Lenovo

ThinkSystem Server with Intel Xeon SP (1st, 2nd Gen) UEFI Manual

Server Models: SD530, SD650, SN550, SN850, SR150, SR250, SR530, SR550, SR570, SR590, SR630, SR650, SR670, SR850, SR850P, SR860, SR950, ST250, ST550, ST558, MX Certified Node on SR650 and MX3520

Tenth Edition (April 2024)

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Chapter 1. ThinkSystem server with Intel Xeon SP (1st, 2nd Gen)

This topic provides general introduction to the Unified Extensible Firmware Interface (UEFI).

UEFI is an interface packed with various features, including system information and settings, boot and runtime services, BMC settings, system event logs, and user security. This guide applies to the following server models:

• SN550 • SN850 • SD530 • SD650 • SR150 • SR250 • SR530 • SR550 • SR570 • SR590 • MX Certified Node on SR650 • MX3520	• SR630 • SR650 • SR670 • SR850 • SR850P • SR860 • SR950 • ST250 • ST550 • ST558

Note: SR150, SR250, and ST250 only support specific functions among the listed ones. See the specific function descriptions for details.

Below table details the main menu.

Note: If the Serial Over LAN (SOL) utility window is displayed incorrectly, change the window buffer size to ROW(100) x Column (31).

Table 1. Main menu details

Item	Options	Description
System Configuration and Boot Management	N/A	Main menu
Select Language		Change the language for the current system.

Table 1. Main menu details (continued)

Launch Graphical System Setup	N/A	Enter the graphical user interface for system setup, provisioning manager, and RAID configuration. When in Graphical System Setup, there will be no screen output to console, use VGA monitor for setup. **Note:** For more information, see Lenovo XClarity Provisioning Manager.
System Information	N/A	Display the basic details of the system.
System Settings	N/A	Display or modify system settings. Changes may not take effect immediately. Save any changed settings and reboot the system.
Date and Time	N/A	Set the local Date and Time of the system.
Start Options	N/A	Boot a desired selection from the primary boot sequence as specified under **Boot Manager**.
Boot Manager	N/A	Change boot order, boot parameters, and boot from a file.
BMC Settings	N/A	Configure the management controller.
System Event Logs	N/A	Clear or view the System Event Log.
User Security	N/A	Set or change Power-On and Administrator passwords.
Save Settings	N/A	Save the changes and commit them to BMC.
Discard Settings	N/A	Discard any changes.
Load Default Settings	N/A	Load the default values for system settings.
Exit Setup Utility	N/A	Exit Setup.

Note: Depending on model and configuration, your server might look slightly different from the images and item descriptions in this guide.

Chapter 2. Get started

First launch

Perform the following steps to first launch the UEFI setup utilities.

1. (Optional)Connect the local keyboard, video, and mouse (KVM) to the server using a cable, or open the **Remote Console** page on the Lenovo XClarity Controller web user interface (XCC WebUI).
2. Power on the system and press F1.
3. If you have set the power on password, enter the correct password.
4. Wait for about 90 seconds, the setup utilities window is displayed.

Switch between graphic/text modes

The setup utilities are launched in graphic mode by default, the utilities can also be launched in text mode. You can switch between the two modes by referring to sections below.

Graphic mode to text mode

If you have entered graphic mode and need to switch to text mode, perform the following steps.

1. On the main interface, choose **UEFI Setup** > **System Settings** > **<F1> Start Control**.
2. Select **Text Setup** for **<F1> Start Control**.
3. Restart the server and press F1.
4. Wait for about 90 seconds, the setup utilities window is displayed in text mode.

Text mode to graphic mode

If you have entered text mode and need to switch to graphic mode, perform the following steps.

1. On the main interface, choose **System Settings** > **<F1> Start Control**.
2. Select **Tool Suite** or **Auto** for **<F1> Start Control**.
3. Restart the server and press F1.
4. Wait for about 90 seconds, the setup utilities window is displayed in graphic mode.

Chapter 3. System configuration and boot management

This chapter details system setup utility.

System information

Select **System Information**, and then the following window is displayed:

Table 2. System information details

Item	Description
System Summary	Display the basic details of the system.
Product Data	Display system firmware information.
Open Source License	Open Source License.

System Summary

Item	Description
System Identification Data	
Machine Type/Model	Specify the system machine type and model.
Serial Number	Specify the tag for the serial number.

UUID Number	Specify the tag for the UUID.
Asset Tag Number	Specify a customer assigned system asset tag number.
Processor	
Installed CPU Packages	Specify the number of installed CPU packages.
Processor Speed	Specify the processor speed.
UPI Link Speed	Specify the UPI link speed.
Memory	
Memory Mode	Specify the memory mode.
Memory Speed	Specify the installed memory speed.
Total Memory Detected	Specify the total amount of the memory from the sum of all DIMM installed.
Total Usable Memory Capacity	Specify the amount of usable memory after deducting the overhead caused by mirroring mode, reserved or bad blocks, etc.
Volatile Memory Capacity*	Usable volatile memory capacity, seen by the OS as standard RAM.
Non-volatile Memory Capacity*	Usable non-volatile memory capacity, could be partitioned and used by the OS as persistent RAM or as persistent storage.

Notes: Settings marked with asterisk (*) are available on the following models only:

- SD530
- SD650
- SN550
- SN850
- SR570
- SR590
- SR630
- SR650
- SR850
- SR860
- SR950

Product Data

Item	Description
Host Firmware	
Build ID	Specify the build ID of the host firmware.
Version	Specify the version of the host firmware.
Build Date	Specify the build date of the host firmware.
BMC Firmware	
Build ID	Specify the build ID of the BMC firmware.

Version	Specify the version of the BMC firmware.
Build Date	Specify the build date of the BMC firmware.

Open Source License

This page lists open-source software acknowledgements and required copyright notices. The content of license varies with the platform.

System setting

Select **System Settings** and press Enter. Then the following window is displayed:

Notes:

- SAS/SATA drives or NVMe drives connected to a storage controller will be displayed in the storage controller submenu: **System settings → Storage → Storage controller xxxx**.
- NVMe drives connected to the system without raid controller (sometimes using a retimer) will be displayed in one of the following pages:
  - **System settings → Foreign Devices**
  - **System settings → Storage**

Table 3. System setting details

Item	Options	Description
Start Control	• **Auto** • Tool Suite • Text Setup	Controls the tools that are started using the F1 key or equivalent IPMI command. • [Tool Suite] starts a graphical suite of tools which support System Information, UEFI setup, Platform Update, Raid Setup, OS installation and Diagnostics functions. • [Text Setup] starts a text mode UEFI setup utility. • [Auto] starts text mode UEFI setup if Serial Over Lan (SOL) or “Console Redirection” are enabled or SOL is configured to [Auto] and an active session is detected. Otherwise, [Auto] starts the graphical [Tool Suite].
Devices and I/O Ports	N/A	Display onboard devices and I/O port options.
Driver Health	N/A	View the health of the controllers in the system as reported by their corresponding drivers.
Foreign Devices	N/A	View a list of foreign devices, including unclassified devices, video devices, input devices, onboard devices, and other devices.
Intel Optane DCPMMs*	N/A	View and configure Intel Optane DCPMMs.
Legacy BIOS	N/A	Configure system UEFI firmware execution environment preferences for supporting legacy OS and legacy Option ROM.
Memory	N/A	Display and provide options to change the memory settings.
Network	N/A	Display network devices and network related settings.
Operating Modes	N/A	Select the operating mode based on your preference. **Note:** Power savings and performance are also highly dependent on hardware configuration and the software running on the system.
Power	N/A	Configure power scheme options.
Processors	N/A	Display and provide options to change the processor settings.
Recovery and RAS	N/A	Configure recovery policies and advanced reliability, availability, and serviceability settings.
Security	N/A	Configure system security settings.
Storage	N/A	Manage storage adapter options. Some systems may use planar devices and can be configured under “Devices and I/O Ports”.

Notes: Setting marked with asterisk (*) is available on the following models only:

- SD530
- SD650
- SN550
- SN850
- SR570

- SR590
- SR630
- SR650
- SR850
- SR860
- SR950

Device and I/O ports

This menu displays onboard devices and I/O port options.

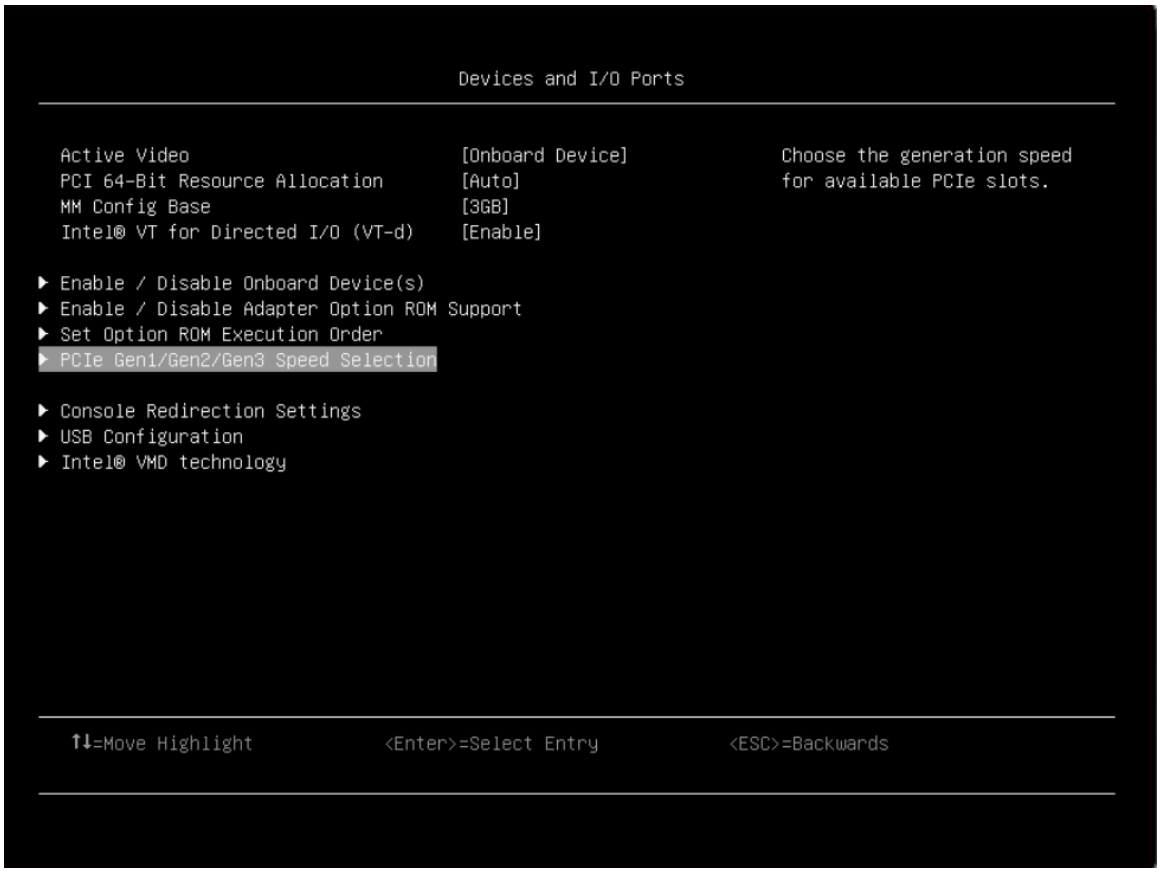


Table 4. Device and I/O ports details

Item	Options	Description
Active Video	• **Onboard Device** • Add-in Device	This setting only applies when the server has an add-in video adapter. When the option ROM is set to Legacy for both onboard and add-in video adapters, the Active Video setting controls which single adapter will display the System Setup utility. **Onboard Device** is the default setting. Regardless of this setting, the system boot early video is displayed at the onboard video only, and the management controller remote console shows the onboard video only. This setting does not affect how the OS chooses to display its graphical desktop.

Table 4. Device and I/O ports details (continued)

PCI 64-Bit Resource Allocation	• Enable • Disable • **Auto**	[Enable] or [Disable] the allocation of 64-bit resources for PCI. **Auto** is the default setting, would allocate some resources below 4GB for legacy compatibility.
MM Config Base	• **3GB** • 2GB • 1GB	Recommend default setting of **3GB**. A higher value will increase memory available to the OS below 4G but reduce memory mapped I/O (MMIO) resource available to PCI adapters. A lower than 3GB value will increase MMIO resources but decrease memory available to OS below 4GB. Revert to your previous selection if you see new issues with changed setting.
Intel® VT for Direct I/O (VT-d)	• **Enable** • Disable	[Enable] or [Disable] Intel® Virtualization Technology for Directed I/O (VT-d) by reporting the I/O device assignment to VMM through DMAR ACPI Tables. **Enable** is the default setting.
SRIOV	• **Enable** • Disable	[Enable] or [Disable] the support of resource allocation for virtual functions of Single Root I/O Virtualization (SR-IOV) during boot.
Enable/Disable Onboard Device(s)	N/A	Enable or disable onboard devices or slots.
Enable/Disable Adapter Option ROM Support	N/A	Control Legacy and UEFI-compliant adapter support. Disabling UEFI/Legacy support may adversely affect pre-boot/boot functions.
Set Option ROM Execution Order	N/A	Control legacy ROM load order.
PCIe Gen1/Gen2/Gen3 Speed Selection	N/A	Choose the generation speed for available PCIe slots.
Console Redirection Settings	N/A	Settings for console redirection and COM port settings.
USB Configuration	N/A	Disable USB storage devices or individual ports.
Intel® VMD technology	N/A	Press Enter to bring up the Intel® VMD for Volume Management Device Configuration menu.

Note: Settings in this menu vary with models and configurations.

Enable/Disable Onboard Device(s)

Item	Options	Description
Onboard Video	• **Enable** • Disable	Disabling an entry will prevent the associated device from being enumerated during subsequent boots. **Enable** is the default setting. [Auto] is removing the port if there is no device or errors on that device. **Note:** [Auto] is the setting for PCIe devices by CPU only.
Onboard SATA	• **Enable** • Disable	Disabling an entry will prevent the associated device from being enumerated during subsequent boots. **Enable** is the default setting. [Auto] is removing the port if there is no device or errors on that device. **Note:** [Auto] is the setting for PCIe devices by CPU only.

Onboard sSATA (for M.2 SATA mode)	• **Enable** • Disable	Disabling an entry will prevent the associated device from being enumerated during subsequent boots. **Enable** is the default setting. [Auto] is removing the port if there is no device or errors on that device. **Note:** [Auto] is the setting for PCIe devices by CPU only.
Slot 1 (Display depending on which riser card is installed)	• **Auto** • Enable • Disable	Disabling an entry will prevent the associated device from being enumerated during subsequent boots. **Auto** is the default setting. [Auto] is removing the port if there is no device or errors on that device. **Note:** [Auto] is the setting for PCIe devices by CPU only.
Slot 2 (Display depending on which riser card is installed)	• **Auto** • Enable • Disable	Disabling an entry will prevent the associated device from being enumerated during subsequent boots. **Auto** is the default setting. [Auto] is removing the port if there is no device or errors on that device. **Note:** [Auto] is the setting for PCIe devices by CPU only.
Slot (n...) (Display depending on which riser card is installed)	• **Auto** • Enable • Disable	Disabling an entry will prevent the associated device from being enumerated during subsequent boots. **Auto** is the default setting. [Auto] is removing the port if there is no device or errors on that device. **Note:** [Auto] is the setting for PCIe devices by CPU only.
Onboard LAN (Display when PHY card installed)	• **Enable** • Disable	Disabling an entry will prevent the associated device from being enumerated during subsequent boots. **Enable** is the default setting. [Auto] is removing the port if there is no device or errors on that device. **Note:** [Auto] is the setting for PCIe devices by CPU only.
Onboard LAN Port 1 (The number of “Onboard LAN Port x” varies with the PHY card.)	• **Enable** • Disable	Disabling an entry will prevent the associated device from being enumerated during boot. Greyout when “Onboard LAN” is [Disable]; Hidden when this port is not present. **Enable** is the default setting.
Onboard LAN Port 2 (The number of “Onboard LAN Port x” varies with the PHY card.)	• **Enable** • Disable	Disabling an entry will prevent the associated device from being enumerated during boot. greyout when “Onboard LAN” is [Disable]; Hidden when this port is not present. **Enable** is the default setting.

Enable/Disable Adapter Option ROM Support

Item	Options	Description
Onboard SATA	• **Auto** • Disable • UEFI • Legacy	Select whether UEFI or legacy option ROM of this device will be executed. [Disable] means both UEFI and legacy option ROM will not be executed. [UEFI] means only UEFI option ROM will be executed. [Legacy] means only legacy option ROM will be executed. [Auto] means option ROMs will be executed based on “System Boot Mode”, UEFI or legacy. When [Legacy] is selected, "Onboard Video" will also be changed to [Legacy] automatically and cannot be changed to other options. **Auto** is the default setting.
Onboard sSATA (for M.2 SATA mode)	• **Auto** • Disable • UEFI • Legacy	Select whether UEFI or legacy option ROM of this device will be executed. [Disable] means both UEFI and legacy option ROM will not be executed. [UEFI] means only UEFI option ROM will be executed. [Legacy] means only legacy option ROM will be executed. [Auto] means option ROMs will be executed based on “System Boot Mode”, UEFI or legacy. When [Legacy] is selected, "Onboard Video" will also be changed to [Legacy] automatically and cannot be changed to other options. **Auto** is the default setting.

Onboard Video	• **Auto** • Disable • UEFI • Legacy	Select whether UEFI or legacy option ROM of this device will be executed. [Disable] means both UEFI and legacy option ROM will not be executed. [UEFI] means only UEFI option ROM will be executed. [Legacy] means only legacy option ROM will be executed. [Auto] means option ROMs will be executed based on “System Boot Mode”, UEFI or legacy. **Auto** is the default setting.
Onboard LAN Port 1 (The number of “Onboard LAN Port x” varies with PHY card.)	• **Auto** • Disable • UEFI • Legacy	Select whether UEFI or legacy option ROM of this device will be executed. [Disable] means both UEFI and legacy option ROM will not be executed. [UEFI] means only UEFI option ROM will be executed. [Legacy] means only legacy option ROM will be executed. [Auto] means option ROMs will be executed based on “System Boot Mode”, UEFI or legacy. When [Legacy] is selected, "Onboard Video" will also be changed to [Legacy] automatically and cannot be changed to other options. **Auto** is the default setting.
Slot 1 (Display depending on which riser card is installed.)	• **Auto** • Disable • UEFI • Legacy	When card installed: Select whether UEFI or legacy option ROM of this device will be executed. [Disable] means both UEFI and legacy option ROM will not be executed. [UEFI] means only UEFI option ROM will be executed. [Legacy] means only legacy option ROM will be executed. [Auto] means option ROMs will be executed based on “System Boot Mode”, UEFI or legacy. When [Legacy] is selected, "Onboard Video" will also be changed to [Legacy] automatically and cannot be changed to other options. When there is NO card installed: Slot is empty **Auto** is the default setting.

Set Option ROM Execution Order

Item	Options	Description
Set Option ROM Execution Order **Notes:** • 1. “Onboard LAN Port x” depends on whether PHY card is installed or not. • 2. Slot 1~3 and Slot 5~6 will display depending on which riser card is installed.	• Onboard Video • Onboard SATA • Onboard sSATA • Onboard LAN • Slot 1 • Slot 2 • Slot 3 • Slot 4 • Slot 5 • Slot 6 • Slot 7 • Slot 8	Select the load order for legacy PCI option ROM(s). Use the + key to execute the selected devices ROM sooner or – key to execute later.

PCIe Gen1/Gen2/Gen3 Speed Selection

Item	Options	Description
Slot 1 (Display depending on which riser card is installed.)	• Gen1 • Gen2 • **Gen3**	Set the PCIe slot as Generation 1 or Generation 2 or Generation 3. **Note:** Some adapters may not operate correctly in Gen2 or Gen3. Make sure to power off and power on the system for these settings to take effect.
Slot 2 (Display depending on which riser card is installed.)	• Gen1 • Gen2 • **Gen3**	Set the PCIe slot as Generation 1 or Generation 2 or Generation 3. **Note:** Some adapters may not operate correctly in Gen2 or Gen3. Make sure to power off and power on the system for these settings to take effect.
Slot 7 (for RAID slot)	• Gen1 • Gen2 • **Gen3**	Set the PCIe slot as Generation 1 or Generation 2 or Generation 3. **Note:** Some adapters may not operate correctly in Gen2 or Gen3. Make sure to power OFF and power ON the system for these settings to take effect.

Console Redirection Settings

Item	Options	Description
COM Port 1	• **Enable** • Disable	Enable or disable COM 1 device. If [Disable] is selected, the associated COM1 terminal settings will be hidden. **Enable** is the default setting.
COM Port 2	• **Enable** • Disable	Enable or disable COM 2 device. If [Disable] is selected, the associated COM 2 terminal settings will be hidden. **Enable** is the default setting.
Console Redirection	• Enable • Disable • **Auto**	Set remote console redirection preference to enable or disable console redirection. While [Auto] is selected, console redirection will be enabled automatically if IPMI Serial over LAN status is active. **Auto** is the default setting.
Serial Port Sharing	• Enable • **Disable**	Enable the system Baseboard Management Controller to allow access to the system serial port. If this option is set to [Enable], the BMC will be allowed to control the serial communication port as requested by remote control commands. If sharing is [Disable], the serial port will be assigned to the BMC unless the “Serial Port Access Mode” is set to [Disable]. **Disable** is the default setting.

Serial Port Access Mode	• Shared • Dedicated • **Disable**	This option allows you to control the access the system Baseboard Management Controller has over the system serial port. 1. Shared mode: By selecting [Shared], the serial port will be available for POST and operating system use; however the BMC will/can monitor the serial data for a takeover control sequence. 2. Dedicated mode: By selecting [Dedicated], the BMC will have complete control of the serial port and POST and/or the operating system will not be able to use the serial port. 3. Disable mode: By selecting [Disable], the BMC will not have any access to the serial port. **Disable** is the default setting.
SP Redirection	• Enable • **Disable**	This option is only displayed while “Console Redirection”, “COM Port 1” and “COM Port 2” set to [Enable]. It allows you to choose which COM port to have the redirection. **Note:** Only show when set Console Redirection to Enable. **Disable** is the default setting.
Legacy OS/Option ROM Display	• COM Port 2 • **COM Port 1**	Select a COM port to display redirection of Legacy OS and Legacy OPROM Messages. **COM Port 1** is the default setting.
COM1 Settings	N/A	Settings required for serial connections used for asynchronous start-stop communication.
COM1 Baud Rate	• **115200** • 57600 • 38400 • 19200 • 9600	Control the connection speed between the host and remote system. **115200** is the default setting.
COM1 Data Bits	• **8** • 7	Set the number of Data bits in each character.
COM1 Parity	• **None** • Odd • Even	Select parity bit in each character to be [None], [Odd], or [Even]. [None] means that no parity bit is sent at all. **None** is the default setting.
COM1 Stop Bits	• 2 • **1**	Set Stop Bits. Stop Bits sent at the end of every character allow the signal receiver to detect the end of a character and to resynchronize with the character stream.
COM1 Terminal Emulation	• VT100 • VT-UTF8 • **ANSI**	Select [VT100] only if the remote emulator does not support ANSI text graphics. Consult the emulator documentation for more information. **ANSI** is the default setting. **Note:** If needed, change the character encoding setting in the remote emulator to ensure the characters show correctly.

COM1 Active After Boot	• Enable • **Disable**	When [Disable] is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When [Enable] is selected, then Legacy Console Redirection is enabled for legacy OS. "COM1 Active after Boot" and "COM2 Active after Boot" settings go together, and if you change one setting, it automatically changes the other. Disable is the default setting.
COM1 Flow Control	• **Disable** • Hardware	Select [Hardware] only if the remote emulator support and is using hardware flow control. Consult the emulator documentation for more information. **Disable** is the default setting.
COM2 Settings	N/A	Settings required for serial connections used for asynchronous start-stop communication.
COM2 Baud Rate	• **115200** • 57600 • 38400 • 19200 • 9600	Control the connection speed between the host and remote system. **115200** is the default setting.
COM2 Data Bits	• **8** • 7	Set the number of Data bits in each character.
COM2 Parity	• **None** • Odd • Even	Select parity bit in each character to be [None], [Odd], or [Even]. [None] means that no parity bit is sent at all. **None** is the default setting.
COM2 Stop Bits	• 2 • **1**	Set Stop Bits. Stop Bits sent at the end of every character allow the signal receiver to detect the end of a character and to resynchronize with the character stream.
COM2 Terminal Emulation	• VT100 • VT-UTF8 • **ANSI**	Select [VT100] only if the remote emulator does not support ANSI text graphics. Consult the emulator documentation for more information. **ANSI** is the default setting.
COM2 Active After Boot	• Enable • **Disable**	When [Disable] is selected, then Legacy Console Redirection is disabled before booting to legacy OS. When [Enable] is selected, then Legacy Console Redirection is enabled for legacy OS. "COM1 Active after Boot" and "COM2 Active after Boot" settings go together, and if you change one setting, it automatically changes the other. **Disable** is the default setting.
COM2 Flow Control	• **Disable** • Hardware	Select [Hardware] only if the remote emulator support and is using hardware flow control. Please consult the emulator documentation for more information. **Disable** is the default setting.

USB Configuration

Item	Options	Description
USB Mass Storage Driver Support	• **Enable** • Disable	Enable/Disable USB Mass Storage Driver Support. This setting only takes effect in post time. **Enable** is the default setting. **Notes:** If the USB Mass Storage Driver Support is disabled, • The GUI tool for UEFI Setup utilities is disabled, in this case, the UEFI Setup utilities can only be launched in text mode. • Some other features relying on the USB Mass Storage Driver Support might be disabled as well.
USB Front Port 1	• **Enable** • Disable	Enable/Disabe USB individual ports. **Enable** is the default setting.
USB Front Port 2	• **Enable** • Disable	Enable/Disabe USB individual ports. **Enable** is the default setting.
USB Rear Port 1	• **Enable** • Disable	Enable/Disabe USB individual ports. **Enable** is the default setting.
USB Rear Port 2	• **Enable** • Disable	Enable/Disabe USB individual ports. **Enable** is the default setting.

Intel® VMD technology

Item	Options	Description
Intel® VMDTechnology	N/A	Press Enter to bring up the Intel® VMD for Volume Management Device Configuration menu.
Enable/Disable Intel® VMD	• Enable • **Disable**	Enable/Disable Intel® Volume Management Device Technology. **Disable** is the default setting.

Driver health

This menu displays the health of the controllers in the system as reported by their corresponding drivers.

Table 5. Driver health details

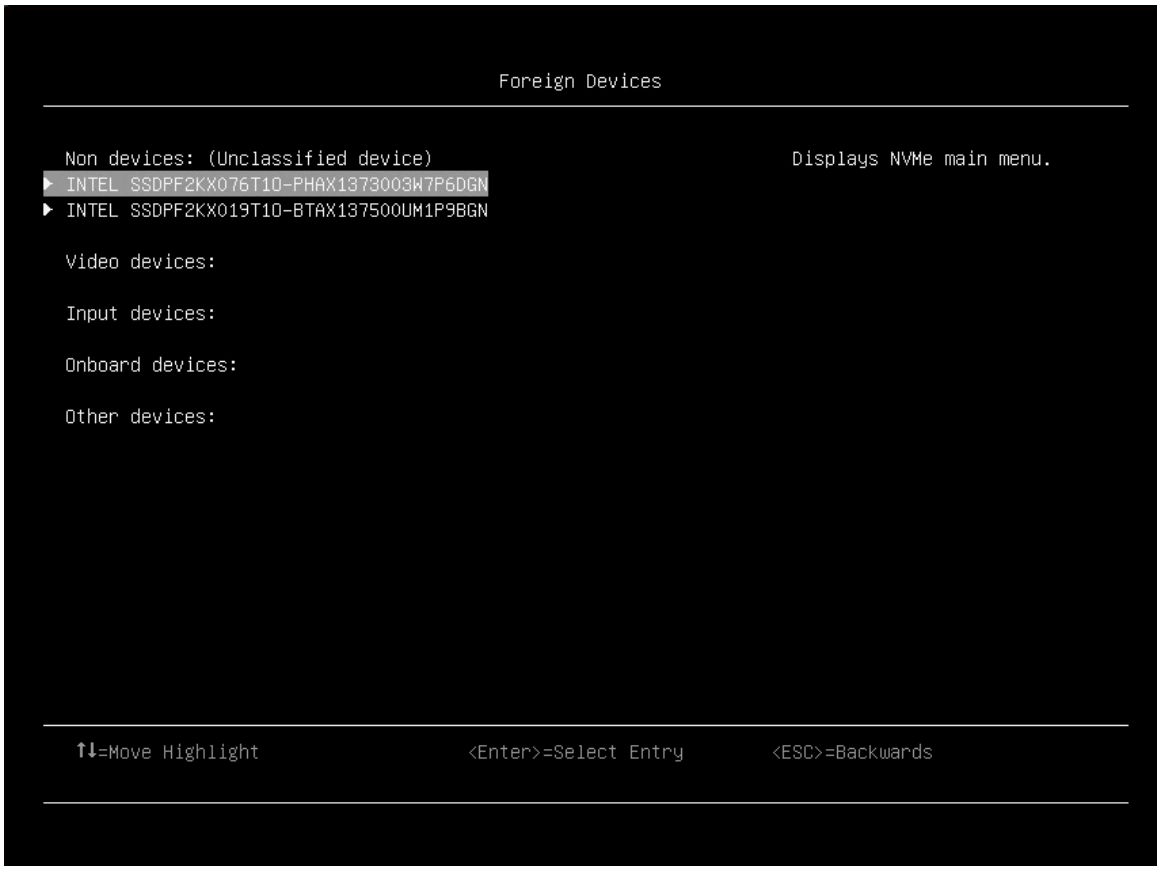
Item	Options	Description
The platform is:	The platform is: • **Healthy** • Repair Required • Configuration Required • Operation Failed • Reconnect Required • Reboot Required • Shutdown Required • No Operation Required	Select this option to view the health of the controllers in the system as reported by their corresponding drivers.
Driver/Controller Status		

Table 5. Driver health details (continued)

Controller Name - Status	• **Healthy** • Repair Required • Configuration Required • Operation Failed • Reconnect Required • Reboot Required • Shutdown Required • No Operation Required	Select this option to view the health of controller.
POST Attempts Driver	• **Healthy** • Repair Required • Configuration Required • Operation Failed • Reconnect Required • Reboot Required • Shutdown Required • No Operation Required	Select this option to view the health of post attempts driver.
Partition Driver (MBR/GPT/El Torito)	• **Healthy** • Repair Required • Configuration Required • Operation Failed • Reconnect Required • Reboot Required • Shutdown Required • No Operation Required	Select this option to view the health of partition driver.

Foreign Devices

This menu displays a list of foreign devices, including unclassified devices, video devices, input devices, onboard devices, and other devices.



Notes:

- Depending on your system configuration (for example, which device is installed), this page might look slightly different from the image.

Table 6. Foreign devices details

Item	Options	Description
Non devices: (Unclassified device)	N/A	Display installed device information dynamically.
Video devices	N/A	
Input devices	N/A	
Onboard devices	N/A	
Other devices	N/A	

Legacy BIOS

This menu configures system UEFI firmware execution environment preferences for supporting legacy OS and legacy Option ROM.

Table 7. Legacy BIOS details

Item	Options	Description
Legacy BIOS	• **Enable** • Disable	Enable/Disable the system UEFI firmware execution environment for supporting legacy OS and legacy Option ROM. **Enable** is the default setting.
Rehook INT 19h	• Enable • **Disable**	[Enable] prevents devices from taking control of the boot process. **Disable** is the default setting.
Non-Onboard PXE	• **Enable** • Disable	Enable/Disable legacy PXE boot for installed network adapters. **Enable** is the default setting.

Memory

This menu displays and provides options to change the memory setting.

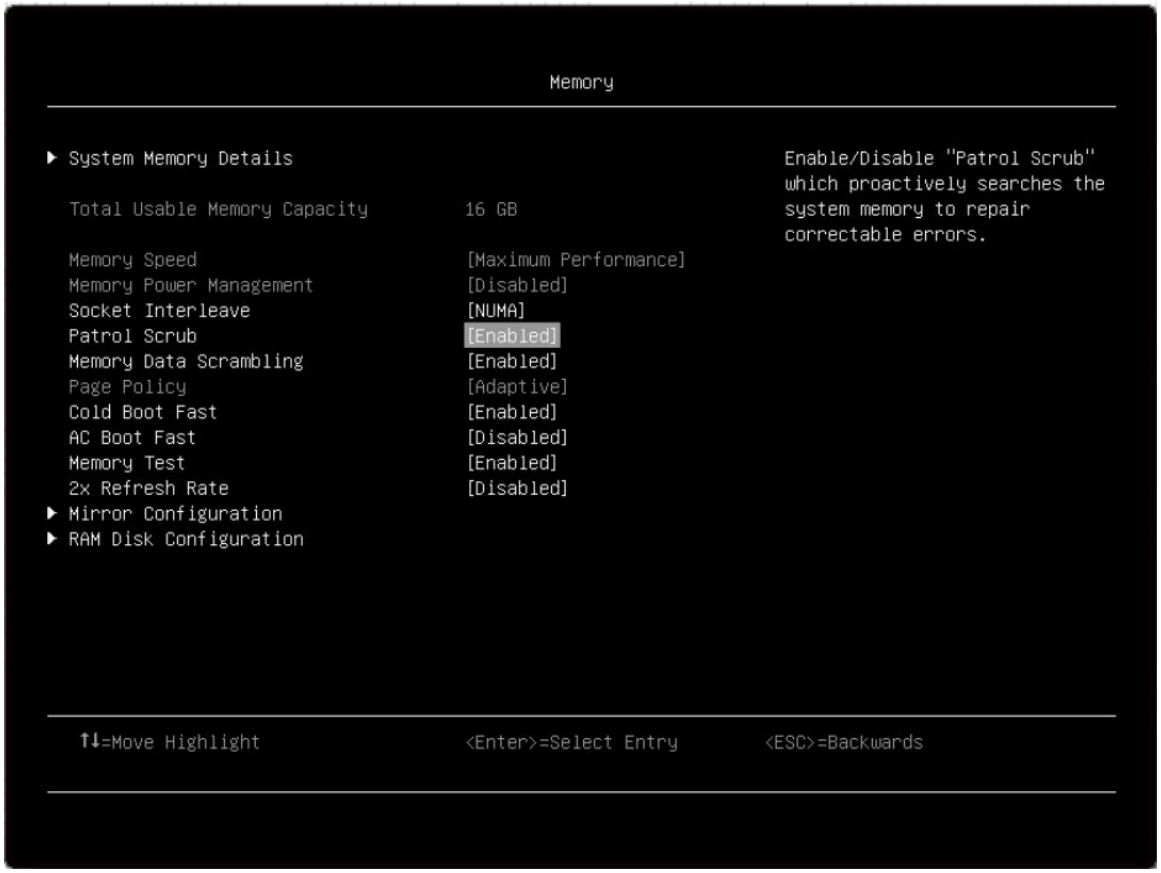


Table 8. Memory details

Item	Options	Description
System Memory Details	N/A	Provides status of System Memory.
Total Usable Memory Capacity	yyyy GB	Display the total usable memory capacity.
Mirror Mode	• **Disable** • Full • Partial **Note:** Partial is only available on Intel Xeon Gold, Platinum processors.	**For Intel Xeon Bronze, Silver processors** Mirror Type configures the system hardware to shadow all memory writes to secondary memory. Full mirroring reduces the available system memory by half of the total installed memory. **For Intel Xeon Gold, Platinum processors** Mirror Type configures the system hardware to shadow all memory writes to secondary memory. Full mirroring reduces the available system memorprocessoty by half of the total installed memory. Partial mirroring reduces the available system memory by a maximum of 36 GB per **Disable** is the default setting.
Mirror below 4GB	• **Disable** • Enable	Mirrors all available system memory below the 4GB address limit when enabled; typically 1 to 3 GB.
Sparing	• **Disable** • Enable	Rank Sparing is supported but default mode of leaving it disabled as ADDDC gives a similar protection without losing capacity. **Disable** is the default setting.

Table 8. Memory details (continued)

Memory Speed	• Minimal Power • Balanced • **Max Performance**	Select the desired memory speed. [Maximum Performance] mode maximizes performance. [Balanced] mode offers a balance between performance and power. [Minimal power] mode maximizes power savings. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, choose [Custom Mode] in "Operating Mode" located under "System Setting" submenu. **Max Performance** is the default setting.
Memory Power Management	• Automatic • **Disable**	[Disable] provides maximum performance but minimum power savings. [Automatic] is suitable for most applications. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in "Operating Mode" located under "System Setting" submenu. **Disable** is the default setting.
Socket Interleave	• **NUMA** • Non-NUMA	Sets Socket Interleave to NUMA(Non Unified Memory Architecture) or Non-NUMA. [NUMA]: Memory is not interleaved across processors. [Non-NUMA]: Memory is interleaved across processors. **Note:** Changing this setting will require a Power Good reset to take effect.
Patrol Scrub	• **Enable** • Disable	Enable/Disable "Patrol Scrub" which proactively searches the system memory to repair correctable errors. **Enable** is the default setting.
Memory Data Scrambling	• **Enable** • Disable	Memory Data Scrambling Disable/Enable. **Enable** is the default setting.
ADDDC Sparing	• **Disable** • Enable	Enable/Disable ADDDC Sparing. This setting is [Disable] and grayed out when **Page Policy** is [Adaptive]. Enabling ADDDC may cause reduced reliability of memory error correction in virtual lockstep under rare conditions. **Disable** is the default setting. **Note:** When the system uses x8 Dimm, this item will be hidden.
Page Policy	• **Adaptive** • Closed	Adaptive Page Policy can improve performance for applications with a highly localized memory access pattern; Closed Page Policy can benefit applications that access memory more randomly. This setting is [Closed] and grayed out when **ADDDC Sparing** is [Enable]. **Adaptive** is the default setting.
Cold Boot Fast	• **Enable** • Disable	Enable/Disable "Cold Boot Fast". **Enable** is the default setting.
Memory Test	• **Automatic** • Disable • Enable	[Enable] Enables memory test during normal boot. [Disable] - Disables this feature. [Automatic] - Skip memory test by default unless memory configuration changed or greater than 90 days since last time test ran. **Automatic** is the default setting.

Table 8. Memory details (continued)

2x Refresh Rate	• **Disabled** • Auto	• **Disabled**: the memory refresh rate of the system is 1x. • **Auto**: the memory refresh rate is 2x if the system supports. Choose a memory refresh rate of 2x to mitigate the rowhammer issue that may have a performance side effect. **Note:** When the system has 16Gb 3DS LRDIMM/RDIMM or 16Gb Quad Rank LRDIMMS, 2x refresh rate is not supported.
Refresh Watermarks	• **Auto** • Low WM	• [Low WM] can mitigate power delivery issues with 128 GB or larger DIMM, and also mitigate failures caused by rowhammer traffic patterns. • [Auto] will use Low Watermarks for 2 DIMM per channel configuration with 3DS non-LRDIMM 16 Gb DIMM, and use High Watermarks for other DIMM configurations.
Mirror Configuration	N/A	Display and configure memory mirror state. **Note: Mirror Configuration** can be configured only when **ADDDC Sparing** is disabled and memory population meets requirements.
RAM Disk Configuration	N/A	Press Enter to create/remove RAM disks.

Mirror Configuration

Item	Options	Description
Configuration Made From OS	N/A	Show the memory mirror configuration state that was defined from OS utility. When a definition is found, you can use **Delete Configuration Made From OS** to clear it.
Mirror Below 4GB	N/A	Display the mirroring configuration of memory below 4 GB. **Note:** This option may be **TRUE** or **FALSE** after the OS has configured **Mirror**.
Partial Mirror Ratio In Basis Points	N/A	Display the memory mirror ratio for the memory above 4 GB in basis points value. The valid range is 1 – 5000, meaning 0.01% to 50%. For example, to mirror 12.75% of memory, input the value 1275. **Note:** After the OS is configured Mirror, this option may display a range of 1 – 5000.
Delete OS Configuration	• **No** • **Yes**	Remove the memory mirror configuration that was made from OS utility. System reboot is required to take effect. **Notes:** • This item only exists if the OS is configured **Mirror**. • If you select **Yes** to delete the item, it will be hidden.
Configuration Made From UEFI	N/A	Show the memory mirror configuration state that was defined from UEFI system utility. In case of conflicting configuration values from OS and UEFI, the values from OS take precedence.

Full Mirror	• **Disable** • Enable	Full mirroring reduces the available system memory by half of the total installed memory.
Partial Mirror	• **Disable** • Enable	Partial mirroring reduces the available system memory by percentage of up to 50% per processor. The percentage is set by **Partial Mirror Ratio In Basis Points**. **Note:** Partial Memory Mirroring is a sub-function of memory mirroring. It requires to follow the memory population for memory mirroring.
Mirror Below 4GB	• **Disable** • Enable	Mirrors all available system memory below the 4GB address limit when enabled; typically 1 to 3 GB. **Note:** Note: This item is only displayed when “Partial Mirror” is set to Enabled.
Partial Mirror Ratio In Basis Points	**200**	Configure the memory mirror ratio for the memory above 4 GB in basis points value. The valid range is 1 – 5000, meaning 0.01% to 50%. For example, to mirror 12.75% of memory, input the value 1275. **Note:** This item is only displayed when “Partial Mirror” is set to Enabled.

RAM Disk Configuration

Item	Options	Description
Disk Memory Type	• **Boot Service Data** • Reserved	Specify type of memory to use from available memory pool in system to create a disk. **Boot Service Data** is the default setting.
Create raw	N/A	Create a raw RAM disk.
Create from file	N/A	Create a RAM disk from a given file.
Create RAM disk list	N/A	Specify RAM disk list.
Remove selected RAM disk(s)	N/A	Remove selected RAM disk(s)

Network

This menu displays network devices and network related setting.

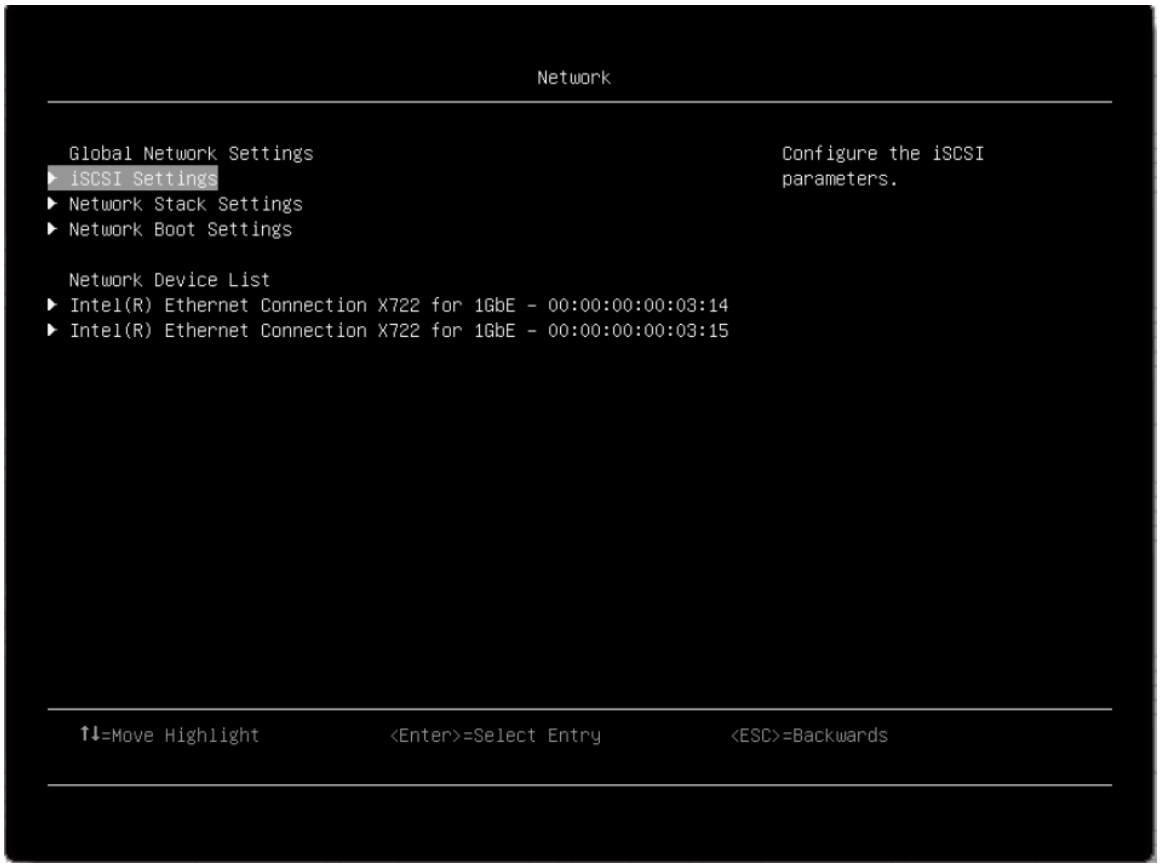


Table 9. Network details

Item	Options	Description
Global Network Settings	N/A	Specify global network settings.
iSCSI Settings	N/A	Configure the iSCSI parameters.
Network Stack Settings	N/A	Specify Network Stack Settings.
Network Boot Settings	N/A	Configure the network boot parameters
Network Device List	N/A	Specify network device list.

iSCSI Settings

Item	Options	Description
iSCSI Initiator Name	Iqn.1986-03.com.example	The worldwide unique name of iSCSI Initiator. Only IQN format is accepted. Range is from 4 to 233.
Add an Attempt	N/A	Add an Attempt
List of Attempts. **Note:** Only appears when attempts exist. Selecting an item will lead to Attempt Configuration page in 2.1.10.1.1.1.	N/A	MAC: XX:XX:XX:XX:XX:XX, PFA: Bus XX | Dev XX | Func XX, “iSCSI Mode”: [%s1], “Internet Protocol”: [%s2] Exact value will be different depends on the attempt settings. %s1 will be option name for iSCSI Mode. %s2 will be the setting name for Internet Protocol.

Delete Attempts	N/A	Delete one or more attempts
Change Attempt Order	N/A	Change the order of Attempts using +/- keys. Use arrow keys to select the attempt then press +/- to move the attempt up/down in the attempt order list.

Network Stack Settings

Item	Options	Description
Network Stack	• **Enable** • Disable	Enable/Disable UEFI Network Stack. **Enable** is the default setting.
IPv4 PXE Support	• **Enable** • Disable	Enable IPv4 PXE Boot Support. If disabled IPv4 PXE boot option will not be created. **Enable** is the default setting.
IPv4 HTTP Support	• Enable • **Disable**	Enable IPv4 HTTP Boot Support. If disabled IPv4 HTTP boot option will not be created. **Enable** is the default setting.
IPv6 PXE Support	• **Enable** • Disable	Enable IPv6 PXE Boot Support. If disabled IPv6 PXE boot option will not be created. **Enable** is the default setting.
IPv6 HTTP Support	• Enable • **Disable**	Enable IPv6 HTTP Boot Support. If disabled IPv6 HTTP boot option will not be created. **Disable** is the default setting.
PXE boot wait time	0	Wait time in seconds to press ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value. **Notes:** When inputting an invalid value, the following popup message box will show up: • ERROR • Invalid Input Range • Ok
Media detect count	1	Number of times presence of media will be checked. Use either +/- or numeric keys to set the value. **Notes:** When inputting an invalid value, the following popup message box will show up: • ERROR • Invalid Input Range • Ok

Network Boot Settings

Item	Options	Description
List of NICs in the system e.g. MAC:XX:XX:XX:XX:XX:XX Onboard PFA XX:XX:XX	N/A	Set the boot configuration parameters on MAC XX:XX:XX:XX:XX:XX PCI Function Address: Bus XX:Dev XX:Func: XX

Operating modes

Select the operating mode bases on your preference.

Table 10. Operating modes details

Item	Options	Description
Choose Operating Mode	• Minimal Power • Efficiency – Favor Power • **Efficiency – Favor Performance** • Custom Mode • Maximum Performance	Select the operating mode based on your preference. Power savings and performance are also highly dependent on hardware and software running on the system. **Efficiency – Favor Performance** is the default setting.
Memory Speed	• Minimal Power • Balanced • **Max Performance**	Select the desired memory speed. [Maximum performance] mode maximizes performance. [Balanced] mode offers a balance between performance and power. [Minimal power] mode maximizes power savings. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, choose [Custom Mode] in “Operating Mode located under “System Setting” submenu. **Max Performance** is the default setting.

Table 10. Operating modes details (continued)

Memory Power Management	• Automatic • **Disabled**	[Disabled] provides maximum performance but minimum power savings. [Automatic] is suitable for most applications. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, choose [Custom Mode] in "Operating Mode" located under "System Setting" submenu. **Disabled** is the default setting.
CPU P-state Control	• None • Legacy • **Autonomous** • Cooperative	Select the method to control CPU P-states (performance states). [None] disables all P-states and the CPUs run at either their rated frequency or in turbo mode (if turbo is enabled). When [Legacy] is selected, the CPU P-states will be presented to the operating system (OS) and the OS power management (OSPM) will directly control which P-state is selected. With [Autonomous], the P-states are controlled fully by system hardware. No P-state support is required in the OS or VM. [Cooperative] is a combination of Legacy and Autonomous. The P-states are still controlled in hardware but the OS can provide hints to the hardware for P-state limits and the desired setting. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Autonomous** is the default setting.
C1 Enhanced Mode	• **Enable** • Disable	Enabling C1E (C1 enhanced) state can save power by halting CPU cores that are idle. An operating system that supports C1E state must be installed to take advantage of this feature. Changing this setting takes effect after the next reboot. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” and [Legacy]/[Disable] in “C-States” located under “System Setting” submenu. C1E is changeable only when C-state is not **Autonomous**. **Enable** is the default setting.
UPI Link Frequency	• Minimal Power • Balanced • **Max Performance**	Select the desired CPU UPI link frequency. [Maximum Performance] mode maximizes performance. [Balanced] mode offers a balance between performance and power. [Minimal Power] maximizes power savings. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Max Performance** is the default setting.

Table 10. Operating modes details (continued)

UPI Link Disable	• **Enable All Links** • Disable 1 Link	Disabling one of the CPU UPI links can save power. If maximum performance is desired, all UPI links should be left enabled. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Enable All Links** is the default setting.
Turbo Mode	• **Enable** • Disable	Enabling turbo mode can boost the overall CPU performance when all CPU cores are not being fully utilized. A CPU core can run above its rated frequency for a short period of time when it is in turbo mode. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Enable** is the default setting.
Energy Efficient Turbo	• **Enable** • Disable	When energy efficient turbo is enabled, the CPU’s optimal turbo frequency will be tuned dynamically based on CPU utilization. The power/performance bias setting also influences energy efficient turbo. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” and [Enable] in "Turbo Mode" located under “System Setting” submenu. **Enable** is the default setting.
C-States	• Legacy • **Autonomous** • Disable	C-states reduce CPU idle power. When [Legacy] is selected, the operating system initiates the C-state transitions. For E5/E7 CPUs, ACPI C1/C2/C3 map to Intel C1/C3/C6. For 6500/7500 CPUs, ACPI C1/C3 map to Intel C1/C3 (ACPI C2 is not available). Some OS SW may defeat the ACPI mapping (e.g. intel_idle driver). When [Autonomous] is selected, HALT and C1 request get converted to C6 requests in hardware. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Autonomous** is the default setting.

Table 10. Operating modes details (continued)

Power/Performance Bias	• **Platform Controlled** • OS Controlled	Power/Performance bias determines how aggressively the CPU will be power managed and placed into turbo. With [Platform Controlled], the system controls the setting. Selecting [OS Controlled] allows the operating system to control it. Not all OSes support this feature. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Platform Controlled** is the default setting.
Platform Controlled Type	• Maximum Performance • **Efficiency - Favor Performance** • Minimal Power	[Maximum Performance] allows the most aggressive use of turbo and power management functions are disabled, thereby increasing power consumption. [Minimal Power] disables turbo and maximizes the use of power management features. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Efficiency - Favor Performance** is the default setting.
Page Policy	• Adaptive • **Closed**	Adaptive Open Page Policy can improve performance for applications with a highly localized memory access pattern; Closed Page Policy can benefit applications that access memory more randomly. **Closed** is the default setting.
MONITOR/MWAIT	• **Enable** • Disable	MONITOR/MWAIT instructions are used to engage C-states. Some operating systems will re-enable C-states even when they are disabled in setup. To prevent this, disable MONNITOR/MWAIT, choose [Custom Mode] in “Operating Mode” and [Disable] in "C-States" located under “System Setting” submenu. This item can be changed after the steps as below. • 1. Operating Modes -> Custom • 2. C-states -> Disable **Enable** is the default setting.
UPI Power Management	N/A	Select the desired power management level for the CPU UPI interface. L1 saves the most power but has longer latency compared to L0p or Disabled. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu.

Power

Use this menu to configure power scheme options.

Table 11. Power details

Item	Options	Description
Power/Performance Bias	• **Platform Controlled** • OS Controlled	Power/Performance bias determines how aggressively the CPU will be power managed and placed into turbo. With [Platform Controlled], the system controls the setting. Selecting [OS Controlled] allows the operating system to control it. Not all OSes support this feature. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Platform Controlled** is the default setting.
Platform Controlled Type	• Maximum Performance • **Efficiency - Favor Performance** • Efficiency - Favor Power • Minimal Power	[Maximum Performance] allows the most aggressive use of turbo and power management functions are disabled, thereby increasing power consumption. [Minimal Power] disables turbo and maximizes the use of power management features. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Efficiency - Favor Performance** is the default setting.

Table 11. Power details (continued)

Workload Configuration	• **Balanced** • I/O sensitive	I/O sensitive should be used with expansion cards that require high I/O bandwidth when the CPU cores are idle to allow enough frequency for the workload. **Balanced** is the default setting.
ACPI Fixed Power Button	• **Enable** • Disable	Enable/Disable ACPI Fixed Power Button. When setting as disabled, physically pressing the power button on front of the system won't execute the Operating System's Power Button Policy such as shutdown, turn off monitor, etc. Also, when disabled the 'Shut down OS and ..." options under the iMM Server Power Actions feature will be disabled. **Enable** is the default setting.
Zero Output	• **Disable** • Advance Mode	When zero output is enabled and multiple power supplies are installed in the server, some of the PSUs will be automatically placed into a low power state under light load conditions. This helps to save power. **Disable** is the default setting.

Processors

This menu displays and provides options to change the processor settings.

Table 12. Processors details

Item	Options	Description
Processor Details	N/A	Displays summary of the installed processors.
Turbo Mode	• **Enable** • Disable	Enabling turbo mode can boost the overall CPU performance when all CPU cores are not being fully utilized. A CPU core can run above its rated frequency for a short period of time when it is in turbo mode. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Enable** is the default setting. **Note:** If CPU doesn’t support the feature, it won’t show.
CPU P-state Control	• None • Legacy • **Autonomous** • Cooperative	Select to control CPU P-states (performance states). [None] disables all P-states and the CPUs run at either their rated frequency or in turbo mode (if turbo is enabled). When [Legacy] is selected, the CPU P-states will be presented to the operating system (OS) and the OS power management (OSPM) will directly control which P-state is selected. With [Autonomous], the P-states are controlled fully by system hardware. No P-state support is required in the OS or VM. [Cooperative] is a combination of Legacy and Autonomous. The P-states are still controlled in hardware but the OS can provide hints to the hardware for P-state limits and the desired setting. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Autonomous** is the default setting.
C-States	• Legacy • **Autonomous** • Disable	C-states reduce CPU idle power. When [Legacy] is selected, the operating system initiates the C-state transitions. For E5/E7 CPUs, ACPI C1/C2/C3 map to Intel C1/C3/C6. For 6500/7500 CPUs, ACPI C1/C3 map to Intel C1/C3 (ACPI C2 is not available). Some OS SW may defeat the ACPI mapping (e.g. intel_idle driver). When [Autonomous] is selected, HALT and C1 request get converted to C6 requests in hardware. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in "Operating Mode" located under "System Setting" submenu. **Autonomous** is the default setting.

Table 12. Processors details (continued)

C1 Enhanced Mode	• **Enable** • Disable	Enabling C1E (C1 enhanced) state can save power by halting CPU cores that are idle. An operating system that supports C1E state must be installed to take advantage of this feature. Changing this setting takes effect after the next reboot. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” and [Legacy]/ [Disable] in “C-States” located under “System Setting” submenu. **Enable** is the default setting. **Note:** C1E can only be changeable when C-state is not “Autonomous”
Hyper-Threading	• **Enable** • Disable	Enable Hyper Threading (Software Method to Enable/ Disable Logical Processor threads). **Enable** is the default setting. **Notes:** • Changing this setting will require a Power Good reset to take effect. • If CPU doesn’t support the feature, it won’t show.
Execute Disable Bit	• **Enable** • Disable	The execute disable bit allows memory to be marked as executable or non-executable when used with a supporting operating system. This can improve system security by configuring the processor to raise an error to the operating system when code attempts to run in non-executable memory. **Enable** is the default setting.
Trusted Execution Technology	• Enable • **Disable**	Enable Intel Trusted Execution Technology (Intel TXT). **Disable** is the default setting.
Intel Virtualization Technology	• **Enable** • Disable	Enable the Virtualization Technology. **Enable** is the default setting.
Hardware Prefetcher	• **Enable** • Disable	Lightly threaded applications and some benchmarks can benefit from having the hardware prefetcher enabled. **Enable** is the default setting.
Adjacent Cache Prefetch	• **Enable** • Disable	Lightly threaded applications and some benchmarks can benefit from having the adjacent cache line prefetch enabled. **Enable** is the default setting.
DCU Streamer Prefetcher	• **Enable** • Disable	Lightly threaded applications and some benchmarks can benefit from having the DCU streamer prefetcher enabled. **Enable** is the default setting.
DCU IP Prefetcher	• **Enable** • Disable	DCU IP prefetcher is typically best left enabled for most environments. **Enable** is the default setting.
DCA	• **Enable** • Disable	DCA capable I/O devices such as network controllers can place data directly into the CPU cache, which improves response times. **Enable** is the default setting.

Table 12. Processors details (continued)

Energy Efficient Turbo	• **Enable** • Disable	When energy efficient turbo is enabled, the CPU's optimal turbo frequency will be tuned dynamically based on CPU utilization. The power/performance bias setting also influences energy efficient turbo. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in "Operating Mode" and [Enable] in "Turbo Mode" located under "System Setting" submenu. **Enable** is the default setting.
Uncore Frequency Scaling	• **Enable** • Disable	When enabled, the CPU uncore will dynamically change speed based on the workload. All miscellaneous logic inside the CPU package is considered to be the uncore. **Enable** is the default setting.
MONITOR/MWAIT	• **Enable** • Disable	MONITOR/MWAIT instructions are used to engage C-states. Some operating systems will re-enable C-states even when they are disabled in setup. To prevent this, disable MONNITOR/MWAIT. Please choose [Custom Mode] in "Operating Mode" and [Disable] in "C-States" located under "System Setting" submenu. **Enable** is the default setting. This item can be changed after the steps as below. • 1. Operating Modes -> Custom • 2. C-states -> Disable
UPI Link Disable	• **Enable All Links** • Disable 1 Link	Disabling one of the CPU UPI links can save power. If maximum performance is desired, all UPI links should be left enabled. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in "Operating Mode" located under "System Setting" submenu. **Enable All Links** is the default setting.
SNC	• Enable • **Disable**	SNC (sub NUMA cluster) partitions the cores and last level cache into clusters with each cluster bound to a set of memory controllers in the system. SNC improves average latency to the last level cache. **Disable** is the default setting.
Snoop Preference	• **Home Snoop Plus** • Home Snoop	Select the appropriate snoop mode based on the workload. Setting the snoop mode preference does not always guarantee that it will be selected. The mode will be changed if the current hardware configuration does not support the desired mode. Also not that SNC has priority over the snoop mode. **Home Snoop Plus** is the default setting.

Table 12. Processors details (continued)

XPT Prefetcher	• **Enable** • Disable	XPT prefetch is a mechanism that enables a read request that is being sent to the last level cache to speculatively issue a copy of that read to the memory controller prefetching. **Enable** is the default setting.
UPI Prefetcher	• **Enable** • Disable	UPI prefetch is a mechanism to get the memory read started early on DDR bus. The UPI receive path will spawn a memory read to the memory controller prefetcher. **Enable** is the default setting.
LLC Prefetch	• Disable • **Enable**	F1 LLC prefetcher is an additional prefetch mechanism on top of the existing prefetchers that prefetch data into the core DCU and MLC. Enabling LLC prefetch gives the core prefetcher the ability to prefetch data directly into the LLC without necessarily filling into the MLC.
L2 RFO Prefetcher	• **Auto** • Disable	One of 4 variables (IRQThreshold, StaleAtoS, CRQoSConfiguration, L2RFOPrefetchDisable) used to optimize performance for SAP HANA on servers with 2-hop memory configurations such as 4-socket ring, 6-socket and 8-socket configurations. The Auto option makes the L2 prefetcher less aggressive and lowers NT write bandwidth. The Disabled menu option limits burstiness and reduces snooping.
Cores in CPU Package	• **All** • 1 • . • . • . • n-1	Select the amount of cores enabled within each CPU Package. **All** is the default setting. n is the maximum number of cores that installed processor support. For example, if the installed processor support 6 cores, it will show All, 1, 2, 3 4, and 5.
UPI Link Frequency	• Minimal Power • Balanced • **Maximum Performance**	Select the desired CPU UPI link frequency. [Maximum Performance] mode maximizes performance. [Balanced] mode offers a balance between performance and power. [Minimal Power] maximizes power savings. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu. **Maximum Performance** is the default setting.

Table 12. Processors details (continued)

UPI Power Management	N/A	Select the desired power management level for the CPU UPI interface. L1 saves the most power but has longer latency compared to L0p or Disabled. When a preset mode is selected, the low-level settings are not changeable and will be grayed out. If user would like to change the settings, please choose [Custom Mode] in “Operating Mode” located under “System Setting” submenu.
CPU Frequency Limits	N/A	The maximum frequency (turbo, AVX, and non turbo) can be restricted to a frequency that is between the maximum turbo frequency for the CPU installed and 1.2GHz. This can be useful for synchronizing CPU tasks. Note that the max frequency for N+1 cores cannot be higher than N cores. If an illegal frequency is entered, it will automatically be limited to a legal value. If the CPU frequency limits are being controlled through application software, leave this menu item at the default ([Full turbo uplift]),please choose [Custom Mode] in "Operating Mode" and [Enable] in "Turbo Mode" located under "System Setting" submenu.

Recovery and RAS

Use this menu to configure recovery policies and advanced reliability, availability, and serviceability settings.

POST Attempts

Item	Options	Description
Post Attempt Limit	• Disable • 9 • 6 • **3**	Configure the number of attempts to POST before the recovery mechanism is invoked. When the number of consecutive failed POST attempts reaches the limit, the system will reboot with the factory default settings. **3** is the default setting.

Note: You may encounter some message boxes when post attempts. Follow the message for setup.

Advanced RAS

Item	Options	Description
Machine Check Recovery	• **Enable** • Disable	Enable software layers (OS, VMM, DBMS, Application) to assist in system recovery from hardware uncorrectable error. **Enable** is the default setting.
PCI Error Recovery	• Enable • **Disable**	Allow the system to recover from an uncorrectable PCIe fault when enabled. The faulting PCIe device will be disabled for error containment and the OS will be notified to rescan the PCIe buses. **Disable** is the default setting. An uncorrectable PCIe fault will result in an NMI when disabled.
PCIe Endpoint Reset on Fatal Error	• Enable • **Disable**	PCIe Endpoint Reset On Fatal Error. **Disable** is the default setting.

Disk GPT Recovery

Item	Options	Description
Disk GPT Recovery	• Automatic • Manual • **None**	[Automatic] means that system UEFI will automatically repair the corrupt GUID Partition Table (GPT). [Manual] means that system UEFI will only repair the corrupt GPT based on user input to a message box. [None] means the system UEFI will not repair the corrupted GPT. Recovery result can be retrieved from the system event log. **None** is the default setting.

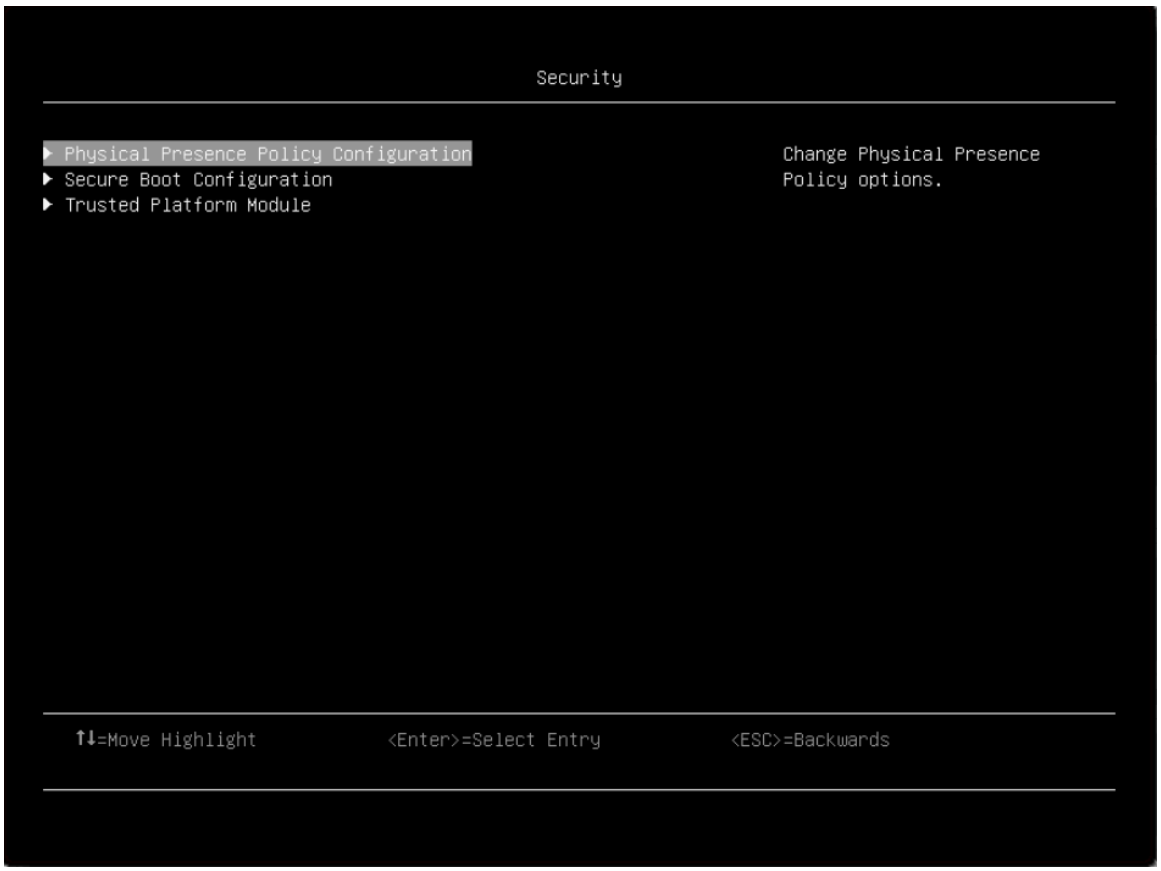
System Recovery

Item	Options	Description
POST Watchdog Timer	• Enable • **Disable**	Enable/Disable POST Watchdog Timer. **Disable** is the default setting.

POST Watchdog Timer Value	[5]	Enter POST loader Watchdog timer value in minutes from the specified range (5-20).
Reboot System On NMI	• **Enable** • Disable	Enable/Disable reboot of the system during non-maskable interrupt. **Enable** is the default setting. **Notes:** • If NMI is triggered by NMI button as diagnostic interrupt, XCC will only drive NMI without reboot action. • If NMI is triggered by XCC WebUI/IPMIcmd as software NMI, XCC will perform action based on setting. The default reboot timeout is 60 seconds.

Security

Use this menu to configure system security settings.



Physical Presence Policy Configuration

Item	Options	Description
Physical Presence Policy	• **Enabled** • Disabled	Enable/Disable "Remote Physical Presence Policy". **Enabled** is the default setting. The option is modifiable when "Physical Presence State" is asserted. Enabled allows Remote Physical Presence to be asserted without the need for Hardware Physical Presence. Once enabled, a time-out value is used to assert the policy for a specified number of minutes. **Note:** If moved to the Disabled state, it will require Hardware Physical Presence to re-enable this policy.
Minutes To Assert	30	Number of minutes (range 1-100) to have Remote Physical Presence asserted. Physical Presence Policy must be Enabled and a value set to have remote physical Presence asserted. NOTE: This is not a count down value.
Physical Presence State	• Hardware Physical Presence Asserted • Remote Physical Presence Asserted • Hardware and Remote Physical Presence are Asserted • **De-asserted**	If Hardware Physical Presence Jumper is Asserted, the only way to de-assert Physical Presence is to change the jumper on the planar. Asserting allows Physical Presence to be set for a duration listed in minutes even if Hardware Physical Presence Jumper is not asserted. Asserting does not require a reboot. Both the Hardware Physical Presence Jumper on the planar and the Remote Physical Presence are Asserted. De-asserting turns off Physical Presence (unless the HW Physical Presence Jumper is asserted). De-asserting does not require a reboot. **De-asserted** is the default setting
Toggle Remote Physical Presence Assert	N/A	Switch the Remote Physical Presence between Assert and De-assert when "Physical Presence Policy" is enabled. The option is NOT modifiable when "Physical Presence Policy" is disabled.

Secure Boot Configuration

Item	Options	Description
Physical Presence	• Asserted • **De-asserted**	Display the current Physical Presence status. Physical Presence is a form of authorization to perform certain security functions. [Asserted] means being authorized. ”Secure Boot Setting” and “Secure Boot Policy” is modifiable when “Physical Presence” is asserted. **De-asserted** is the default setting **Note:** When the setting is De-asserted, the whole page is grayed.
Secure Boot Status	• **Disabled** • Enabled	Display the current secure boot status. **Disabled** is the default setting.
Secure Boot Mode	• Setup Mode • **User Mode**	System will do secure boot authentication when “Secure Boot Mode” is [User Mode] and secure boot is enabled. **User Mode** is the default setting.
Secure Boot Setting	• Enable • **Disable**	Enable/Disable secure boot. This setting is modifiable when “Physical Presence” is asserted and cannot be loaded to default in Setup Utility. **User Mode** is the default setting. **Notes:** • When you attempt to enable secure boot while CSM is enabled, there is a prompt to tell you. • Legacy BIOS will be disabled when secure boot is enabled. • When you fail to change secure boot settings, verify physical presence and retry.
Secure Boot Policy	• **Factory Policy** • Custom Policy • Delete All Keys • Delete PK • Reset All Keys to Default	This setting is modifiable when "Physical Presence" is asserted and cannot be loaded to default in Setup Utility. [Factory Policy]: Factory default keys will be used after reboot. **Factory Policy** is the default setting. [Custom Policy]: Customized keys will be used after reboot. [Delete All Keys]: PK, KEK, DB and DBX will be deleted after reboot. [Delete PK]: PK will be deleted after reboot. "Secure Boot Mode" is [Setup Mode] and "Secure Boot Policy" is [Custom Policy] after PK is deleted. [Reset All Keys to Default]: All the keys will be set to factory defaults and "Secure Boot Policy" is [Factory Policy] after reboot.

View Secure Boot Keys	N/A	View the details of PK(Platform Key) , KEK (Key Exchange Key) , DB (Authorized Signature Database) and DBX (Forbidden Signature Database).
Secure Boot Custom Policy	N/A	Customize PK (Platform Key), KEK (Key Exchange Key), DB (Authorized Signature Database) and DBX (Forbidden Signature Database). User could enter this page when “Secure Boot Policy” is [Custom Policy].

Trusted Platform Module (TPM 2.0)

Item	Options	Description
TPM 2.0	N/A	Configure the TPM 2.0 Setup options. Click this menu to see more information about TPM 2.0.
Update to TPM1.2 compliant	N/A	Update to TPM 1.2. **Notes:** • Change is effective after system reboot and physical presence confirmed. You can only switch TPM firmware 128 times. • Click this button, a pop-up warning message will show up to confirm the action. • When NationZ TPM20 card is plugged in, this item will disappear. • Update to TPM1.2 compliant is a significant change to the system since TPM 1.2 and 2.0 are not compatible. All keys and encrypted data will be lost.
SHA-1 PCR Bank	Enabled/Disabled	Enable or Disable SHA-1 PCR Bank.

Trusted Platform Module (TPM 1.2)

Item	Options	Description
TPM 1.2	N/A	Configure the TPM 1.2 Setup options. Click this menu to see more information about TPM 1.2.
Update to TPM 2.0 compliant	N/A	Update to TPM 2.0. **Notes:** • When update TPM version to TPM 2.0 compliant, do not boot a legacy OS due to security consideration. Change is effective after system reboot and physical presence confirmed. You can only switch TPM firmware 128 times. • Click this button, a pop-up warning message will show up to confirm the action. • When NationZ TPM20 card is plugged in, this item will disappear. • Update to TPM 2.0 compliant is a significant change to the system since TPM 2.0 and 1.2 are not compatible. All keys and encrypted data will be lost.

Storage

Use this menu to manage storage adapter options. Some systems may use planar devices and can be configured under **Devices and I/O ports**.

Item	Description
NVMe	NVMe Devices list.
Intel(R) Virtual RAID on CPU	This submenu allows the user to manage Intel(R) Virtual RAID on CPU.

Notes:

- The device list is based on your system configuration and system setting. The contents in this page are dynamically generated by installed storage vendor's HII utilities.
- All onboard NVMe drives connected to the system will be only displayed in the page: **System settings → Storage → NVMe**.
- Onboard NVMe devices will not list when VMD is enabled.

Date and time

Use this menu to set the local Date and Time of the system.

Table 13. Date and time details

Item	Format	Description
System Date	MM/DD/YYYY	Use the +/- to set the month, day and year (2000 – 2099). The date is saved as it is set.
System Time	HH:MM:SS	Use the +/- to set the hour, minutes, and seconds. Use a 24 hour format. Example: 15:00 for 3pm.

Start options

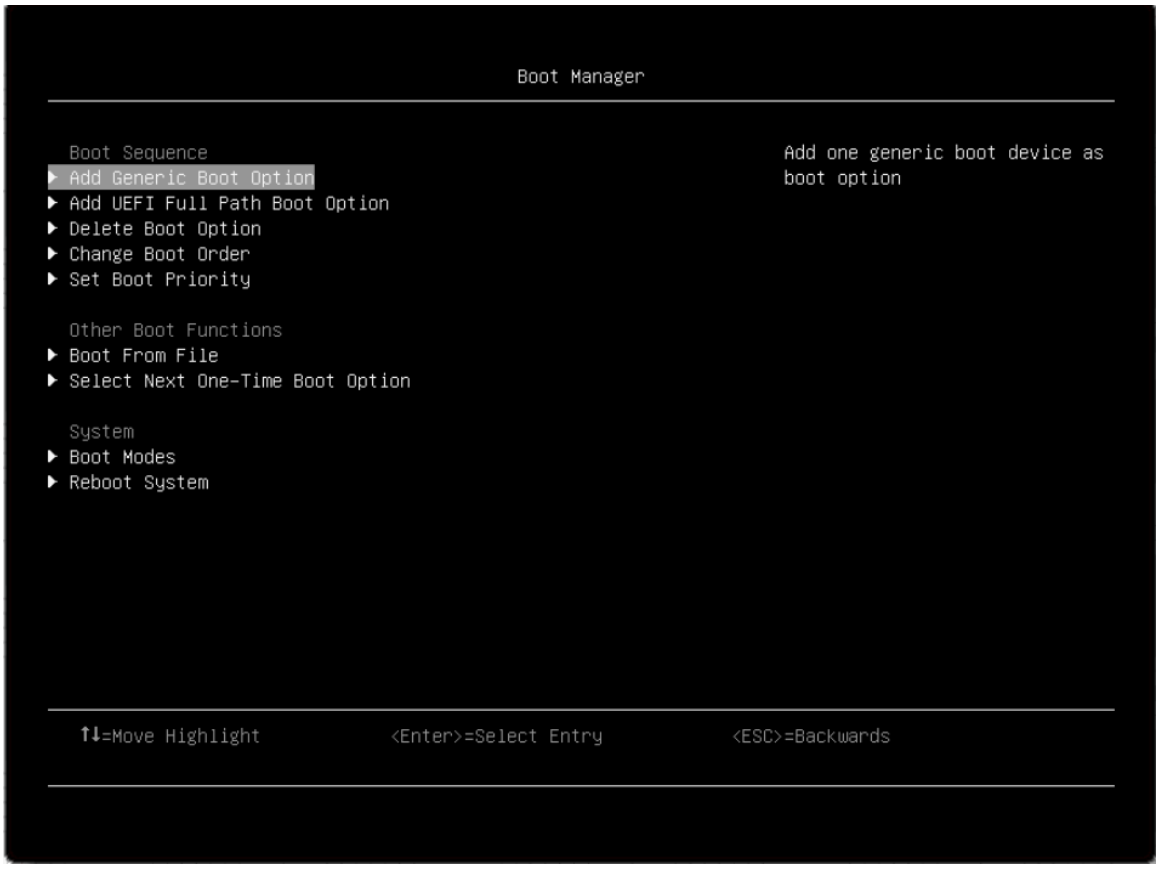
Use this menu to boot a desired selection from the primary boot sequence from the primary boot sequence as specified under **Boot Manager**.

Table 14. Start options details

Item	Function
CD/DVD Rom	Executable item Select the hexadecimal device address and the server will boot from this device next time.
Hard Disk	
Network	

Boot manager

Use this menu to choose boot order, boot parameters, and boot from a file.



Add Generic Boot Option

Add one generic boot device as boot option:

Item	Options	Description
USB Storage	N/A	VenHw(B2AD3248-4F72-4950-A966-CFE5062DB83A,04000000)

Add UEFI Full Path Boot Option

Add one UEFI application or one removable file systems as boot option.

Item	Options	Description
Boot option File Path	N/A	File path for newly created boot option
Input the Description	N/A	Specify name for the new boot option
Select Device Path Option	Xxxx {xxxx-xxx-xxx…}	Select device path option.
Commit Changes and Exit	N/A	Save changes and exit.

Delete Boot Option

Remove boot option(s) from “Boot Order”.

Item	Options	Description
CD/DVD Rom	• [] • [X]	VenHw(B2AD3248-4F72-4950-A966-CFE5062DB83A,02000000)
Hard Disk	• [] • [X]	VenHw(B2AD3248-4F72-4950-A966-CFE5062DB83A,01000000)
Network	• [] • [X]	VenHw(B2AD3248-4F72-4950-A966-CFE5062DB83A,05000000)
Commit Changes and Exit	N/A	Save changes and exit.

Change Boot Order

Modify the ordering of selections within “Boot Order”.

Item	Options	Description
Change the Order	• CD/DVD Rom • Hard Disk • Network	Change the order. It would display the boot options in [Start Options]
Commit Changes and Exit	N/A	Save changes and exit.

Set Boot Priority

Set boot priority of the devices in a device group.

Item	Options	Description
CD/DVD Priority	N/A	Set boot priority in the CD/DVD group if multiple devices exist in the system.
Hard Disk Priority	N/A	Set boot priority in the Hard Disk group if multiple devices exist in the system.
Network Priority	N/A	Set boot priority in the Network group if multiple devices exist in the system.
USB Priority	N/A	Set boot priority in the USB group if multiple devices exist in the system.

Boot From File

Boot the system from a specific file or device.

Select Next One-Time Boot Option

Select the one-time boot option for the next boot.

Item	Options	Description
Boot Option	• CD/DVD Rom • Hard Disk • Network • System Setup • **NONE**	Select the one-time boot option for next boot. **NONE** is the default setting.

Boot Modes

Change between UEFI boot mode and legacy boot mode.

Item	Options	Description
System Boot Mode	• **UEFI Mode** • Legacy Mode	Drivers, option ROMs and OS loaders the “Boot Manager” attempt to boot. [UEFI Mode]: Run UEFI drivers and boot a UEFI OS loader. **UEFI Mode** is the default setting. [Legacy Mode]: Run option ROMs and boot a legacy OS. **Note:** This setting will be forced to [UEFI Mode] when Legacy BIOS is disabled in System Settings->Legacy BIOS->Legacy BIOS.
Infinite Boot Retry	• Enable • **Disable**	Continuously retry the Boot Order. Ensure a bootable device is specified in “Boot Order”. **Disable** is the default setting.
Prevent OS Changes To Boot Order	• Enable • **Disable**	When set to "Enable", UEFI will remove the boot option which is created by OS or OS Installer from Boot Order List. **Disable** is the default setting.
Specify PCIe Slot For Network Boot	255	Restrict network boot to one particular NIC installed at the specified PCIe slot number 0-254. • A value of 255 (255 is the default value) means no restriction. • In general, the value 0 refers to the onboard LAN but there are exceptions to that. If there is no NIC installed at the specified slot, network boot will fail.

Reboot Systems

Prompt to reboot the system. If Y is pressed, any setup changes will be lost and the system will reboot.

BMC settings

Use this menu to configure the management controller.

Note: For SR150, SR250 and ST250, there are default settings for options on **BMC settings** page.

Table 15. BMC settings settings

Item	Options	Description
Power Restore Policy	• Always Off • Restore • Always On	Determine the mode of operation after loss of power. [Always Off]: System remains off upon power restore. [Restore]: System restores to the state it was before power failed. [Always On]: System turns on upon power restore. Allow a few minutes for the changes to take effect. **Note:** This option is configuration dependent, and this item could not use Setup load default to back to default value.
Power Restore Random Delay	• Enabled • Disabled	Provide a random delay between 1 and 15 seconds for Power On. If system state is on before power fails, the system will delay Power On once power is restored. **Notes:** • This item is configuration dependent, and it cannot restore to default value by using the "load default" option in Setup. • When the Power Restore Policy is [Always Off], the item is not displayed.

Table 15. BMC settings settings (continued)

Ethernet over USB interface	• Enable • Disable	[Enable] for using the xClarity Essentials in-band update utility. [Disable] will prevent xClarity Essentials and other applications that are running on the server from requesting the BMC to perform tasks.
Network Settings	N/A	Configure the network of the management controller.
Reset Factory Defaults Setting	N/A	Restore all management controller settings to factory defaults, including network configuration and credentials, the management controller will be restarted automatically.
Restart BMC	N/A	Restart the BMC.

Network settings

Item	Options	Description
Network Interface Port	• Dedicated • Shared	Select the System Management Network Interface Port. **Note:** This option is configuration dependent.
Shared NIC on	1. ML2 Card 2. PHY Card 3. Onboard Port 1	Select the shared NIC port. **Note:** This item is only on when network interface port is on Shared, and this option is configuration dependent.
Fail-Over Rule	• None • Failover to shared (Optional Card ML2) • Failover to shared (Optional Card PHY) • Failover to shared (Onboard Port)	Setting to control Fail-Over types allowed. **Note:** This item is only on when Network Interface Port is set to [Dedicated], and this option is configuration dependent.
Network Setting	• Synchronization • Independence	The item will be selectable when Fail-Over Rule enabled to onboard port or optional card. Please setup the share mode network settings after changing “Synchronization” to “Independence” in NIC failover mode.
Burned-in MAC Address	N/A	
Hostname	N/A	Change the host name. The new name should be within 1 to 63 characters.
DHCP Control	• Static IP • DHCP Enabled • DHCP with Fallback	Configure DHCP Control or manually configure a static IP address. Fallback will use static IP address if DHCP fails. Select Static to enter IPV4 address manually.
IP Address	**x.x.x.x**	Enter IP address in dotted-decimal notation. When entering an invalid IP address: • ERROR • Invalid Input Range • Ok

Subnet Mask	**x.x.x.x**	Enter Subnet Mask in dotted-decimal notation. When entering an invalid IP address: • ERROR • Invalid Input Range • Ok
Default Gateway	**x.x.x.x**	Enter Default Gateway in dotted-decimal notation. When entering an invalid IP address: • ERROR • Invalid Input Range • Ok
IP6	• Enable • Disable	Enable/Disable IPv6 support on management port.
Local Link Address	N/A	
VLAN Support	• Enable • Disable	Enable VLAN Support to specify the 802.1q VLAN ID on the management port network device.
Advanced Setting for BMC Ethernet	N/A	Advanced Setting for BMC Ethernet.

Advanced Settings for BMC Ethernet

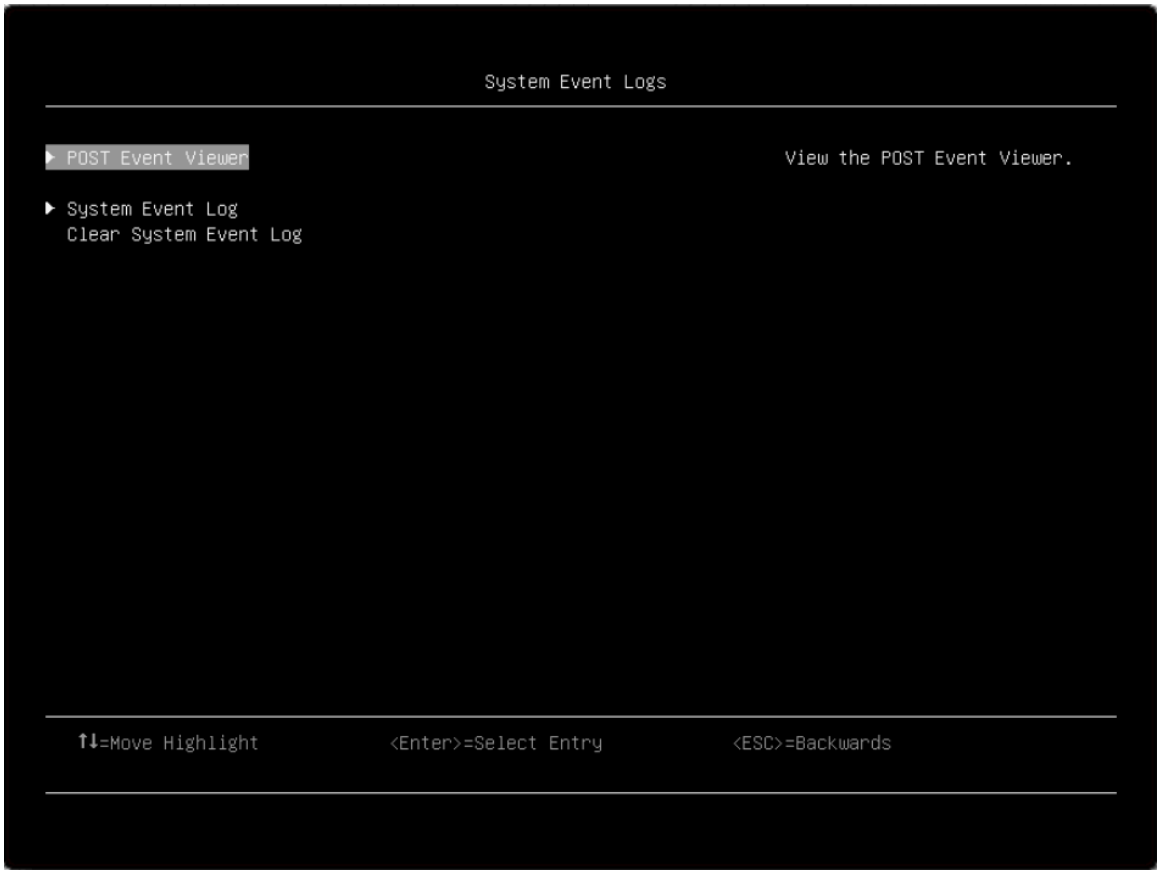
Item	Options	Description
Autonegotiation	• No • Yes	Choose whether the Data rate and Duplex network settings are configurable or not.
Data rate	Autonegotiation is 'Yes': Auto Autonegotiation is 'No': 100 Mb (Ethernet) 10 Mb (Ethernet)	Amount of data to be transferred per second over LAN connection.

Duplex	Autonegotiation is ‘Yes’: Auto Autonegotiation is ‘No’: Half Full	Type of communication channel used in your network. • [Full]: Allow data to be transferred in both directions at once. • [Half]: Allow data to be transferred in either one direction or the other, but not both at the same time.
Maximum Transmission Unit	1500	Specify the maximum size of a packet (in bytes) for the network interface. For IPv4-only networks, the valid MTU range is 68 - 1500. For networks that implement IPv6, the valid MTU range is 1280 - 1500.

Note: Changes will be valid after saving network settings in previous page.

System event logs

Use this menu to clear or view the System Event Log.



Post Event Viewer

View the Post Event Viewer.

System Event Log

View the System Event Log.

Item	Options	Description
Total SEL entries	N/A	Total number of System Event Logs retrieved from the BMC. This does not include any associated extended logs.

User security

Use this menu to set or change Power-On and Administrator passwords.

Table 16. User security details

Item	Options	Description
Password Rule and Policy	**N/A**	Set rule and policy.

Table 16. User security details (continued)

Set Power-On Password	N/A	Set the power-On password. The password can only contain the following characters (no white-space characters allowed): A-Z, a-z, 0-9, ~`!@#$ %^&*()-+={}[]|:;"'<>,?/._ Must contain at least one letter Must contain at least one number Must contain at least 2 of the following combinations: • At least one upper-case letter • At least one lower-case letter • At least one special character No more than 2 consecutive occurrences of the same character Must be at least 8 characters if doesn't select other value in "Minimum password length" option. **Notes:** Click the button, pop-up message box will show up. • Please type in your password • Please type in your new password • Please confirm your new password • Power-On Password has been set successfully • The password failed to meet the "Minimum password reuse cycle" requirements. • Please enter enough characters Press Enter to Continue • The password can't be changed because the "Minimum password change interval" time is not exceeded. • The password does not meet the minimum password complexity requirements. Please check the help for "Set Power-On Password" or "Set Administrator Password" settings. • Passwords are not the same Press Enter to Continue • Incorrect Password Press Enter to Continue • Passwords operation have unknown problem. Press Enter to Continue When IPMI command has no response, then pop out this message.

Table 16. User security details (continued)

Clear Power-On Password	N/A	Clear the Power-On password. **Note:** Click the button, pop-up message box will show up. • Power-On Password is not set Press Enter to Continue • An existing Power-On Password will be deleted. <ENTER> Continue. <ESC> Return to Setup Utility • Power-On Password has been cleared successfully Press Enter to Continue
Set Administrator Password	N/A	Set the Administrator password. The password can only contain the following characters (no white-space characters allowed): A-Z, a-z, 0-9, ~`!@#$ %^&*()-+={}[]|:;"'<>,?/._ Must contain at least one letter Must contain at least one number Must contain at least 2 of the following combinations: • At least one upper-case letter • At least one lower-case letter • At least one special character No more than 2 consecutive occurrences of the same character Must be at least 8 characters if doesn't select other value in "Minimum password length" option. **Notes:** Clicking the button, pop-up message box will show up. • Please type in your password • Please type in your new password • Please confirm your new password • Administrative Password has been set successfully • The password failed to meet the "Minimum password reuse cycle" requirements. • The password can't be changed because the "Minimum password change interval" time is not exceeded. • The password does not meet the minimum password complexity requirements. Please check the help for "Set Power-On Password" or "Set Administrator Password" settings. • Please enter enough characters Press Enter to Continue

Table 16. User security details (continued)

		• Passwords are not the same Press Enter to Continue • Incorrect Password Press Enter to Continue • Passwords operation have unknown problem. Press Enter to Continue When IPMI command has no response then pop out this message.
Clear Administrator Password	N/A	Clear the Administrator password. Clicking the button, pop-up message box will show up. • An existing Administrative Password will be deleted <ENTER> Continue. <ESC> Return to Setup Utility • Administrative Password has been cleared successfully Press Enter to Continue • Administrative Password is not set Press Enter to Continue

Password Rule and Policy

Item	Options	Function
Minimum password length	8~20	Input a value from 8 to 20. The minimum number of characters that can be used to specify a valid password.
Password expiration period	0~365	Input a value from 0 to 365. The number of days a password may be used before it must be changed. If set to 0 the passwords never expire.
Password expiration warning period	0~365	Input a value from 0 to 365. The number of days before receiving a warning about the expiration of the password. If set to 0 the passwords never warned.
Minimum password change interval	0~240	Input a value from 0 to 240. The number of hours that must elapse before changing a password. The value specified for this setting cannot exceed the value specified for the “Password expiration period”. If set to 0 the passwords may be changed immediately.
Minimum password reuse cycle	0~10	Input a value from 0 to 10. The minimum number of times a unique password must be set before reusing a previous password. If set to 0 the passwords may be reused immediately.

Maximum number of login failures	0~100	Input a value from 0 to 100. The number of login attempts that can be made with an incorrect password before the user account is locked out. The account is locked out for the time specified in “Lockout period after maximum login failures”. If set to 0 accounts are never locked. The failed login counter is reset to zero after a successful login.
Lockout period after maximum login failures	0~2880	Input a value from 0 to 2880. The number of minutes that must pass before a locked out user can attempt to login. Entering a valid password does not unlock the account during the lockout period. If set to 0 the accounts will not be locked out even if the “Maximum number of login failures” is exceeded.

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