



UEFI Manual for ThinkSystem Server with Intel Xeon 6 Processors



Server Models: SD520 V4, SR630 V4

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Chapter 1. UEFI Introduction

Unified Extensible Firmware Interface (UEFI) defines the architecture of the platform firmware used for booting the system hardware and interacting with the operating system. UEFI is an interface packed with various features, including but not limited to:

- System information and settings
- Boot and runtime services
- BMC settings
- System event logs
- User security

This guide applies to the following server models:

- SR630 V4
- SD520 V4

Chapter 2. Get Started

This chapter describes how to get started with the UEFI Setup Utility.

First launch

Perform the following steps to first launch the UEFI Setup utility.

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).

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

2. Power on the system and press F1.
3. If you have set the power-on password, enter the correct password.

Wait for about 90s. The setup utility window is displayed.

Switch between graphic/text modes

The setup utility can be launched in graphic mode (default) or in text mode. You can switch between the two modes by referring to sections below.

- **Graphic mode to text mode**

Perform the following steps to switch from graphic mode to text mode:

1. On the main interface, choose **UEFI Setup > System Settings > <F1> Start Control**.
2. Select **Text Setup** for **<F1> Start Control**.
3. Save the setting.
4. Restart the server and press F1.

Wait for about 90s. The setup utility window is displayed in text mode.

- **Text mode to graphic mode**

Perform the following steps to switch from text mode to graphic mode:

1. On the main interface, choose **System Settings > <F1> Start Control**.
2. Select **Tool Suite** or **Auto** for **<F1> Start Control**.
3. Save the setting.
4. Restart the server and press F1.

Wait for about 90s. The setup utility window is displayed in graphic mode.

Chapter 3. UEFI Setup Utility Overview

This topic provides a general introduction to the UEFI Setup Utility.

Notes:

- UEFI system configuration options vary by server platform. Some menus or options described in this document might not be available on your platform.
- The default settings already are optimized for you. Use the default value for any item you are not familiar with. Do not change the value of unfamiliar items to avoid unexpected problems. If you consider changing the server configuration, proceed with extreme caution. Setting the configuration incorrectly might cause unexpected results.
- For those settings that need a system boot to take effect, you need to reboot the system using one of the following methods:
 - After changing the settings, click **Save Settings → Exit Setup Utility** on the main menu.
 - After changing the settings, press Esc and select <Y> **Save and Exit the Setup Utility** on the main menu.

If you are on a nested submenu, press Esc repeatedly until you reach the main menu.

The following table details the main menu of the UEFI Setup Utility:

Table 1. System Configuration and Boot Management

Item	Description
Chapter 4 “System Configuration and Boot Management” on page 7	Main menu
Launch Graphical System Setup	Start the graphical user interface for Provisioning Manager. You can view or change UEFI settings on the UEFI Setup page. Note: When navigating in the graphical System Setup, there will be no screen output through text-based console redirection. Please use a VGA monitor or the XCC Remote Console web viewer for graphical system setup screen output.
“System Information” on page 7	View basic details of the system.
“System Settings” on page 8	View or modify system settings. Changes might not take effect immediately. Save changes and reboot the system.
“Date and Time” on page 47	Set the local date and time of the system.
“Start Options” on page 48	Boot a desired selection from the primary boot sequence in the Boot Manager menu.
“Boot Manager” on page 48	Change boot order, boot parameters, and boot from a file.
“BMC Settings” on page 51	Configure the baseboard management controller (BMC).
“System Event Logs” on page 54	Clear or view the system event log.
“User Security” on page 54	Set or change the power-on and administrator passwords.
“Default Options” on page 56	Configure options for factory default and custom default. <ul style="list-style-type: none">• [Factory Default]: are the settings from original manufacturer.• [Custom Default]: are the settings saved by the user.

Table 1. System Configuration and Boot Management (continued)

Item	Description
Save Settings	Save changed settings and commit them to BMC.
Discard Settings	Discard changes.
Load Default Settings	Load default values for system settings.
Exit Setup Utility	Exit the Setup Utility.

Keyboard navigation tip:

Here are some useful keys for you to navigate items through the UEFI Setup in text mode using a keyboard:

- Enter: Select.
- +: Increase the value.
- -: Decrease the value.
- Esc: Return to the previous interface.
- F1: Display the help information.

Chapter 4. System Configuration and Boot Management

This chapter details the system UEFI Setup Utility.

System Information

Table 2. System Information

Item	Description
“System Summary” on page 7	A summary of detailed system information
“Product Data” on page 8	System firmware information
Run Intel Rc Setup driver	Run Intel Rc Setup driver
Dump Hii Database	Dump Hii Database

System Summary

Table 3. System Summary

Item	Format	Description
System Identification Data		
Machine Type/Model	ASCII string of 10 or 8 characters	System machine type and model
Serial Number	ASCII string of 10 or 8 characters	Serial number
UUID Number	16-byte Hexadecimal String of 32 characters	Universally Unique Identifier (UUID)
Asset Tag Number	ASCII string of 32 characters	A customer assigned system asset tag number
Processor		
Installed CPU Packages	ASCII string of 1 character	Number of installed CPU packages
Processor Speed	y.yyy GHz	Processor speed
UPI Link Speed	yy.y GT/s	UPI link speed Note: The UPI function works only when two or more processors are installed.
Memory		
Memory Mode	ASCII string	Memory mode
Memory Speed	yyyy MHz	Speed of the installed memory
Total Memory Detected	yyyy GB	Total capacity of all installed DIMMs
Total Usable Memory Capacity	yyyy GB	Amount of usable memory after deducting the overhead caused by mirroring mode, reserved or bad blocks and other factors

Product Data

Table 4. Product Data

Item	Format	Description
Host Firmware		
Build ID	ASCII string of 7 characters	Build ID of the host firmware
Version	String format: X.YY (where X is the major revision and YY is the minor revision)	Version of the host firmware
Build Date	Character string format: MM/DD/YYYY	Build date of the host firmware
BMC Firmware		
Build ID	ASCII string	Build ID of the baseboard management controller (BMC) firmware
Version	ASCII string	Version of the BMC firmware
Build Date	Character string format: MM/DD/YYYY	Build date of the BMC firmware

System Settings

On this menu, you can view and configure system settings.

Table 5. System Settings

Item	Option	Description
<F1> Start Control	<ul style="list-style-type: none"> • Auto (Default) • Tool Suite • Text Setup 	<p>Select the tool to be started using the F1 key or equivalent IPMI command.</p> <ul style="list-style-type: none"> • [Tool Suite]: starts a graphical tool suite which supports the following functions: system information summary, UEFI setup, platform update, RAID setup, OS installation and diagnostics. • [Text Setup]: starts the UEFI Setup Utility in text mode. • [Auto]: starts the UEFI Setup Utility in text mode if Serial Over LAN (SOL) or "Console Redirection" is enabled or SOL is configured to [Auto] and an active session is detected. Otherwise, [Auto] starts a graphical tool suite.
Workload Profile	<ul style="list-style-type: none"> • General Computing – Power Efficiency (Default) • General Computing – Peak Frequency • General Computing – Max Performance • High Performance Computing • Custom 	<p>Select the profile based on your preference.</p> <p>The selected workload profile will automatically change low-level settings per the profile selected and will not allow them to be changed individually. To set low-level settings individually, select the [Custom] option.</p> <p>The "Power Efficiency" profiles are comprised of settings comparable to Intel's Optimized Power Mode (OPM).</p>
"Devices and I/O Ports" on page 9	N/A	View and configure onboard devices and I/O port options.

Table 5. System Settings (continued)

Item	Option	Description
“Driver Health” on page 15	N/A	View the health status of the drivers.
Foreign Devices	N/A	View the foreign devices if installed.
“Memory” on page 16	N/A	View and configure the memory settings.
“Network” on page 19	N/A	View and configure network devices and network related settings.
“Power” on page 29	N/A	Configure power plan options.
“Processors” on page 30	N/A	View and configure the processor settings.
“Recovery and RAS” on page 40	N/A	Configure recovery policies and advanced reliability, availability, and serviceability (RAS) settings.
“Security” on page 42	N/A	Configure system security settings.
“Storage” on page 46	N/A	Manage storage adapter options. Some systems may use planar devices and can be configured under the Devices and I/O Ports menu.

Devices and I/O Ports

Items on this menu vary by server platform. The following is a demonstration. Items described here might be slightly different from those for your platform.

Table 6. Devices and I/O Ports

Item	Options	Description
MM Config Base	<ul style="list-style-type: none"> • Auto (Default) 	<p>[Auto]: The system assigns the value automatically.</p> <p>A higher value increases memory available to the operating system below 4GB, but reduces memory mapped I/O (MMIO) resource available to PCI adapters. A lower value increases MMIO resources but decreases memory available to the operating system below 4GB.</p> <p>If there is any issue occurred after changing the setting, you can revert to the previous selection.</p>
MMIOH Base	<ul style="list-style-type: none"> • 40T • 24T • 16T • 4T • 2T • Auto (Default) 	<p>Set the MMIOH High base address. This setting can be configured with a value which is higher than the total memory installed, including any CXL memory.</p>
MMIOH Size	<ul style="list-style-type: none"> • 64G • 256G • 1024G (Default) 	<p>Select the available granularity size used to assign MMIO high resources. Per stack MMIO high resource assignments are multiples of the granularity where 1 unit per stack is the default allocation.</p>

Table 6. Devices and I/O Ports (continued)

Item	Options	Description
SRIOV	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Enable or disable support of resource allocation for Single Root I/O Virtualization (SR-IOV) virtual functions during system boot.</p> <p>Note: When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.</p>
Resizable BAR	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Resizable Base Address Register (BAR) is a PCIe capability. It essentially allows the compatible PCIe devices to negotiate more BAR resource from system, resulting in improved performance.</p>
DMA Control Opt-In Flag	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Enable or disable the DMA Control Opt-In Flag (DMA_CTRL_PLATFORM_OPT_IN_FLAG) in DMA Remapping (DMAR) ACPI table.</p> <p>This item is not compatible with Direct Device Assignment (DDA).</p>
Pre-boot DMA Protection	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Enable or disable Direct Memory Access (DMA) protection in pre-boot environment.</p>
“Enable/Disable Onboard Device(s)” on page 10	N/A	<p>Enable or disable onboard devices or slots.</p>
“Enable/Disable Adapter Option ROM Support” on page 11	N/A	<p>Enable or disable UEFI-compliant adapter support. Disabling UEFI support may adversely affect pre-boot/boot functions</p>
“PCIe Gen Speed Selection” on page 11	N/A	<p>Choose the generation speed for the available PCIe slots.</p>
“Override Slot Bifurcation” on page 12	N/A	<p>This setting is used to override the bifurcation setting of the physical x16 slot to support the adapter with multiple devices.</p>
“PCIe Link Degraded Reporting Selection” on page 12	N/A	<p>Choose whether to suppress the PCIe link degraded error for available PCIe slots.</p>
“Console Redirection Settings” on page 13	N/A	<p>Configure console redirection and COM port settings</p>
“Intel® VMD technology” on page 14	N/A	<p>Enable or disable Intel® Volume Management Device (VMD) technology.</p>

Enable/Disable Onboard Device(s)

Items on this menu vary by server platform. The following is a demonstration. Items described here might be slightly different from those for your platform.

Table 7. Enable/Disable Onboard Device(s)

Item	Options	Description
Onboard Video	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Enable or disable the onboard video device.</p> <p>If [Disabled] is selected, the associated device will not be enumerated during the subsequent boot.</p> <p>[Auto] is to disable this port if there is no device installed or there are errors detected on that device.</p>
Slot (n...) ("n" can be 1, 2, 3, ... etc, depending on where the device is installed.)	<ul style="list-style-type: none"> • Disabled • Enabled (Default) Or <ul style="list-style-type: none"> • Disabled • Enabled • Auto (Default) 	<p>Enable or disable the associated device.</p> <p>If [Disabled] is selected, the associated device will not be enumerated during the subsequent boot.</p> <p>[Auto] is to disable this port if there is no device installed or there are errors detected on that device.</p>
M.2 NVMe Bay (n...)	<ul style="list-style-type: none"> • Auto • Enabled (Default) • Disabled 	<p>Enable or disable the associated device.</p> <p>If [Disabled] is selected, the associated device will not be enumerated during the subsequent boot.</p> <p>[Auto] is to disable this port if there is no device installed or there are errors detected on that device.</p>

Enable/Disable Adapter Option ROM Support

The actual order of items on this menu may be different from the following table because some of them are dynamically scanned.

Table 8. Enable/Disable Adapter Option ROM Support

Item	Options	Description
Onboard Video	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Enable or disable option ROMs of the onboard video device.</p> <p>Note: Disabling some UEFI OpROMs may adversely affect iSCSI and BoFM operation.</p>
Slot (n...) ("n" can be 1, 2, 3, ... etc, depending on where the device is installed.)	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Enable or disable option ROMs of the PCIe device.</p> <p>Note: Disabling some UEFI OpROMs may adversely affect iSCSI and BoFM operation.</p>
M.2 NVMe Bay (n...)	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Enable or disable option ROMs of the M.2 device.</p> <p>Note: Disabling some UEFI OpROMs may adversely affect iSCSI and BoFM operation.</p>

PCIe Gen Speed Selection

Items on this menu vary by server platform. The following is a demonstration. Items described here might be slightly different from those for your platform.

Table 9. PCIe Gen Speed Selection

Item	Options	Description
Slot (n...) ("n" can be 1, 2, 3, ... etc, depending on where the device is installed.)	<ul style="list-style-type: none"> • Auto (Default) • Gen1 • Gen2 • Gen3 • Gen4 • Gen5 <p>Note: The options displayed depend on the speed supported by the device.</p>	Set the maximum speed supported by the device.
M.2 NVMe Bay (n...)	<ul style="list-style-type: none"> • Auto (Default) • Gen1 • Gen2 • Gen3 • Gen4 • Gen5 <p>Note: The options displayed depend on the speed supported by the device.</p>	Set the maximum speed supported by the device.

Override Slot Bifurcation

Items on this menu vary by server platform. The following is a demonstration. Items described here might be slightly different from those for your platform.

Table 10. Override Slot Bifurcation

Item	Options	Description
Slot (n...) ("n" can be 1, 2, 3, ... etc, depending on where the device is installed.)	<ul style="list-style-type: none"> • x16 (Default) • x8x8 • x8x4x4 • x4x4x8 • x4x4x4x4 	Configure the bifurcation setting of the physical x16 slot to support the adapter with multiple devices. <ul style="list-style-type: none"> • [x16]: uses the system setting to bifurcate the slot. • [x8x8]: bifurcates the physical x16 slot to support two x8 devices at maximum. • [x8x4x4] or [x4x4x8]: bifurcates the physical x16 slot to support one x8 device and two x4 devices at maximum. • [x4x4x4x4]: bifurcates the physical x16 slot to support four x4 devices at maximum.

PCIe Link Degraded Reporting Selection

Items on this menu vary by server platform. The following is a demonstration. Items described here might be slightly different from those for your platform.

Table 11. PCIe Link Degraded Reporting Selection

Item	Options	Description
Slot (n...) ("n" can be 1, 2, 3, ... etc, depending on where the device is installed.)	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	Choose whether to suppress the PCIe link degraded error for the PCIe slot.
M.2 NVMe Bay (n...)	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	Choose whether to suppress the PCIe link degraded error for the PCIe slot.

Console Redirection Settings

Table 12. Console Redirection Settings

Item	Options	Description
COM Port 1	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	Enable or disable the COM 1 device. When [Disabled] is selected, the associated COM 1 terminal settings are hidden.
Virtual COM Port 2	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	Enable or disable the Virtual COM Port 2 device. When [Disabled] is selected, SSH for console redirection is disabled.
Console Redirection	<ul style="list-style-type: none"> • Enabled • Disabled • Auto (Default) 	Set remote console redirection preference to enable or disable console redirection. When [Auto] is selected, console redirection is enabled automatically if IPMI Serial over LAN (SOL) status is active.
Serial Port Sharing	<ul style="list-style-type: none"> • Enabled • Disabled (Default) 	Enable the BMC to allow access to the system serial port. When [Enabled] is selected, the BMC is allowed to control the serial communication port as requested by remote control commands. When [Disabled] is selected, the serial port is assigned to BMC unless Serial Port Access Mode is set to [Disabled].
Serial Port Access Mode	<ul style="list-style-type: none"> • Shared • Dedicated • Disabled (Default) 	Control the access that the system BMC has over the system serial port. <ul style="list-style-type: none"> • [Shared]: The serial port is available for POST and operating system use; however, the BMC will/can monitor the serial data for a takeover control. • [Dedicated]: The BMC has complete control of the serial port. POST and/or OS will not be able to use the serial port. • [Disabled]: The BMC has no access to the serial port.

Table 12. Console Redirection Settings (continued)

Item	Options	Description
SP Redirection	<ul style="list-style-type: none"> Enabled Disabled (Default) 	<p>Serial over LAN (SOL) or Serial over SSH redirection enables a system administrator to use the BMC as a serial terminal server. This item allows you to choose which mode to have the redirection, SOL or SSH.</p> <ul style="list-style-type: none"> When [Disabled] is selected, it is configured with SOL redirection. When [Enabled] is selected, a server serial port can be accessed from SSH connection (Virtual COM 2). <p>Note: This item is only displayed when Console Redirection is set to [Enabled].</p>
COM1 Settings		
COM1 Baud Rate	<ul style="list-style-type: none"> 115200 (Default) 57600 38400 19200 9600 	Control the connection speed between the host and the remote system.
COM1 Data Bits	<ul style="list-style-type: none"> 8 (Default) 7 	Set the number of data bits in each character.
COM1 Parity	<ul style="list-style-type: none"> None (Default) Odd Even 	<p>Set the parity bit in each character to be [None], [Odd], or [Even].</p> <p>[None] means that no parity bit is transmitted.</p>
COM1 Stop Bits	<ul style="list-style-type: none"> 2 1 (Default) 	Set Stop Bits. Stop bits which follow at the end of each character allow the signal receiver to detect the end of a character and to resynchronize with the character stream.
COM1 Terminal Emulation	<ul style="list-style-type: none"> VT100 VT100Plus VT-UTF8 ANSI (Default) 	<p>Select [VT100] only if the remote emulator does not support ANSI text graphics.</p> <p>Note: If needed, change the character encoding setting in the remote emulator to ensure the characters show correctly.</p>
COM1 Flow Control	<ul style="list-style-type: none"> Disabled (Default) Hardware 	Select [Hardware] only if the remote emulator supports and is using hardware flow control.

Intel® VMD technology

Table 13. Intel® VMD Technology

Item	Options	Description
Intel® VMD Technology	NA	Press Enter to enter the menu for configuring the Intel® Volume Management Device (VMD) Technology.
Enable/Disable Intel® VMD	<ul style="list-style-type: none"> Enabled Disabled (Default) 	Enable or disable the Intel® VMD Technology.

Driver Health

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

Table 14. Driver Health

Item	Options	Description
The platform is:	<ul style="list-style-type: none"> • Healthy • Repair Required • Configuration Required • Operation Failed • Reconnect Required • Reboot Required • Shutdown Required • No Operation Required 	Displays the health status of the system.
Driver/Controller Status		
Driver/Controller Name - Status	<ul style="list-style-type: none"> • Healthy • Repair Required • Configuration Required • Operation Failed • Reconnect Required • Reboot Required • Shutdown Required • No Operation Required 	Displays the health status of drivers/controllers.
POST Attempts Driver	<ul style="list-style-type: none"> • Healthy • Repair Required • Configuration Required • Operation Failed • Reconnect Required • Reboot Required • Shutdown Required • No Operation Required 	Displays the health status of POST Attempts Driver.

Memory

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

Table 15. Memory

Item	Options	Description
“System Memory Details” on page 17	N/A	View the status of the system memory.
ADDDC Sparing	<ul style="list-style-type: none"> • Disabled(Default) • Enabled 	<p>Adaptive Double Device Data Correction (ADDDC) Sparing is a RAS function that provides more reliability of memory error correction in virtual lockstep mode. When the memory correctable error count reaches a pre-defined threshold, ADDDC will trigger virtual lockstep mode, which can significantly reduce performance.</p> <p>For high frequency, low latency, or low jitter workloads, Lenovo generally recommends disabling ADDDC sparing for high performance.</p> <p>ADDDC Sparing will not take effect if the system has x8 DIMMs or 9x4 value DIMMs or if memory is set to [Mirror mode] (Full or Partial).</p>
Page Policy	<ul style="list-style-type: none"> • Closed (Default) • Adaptive 	<p>Page Policy setting determines whether the memory controller keeps the last accessed page open.</p> <ul style="list-style-type: none"> • [Adaptive]: improves performance for applications with a highly localized memory access pattern. • [Closed]: benefits applications that access memory more randomly.
DDR MBIST	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	Enable or disable DDR Memory Built-In Self Test (MBIST).
DRAM Post Package Repair	<ul style="list-style-type: none"> • Enabled(Default) • Disabled 	Enable or disable DRAM Post Package Repair (PRR).
Memory Test	<ul style="list-style-type: none"> • Disabled • Enabled (Default) 	Enable or disable memory test during normal boot.
Cold Boot Fast	<ul style="list-style-type: none"> • Disabled • Enabled (Default) 	Enable or disable Cold Boot Fast.
AC Boot Fast	<ul style="list-style-type: none"> • Disabled • Enabled (Default) 	<p>Enable or disable AC Boot Fast which is for AC boot only.</p> <p>Note: This item is available and functional only when Cold Boot Fast is enabled.</p>
Global Data Scrambling	<ul style="list-style-type: none"> • Disabled • Enabled (Default) 	Memory traffic on the data bus is not random and can cause current “hot spots” on the DIMM. Memory data scrambling uses a data scrambling feature in the memory controller to create pseudo-random patterns on the data bus to reduce possibility of data-bit errors due to the impact of excessive current fluctuations

Table 15. Memory (continued)

Item	Options	Description
Patrol Scrub	<ul style="list-style-type: none"> Disabled Enabled (Default) 	<p>Patrol Scrub works in the background to proactively check DIMMs to repair correctable errors.</p> <p>When enabled, Patrol Scrub takes effect at the end of POST.</p>
Dynamic ECC Mode Selection	<ul style="list-style-type: none"> Disabled Enabled (Default) 	Enable or disable dynamic ECC mode selection.
Memory Speed	<ul style="list-style-type: none"> Max (Default) Power Efficient Min 	<p>Select the memory speed.</p> <ul style="list-style-type: none"> [Max]: maximizes performance. [Power Efficient]: offers a balance between performance and power. [Min]: maximizes power savings. <p>When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.</p>
Memory Refresh Rate	<ul style="list-style-type: none"> Auto 1x (Default) 2x 	<p>Select the memory refresh rate.</p> <p>When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.</p>
DDR5 ECS	<ul style="list-style-type: none"> Disabled Enabled (Default) Enable ECS with Result Collection 	<p>The Error check and scrub (ECS) function allows early detection of possible DRAM failures to avoid or reduce downtime.</p> <ul style="list-style-type: none"> [Disabled]: Disables the ECS function. [Enabled]: Enables ECS without result collection. [Enable ECS with Result Collection]: Enables ECS with result collection.
“Mirror Configuration” on page 18	N/A	<p>View and configure the memory mirror state.</p> <p>Note: This item can be configured only when ADDDC Sparing is disabled and memory population meets the requirements.</p>
“Memory Power Savings Advanced Option” on page 19	N/A	Configure advanced settings for CKE and related memory power savings features.

System Memory Details

System Memory Details

Table 16. System Memory Details

Item	Description
DIMM Details For Processor X	View the status of DIMMs. See “DIMM Details” below for more details.

DIMM Details

If a double bit error (DBE) occurs on the DIMM, the [Enabled] and [Disabled] options will be available. For current generation, [Enabled] is the default setting.

Mirror Configuration

Table 17. Mirror Configuration

Item	Options	Description
Mirror Fail-Over	<ul style="list-style-type: none"> • Disabled • Enabled (Default) 	<p>Enable or disable mirror fail-over.</p> <ul style="list-style-type: none"> • When [Enabled] is selected, a persistent memory uncorrectable error will trigger mirror fail-over. • When [Disabled] is selected, mirror fail-over is skipped even a persistent uncorrectable error happens. <p>Notes:</p> <ul style="list-style-type: none"> • This item only takes effect when Full Mirror or Partial Mirror is enabled. • This item is not supported for High Bandwidth Memory (HBM).
Configuration Made From OS	N/A	<p>Display the memory mirror configuration state that was defined from the OS utility.</p> <p>When a definition is found, you can use Delete Configuration Made From OS to clear it.</p>
Mirror Below 4GB	None	<p>Display the mirroring configuration of memory below 4 GB.</p> <p>Note: The option may be [TRUE] or [FALSE] after the OS has configured memory mirroring.</p>
Partial Mirror Ratio In Basis Points	None	<p>Display the mirroring ratio for the memory above 4GB in basis points.</p> <p>The valid range is 1 – 5000, meaning 0.01% to 50%. For example, to mirror 12.75% of memory, input the value 1275.</p> <p>Note: The option may be a value within the range of 1 – 5000 after the OS has configured memory mirroring.</p>
Configuration Made From UEFI	N/A	<p>Display the memory mirror configuration state that was defined from the UEFI system utility.</p> <p>In case of a conflict with the configuration values from OS, the values from OS will take precedence.</p>

Table 17. Mirror Configuration (continued)

Item	Options	Description
Full Mirror	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	Full mirroring reduces the available system memory by half of the total installed memory. Note: DDR5 9x4 value DIMMs do not support full mirroring.
Partial Mirror	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	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 . Notes: <ul style="list-style-type: none"> • Partial memory mirroring is a sub-function of memory mirroring. It requires to follow the memory population for memory mirroring. • DDR5 9x4 value DIMMs do not support partial mirroring.

Memory Power Savings Advanced Option

Table 18. Memory Power Savings Advanced Option

Item	Option	Description
CKE Throttling	<ul style="list-style-type: none"> • Auto (Default) • Manual 	Configure CKE Throttling. Note: The submenu CKE Feature is available only when CKE Throttling is set to [Manual]
CKE Feature	NA	See “CKE Feature” below for more details.

CKE Feature

Item	Option	Description
CKE Idle Timer	<ul style="list-style-type: none"> • 20 (Default) (0 – 255) 	Set the CKE idle timer in ns.
APD	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	Enable or disable the Active Power-Down (APD) mode.
PPD	<ul style="list-style-type: none"> • Disabled • Enabled(Default) 	Enable or disable the Pre-charge Power-Down (PPD) mode.

Network

This menu displays the network devices and network-related settings.

Table 19. Network

Item	Description
“Network Boot Settings” on page 20	Configure network boot parameters.
“iSCSI Settings” on page 23	Configure iSCSI parameters.
“Network Stack Settings” on page 27	Configure network stack settings.

Table 19. Network (continued)

Item	Description
“HTTP Boot Configuration” on page 27	Configure HTTP Boot parameters. Note: This item is available only when Network -> Network Stack Setting -> IPv4 HTTP Support or IPv6 HTTP support is enabled.
“Tls Auth Configuration” on page 28	You can press Enter to select Tls Auth Configuration. Note: This item is available only when Network -> Network Stack Setting -> IPv4 HTTP Support or IPv6 HTTP support is enabled.
Network Device list	View the network devices. The information of on-board cards or add-on cards will be displayed here, for example, the title of a card, the MAC address, or PFA.

Network Boot Settings

Table 20. Network Boot Settings

Item	Description
MAC:XX:XX:XX:XX:XX:XX SlotXXX PCI X:XX:X:X	Set boot configuration parameters on MAC XX:XX:XX:XX:XX:XX PCI function address: Bus XX:Dev XX:Func XX See Table 21 “MAC:Onboard PFA 1:0:0” on page 20 below for more details.
VLAN Configuration List: Slot X: VLAN Configuration Note: For onboard devices, there is no “Slot X:” string.	Configure VLAN parameters. (MAC:XXXXXXXXXXXX) See Table 22 “VLAN Configuration” on page 21 below for more details.
IPv4 Configuration List: Slot X: IPv4 Network Configuration Note: For onboard devices, there is no “Slot X:” string.	Configures IPv4 network parameters. (MAC:XXXXXXXXXXXX) See Table 23 “SlotX: IPv4 Network Configuration” on page 21 below for more details.
IPv6 Configuration List: Slot X: IPv6 Network Configuration Note: For onboard devices, there is no “Slot X:” string.	Configure IPv6 network parameters. (MAC:XXXXXXXXXXXX) See Table 24 “SlotX: IPv6 Current Setting” on page 21 below for more details.

MAC:Onboard PCI

Table 21. MAC:Onboard PFA 1:0:0

Item	Options	Description
UEFI PXE Mode	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	Enable or disable NIC to include or skip boot attempt during generic PXE network boot.

VLAN Configuration

On **Enter Configuration Menu**, press ENTER to enter the VLAN configuration menu.

Table 22. VLAN Configuration

Item	Options	Description
Create new VLAN		
VLAN ID	0–4094	Set the VLAN ID of a new VLAN or an existing VLAN. The valid value is 0–4094.
Priority	0–7	Set 802.1Q priority. The valid value is 0–7.
Add VLAN	N/A	Create a new VLAN or updates an existing VLAN.
Configured VLAN list		
Lists of the configured VLANs. Only appears when VLANs are configured. Example: VLAN ID: X, Priority:X	Check box: <ul style="list-style-type: none"> • Empty • X 	Select a VLAN from the list to remove it.
Remove VLAN	N/A	Remove selected VLANs.

IPv4 Network Configuration

Table 23. SlotX: IPv4 Network Configuration

Item	Options	Description
Configured	Check box: <ul style="list-style-type: none"> • Empty • X 	Indicates whether the network address is configured successfully or not.
Save Changes and Exit	N/A	Save changes and exit.

IPv6 Network Configuration

On **Enter Configuration Menu**, press ENTER to enter the IPv6 network configuration menu.

Table 24. SlotX: IPv6 Current Setting

Item	Options	Description
Interface Name	N/A	Name of the network interface
Interface Type	N/A	Interface type of the network interface, defined in RFC1700
MAC address	XX-XX-XX-XX-XX-XX	Hardware address of the network interface
Host address	XXXX::XXXX:XXXX:XXXX:XXXX/XX	List of host addresses, which contains the local IPv6 addresses and the corresponding prefix length information
Route Table	XXXX::/64>>::	Route table of the IPv6 network stack runs on this interface

Table 24. SlotX: IPv6 Current Setting (continued)

Item	Options	Description
Gateway addresses	N/A	List of current gateway IPv6 addresses
DNS addresses	N/A	List of current gateway DNS addresses
Interface ID	N/A	The 64 bit alternative interface ID for the device. The string is colon separated. e.g. ff:dd:88:66:cc:1:2:3
DAD Transmit Count	N/A	Number of consecutive neighbor solicitation messages sent while performing duplicate address detection (DAD) on a tentative address. A value of "0" (zero) indicates that duplicate address detection is not performed.
Policy	<ul style="list-style-type: none"> • automatic • manual 	Specifies the network configuration policy.
Advanced Configuration	N/A	Configures network settings for the interface manually, including IP addresses, gateway address, and DNS server address.
Save Changes and Exit	N/A	Save changes and exit.

Table 25. Advanced Configuration

Item	Options	Description
New IPv6 address	N/A	This item can be configured only when the Policy is set to manual . Separate the IP address with blank space to configure more than one address. e.g. 2002::1/64 2002::2/64
New Gateway addresses	N/A	This item can be configured only when the Policy is set to manual . Separate the IP address with blank space to configure more than one address.
New DNS addresses	N/A	This item can be configured only when the Policy is set to manual . Separate the IP address with blank space to configure more than one address.
Commit Changes and Exit	N/A	Commit changes and exit.
Discard Changes and Exit	N/A	Discard changes and exit.

iSCSI Settings

Table 26. iSCSI Settings

Item	Options	Description
iSCSI Initiator Name	lqn.1986-03.com.example	Worldwide unique name of the iSCSI initiator Only the iSCSI Qualified Name (IQN) format is accepted.
“Add an attempt” on page 23	N/A	Configure and add an attempt.
List of Attempts e.g. <ul style="list-style-type: none"> • Attempt 1 • Attempt 2 Selecting any item in the list will lead to “Attempt Settings” on page 23	N/A	After an attempt is added, the attempt will be listed here. The value of each attempt will be displayed as follows: MAC: XX:XX:XX:XX:XX:XX, PFA: Bus XX Dev XX Func XX, “iSCSI Mode”: [%s1], “Internet Protocol”: [%s1]. Notes: <ul style="list-style-type: none"> • The exact value will be different, depending on the attempt settings. • %s1 is the option name for iSCSI Mode. • %s2 is the setting name for Internet Protocol.
“Delete Attempts” on page 26	N/A	Delete one or more attempts.
“Change Attempt Order” on page 26	N/A	You can change attempt order by using +/- keys, and use arrow keys to select an attempt and press +/- to move the attempt up/down in the attempt order list.

Add an attempt

Table 27. MAC Selection

Item	Description
List of NICs in the system: Example: MAC XX:XX:XX:XX:XX:XX	You can select the item that you want to add. The format of the attempt is as follows: PFA: Bus XX Dev XX Func XX.

Attempt Settings

Table 28. Attempt Settings

Item	Options	Description
iSCSI Attempt Name	N/A	Human-readable name for the iSCSI attempt. This item is read only.
iSCSI Mode	<ul style="list-style-type: none"> • Disabled (Default) • Enabled • Enable for MPIO 	Enable or disable iSCSI mode, or enable iSCSI mode for multipath I/O (MPIO). Note: Make sure all necessary items (e.g. initiator IP, target IP, and authentication settings) are set appropriately before you enable this feature. Otherwise, this attempt may be lost after reboot.

Table 28. Attempt Settings (continued)

Item	Options	Description
Internet Protocol	<ul style="list-style-type: none"> • IPv4 (Default) • IPv6 • Autoconfigure 	<ul style="list-style-type: none"> • [IPv4]: default setting • [IPv6]: Initiator IP address is assigned by the system. • [Autoconfigure]: iSCSI driver attempts to connect iSCSI target via IPv4 stack. If this fails, then it will attempt to connect via IPv6 stack.
Connection Retry Count	0	<p>The minimum value is 0 and the maximum value is 16.</p> <p>Value "0" means that you do not want to retry.</p>
Connection Establishing Timeout	1000	<p>Timeout value in milliseconds</p> <p>The minimum value is 100 milliseconds and the maximum is 20 seconds.</p>
ISID	e. g., C68EF8	<p>OUI-format ISID in 6 bytes, iSCSI Session Identifier (ISID) specifies the iSCSI initiator during login.</p> <p>The default value is derived from the MAC address. Only the last 3 bytes are configurable.</p> <p>Example: Update 0ABBCCDDEEFF to 0ABBCCF07901 by input F07901.</p>
Enable DHCP	<p>Check box:</p> <ul style="list-style-type: none"> • Empty (Default) • X 	Enable or disable DHCP.
Initiator IP Address	0.0.0.0	<p>Set the initiator IP address in dotted-decimal notation.</p> <p>Note: This item is available only when Enable DHCP is not enabled.</p>
Initiator Subnet Mask	0.0.0.0	<p>Set initiator subnet mask IP address in dotted-decimal notation.</p> <p>Note: This item is available only when Enable DHCP is not enabled.</p>
Gateway	0.0.0.0	<p>Set initiator gateway IP address in dotted-decimal notation.</p> <p>Note: This item is available only when Enable DHCP is not enabled.</p>
Get target info via DHCP	<p>Check box:</p> <ul style="list-style-type: none"> • Empty (Default) • X 	<p>Get target info via DHCP.</p> <p>Note: This item is available only when Enable DHCP is enabled.</p>

Table 28. Attempt Settings (continued)

Item	Options	Description
Target Name	N/A	Worldwide unique name of the target. Only IQN format is accepted. Note: This item is not available when Get target info via DHCP is enabled.
Target Address	N/A	Enter an IPv4 or IPv6 address or a URL string. You need to configure DNS server address in advance if input a URL string. Note: This item is not available when Get target info via DHCP is enabled.
Target Port	3260	Set the target port number. Note: This item is not available when Get target info via DHCP is enabled.
Boot LUN	0	Set the hexadecimal representation of the boot logical unit (LUN) number. Examples: 4751-3A4F-6b7e-2F99, 6734-9-156f-127, 4186-9 Note: This item is not available when Get target info via DHCP is enabled.
Authentication Type	<ul style="list-style-type: none"> • CHAP • None (Default) 	Select the authentication method.
CHAP Type	<ul style="list-style-type: none"> • One way • Mutual (Default) 	Set the Challenge-Handshake Authentication Protocol (CHAP) type. Note: This item is available only when Authentication Type is set to [CHAP].
CHAP Name	N/A	Set the CHAP Name. Note: This item is available only when Authentication Type is set to [CHAP].
CHAP Secret	N/A	Set the CHAP secret password. The secret length range is 12 to 16 bytes. Note: This item is available only when Authentication Type is set to [CHAP].
Reverse CHAP Name	N/A	Reverse the CHAP Name. Note: This item is available only when CHAP Type is set to [Mutual].

Table 28. Attempt Settings (continued)

Item	Options	Description
Reverse CHAP Secret	N/A	Reverse the CHAP secret password. The secret length range is 12 to 16 bytes. Note: This item is available only when CHAP Type is set to [Mutual].
Save Changes	N/A	Rebooting the system manually is required for changes to take effect.
Back to Previous Page	N/A	Go back to the previous page.

Delete Attempts

Table 29. Delete Attempts

Item	Options	Description
List of Attempts e.g., Attempt 1	Check box: <ul style="list-style-type: none"> • Empty (Default) • X 	You can select an attempt to be deleted. The value of each attempt will be displayed as follows: MAC: XX:XX:XX:XX:XX:XX, PFA: Bus XX Dev XX Func XX, "iSCSI Mode": [%s1], "Internet Protocol": [%s2] Notes: <ul style="list-style-type: none"> • The exact value will be different, depending on the attempt settings. • %s1 is the option name for iSCSI Mode. • %s2 is the setting name for Internet Protocol.
Commit Changes and Exit	N/A	Save changes and exit.
Discard Changes and Exit	N/A	Discard changes and exit.

Change Attempt Order

Table 30. Change Attempt Order

Item	Options	Description
Change Attempt Order	<ul style="list-style-type: none"> • e.g. • Attempt 1 • Attempt 2 	Existing attempts are listed here. You can use +/- keys to change attempt order. Use arrow keys to select the attempt and then press +/- to move the attempt up/down in the attempt order list.
Commit Changes and Exit	N/A	Save changes and exit.
Discard Changes and Exit	N/A	Discard changes and exit.

Network Stack Settings

Table 31. Network Stack Settings

Item	Options	Description
Network Stack	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	Enables or disables UEFI network stack.
IPv4 PXE Support	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	Enables or disables IPv4 PXE Boot Support. If this item is disabled, IPv4 PXE boot option will not be created.
IPv4 HTTP Support	<ul style="list-style-type: none"> • Enabled • Disabled (Default) 	Enables or disables IPv4 HTTP Boot Support. If this item is disabled, IPv4 HTTP boot option will not be created.
IPv6 PXE Support	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	Enables or disables IPv6 PXE Boot Support. If this item is disabled, IPv6 PXE boot option will not be created.
IPv6 HTTP Support	<ul style="list-style-type: none"> • Enabled • Disabled (Default) 	Enables or disables IPv6 HTTP Boot Support. If this item is disabled, IPv6 HTTP boot option will not be created.
PXE boot wait time	0	Wait time in seconds to press the ESC key to abort the PXE boot. Use either +/- or numeric keys to set the value.
Media detect count	1	Number of times the presence of media will be checked. Use either +/- or numeric keys to set the value.

HTTP Boot Configuration

Notes:

- The **HTTP Boot Configuration** menu is displayed on the **Network** page only when **Network -> Network Stack Setting -> IPv4 HTTP Support** or **IPv6 HTTP support** is enabled.
- When the network adapter is installed in the system, you will see the submenu, or nothing will be displayed in **HTTP Boot Configuration** form.

Table 32. HTTP Boot Configuration

Item	Options	Description
List of NICs in the system e. g., MAC:XX:XX:XX:XX:XX:XX HTTP Boot Configuration	N/A	Configure HTTP Boot parameters. (MAC: XXXXXXXXXXXXX)

Table 33. MAC:xxxxxxxxxxx-HTTP Boot Configuration

Item	Options	Description
Input the description	N/A	Enter the boot description.
Internet Protocol	<ul style="list-style-type: none"> IPv4 IPv6 	Select version of the Internet Protocol.
Boot URI	N/A	A new boot option will be created according to the boot URI.

Tls Auth Configuration

Note: The **Tls Auth Configuration** menu is displayed on the **Network** page only when **Network -> Network Stack Setting -> IPv4 HTTP Support** or **IPv6 HTTP support** is enabled.

Table 34. Tls Auth Configuration

Item	Description
"Server CA Configuration" on page 28	You can press Enter to configure server Certificate Authority (CA).
Client Cert Configuration	Client certificate configuration is unsupported currently.

Server CA Configuration

Table 35. Server CA Configuration

Item	Description
"Enroll Cert" on page 28	You can press Enter to enroll the certificate.
"Delete Cert" on page 28	You can press Enter to delete the certificate.

Enroll Cert

Table 36. Enroll Cert

Item	Description
Enroll Cert Using File	Enroll the certificate using a certificate file.
Cert GUID	Enter the certificate GUID in the following format: 11111111-2222-3333-4444-1234567890ab.
Commit Changes and Exit	Save changes and exit.
Discard Changes and Exit	Discard changes and exit.

Delete Cert

Table 37. Delete Cert

Item	Options	Description
xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx	Check box: <ul style="list-style-type: none"> Empty X 	List of certificate GUIDs. You can select the check box to delete the certificate. Note: If there is no security certificate file, no certificate GUID is displayed.

Power

This menu allows you to configure power scheme options.

Table 38. Power

Item	Options	Description
Power/Performance Bias	<ul style="list-style-type: none"> • Platform Controlled (Default) • OS Controlled • PECI Controlled 	<p>Power/Performance bias determines how aggressively the processor will be power managed and placed into Turbo. Not all OSES support this feature.</p> <ul style="list-style-type: none"> • [Platform Controlled]: The system controls the setting. • [OS Controlled]: The operating system controls the setting. • [PECI Controlled]: This option allows BMC to control energy/performance bias. <p>Note: The option [OS Controlled] is not available when Processor → CPU P-state Control is set to Autonomous.</p>
Platform Controlled Type	<ul style="list-style-type: none"> • Performance • Balanced Performance (Default) • Balanced Power • Power 	<p>Controls how aggressively the processor's Power Control Unit (PCU) will engage power management and how the CPU cores are placed into Turbo mode.</p> <ul style="list-style-type: none"> • [Performance]: allows the most aggressive use of Turbo. Power management functions are disabled, thereby increasing power consumption. • [Power]: disables Turbo and maximizes the use of power management features. • [Balanced Performance] and [Balanced Power] are two intermediate options between [Performance] and [Power], with the former being more inclined to improve performance and the latter being more inclined to reduce power consumption. <p>When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.</p>
Workload Configuration	<ul style="list-style-type: none"> • Balanced (Default) • I/O sensitive 	<p>Workload configuration bias is used to tune the system's I/O bandwidth profile. This setting tunes how aggressively the system will allocate processor core and uncore frequency to handle I/O requests.</p> <ul style="list-style-type: none"> • [Balanced]: CPU core and uncore frequency is balanced to provide equal performance weighting between I/O tasks and application workload threads. • [I/O sensitive]: CPU core and uncore frequency is weighted to allocate enough resources to provide high I/O bandwidth when CPU cores are at low utilization. <p>[I/O sensitive] is recommended for expansion cards that require the high bandwidth I/O when the processor cores are idle to allow enough frequency for the workload.</p>

Table 38. Power (continued)

Item	Options	Description
ASPM	<ul style="list-style-type: none"> • Auto • Disabled(Default) 	<p>PCIe Active State Power Management (ASPM) is a PCIe power saving feature. It puts the PCIe link into a low power mode when the link is idle.</p> <ul style="list-style-type: none"> • [Auto]: enables ASPM on PCIe endpoint adapters that support it. • [Disabled]: disables ASPM for all PCIe endpoints.
ACPI Fixed Power Button	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>When the setting is disabled, manually pressing the power button which is located in front of the system won't execute the Operating System's Power Button Policy such as shutdown, turn off monitor, etc. In addition, the following options under the BMC Server (Web) Power Actions feature will be disabled:</p> <ul style="list-style-type: none"> • Power off server normally • Restart server normally

Processors

This menu offers options to change the processor settings.

Table 39. Processors

Item	Options	Description
"Processor Details" on page 39	N/A	Summary of the installed processors
Turbo Mode	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>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.</p> <p>Notes:</p> <ul style="list-style-type: none"> • This item is not available if the processor does not support this feature. • When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.
Energy Efficient Turbo	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>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.</p> <p>Note:</p> <p>When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.</p>

Table 39. Processors (continued)

Item	Options	Description
<p>Turbo Boost Max 3.0</p>	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Enable or disable Turbo Boost Max 3.0.</p> <p>Intel® Turbo Boost Max Technology 3.0 is an enhanced version of 2.0 that boosts the speed of a CPU's fastest cores individually, while also directing critical workloads to those boosted cores.</p> <p>Note: This item is available only when the CPU supports this function and CPU P-state Control is set to [Cooperative without Legacy] or [Cooperative with Legacy].</p>
<p>CPU P-state Control</p>	<ul style="list-style-type: none"> • None • Legacy • Autonomous (Default) • Cooperative without Legacy • Cooperative with Legacy 	<p>The processor active power management state (P-state control) affects how the CPU operating frequencies are selected, based on the workload.</p> <ul style="list-style-type: none"> • [Autonomous]: This mode is part of Intel's Hardware Power Management (HWPM) feature and is the default mode. In this mode, all CPU P-state management is handled automatically in the background without any OS intervention. Autonomous mode is used for normal power savings and serves well for most typical business applications. • [Legacy]: The processor P-states will be presented to the OS and the OS power management (OSPM) will directly control which P-state is selected. Legacy control mechanism is currently implemented for systems with processors prior to the Intel Xeon Scalable Processor codenamed Skylake. Uses the standard ACPI interface. This mode is used for applications which benefit from OS level frequency controls. • [Cooperative without Legacy]: UEFI doesn't provide legacy P-States. The OS provides hints to the processor's power control unit (PCU) for the desired P-state min/max levels. The PCU runs in Autonomous mode until the OS sets the desired frequency. The hints provided by the OS affect the final P-state selected by the PCU. • [Cooperative with Legacy]: UEFI leaves the legacy P-states interface initially enabled until/if later an OS that is aware of Intel Hardware P-states (HWP) native mode sets the bit. Legacy P-states will be used until the OS sets the HWP native mode. After that, P-states will switch to the same behavior as "Cooperative without Legacy". • [None]: No ACPI table entries for P-states are created. P-states are disabled. Use this setting to minimize latency caused by P-state transitions. Recommended for latency sensitive workloads. CPUs run at either their rated frequency or in turbo mode, if turbo is enabled. <p>For applications which are clock frequency sensitive it is recommended to test with Cooperative or Legacy mode.</p> <p>Note:</p>

Table 39. Processors (continued)

Item	Options	Description
		When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.
C-States	<ul style="list-style-type: none"> • Legacy (Default) • Disabled 	<p>C-states reduces power consumption during the idle time.</p> <p>When [Legacy] is selected, the operating system initiates the C-state transitions. Some OS software may defeat the ACPI mapping (e.g. intel_idle driver).</p> <p>Note: When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.</p>
Package C State	<ul style="list-style-type: none"> • C0/C1 • C2 • C6NR (Default) • No limit 	<p>Low power C-states have higher exit latencies and higher power C-states have lower exit latencies.</p> <p>Notes:</p> <ul style="list-style-type: none"> • When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.
C1 Enhanced Mode	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>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 support this feature.</p> <p>Note: When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting. Changes will take effect after the system reboots.</p>
Uncore Frequency Scaling	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>When enabled, the processor will dynamically change frequencies based on the workload. All miscellaneous logic inside the CPU package is considered the Uncore.</p> <p>Note: When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.</p>
Trusted Execution Technology	<ul style="list-style-type: none"> • Enabled • Disabled (Default) 	<p>Enable or disable Intel Trusted Execution Technology (Intel TXT).</p> <p>Intel TXT is a set of hardware extensions to Intel processors and chipsets that enhance the digital office platform with security capabilities such as measured launch and protected execution.</p>

Table 39. Processors (continued)

Item	Options	Description
Intel Virtualization Technology	<ul style="list-style-type: none"> • Disabled • Enabled (Default) 	<p>Enable or disable Intel Virtualization Technology.</p> <p>Intel Virtualization Technology abstracts hardware that allows multiple workloads to share a common set of resources.</p> <p>Note: When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.</p>
Hardware Prefetcher	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>When enabled, the hardware prefetcher will prefetch data from the main system memory to the Level 2 cache to help expedite data transaction for memory performance enhancement.</p> <p>Lightly-threaded applications and some benchmarks can benefit from having the hardware prefetcher enabled.</p>
Adjacent Cache Prefetch	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>The adjacent cache line prefetcher automatically fetches adjacent cache lines to ones being accessed by the program. This reduces cache latency by making the next cache line immediately available if the processor requires it.</p> <p>Lightly-threaded applications and some benchmarks can benefit from having Adjacent Cache Prefetch enabled.</p>
DCU Streamer Prefetcher	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>The Data Cache Unit (DCU) streamer prefetcher detects multiple reads to a single cache line in a certain period of time and choose to load the following cache line to the L1 data caches.</p> <p>Lightly-threaded applications and some benchmarks can benefit from having DCU Streamer Prefetcher enabled.</p>
DCU IP Prefetcher	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>DCU IP prefetcher looks for sequential load history to determine whether to prefetch the following data to the L1 caches.</p> <p>It is recommended that the DCU IP prefetcher is enabled for the most environments. However, some environments may benefit from having it disabled, e.g. Java.</p>
L1 Next Page Prefetcher	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Next page prefetcher is an L1 data cache page prefetcher (MSR 1A4h [4]), which detects accesses that are likely to cross a page boundary and starts the access early.</p> <p>Note: This item is only available for Intel® Xeon® 6 processors (formerly codenamed "Sierra Forest").</p>

Table 39. Processors (continued)

Item	Options	Description
UPI Link Disable	<ul style="list-style-type: none"> • Enabled All Links (Default) • Minimum Number of Links Enabled 	<p>Limiting the QPI/UPI connections to the minimum number can save power. If maximum performance is desired, all QPI links should be left enabled.</p> <p>Notes:</p> <ul style="list-style-type: none"> • The UPI function is supported only when two or more processors are installed. • When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.
SNC	<ul style="list-style-type: none"> • Enabled • Disabled (Default) 	<p>Sub NUMA Clustering (SNC) partitions the cores and last level cache (LLC) into clusters with each cluster bound to a set of memory controllers in the system, dividing each CPU package into multiple NUMA nodes. This can improve average latency to the last level cache.</p> <p>Notes: This item is available for below processors:</p> <ul style="list-style-type: none"> • Intel® Xeon® 6 processors (formerly codenamed "Sierra Forest"): ZCC SKUs
Directory Mode Enable	<ul style="list-style-type: none"> • Enabled • Disabled • Auto (Default) 	<p>When enabled, additional features such as Opportunistic Snoop Broadcast (OSB), HitME cache, and I/O Directory Cache (IODC) are used to reduce the overhead of directory reads. When disabled, all memory accesses will require a snoop which is not recommended for most workloads.</p> <p>Note: When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.</p>
XPT Prefetcher	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Extended Prediction Table (XPT) prefetcher (memory prefetch from the core) 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. It is designed to reduce local memory access latency.</p>
UPI Prefetcher	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Ultra Path Interconnect (UPI) prefetch enables an early memory read on the memory bus. The UPI receive path spawns a memory read to the memory controller prefetcher.</p> <p>Note: This item is available only when two or more processors are installed.</p>
D2U	<ul style="list-style-type: none"> • Enabled • Disabled • Auto (Default) 	<p>Latency saving feature for remote read transactions. Workloads that are highly dependent on remote idle latency may see an impact when D2U is disabled.</p> <p>Note: This item is available only when two or more processors are installed.</p>

Table 39. Processors (continued)

Item	Options	Description
IODC	<ul style="list-style-type: none"> • Disabled • Auto (Default) • Enable for Remote InvltoM Hybrid Push • Enable for Remote InvltoM AllocFlow • Enable for Remote InvltoM Hybrid AllocNonAlloc • Enable for Remote InvltoM and Remote WCiLF 	<p>When I/O Directory Cache (IODC) is enabled, this reduces directory-based write overhead. When disabled, it does not suppress directory read/updates for non-cacheable write transactions.</p> <p>Note: This item is available only when two or more processors are installed.</p>
Loctorem Thresholds Normal	<ul style="list-style-type: none"> • Disabled • Auto (Default) • Low • Medium • High 	<p>The BIOS option provides a set of thresholds that can control how much of the various types of requests are allowed to occupy the Table Of Requests (TOR), thus helping to avoid the imbalance between local requests and remote requests. This BIOS option controls the number of local-to-remote (Loctorem) requests allowed in the pipeline when the pipeline is empty of remote requests (EMPTY) and when remote requests are also present in the pipeline (NORMAL).</p> <p>Auto is default and controlled by Si Compatibility.</p>
Loctorem Thresholds Empty	<ul style="list-style-type: none"> • Disabled • Auto (Default) • Low • Medium • High 	<p>The BIOS option provides a set of thresholds that can control how much of the various types of requests are allowed to occupy the Table Of Requests (TOR), thus helping to avoid the imbalance between local requests and remote requests. This BIOS option controls the number of local-to-remote (Loctorem) requests allowed in the pipeline when the pipeline is empty of remote requests (EMPTY) and when remote requests are also present in the pipeline (NORMAL).</p> <p>Auto is default and controlled by Si Compatibility.</p>
Total Memory Encryption	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	<p>Intel Total Memory Encryption (TME) encrypts the entire physical memory of a system with a single encryption key.</p>
Multikey Total Memory Encryption	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	<p>Intel Multikey Total Memory Encryption (MK-TME) technology is built on top of Intel TME. It enables the use of multiple encryption keys, allowing selection of one encryption key per memory page using the processor page tables.</p> <p>Note: This item is available only when Total Memory Encryption is set to [Enabled].</p>
Memory Integrity	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	<p>Enable or disable memory integrity. Memory integrity is a feature of core isolation.</p> <p>Note: This item is available only when Total Memory Encryption is set to [Enabled].</p>

Table 39. Processors (continued)

Item	Options	Description
Max MKTME Keys	Dynamic value	Total number of keys that can be used by TME-MT. Note: This item is available only when Total Memory Encryption is set to [Enabled].
Trust Domain Extension (TDX)	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	Enable or disable Trust Domain Extension (TDX).
TDX Secure Arbitration Mode Loader (SEAM Loader)	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	Enable or disable TDX Secure Arbitration Mode Loader (SEAM Loader). Note: This item will be grayed out if TDX is disabled.
TME-MT/TDX key split	<ul style="list-style-type: none"> • 0x1 (Default) The value range is 1 to N, where N depends on the system configuration.	Designate number of bits for TDX usage. The rest will be used by TME-MT. Note: This item is not available if TDX is disabled.
TME-MT keys	Dynamic value, depending on the value of TME-MT/TDX key split	Number of keys designated for TME-MT usage Note: This item is not available if TDX is disabled.
TDX keys	Value = Max MKTME Keys - TME-MT keys	Number of keys designated for TDX usage Note: This item is not available if TDX is disabled.
SW Guard Extensions	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	Enable or disable Software Guard Extensions (SGX). Note: This item is available only when the system supports Total Memory Encryption (TME) and TME is enabled. In addition, disable Patrol Scrub and Mirror Mode before you enable SGX. Otherwise, SGX function may not work well.
SGX Factory Reset	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	Enable or disable SGX Factory Reset. When [Enabled] is selected, it erases all registration data on subsequent boot, and additionally forces an Initial Platform Establishment flow when SGX is enabled. Note: This item is available only when the system supports Total Memory Encryption (TME) and TME is enabled. In addition, disable Patrol Scrub and Mirror Mode before you enable SGX. Otherwise, SGX function may not work well.
SGX Package Info In-Band Access	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	Enable or disable Software Guard Extensions (SGX) Package Info In-Band Access. Note: This item is available only when the system supports Total Memory Encryption (TME) and TME is enabled. In addition, disable Patrol Scrub and Mirror Mode before you enable SGX. Otherwise, SGX function may not work well.

Table 39. Processors (continued)

Item	Options	Description
SGX PRM Size	<ul style="list-style-type: none"> • 1G(Default) • 2G • 4G • 8G <p>Note: The default value and options change dynamically, depending on system configuration.</p>	<p>SGX PRM Size is a constituent which may not be equal to the total PRM size.</p> <p>Note: This item will be grayed out if SW Guard Extensions is disabled.</p>
Intel Speed Select	<ul style="list-style-type: none"> • Base • Auto • Config1 • Config2 • SST-PP V2 <p>Note: Depending on the CPU configuration, options [Config1], [Config2], and [SST-PP V2] may not be displayed.</p>	<p>With Intel Speed Select Technology (SST), the rated frequency of the CPU can increase as the number of CPU cores that are enabled in UEFI goes down. Essentially, with SST, the CPU can achieve a guaranteed turbo frequency.</p> <p>If the processor installed doesn't support SST, the [Base] option will be used regardless of the setting selected.</p> <ul style="list-style-type: none"> • [Bases]: effectively disables SST. • [Auto]: The level of SST enablement is controlled automatically based on the number of CPU cores enabled in UEFI. • [Config1]: forces the SST cores limits based on the Config option selected. [Config1] may override the option that enables the number CPU cores in UEFI. • [Config2]: forces the SST cores limits based on the Config option selected. [Config2] may override the option that enables the number CPU cores in UEFI. • [SST-PP V2] enables dynamic SST-PP mode. With SST-PP V2, the mode can be dynamically changed at runtime via the Linux OS. <p>Note: This item is not available if the processor does not support SST.</p>
SST-BF	<ul style="list-style-type: none"> • Enabled • Disabled(Default) 	<p>This Option allows SST-BF to be enabled and allows BIOS to configure SST-BF High Priority Cores so that software does not have to configure it.</p> <p>Note: This item is not available if the CPU does not support SST-BF or CPU P-state Control is not set to [Cooperative without Legacy].</p>
PECI Is Trusted	<ul style="list-style-type: none"> • Disabled • Enabled (Default) 	<p>Enable or disable trust for the Platform Environment Control Interface (PECI) of the system.</p> <p>You can select [Disabled] if a higher level of security is required, but some functions such as memory and I/O utilization reporting may not work.</p>

Table 39. Processors (continued)

Item	Options	Description
Cores in CPU Package	<ul style="list-style-type: none"> • All (Default) List of all available core counts based on CPU architecture 	<p>Select the amount of cores enabled within each CPU package.</p> <p>Notes: The available core counts are based on the CPU architecture.</p> <ul style="list-style-type: none"> • For Intel® Xeon® 6 processors (formerly codenamed "Sierra Forest"), the available options are the multiples of 2 or 4, based on the CPU internal packages.
CPU PCIe Relaxed Ordering	<ul style="list-style-type: none"> • Enabled • Disabled (Default) 	Enabling CPU PCIe Relaxed Ordering will always allow downstream completions to pass posted writes.
OSB Enabled	<ul style="list-style-type: none"> • Enabled • Disabled • Auto (Default) 	<p>The Opportunistic Snoop Broadcast(OSB) feature attempts to avoid memory read latency by snooping the local (home) agent and remote socket peers.</p> <p>Auto is default and controlled by Si Compatibility.</p>
OSB Local Rd Enabled	<ul style="list-style-type: none"> • Enabled • Disabled • Auto (Default) 	Auto is default and controlled by Si Compatibility.
OSB Local RdCur Enabled	<ul style="list-style-type: none"> • Enabled • Disabled • Auto (Default) 	Auto is default and controlled by Si Compatibility.
OSB Remote Rd Enabled	<ul style="list-style-type: none"> • Enabled • Disabled • Auto (Default) 	Auto is default and controlled by Si Compatibility.
Gate OSB IODC Allocation Enabled	<ul style="list-style-type: none"> • Enabled • Disabled • Auto (Default) 	<p>When OSB indicates that there aren't enough snoop credits, no IODC entry will be allocated.</p> <p>Auto is default and controlled by Si Compatibility.</p>
Stale AtoS	<ul style="list-style-type: none"> • Enabled • Disabled • Auto (Default) 	State AtoS controls whether a cache line should transition from A (snoopAll) state to S (Shared) state when snoop misses.
LLC dead line alloc	<ul style="list-style-type: none"> • Enabled (Default) • Disabled • Auto 	<ul style="list-style-type: none"> • [Enabled]: The LLC opportunistically fills dead lines into LLC if there is free space available. • [Disabled]: Dead lines will always be dropped and will never fill into the LLC.
UPI Link Frequency	<ul style="list-style-type: none"> • Minimal Power • Balanced • Maximum Performance (Default) 	<p>Select the desired UPI link frequency.</p> <ul style="list-style-type: none"> • [Maximum performance]: maximizes the performance. • [Balanced]: offers a balance between performance and power. • [Minimal power]: maximizes power savings. <p>Note: The UPI function works only when two or more processors are installed.</p>

Table 39. Processors (continued)

Item	Options	Description
“CPU Frequency Limits” on page 40	<ul style="list-style-type: none"> • Full turbo uplift (Default) • Restrict maximum frequency 	<p>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 1.2 GHz. This can be useful for synchronizing CPU tasks.</p> <p>The max frequency for N+1 cores cannot be higher than N cores. If an unsupported frequency is entered, it will automatically be limited to a supported value. If the CPU frequency limits are being controlled through application software, leave this menu item at the default setting ([Full turbo uplift]).</p> <p>Note: This item is available only when Turbo Mode is enabled.</p>
Rocket Mode	<ul style="list-style-type: none"> • Enabled • Disabled (Default) 	<p>When [Enabled] is selected, Rocket Mode allows the cores to jump to max turbo instantly rather than on a smooth curve.</p> <p>When Rocket Mode is enabled, it is only engaged when P-states are set to [Autonomous].</p>
C0 Nap Time	0	Controls maximum allowed time to nap in C0 sub-state, and to control whether C0.2 is supported.
UPI Power Management	<ul style="list-style-type: none"> • L1 <ul style="list-style-type: none"> – Enabled (Default) – Disabled • L0p <ul style="list-style-type: none"> – Enabled (Default) – Disabled 	<p>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].</p> <p>Notes:</p> <ul style="list-style-type: none"> • The UPI function works only when two or more processors are installed. • When a preset workload profile is selected, this setting is not changeable and is grayed out. To change the setting, select System Settings → Workload Profile → Custom first. Then, you can make change to this setting.

Processor Details

Table 40. Processor Details

Item	Format	Description
Processor Socket	<ul style="list-style-type: none"> • Socket 1 • Socket n 	Processor socket table
Processor ID	ASCII string	Tag of the processor ID
Processor Frequency	ASCII string	Value of the processor frequency
Processor Revision	ASCII string	Value of the microcode revision
L1 Cache RAM	ASCII string	Amount of L1 Cache RAM
L2 Cache RAM	ASCII string	Amount of L2 Cache RAM
L3 Cache RAM	ASCII string	Amount of L3 Cache RAM

Table 40. Processor Details (continued)

Item	Format	Description
Cores Per Socket (Supported/ Enabled)	ASCII string	Number of supported and enabled processor cores per processor socket
Threads Per Socket (Supported/ Enabled)	ASCII string	Number of supported and enabled processor threads per processor socket
Processor 1 Version	ASCII string	Version of processor 1
Processor n Version	ASCII string	Version of processor n

CPU Frequency Limits

Table 41. CPU Frequency Limits

Item	Options	Description
CPU Frequency Limits		
<p>Processors X to X cores active</p> <p>Note: This item is dynamic text, depending on the current processor state.</p>	<ul style="list-style-type: none"> • Max turbo frequency bin • Max turbo frequency -1 bin • Max turbo frequency -2 bins • ... • Base frequency +1 bins 	<p>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 1.2 GHz. This can be useful for synchronizing CPU tasks.</p> <p>The max frequency for N+1 cores cannot be higher than N cores. If an unsupported frequency is entered, it will automatically be limited to a supported value. If the CPU frequency limits are being controlled through application software, leave this menu item at the default setting ([Full turbo uplift]).</p>

Recovery and RAS

This menu allows you to configure recovery policies and advanced reliability, availability, and serviceability settings.

Table 42. Recovery and RAS

Item	Description
“POST Attempts” on page 41	Configure number of attempts to POST before the recovery mechanisms is invoked.
“Advanced RAS” on page 41	Choose whether to enable various advanced RAS options or not.
“Disk GPT Recovery” on page 41	Configure Disk GUID Partition Table (GPT) Recovery options.
“System Recovery” on page 42	Configure system recovery settings.

POST Attempts

Table 43. POST Attempts

Item	Options	Description
Post Attempt Limit	<ul style="list-style-type: none">• Disabled• 9• 6• 3 (Default)	<p>Configure the number of attempts to POST before the recovery mechanism is invoked.</p> <p>When the number of consecutive failed POST attempts reaches the limit, the system will reboot with the factory default settings.</p>

Advanced RAS

Table 44. Advanced RAS

Item	Options	Description
Machine Check Recovery	<ul style="list-style-type: none">• Enabled (Default)• Disabled	When enabled, it enables the software layers (OS, VMM, DBMS, application) to assist in system recovery from hardware uncorrectable error
PCI Error Recovery	<ul style="list-style-type: none">• Enabled (Default)• Disabled	<p>When enabled, it allows the system to recover from an uncorrectable PCIe error. The corresponding PCIe device will be disabled to prevent the error from damaging the system, and the operating system will rescan the PCIe buses.</p> <p>When disabled, an uncorrectable PCIe error results in an NMI.</p>
PCIe Endpoint Reset on Fatal Error	<ul style="list-style-type: none">• Disabled (Default)• Enabled	When enabled, the system resets the PCIe endpoint when a fatal error occurs.

Disk GPT Recovery

Table 45. Disk GPT Recovery

Item	Options	Description
Disk GPT Recovery	<ul style="list-style-type: none">• Automatic• Manual• None (Default)	<ul style="list-style-type: none">• [Automatic]: The system UEFI will automatically repair the corrupt GUID Partition Table (GPT).• [Manual]: The system UEFI will only repair the corrupt GPT based on user input.• [None]: The system UEFI will not repair the corrupted GPT. Recovery result can be retrieved from the system event log.

System Recovery

Table 46. System Recovery

Item	Options	Description
POST Watchdog Timer	<ul style="list-style-type: none">• Enabled• Disabled (Default)	Enable or disable the POST Watchdog Timer.
POST Watchdog Timer Value	[5]	Enter the POST Watchdog Timer Value in minutes within the specified range (5-20).
Reboot System On NMI	<ul style="list-style-type: none">• Enabled (Default)• Disabled	Specify whether to reboot the system during non-maskable interrupt (NMI).

Security

This menu allows you to configure system security settings.

Table 47. Security

Item	Description
“Secure Boot Configuration” on page 42	Configure secure boot options.
“Trusted Platform Module” on page 45	Configure TPM setup options.

Secure Boot Configuration

Table 48. Secure Boot Configuration

Item	Options	Description
Secure Boot Status	<ul style="list-style-type: none">• Disabled• Enabled	Display the current secure boot status.
Secure Boot Mode	<ul style="list-style-type: none">• User Mode• Setup Mode	System performs secure boot authentication when this item is set to [User Mode] and secure boot is enabled.
Secure Boot Setting	<ul style="list-style-type: none">• Enabled• Disabled (Default)	Enable or disable Secure Boot. A mode change requires a system reboot. The Secure Boot feature is Active only when Secure Boot is enabled, Platform Key (PK) is enrolled, and the system is in [User Mode] (Secure Boot Mode).

Table 48. Secure Boot Configuration (continued)

Item	Options	Description
Secure Boot Policy	<ul style="list-style-type: none"> • Factory Policy (Default) • Custom Policy • Delete All Keys • Delete PK 	<p>Secure Boot policy options:</p> <ul style="list-style-type: none"> • [Factory Policy]: Factory default keys will be used after reboot. When this option is selected, customized keys will be deleted. • [Custom Policy]: Customized keys will be used after reboot. When this option is selected, you can enter the Secure Boot Custom Policy page to do key customization, for example, add/delete a specific key or enroll a UEFI image. • [Delete All Keys]: Platform Key (PK), Key Exchange Key (KEK), Authorized Signature Database (DB), and Forbidden Signature Database (DBX) will be deleted after reboot. After all keys are deleted, Secure Boot Mode will be [Setup Mode] and Secure Boot Policy will be [Custom Policy]. • [Delete PK]: PK will be deleted after reboot. After the PK is deleted, Secure Boot Mode will be [Setup Mode] and Secure Boot Policy will be [Custom Policy]. • [Reset All Keys to Default]: All keys will be set to factory defaults and Secure Boot Policy will be set to [Factory Policy] after reboot. <p>Note: The options cannot be loaded to default in the Setup Utility.</p>
“View Secure Boot Keys” on page 43	N/A	View the details of the PK, KEK, DB, and DBX.
“Secure Boot Custom Policy” on page 44	N/A	<p>Customize the PK, KEK, DB, and DBX.</p> <p>Note: This menu is configurable only when Secure Boot Policy is set to [Custom Policy].</p>

View Secure Boot Keys

Table 49. View Secure Boot Keys

Item	Description
Secure Boot variable	Table header, lists the Platform Key (PK), Key Exchange Key (KEK), Authorized Signature Database (DB), and Forbidden Signature Database (DBX).
Size	Table header, displays number of key bytes.
Keys	Table header, displays number of certificates.
Key Source	Table header, displays certificate sources. The sources can be Factory Default , No Keys , or Customized .
PK	View certificate in PK. Note: There is only one PK in the system.
KEK	View all certificates in KEK.

Table 49. View Secure Boot Keys (continued)

Item	Description
DB	View all certificates in DB.
DBX	View all certificates in DBX.

Secure Boot Custom Policy

Table 50. Secure Boot Custom Policy

Item	Description
“PK Options” on page 44	Enroll a custom PK or delete the existing PK. Note: There is only one PK in the system. If you need to insert a custom PK, delete the original PK first. Secure boot will be disabled after you delete the PK.
“KEK Options” on page 44	Enroll a KEK entry or delete the existing entry from the KEK list.
“DB Options” on page 45	Enroll a DB entry or delete the existing entry from the DB list.
“DBX Options” on page 45	Enroll a DBX entry or delete the existing entry from the DBX list.

PK Options

Table 51. PK Options

Item	Description
Enroll PK	Enroll a custom PK. Note: There is only one PK in the system. If you need to insert a custom PK, delete the original PK first. Secure boot will be disabled after you delete the PK.
Delete PK	Delete the existing PK. Note: There is only one PK in the system. If you need to insert a custom PK, delete the original PK first. Secure boot will be disabled after you delete the PK.
Enroll PK Using File	Enroll a custom PK from a file using an external USB or storage device.
Commit Changes and Exit	Commit changes and exit.
Discard Changes and Exit	Discard changes and exit.

KEK Options

Table 52. KEK Options

Item	Description
Enroll KEK	Enroll a KEK.
Delete KEK	Delete an existing KEK from the KEK list.
Enroll KEK Using File	Enroll a KEK from a file using an external USB or storage device.
Commit Changes and Exit	Commit changes and exit.
Discard Changes and Exit	Discard changes and exit.

DB Options

Table 53. DB Options

Item	Description
Enroll Signature	Enroll a signature entry.
Delete Signature	Delete a signature entry from the KEK list.
Enroll Signature Using File	Enroll a signature from a file using an external USB or storage device.
Commit Changes and Exit	Commit changes and exit.
Discard Changes and Exit	Discard changes and exit.

DBX Options

Table 54. DBX Options

Item	Options	Description
Enroll Signature	N/A	Enroll a signature entry.
Delete Signature	N/A	Delete a signature entry from the KEK list.
Enroll Signature Using File	N/A	Enroll a signature from a file using an external USB or storage device.
Signature GUID		
Signature Format	<ul style="list-style-type: none">• X509 CERT SHA256• X509 CERT SHA384• X509 CERT SHA512• X509 CERT	Different X509 DER-Cert are enrolled. Select an option to enroll it into the DBX list.
Always Revocation	Check box	Indicates whether the certificate is always revoked.
Commit Changes and Exit	N/A	Commit changes and exit.
Discard Changes and Exit	N/A	Discard changes and exit.

Trusted Platform Module

Table 55. Trusted Platform Module

Item	Options	Description
"TPM 2.0" on page 46	N/A	Configure the TPM 2.0 Setup options.

Trusted Platform Module (TPM 2.0)

Table 56. Trusted Platform Module (TPM 2.0)

Item	Options	Description
TPM Status		
TPM Vendor	N/A	Vendor information of the TPM device
TPM Firmware Version	N/A	Current firmware version of the TPM device
TPM Settings		
TPM2 Operation	<ul style="list-style-type: none"> • No Action (Default) • Clear 	<p>You can select [Clear] to clear TPM data.</p> <p>Attention: This will erase the contents of the TPM. A system reboot is required.</p>
TPM Device	<ul style="list-style-type: none"> • Enabled (Default) • Disabled 	<p>Enable or disable the TPM. If you disable the TPM device from the OS, the TPM device object will not be present in the ACPI namespace.</p>

Storage

The device list is based on your system configuration and system setting. Contents of this page are dynamically generated by the storage vendor's HII utilities.

Table 57. Storage

Item	Description
“NVMe” on page 46	Lists the NVMe devices.

NVMe

Table 58. NVMe

Item	Description
<p>Bay X: NVMe Bus-Dev-Fun</p> <p>e.g. NVMe 64-0-0</p>	<p>This string is defined by platform. Each platform may display a different string.</p> <p>“X” is the bay number. “Bus-Dev-Fun” is the PCI address value.</p>

Table 59. NVMe Detail Information

Item	Format	Description
Model Name	ASCII string	Model name of the NVMe device
Serial Number	ASCII string	Serial number of the NVMe device
Firmware Revision	ASCII string	Firmware revision of the NVMe device
Vendor ID	0XXXXX (XXX is hex number)	Vendor ID of the NVMe device
Device ID	0XXXXX (XXX is hex number)	Device ID of the NVMe device

Table 59. NVMe Detail Information (continued)

Item	Format	Description
Subsystem Vendor ID	0xXXXX (XXX is hex number)	Subsystem vendor ID of the NVMe device
Subsystem ID	0xXXXX (XXX is hex number)	Subsystem ID of the NVMe device
Maximum Link Speed	Gen N (N is number)	Maximum link speed
Maximum Link Width	xN (N is number)	Maximum link width
Negotiated Link Speed	Gen N (N is number)	Negotiated link speed
Negotiated Link Width	xN (N is number)	Negotiated link width
Number of Namespaces	N (N is number)	Number of namespaces
Total Size	X.XX TB (Unit can be GB or MB, depending on the size)	Total size
Device driver data link		
Device HII Title	N/A	Description of the device HII The title and description are generated by the installed storage vendor's HII utilities. If the device does not provide HII data, "N/A" will be displayed.

Date and Time

This menu allows you to set the local date and time of the system.

Table 60. Date and Time

Item	Format	Description
System Date	MM/DD/YYYY	You can use the +/- or the numeric keys to set the date of the server.
System Time	HH:MM:SS	You can use the +/- or the numeric keys to set the time of the server.

Start Options

This menu lists the current boot order. The table is for default boot order. Contents will be different if the system has a different boot order.

Table 61. Start Options

Item	Description
DVD ROM	Device Path: VenHw(61A3F2B1-3611-43BD-BF73-74472A2DEFFB,01000000)
Hard Disk	Device Path: VenHw(61A3F2B1-3611-43BD-BF73-74472A2DEFFB,02000000)
Network	Device Path: VenHw(61A3F2B1-3611-43BD-BF73-74472A2DEFFB,03000000)
USB Storage	Device Path: VenHw(61A3F2B1-3611-43BD-BF73-74472A2DEFFB,04000000)

Boot Manager

This menu allows you to manage the boot settings, such as the boot order, boot options, boot modes, and system reboot.

Table 62. Boot Manager

Item	Options	Description
Boot Sequence		
“Add UEFI Full Path Boot Option” on page 49	N/A	Add one UEFI application or one removable file system as the boot option.
“Boot Option Maintenance” on page 49	N/A	Change the boot order, select boot option(s), or delete boot option(s).
“Set Boot Priority” on page 49	N/A	Set the boot priority of the devices in a device group.
Other Boot Functions		
“Boot From File” on page 50	Xxxx {xxxx-xxx-xxx...}	Boot the system from a specific file or a device.
“Select Next One-Time Boot Option” on page 50	N/A	Select the one-time boot option for the next boot.
System		
“Boot Modes” on page 50	N/A	Change the boot settings.
“Reboot System” on page 51	N/A	Reboot the system. If <Y> is pressed, any setup changes will be lost and the system will reboot.

Add UEFI Full Path Boot Option

Table 63. Add UEFI Full Path Boot Option

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

Boot Option Maintenance

Table 64. Boot Option Maintenance

Item	Options	Description
Boot Order	N/A	You can use the +/- keys on the numeric keypad to change the boot order.
Select Boot Option		
List of boot options e.g. <ul style="list-style-type: none"> • DVD ROM • Hard Disk • Network • USB storage The boot option list varies by platform.	Check box: <ul style="list-style-type: none"> • Empty • X (Default) 	You can select the check box to select a boot option. After you select a boot option, it will be add to the boot order. If you clear the check box, the boot option will be removed from the boot order.
Delete Boot Option		
<ul style="list-style-type: none"> • Shell The boot option list varies by platform.	Check box: <ul style="list-style-type: none"> • Empty (Default) • X 	You can select the check box to delete a boot option.

Set Boot Priority

Table 65. Set Boot Priority

Item	Description
DVD ROM Priority	Set the boot priority for the DVD ROM device group if multiple devices exist in the system.
Hard Disk Priority	Set the boot priority for the hard disk group if multiple devices exist in the system.
Network Priority	Set the boot priority for the network device group if multiple devices exist in the system.
USB Priority	Set the boot priority for the USB device group if multiple devices exist in the system.

Boot From File

Use this menu to boot the system from a specific file or device. Message boxes will be displayed to guide you through the process.

Select Next One-Time Boot Option

Use this menu to select the one-time boot option for the next boot.

Table 66. Select Next One-Time Boot Option

Item	Options	Description
Select Next One-Time Boot Option	<ul style="list-style-type: none"> • System Setup • DVD ROM • Hard Disk • Network • USB Storage • None (Default) <p>Note: This option list contains the boot options in the current boot order list, [System Setup], and [None]. The options will be different if the system has a different boot order.</p>	Select the one-time boot option for the next boot.

Boot Modes

Table 67. Boot Modes

Item	Options	Description
System Boot Mode	<ul style="list-style-type: none"> • UEFI Mode (Default) 	<p>Drivers, option ROMs and OS loaders the Boot Manager attempts to boot.</p> <p>[UEFI Mode] runs UEFI drivers and boot an UEFI OS loader. Only the UEFI mode is supported.</p>
Infinite Boot Retry	<ul style="list-style-type: none"> • Enabled • Disabled (Default) 	<p>The system continuously attempts the Boot Order.</p> <p>Make sure that a bootable device is specified in Boot Order.</p>
Prevent OS Changes To Boot Order	<ul style="list-style-type: none"> • Enabled • Disabled (Default) 	When [Enabled] is selected, UEFI removes the boot option which is created by OS or OS Installer from the boot order list.
Accelerated Boot	<ul style="list-style-type: none"> • Disabled (Default) • Enabled 	<p>Accelerated Boot extremely speeds up the UEFI boot process if there is no error or exception.</p> <p>Disable this item for hardware change and firmware update on options. Otherwise, limitations may appear.</p> <p>Note: This item is not available if there is no BMC license installed.</p>

Reboot System

Table 68. Reboot System

Item	Description
Reboot System	Prompt to reboot the system. If <Y> is pressed, any setup change will be lost and the system will reboot.

BMC Settings

This menu allows you to configure the baseboard management controller (BMC) settings.

Note: All settings under BMC page are unable to reset to default with **Load Default Settings**. Use **Reset Factory Defaults Setting** on this page to reset to default settings.

Table 69. BMC Settings

Item	Options	Description
Power Restore Policy	<ul style="list-style-type: none"> Always Off Restore Always On 	<p>Determines how the system reacts when the power is restored from a power loss. It will take a few minutes for the changes to take effect.</p> <ul style="list-style-type: none"> [Always Off]: The system remains off even when power is restored. [Restore]: The system returns to the state before power was lost. [Always On]: The system turns on when power is restored.
Power Restore Random Delay	<ul style="list-style-type: none"> Enabled Disabled 	<p>Provides a random delay of 1 to 15 seconds for Power On. If the server status is on before a power failure occurs, the power-on will be delayed once power is restored.</p> <p>Note: This item is not available when Power Restore Policy is set to [Always Off].</p>
Ethernet over USB interface	<ul style="list-style-type: none"> Enabled Disabled 	<p>Controls the Ethernet over USB interface used for in-band communication to the BMC.</p> <ul style="list-style-type: none"> [Enabled]: Enables in-band communication between the BMC and the xClarity Essentials in-band update utility running on the server. [Disabled]: Prevents xClarity Essentials and other applications running on the server from requesting the BMC to perform tasks. <p>Note: Change to the settings may keep stale for a while and do not take effect immediately.</p>
"Network Settings" on page 52	N/A	Configure network settings of the BMC.
Reset Factory Defaults Setting	N/A	Restore all BMC settings to factory defaults, including network configuration and credentials. The BMC will be restarted automatically.
Restart BMC	N/A	Restart the BMC.

Network Settings

Attention: Clicking **Save Network Settings** at the bottom of this page is required to save changes on this page and its subpage.

Table 70. Network Settings

Item	Options	Description
Network Interface Port	<ul style="list-style-type: none"> Dedicated Shared 	Select the network port used by the BMC controller, including the dedicated and shared ports.
Fail-Over Rule	<ul style="list-style-type: none"> None Failover to shared (Optional Card ML2) Failover to shared (Optional Card PHY) Failover to shared (Onboard Port) 	<p>This item controls the types of fail-over allowed.</p> <p>Note: This item is available only when Network Interface Port is set to [Dedicated].</p>
Shared NIC on	OCP Card	<p>Select the shared NIC port.</p> <p>Note: This item is available only when Network Interface Port is set to [Shared].</p>
Network Setting	<ul style="list-style-type: none"> Synchronization Independence 	The item is selectable only when Fail-Over Rule is configured to allow a failover to an onboard port or optional card.
Burned-in MAC Address	N/A	Burned-in MAC address of the network interface controller
Hostname	N/A	<p>Host name of the BMC controller</p> <p>The BMC host name is generated using a combination of the string “XCC-“ followed by the server machine type and server serial number (for example. “XCC-7DG8-1234567890”)</p> <p>You can change the host name by entering up to a maximum of 63 characters in this field.</p>
DHCP Control	<ul style="list-style-type: none"> Static IP DHCP Enabled DHCP with Fallback 	<p>Configure DHCP Control or configure a static IP address manually.</p> <ul style="list-style-type: none"> [Static IP]: Enter an IP address manually. [DHCP Enabled]: The IP address will be assigned automatically by the DHCP server. [DHCP with Fallback]: The static IP address will be used if DHCP fails.
IP Address	x.x.x.x	Enter the IP address in dotted-decimal notation.
Subnet Mask	x.x.x.x	Enter the subnet mask address in dotted-decimal notation.
Default Gateway	x.x.x.x	Enter the default gateway address in dotted-decimal notation.
IPv6	<ul style="list-style-type: none"> Enabled Disabled 	<p>Enable or disable IPv6 support on the management port.</p> <p>Note: This item is unable to reset to the default value by using Load Default Settings on the main menu.</p>

Table 70. Network Settings (continued)

Item	Options	Description
Local Link Address	N/A	Local link address
VLAN Support	<ul style="list-style-type: none"> • Enabled • Disabled 	<p>Enable or disable Virtual LAN (VLAN) support.</p> <p>When VLAN is enabled, you can specify an 802.1q VLAN ID for the management network port.</p> <p>Note: This item is unable to reset to the default value by using Load Default Settings on the main menu.</p>
VLAN ID	1	<p>Specify a VLAN ID. The value range is 1 to 4094.</p> <p>Note: This item is only when VLAN Support is enabled.</p>
Autonegotiation	Unknown	<p>Specify whether to enable auto-negotiation between the network connection.</p> <ul style="list-style-type: none"> • [No]: You can manually choose the data rate and duplex mode. • [Yes]: The data rate and duplex mode are set automatically. <p>Note: This item is unable to reset to the default value by using Load Default Settings on the main menu.</p>
Data rate	Unknown	<p>Set the amount of data to be transferred per second over LAN connection.</p> <p>Notes:</p> <ul style="list-style-type: none"> • This item is available only when Autonegotiation is set to [No]. If auto-negotiation is enabled, the data rate is selected automatically. • This item is unable to reset to the default value by using Load Default Settings on the main menu.
Duplex	Unknown	<p>Set the type of communication channel used in the network.</p> <ul style="list-style-type: none"> • [Full] allows the data to be transferred in both directions simultaneously. • [Half] allows the data to be transferred in one direction at a time. <p>Notes:</p> <ul style="list-style-type: none"> • This item is available only when Autonegotiation is set to [No]. If auto-negotiation is enabled, the duplex mode is selected automatically. • This item is unable to reset to the default value by using Load Default Settings on the main menu.

Table 70. Network Settings (continued)

Item	Options	Description
Maximum Transmission Unit	Unknown	Specify the maximum size of a packet (in bytes) for the network interface. For IPv4 networks, the MTU range is 68-1500 bytes For IPv6 networks, the MTU range is 1280-1500 bytes.
Save Network Settings	N/A	Save the network setting changes to the BMC. It takes a few minutes for the changes to take effect.

System Event Logs

This menu allows you to clear or view the system event logs.

Table 71. System Event Logs

Item	Description
System Event Log	View the system event logs.
Clear System Event Log	Clear the system event logs.

User Security

This menu allows you to set or change power-on and administrator passwords.

Table 72. User security

Item	Description
"Password Rule and Policy" on page 55	Set the password rule and policy.
Set Power-On Password	Set the power-on password. The password can only contain the following characters (excluding white-space characters): A-Z, a-z, 0-9, ~!@#\$%^&*()-+={} :;'"<>,?/\._ Must contain at least one letter. Must contain at least one number. Must contain at least two of the following characters in combination: <ul style="list-style-type: none"> • At least one upper-case letter • At least one lower-case letter • At least one special character No more than two consecutive occurrences of the same character Must contain at least 8 characters if Minimum password length is not set.
Clear Power-On Password	Clear the power-on password.

Table 72. User security (continued)

Item	Description
Set Administrator Password	<p>Set the administrator password.</p> <p>The password can only contain the following characters (excluding white-space characters): A-Z, a-z, 0-9, ~!@#\$%^&*()-+={} ;:"'<>?/_</p> <p>Must contain at least one letter.</p> <p>Must contain at least one number.</p> <p>Must contain at least two of the following characters in combination:</p> <ul style="list-style-type: none"> • At least one upper-case letter • At least one lower-case letter • At least one special character <p>No more than two consecutive occurrences of the same character</p> <p>Must contain at least 8 characters if Minimum password length is not set.</p>
Clear Administrator Password	Clear the administrator password.

Password Rule and Policy

Table 73. Password Rule and Policy

Item	Options	Function
Minimum password length	8-20	<p>Minimum number of characters, which is part of the rules to specify a valid password</p> <p>You can set a value between 8 and 20.</p>
Password expiration period	0-365	<p>Number of days a password can be used before it must be changed</p> <p>You can set a value between 0 and 365. If you set the value to "0", the password will never expire.</p>
Password expiration warning period	0-365	<p>Number of days before you receive a warning about the expiration of the password</p> <p>You can set a value between 0 and 365. If you set the value to "0", you will never receive the warning.</p>
Minimum password change interval	0-240	<p>Number of hours that must elapse before you change a password</p> <p>You can set a value between 0 and 240. The value cannot exceed the value specified for the Password expiration period. If you set the value to "0", you can change the password immediately.</p>
Minimum password reuse cycle	0-10	<p>Number of unique new passwords that must be set before an old password can be reused</p> <p>You can set a value between 0 and 10. If you set the value to 0, an old password can be reused immediately.</p>

Table 73. Password Rule and Policy (continued)

Item	Options	Function
Maximum number of login failures	0-100	Number of login attempts that can be made with an incorrect password before the user account is locked. The lockout period is specified in Lockout period after maximum login failures . You can set a value between 0 and 10. If you set the value to "0", accounts will never be locked.
Lockout period after maximum login failures	0-2880	Time period (in minutes) that a locked user must wait before attempting to login again. Entering a valid password does not unlock the account during the lockout period. You can set a value between 0 and 2880. If you set the value to "0", accounts will not be locked even if the maximum number of login failures is exceeded.

Default Options

This menu allows you to configure options for the factory default settings and custom default settings.

Table 74. Default Options

Item	Options	Description
Save Custom Default Settings	N/A	Save all the current settings as the custom default settings.
Delete Custom Default Settings	N/A	Delete the existing custom default settings. Note: This item will be grayed out if custom default settings do not exist.
Select Default Settings	<ul style="list-style-type: none"> • Custom Default • Factory Default 	Specify whether to load the factory default settings or the custom default settings when loading default settings. Note: This item will be grayed out if custom default settings do not exist.

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