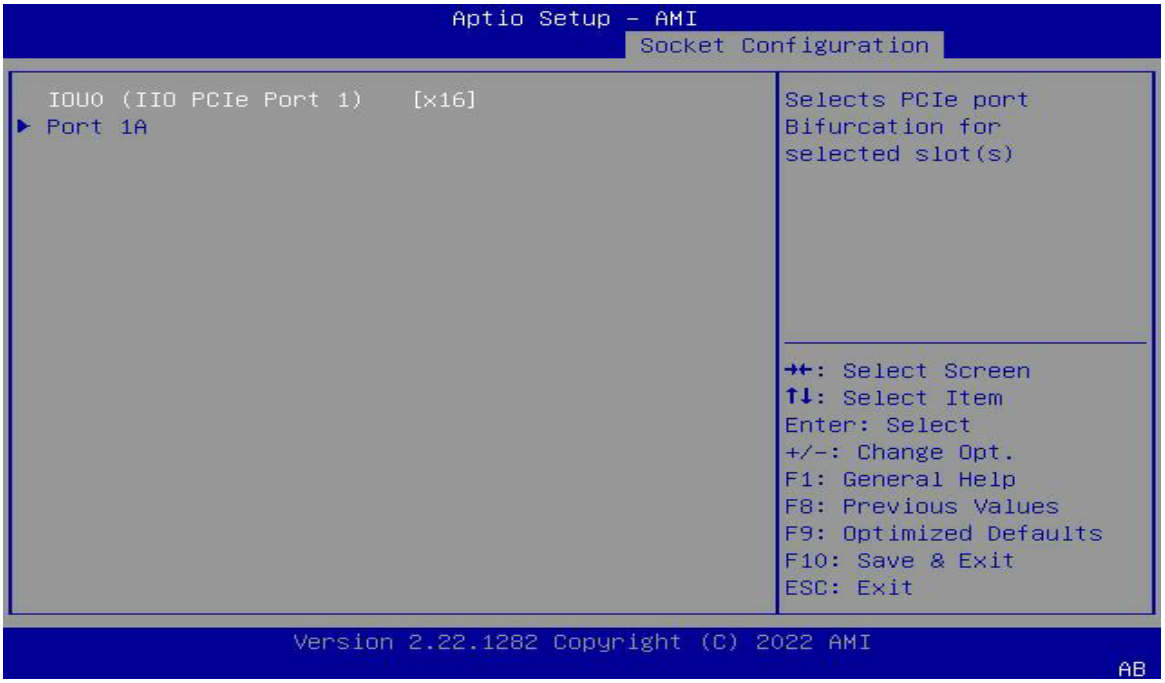


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## 5.5.4 IIO Configuration




### 5.5.4.1. Sub-Menu: Socket0 Configuration

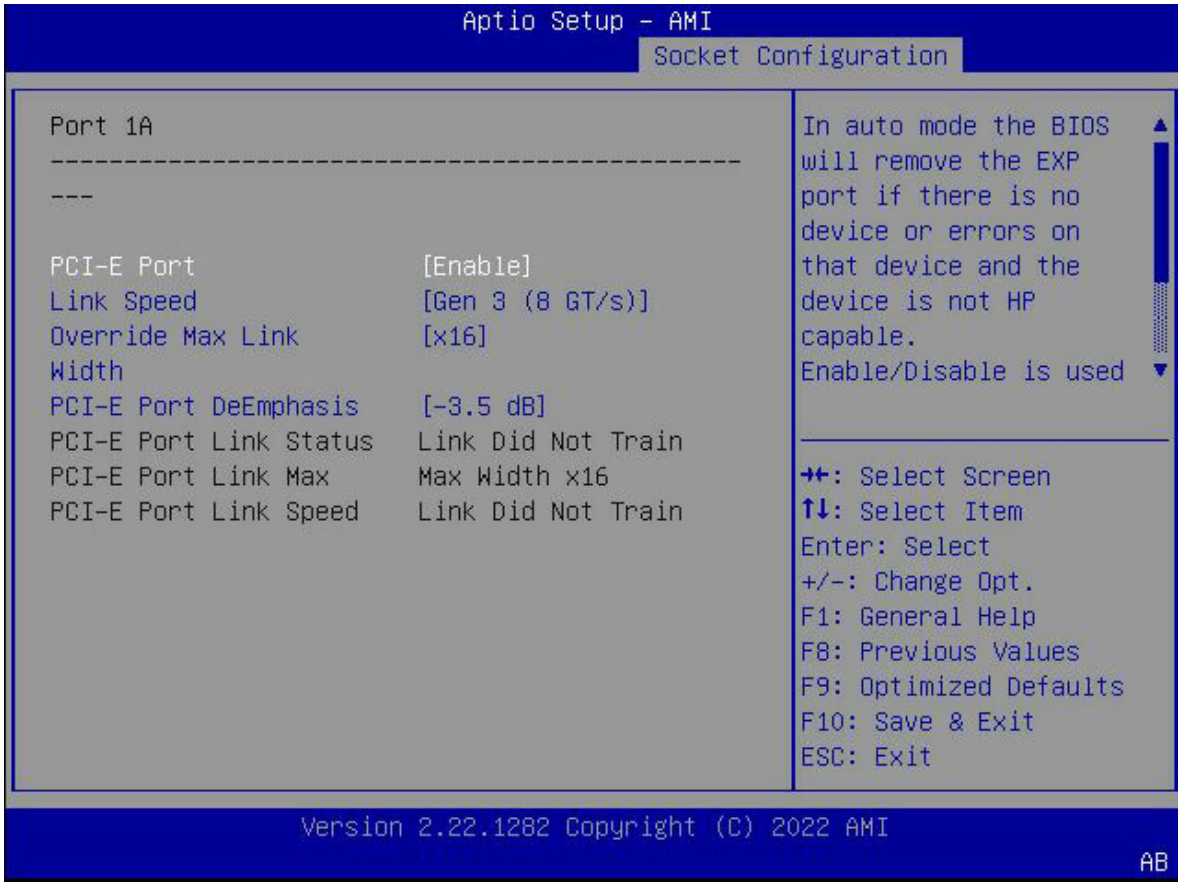



| BIOS Item | Options | Description |
|---|---|---|
| IOU0 (IIO PCIe Port 1) | X4x4x4x4 / X4x4x8 X8x4x4 / X8x8 / **X16** | Selects PCIe port bifurcation for riser card upstream port |
| Port 1A | **Sub Page** | To show PCIe port link status |



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### Socket0 Configuration > Port 1A

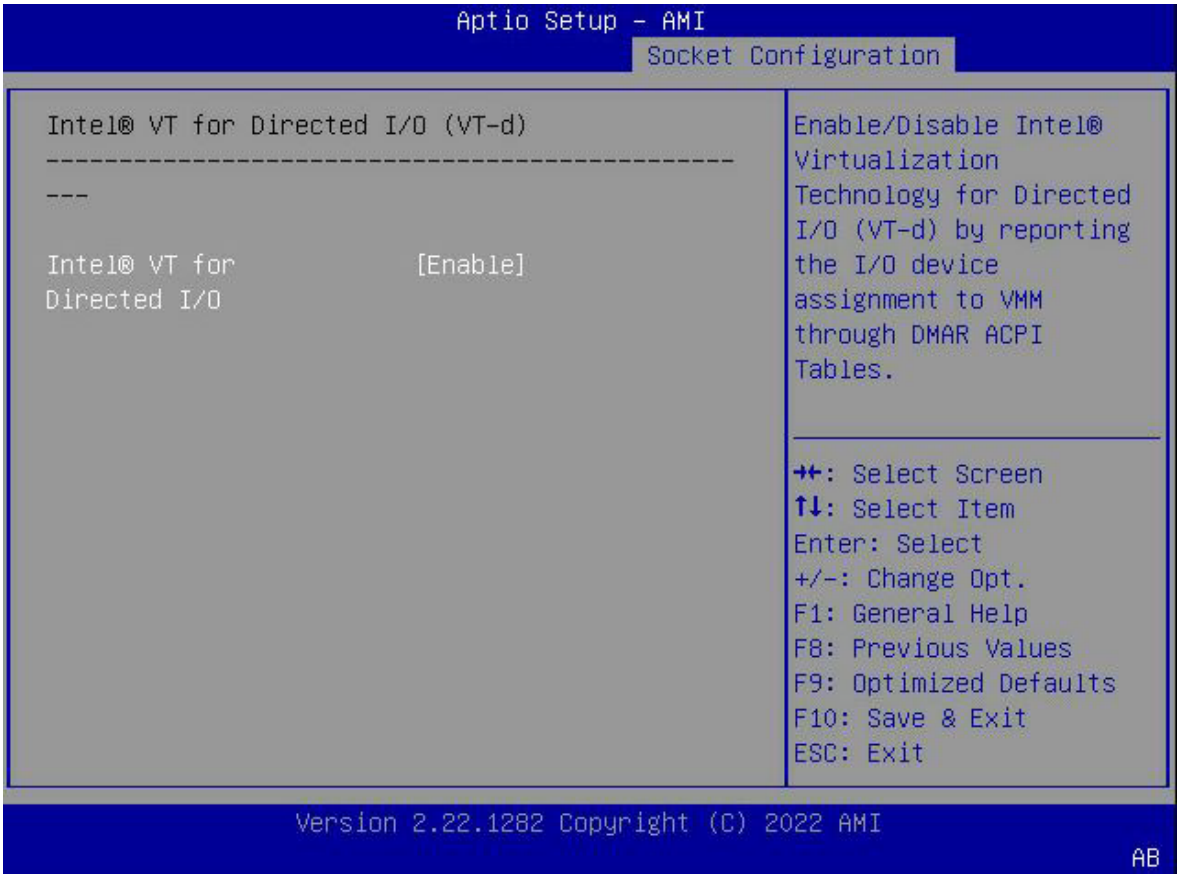



| BIOS Item | Options | Description |
|---|---|---|
| PCI-E Port | Disable/**Enable** | To enable or disable PCI-E Port |
| Link Speed | Gen 1 (2.5 GT/s)<br>Gen 2 (5 GT/s)<br>**Gen 3 (8 GT/s)** | Choose Link Speed |
| Override Max Link Width | Auto/X1/X2/X4/X8/**X16** | Override the max link width that was set by bifurcation |
| PCI-E Port DeEmphasis | **-3.5 dB** / -6.0 dB | De-Emphasis control (LNKCON2[6]) |
| PCI-E Port Link Status<br>PCI-E Port Link Max<br>PCI-E Port Link Speed | **Info Only** | To show PCIE-E Port link or lot; width; speed |



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### 5.5.4.2. Intel(R) VT for Directed I/O (vt-d)



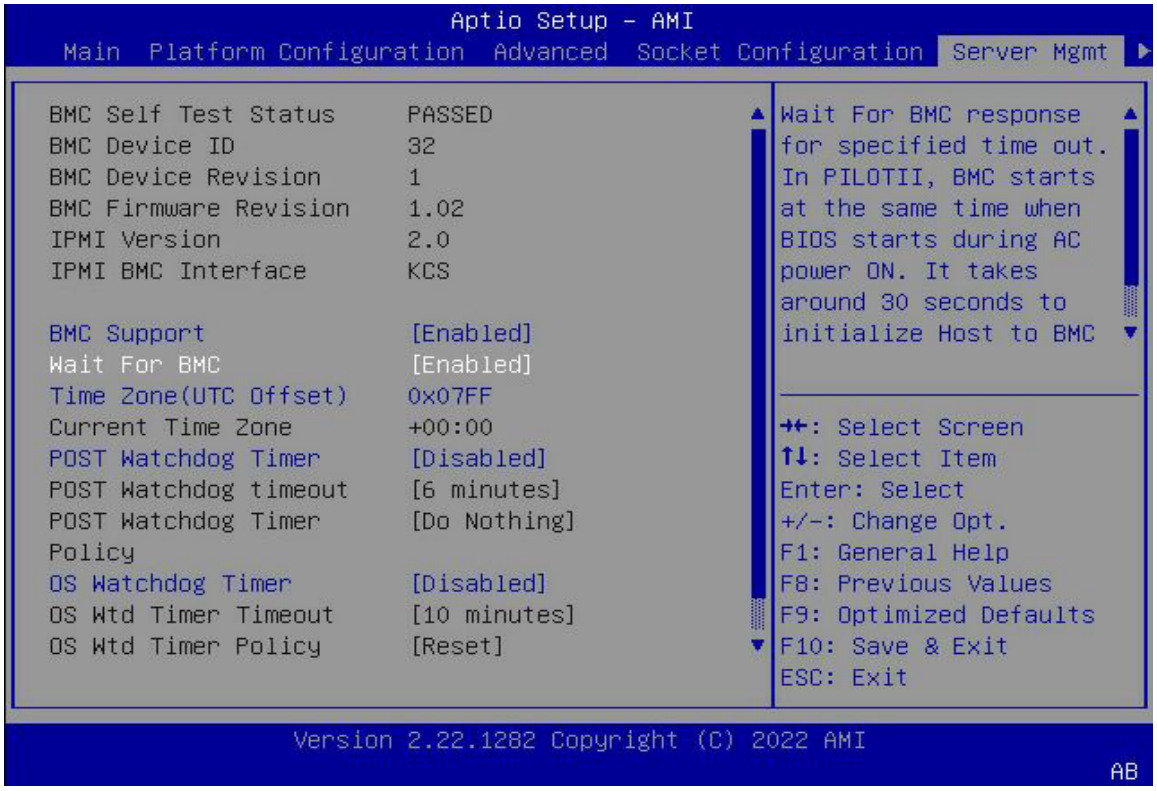

| BIOS Item | Options | Description |
|---|---|---|
| Intel(R) VT for Directed I/O (VT-d) | Disable<br>**Enable** | To enable or disable Intel Virtualization Technology for Directed I/O |



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# 5.6 Server Mgmt Menu

This menu contains the Server Management settings.



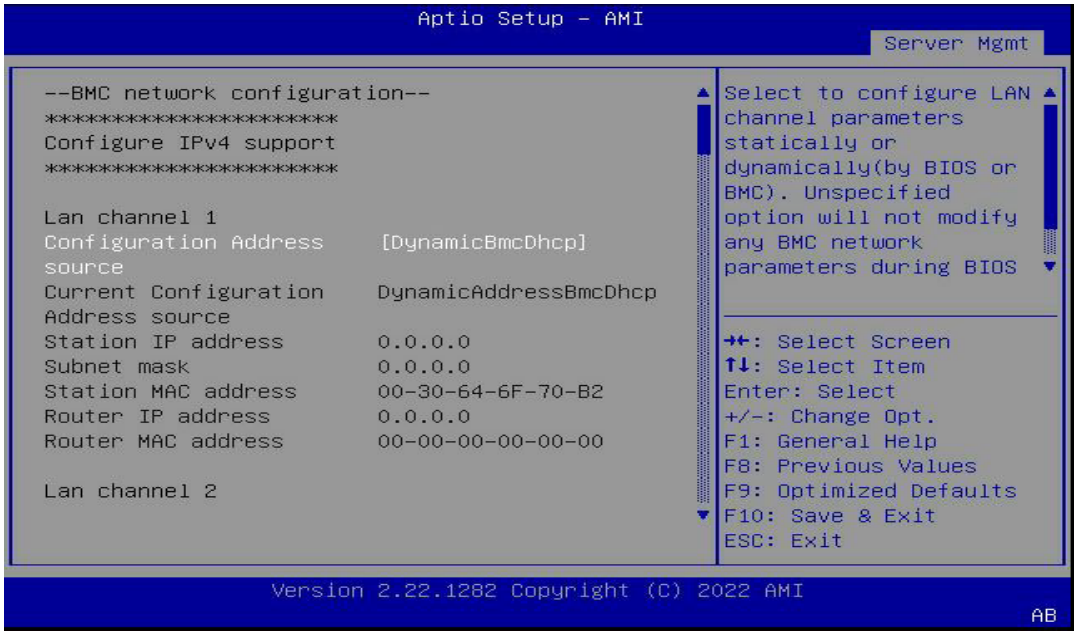

| BIOS Item | Options | Description |
|---|---|---|
| BMC Self Test Status | **Info-only** | To show BMC self test status |
| BMC Device ID | **Info-only** | To show BMC Device ID |
| BMC Device Revision | **Info-only** | To show BMC Device Revision |
| BMC Firmware Revison | **Info-only** | To show BMC Firmware version |
| IPMI Version | **Info-only** | To show IPMI version |
| BMC Interfaces(s) | **Info-only** | To show BMC interface such as KCS |
| BMC support | **Enabled**<br>Disabled | To enable or disable communicate with BMC |
| Wait For BMC | Enabled<br>**Disabled** | To enable or disable wait for BMC 30s before sending Self Test command |
| Time Zone (UTC Offset)<br>Current Time Zone | **0x7FFF**<br>**Info-only** | Enter UTC Offset in hours, ox7FFF to consider BIOS time as local time |
| POST Watchdog Timer | **Enabled**<br>Disabled | Enable or Disable POST Watchdog Timer(FRB-2 timer) |
| POST Watchdog timeout | 3mins/4mins<br>5mins/**6mins** | Select 3mins/4mins/5mins/6mins for POST Watchdog Timer Expiration value |
| POST Watchdog Timer Policy | **Do Nothing**<br>Reset<br>Power Down<br>Power Cycle | Configure how the system should respond if the POST Watchdog Timer (FRB-2 Timer) expires. Not available if Timer is disabled. |



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| BIOS Item | Options | Description |
|---|---|---|
| OS Watchdog Timer | Enabled<br>**Disabled** | If enabled, starts a BIOS timer which can only be shut off by Management Software after the OS loads. Helps determine that the OS successfully loaded or follows the OS Boot Watchdog Timer policy. |
| OS Watchdog timeout | 5 minutes<br>10 minutes<br>15 minutes<br>**20 minutes** | Select 5mins/10mins/15mins/20mins for OS Boot Watchdog Timer Expiration. Not available if OS Boot Watchdog Timer is disabled. |
| OS Watchdog Timer Policy | Do Nothing<br>**Reset**<br>Power Down<br>Power Cycle | Configure how the system should respond if the OS Boot Watchdog Timer expires. Not available if OS Boot Watchdog Timer is disabled. |
| BMC network configuration | **Sub-Menu** | Configure BMC network parameters |

## 5.6.1 BMC Network Configuration




| BIOS Item | Options | Description |
|---|---|---|
| Configure IPV4 support | **Read only** | |
| Configuration Address source | Static<br>**DynamicBmcDhcp** | Select to configure LAN channel parameters statically or dynamically(by BIOS or BMC) |
| Configure IPV6 support | **Read only** | |
| IPV6 Support | **Disable** / Enable | Enable or Disable LAN IPV6 Support |
| Configuration Address source | Static<br>**DynamicBmcDhcp** | To configure LAN Address source when IPV6 supported |



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# 5.7 Security Menu

This menu contains the Security settings.



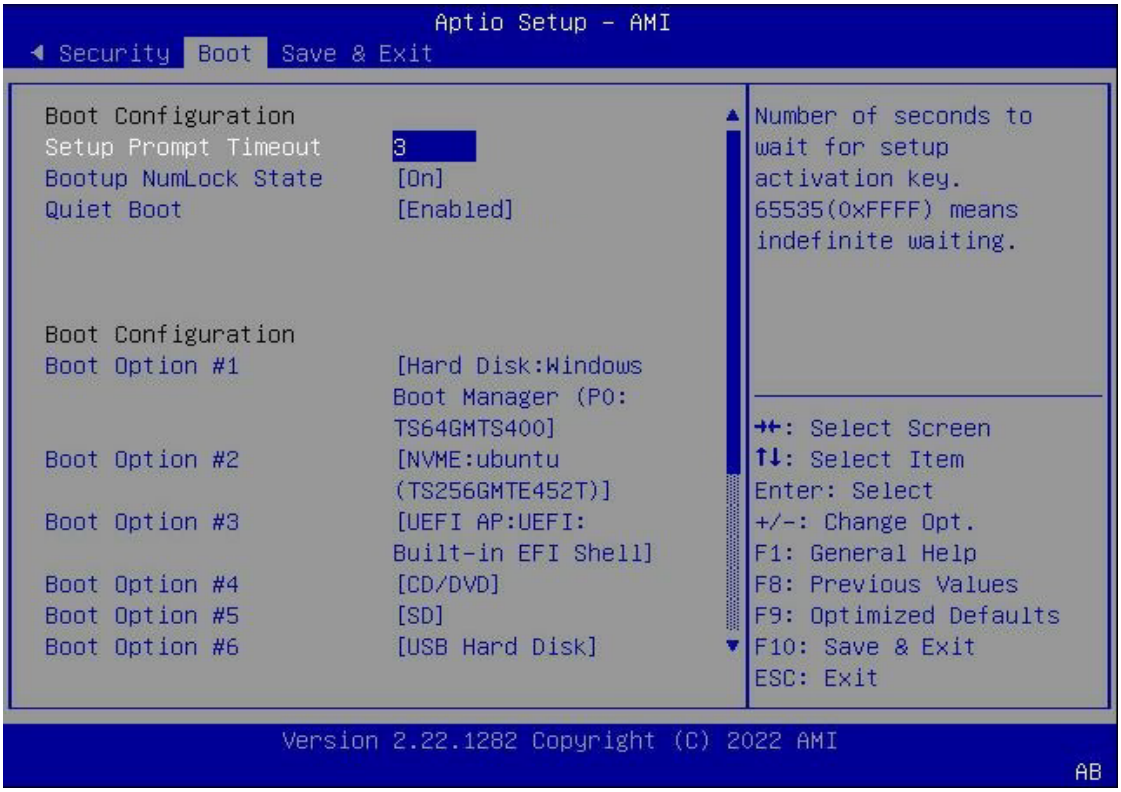

| BIOS Item | Options | Description |
|---|---|---|
| Administrator Password | **Enter to set password** | Configure/Clear Administrator Password.<br>When pressing enter, a menu will be popped up for creating new password. When password installed, press enter without inputting password, it will clear password. |
| User Password | **Enter to set password** | Configure/Clear User Password.<br>When pressing enter, a menu will be popped up for creating new password. When password installed, press enter without inputting password, it will clear password. |
| Secure Boot | **Sub-Menu** | Secure Boot Menu. Default is Disabled. |



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# 5.8 Boot Menu

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

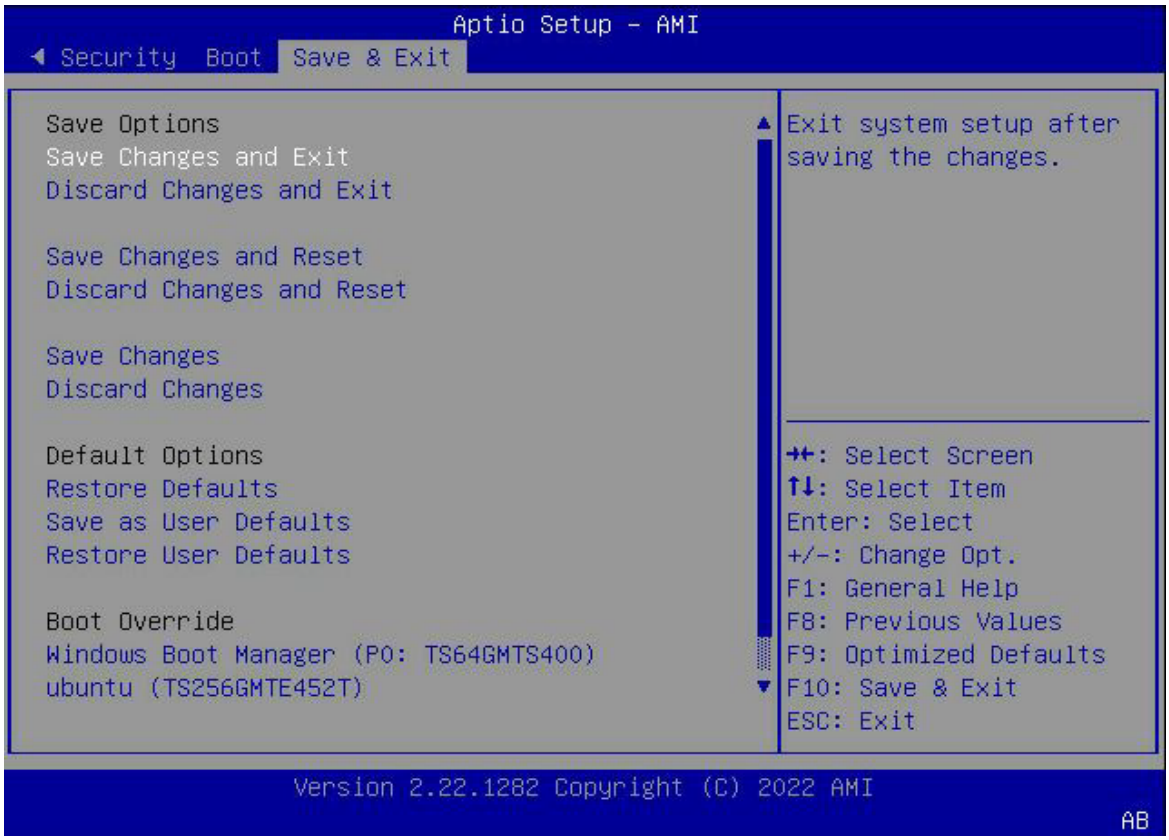



| BIOS Item | Options | Description |
|---|---|---|
| Setup Prompt Timeout | 3 | Number of seconds to wait for setup activation |
| Bootup NumLock State | **On**<br>Off | |
| Quiet Boot | **Enabled**<br>Disabled | |
| Boot Option #1 ~ #9 | #1: Hard Disk<br>#2: CD/DVD<br>#3: SD<br>#4: USB Hard Disk<br>#5: USB CD/DVD<br>#6: USB Key<br>#7: USB Floppy<br>#8: USB LAN<br>#9: Network | For boot priority setting. |
| XXXX Drive BBS Priorities | **Sub-Menu** | 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 sub-menu. |



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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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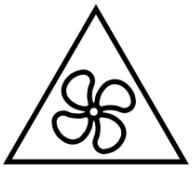
# Important Safety Instructions

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 55°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.




**Hazardous moving parts.** Keep body parts out of the motion path.



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.
   - The power cord must be connected to a socket or outlet with a ground connection.
7. Never attempt to fix the equipment. Equipment should only be serviced by qualified personnel.
8. An RTC battery may be provided for uninterrupted, backup or emergency power.




**Risk of explosion** if battery is replaced with one of an incorrect type. Discard used batteries according to the manufacturer's instructions.



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9. This equipment is not suitable for use in locations where children are likely to be present.
10. 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.
11. Please pay strict attention to all warnings and advisories appearing on the device, to avoid injury or damage.
12. 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.




**Shock hazard!** Disconnect all power supply inputs before servicing.



Shock hazard!



Multiple power sources

13. 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.
14. Suitable for installation in Information Technology Rooms in accordance with Article 645 of the National Electrical Code and NFPA 75.
15. This product is intended to be supplied by a certified DC power source providing reinforced/double insulation from AC mains with an output rating of -48V to -60V DC, 12A min., Tma = 55°C. All power connection wiring must be performed by a qualified electrician in accordance with National Electrical Code, ANSI/NFPA 70 and Canadian Electrical Code, Part I, CSA C22.1. The DC power supply should be well-grounded to ensure safe operation. The protective earthing conductor shall be minimum 14 AWG and having green-and-yellow insulation. The ground wire should be installed first (before "+" and "-") and then removed.
16. When using a Fiber Optic Small-Form Pluggable (SFP) module, ensure it is IEC 60825-1, IEC 60825-2 and IEC 60950-1 or IEC 62368-1 certified and a Class 1 Laser Product.



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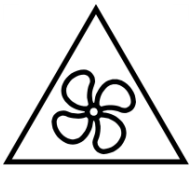
# Consignes de Sécurité Importantes

*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 55 °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.*




***Pièces mobiles dangereuses.** Gardez les parties du corps hors de la trajectoire.*



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.*
   - *Le cordon d'alimentation doit être connecté à une prise ou à une prise de courant avec mise à la terre.*
7. *N'essayez jamais de réparer l'équipement. L'équipement ne doit être réparé que par du personnel qualifié.*



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8. *Une pile au lithium peut être installée pour assurer l'alimentation de secours ou d'urgence en continu.*



*mise en garde*

***Risque d'explosion** si la batterie est remplacée par une batterie d'un type incorrect. Jetez les piles usagées conformément aux instructions du fabricant.*

9. *Cet équipement ne convient pas à une utilisation dans des lieux pouvant accueillir des enfants.*
10. *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.*
11. *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.*
12. *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.*



*mise en garde*

***Risque d'électrocution!** Débranchez toutes les entrées d'alimentation avant de procéder à l'entretien.*


Shock hazard!
Risque d'électrocution!


Multiple power sources
Sources d'alimentation multiples

13. *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.*
14. *Peut être installé dans des salles de matériel de traitement de l'information conformément à l'article 645 du National Electrical Code et à la NFPA 75.*
15. *Ce produit est destiné à être alimenté par une source d'alimentation CC certifiée fournissant une isolation renforcée/double du secteur CA avec une puissance de sortie de -48 V à -60 V CC, 12 A min., Tma = 55°C. Tout le câblage de connexion d'alimentation doit être effectué par un électricien qualifié conformément au Code national de l'électricité, ANSI / NFPA 70 et au Code canadien de l'électricité, Partie I, CSA C22.1. L'alimentation CC doit être bien mise à la terre pour garantir un fonctionnement sûr. Le conducteur de mise à la terre de protection doit être au minimum 14 AWG et avoir une isolation verte et jaune. Le fil de terre doit être installé en premier (avant «+» et «-») puis retiré.*



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# Getting Service

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