



# BIOS Parameters by Server Model

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## C22 and C24 Servers

### Main BIOS Parameters for C22 and C24 Servers

Name	Description
TPM Support	<p>TPM (Trusted Platform Module) is a microchip designed to provide basic security-related functions primarily involving encryption keys. This option allows you to control the TPM Security Device support for the system. It can be one of the following:</p> <ul style="list-style-type: none"><li>• <b>Disabled</b>—The server does not use the TPM.</li><li>• <b>Enabled</b>—The server uses the TPM.</li></ul> <p><b>Note</b> We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>

## Advanced BIOS Parameters for C22 and C24 Servers

### Processor Configuration Parameters

Name	Description
<b>Intel Hyper-Threading Technology</b>	<p>Whether the processor uses Intel Hyper-Threading Technology, which allows multithreaded software applications to execute threads in parallel within each processor. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not permit hyperthreading.</li> <li>• <b>Enabled</b>—The processor allows for the parallel execution of multiple threads.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Number of Enabled Cores</b>	<p>Allows you to disable one or more of the physical cores on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>All</b>—Enables all physical cores. This also enables Hyper Threading on the associated logical processor cores.</li> <li>• <b>1 through <i>n</i></b>—Specifies the number of physical processor cores that can run on the server. Each physical core has an associated logical core.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Execute Disable</b>	<p>Classifies memory areas on the server to specify where application code can execute. As a result of this classification, the processor disables code execution if a malicious worm attempts to insert code in the buffer. This setting helps to prevent damage, worm propagation, and certain classes of malicious buffer overflow attacks. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not classify memory areas.</li> <li>• <b>Enabled</b>—The processor classifies memory areas.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>

Name	Description
<b>Intel VT</b>	<p>Whether the processor uses Intel Virtualization Technology (VT), which allows a platform to run multiple operating systems and applications in independent partitions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not permit virtualization.</li> <li>• <b>Enabled</b>—The processor allows multiple operating systems in independent partitions.</li> </ul> <p><b>Note</b> If you change this option, you must power cycle the server before the setting takes effect.</p>
<b>Intel VT-d</b>	<p>Whether the processor uses Intel Virtualization Technology for Directed I/O (VT-d). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not use virtualization technology.</li> <li>• <b>Enabled</b>—The processor uses virtualization technology.</li> </ul>
<b>Intel VT-d Coherency Support</b>	<p>Whether the processor supports Intel VT-d Coherency. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support coherency.</li> <li>• <b>Enabled</b>—The processor uses VT-d Coherency as required.</li> </ul>
<b>Intel VT-d ATS Support</b>	<p>Whether the processor supports Intel VT-d Address Translation Services (ATS). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support ATS.</li> <li>• <b>Enabled</b>—The processor uses VT-d ATS as required.</li> </ul>

Name	Description
<b>CPU Performance</b>	<p>Sets the CPU performance profile for the server. The performance profile consists of the following options:</p> <ul style="list-style-type: none"> <li>• DCU Streamer Prefetcher</li> <li>• DCU IP Prefetcher</li> <li>• Hardware Prefetcher</li> <li>• Adjacent Cache-Line Prefetch</li> </ul> <p>This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enterprise</b>—All options are enabled.</li> <li>• <b>High Throughput</b>—Only the DCU IP Prefetcher is enabled. The rest of the options are disabled.</li> <li>• <b>HPC</b>—All options are enabled. This setting is also known as high performance computing.</li> <li>• <b>Custom</b>—All performance profile options can be configured from the BIOS setup on the server. In addition, the Hardware Prefetcher and Adjacent Cache-Line Prefetch options can be configured in the fields below.</li> </ul>
<b>Hardware Prefetcher</b>	<p>Whether the processor allows the Intel hardware prefetcher to fetch streams of data and instruction from memory into the unified second-level cache when necessary. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The hardware prefetcher is not used.</li> <li>• <b>Enabled</b>—The processor uses the hardware prefetcher when cache issues are detected.</li> </ul>
<b>Adjacent Cache Line Prefetcher</b>	<p>Whether the processor fetches cache lines in even/odd pairs instead of fetching just the required line. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor only fetches the required line.</li> <li>• <b>Enabled</b>— The processor fetches both the required line and its paired line.</li> </ul>

Name	Description
<b>DCU Streamer Prefetch</b>	<p>Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not try to anticipate cache read requirements and only fetches explicitly requested lines.</li> <li>• <b>Enabled</b>—The DCU prefetcher analyzes the cache read pattern and prefetches the next line in the cache if it determines that it may be needed.</li> </ul>
<b>DCU IP Prefetcher</b>	<p>Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not preload any cache data.</li> <li>• <b>Enabled</b>—The DCU IP prefetcher preloads the L1 cache with the data it determines to be the most relevant.</li> </ul>
<b>Direct Cache Access Support</b>	<p>Allows processors to increase I/O performance by placing data from I/O devices directly into the processor cache. This setting helps to reduce cache misses. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Data from I/O devices is not placed directly into the processor cache.</li> <li>• <b>Enabled</b>—Data from I/O devices is placed directly into the processor cache.</li> </ul>

Name	Description
<b>Power Technology</b>	<p>Enables you to configure the CPU power management settings for the following options:</p> <ul style="list-style-type: none"> <li>• Enhanced Intel Speedstep Technology</li> <li>• Intel Turbo Boost Technology</li> <li>• Processor Power State C6</li> </ul> <p>Power Technology can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Custom</b>—The server uses the individual settings for the BIOS parameters mentioned above. You must select this option if you want to change any of these BIOS parameters.</li> <li>• <b>Disabled</b>—The server does not perform any CPU power management and any settings for the BIOS parameters mentioned above are ignored.</li> <li>• <b>Energy Efficient</b>—The server determines the best settings for the BIOS parameters mentioned above and ignores the individual settings for these parameters.</li> </ul>
<b>Enhanced Intel Speedstep Technology</b>	<p>Whether the processor uses Enhanced Intel SpeedStep Technology, which allows the system to dynamically adjust processor voltage and core frequency. This technology can result in decreased average power consumption and decreased average heat production. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor never dynamically adjusts its voltage or frequency.</li> <li>• <b>Enabled</b>—The processor utilizes Enhanced Intel SpeedStep Technology and enables all supported processor sleep states to further conserve power.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>

Name	Description
<b>Intel Turbo Boost Technology</b>	<p>Whether the processor uses Intel Turbo Boost Technology, which allows the processor to automatically increase its frequency if it is running below power, temperature, or voltage specifications. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not increase its frequency automatically.</li> <li>• <b>Enabled</b>—The processor utilizes Turbo Boost Technology if required.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Processor Power State C6</b>	<p>Whether the BIOS sends the C6 report to the operating system. When the OS receives the report, it can transition the processor into the lower C6 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The BIOS does not send the C6 report.</li> <li>• <b>Enabled</b>—The BIOS sends the C6 report, allowing the OS to transition the processor to the C6 low power state.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Processor Power State C1 Enhanced</b>	<p>Whether the CPU transitions to its minimum frequency when entering the C1 state. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The CPU continues to run at its maximum frequency in C1 state.</li> <li>• <b>Enabled</b>—The CPU transitions to its minimum frequency. This option saves the maximum amount of power in C1 state.</li> </ul>
<b>Frequency Floor Override</b>	<p>Whether the CPU is allowed to drop below the maximum non-turbo frequency when idle. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— The CPU can drop below the maximum non-turbo frequency when idle. This option decreases power consumption but may reduce system performance.</li> <li>• <b>Enabled</b>— The CPU cannot drop below the maximum non-turbo frequency when idle. This option improves system performance but may increase power consumption.</li> </ul>

Name	Description
<b>P-STATE Coordination</b>	<p>Allows you to define how BIOS communicates the P-state support model to the operating system. There are 3 models as defined by the Advanced Configuration and Power Interface (ACPI) specification.</p> <ul style="list-style-type: none"> <li>• <b>HW_ALL</b>—The processor hardware is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package).</li> <li>• <b>SW_ALL</b>—The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a physical package), and must initiate the transition on all of the logical processors.</li> <li>• <b>SW_ANY</b>—The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package), and may initiate the transition on any of the logical processors in the domain.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Energy Performance</b>	<p>Allows you to determine whether system performance or energy efficiency is more important on this server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Balanced Energy</b></li> <li>• <b>Balanced Performance</b></li> <li>• <b>Energy Efficient</b></li> <li>• <b>Performance</b></li> </ul>



### Memory Configuration Parameters

Name	Description
<b>Select Memory RAS</b>	<p>How the memory reliability, availability, and serviceability (RAS) is configured for the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Maximum Performance</b>—System performance is optimized.</li> <li>• <b>Mirroring</b>—System reliability is optimized by using half the system memory as backup.</li> <li>• <b>Lockstep</b>—If the DIMM pairs in the server have an identical type, size, and organization and are populated across the SMI channels, you can enable lockstep mode to minimize memory access latency and provide better performance. This option offers better system performance than Mirroring and better reliability than Maximum Performance but lower reliability than Mirroring and lower system performance than Maximum Performance.</li> </ul>
<b>DRAM Clock Throttling</b>	<p>Allows you to tune the system settings between the memory bandwidth and power consumption. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Balanced</b>— DRAM clock throttling is reduced, providing a balance between performance and power.</li> <li>• <b>Performance</b>—DRAM clock throttling is disabled, providing increased memory bandwidth at the cost of additional power.</li> <li>• <b>Energy Efficient</b>—DRAM clock throttling is increased to improve energy efficiency.</li> </ul>
<b>NUMA</b>	<p>Whether the BIOS supports Non-Uniform Memory Access (NUMA). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The BIOS does not support NUMA.</li> <li>• <b>Enabled</b>—The BIOS includes the ACPI tables that are required for NUMA-aware operating systems. If you enable this option, the system must disable Inter-Socket Memory interleaving on some platforms.</li> </ul>

Name	Description
<b>Low Voltage DDR Mode</b>	<p>Whether the system prioritizes low voltage or high frequency memory operations. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Power Saving Mode</b>—The system prioritizes low voltage memory operations over high frequency memory operations. This mode may lower memory frequency in order to keep the voltage low.</li> <li>• <b>Performance Mode</b>—The system prioritizes high frequency operations over low voltage operations.</li> </ul>
<b>DRAM Refresh rate</b>	<p>Allows you to set the rate at which the DRAM cells are refreshed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>1x</b>—DRAM cells are refreshed every 64ms.</li> <li>• <b>2x</b>—DRAM cells are refreshed every 32ms.</li> <li>• <b>3x</b>—DRAM cells are refreshed every 21ms.</li> <li>• <b>4x</b>—DRAM cells are refreshed every 16ms.</li> <li>• <b>Auto</b>—DRAM cells refresh rate is automatically chosen by the BIOS based on the system configuration. This is the recommended setting for this parameter.</li> </ul>
<b>Channel Interleaving</b>	<p>Whether the CPU divides memory blocks and spreads contiguous portions of data across interleaved channels to enable simultaneous read operations. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines what interleaving is done.</li> <li>• <b>1 Way</b>—Some channel interleaving is used.</li> <li>• <b>2 Way</b></li> <li>• <b>3 Way</b></li> <li>• <b>4 Way</b>—The maximum amount of channel interleaving is used.</li> </ul>

Name	Description
<b>Rank Interleaving</b>	<p>Whether the CPU interleaves physical ranks of memory so that one rank can be accessed while another is being refreshed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines what interleaving is done.</li> <li>• <b>1 Way</b>—Some rank interleaving is used.</li> <li>• <b>2 Way</b></li> <li>• <b>4 Way</b></li> <li>• <b>8 Way</b>—The maximum amount of rank interleaving is used.</li> </ul>
<b>Patrol Scrub</b>	<p>Whether the system actively searches for, and corrects, single bit memory errors even in unused portions of the memory on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The system checks for memory ECC errors only when the CPU reads or writes a memory address.</li> <li>• <b>Enabled</b>—The system periodically reads and writes memory searching for ECC errors. If any errors are found, the system attempts to fix them. This option may correct single bit errors before they become multi-bit errors, but it may adversely affect performance when the patrol scrub is running.</li> </ul>
<b>Demand Scrub</b>	<p>Whether the system corrects single bit memory errors encountered when the CPU or I/O makes a demand read. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— Single bit memory errors are not corrected.</li> <li>• <b>Enabled</b>— Single bit memory errors are corrected in memory and the corrected data is set in response to the demand read.</li> </ul>

Name	Description
<b>Altitude</b>	<p>The approximate number of meters above sea level at which the physical server is installed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines the physical elevation.</li> <li>• <b>300 M</b>—The server is approximately 300 meters above sea level.</li> <li>• <b>900 M</b>—The server is approximately 900 meters above sea level.</li> <li>• <b>1500 M</b>—The server is approximately 1500 meters above sea level.</li> <li>• <b>3000 M</b>—The server is approximately 3000 meters above sea level.</li> </ul>

#### QPI Configuration Parameters

Name	Description
<b>QPI Link Frequency Select</b>	<p>The Intel QuickPath Interconnect (QPI) link frequency, in gigatransfers per second (GT/s). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines the QPI link frequency.</li> <li>• <b>6.4 GT/s</b></li> <li>• <b>7.2 GT/s</b></li> <li>• <b>8.0 GT/s</b></li> </ul>

Name	Description
<b>QPI Snoop Mode</b>	<p>The Intel QuickPath Interconnect (QPI) snoop mode. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU automatically recognizes this as Early Snoop mode.</li> <li>• <b>Early Snoop</b>— The distributed cache ring stops can send a snoop probe or a request to another caching agent directly. This mode has lower latency and it is best for workloads that have shared data sets across threads and can benefit from a cache-to-cache transfer, or for workloads that are not NUMA optimized.</li> <li>• <b>Home Snoop</b>— The snoop is always spawned by the home agent (centralized ring stop) for the memory controller. This mode has a higher local latency than early snoop, but it provides extra resources for a larger number of outstanding transactions.</li> <li>• <b>Home Directory Snoop</b>— The home directory is an optional enabled feature that is implemented at both the HA and iMC logic in the processor. The goal of the directory is to filter snoops to the remote sockets and a node controller in scalable platforms and 2S and 4S configurations.</li> <li>• <b>Home Directory Snoop with OSB</b>— In the Opportunistic Snoop Broadcast (OSB) directory mode, the HA could choose to do speculative home snoop broadcast under very lightly loaded conditions even before the directory information has been collected and checked.</li> </ul>

#### Onboard Storage Parameters

Name	Description
<b>Onboard SCU Storage Support</b>	<p>Whether the onboard software RAID controller is available to the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The software RAID controller is not available.</li> <li>• <b>Enabled</b>—The software RAID controller is available.</li> </ul>

### USB Configuration Parameters

Name	Description
<b>Legacy USB Support</b>	<p>Whether the system supports legacy USB devices. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—USB devices are only available to EFI applications.</li> <li>• <b>Enabled</b>—Legacy USB support is always available.</li> <li>• <b>Auto</b>—Disables legacy USB support if no USB devices are connected.</li> </ul>
<b>Port 60/64 Emulation</b>	<p>Whether the system supports 60h/64h emulation for complete USB keyboard legacy support. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—60h/64 emulation is not supported.</li> <li>• <b>Enabled</b>—60h/64 emulation is supported.</li> </ul> <p>You should select this option if you are using a non-USB aware operating system on the server.</p>
<b>All USB Devices</b>	<p>Whether all physical and virtual USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—All USB devices are disabled.</li> <li>• <b>Enabled</b>—All USB devices are enabled.</li> </ul>
<b>USB Port: Rear</b>	<p>Whether the rear panel USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the rear panel USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the rear panel USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>
<b>USB Port: Front</b>	<p>Whether the front panel USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the front panel USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the front panel USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>

Name	Description
<b>USB Port: Internal</b>	<p>Whether the internal USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the internal USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the internal USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>
<b>USB Port: KVM</b>	<p>Whether the KVM ports are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the KVM keyboard and/or mouse devices. Keyboard and/or mouse will not work in the KVM window.</li> <li>• <b>Enabled</b>—Enables the KVM keyboard and/or mouse devices.</li> </ul>
<b>USB Port: vMedia</b>	<p>Whether the virtual media devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the vMedia devices.</li> <li>• <b>Enabled</b>—Enables the vMedia devices.</li> </ul>

### PCI Configuration Parameters

Name	Description
<b>MMIO Above 4GB</b>	<p>Whether to enable or disable MMIO above 4GB or not. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The server does not map I/O of 64-bit PCI devices to 4GB or greater address space.</li> <li>• <b>Enabled</b>—The server maps I/O of 64-bit PCI devices to 4GB or greater address space.</li> </ul>
<b>ASPM Support</b>	<p>Allows you to set the level of ASPM (Active Power State Management) support in the BIOS. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—ASPM support is disabled in the BIOS.</li> <li>• <b>Force L0s</b>—Force all links to L0 standby (L0s) state.</li> <li>• <b>Auto</b>—The CPU determines the power state.</li> </ul>

Name	Description
<b>VGA Priority</b>	<p>Allows you to set the priority for VGA graphics devices if multiple VGA devices are found in the system. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Onboard</b>—Priority is given to the onboard VGA device. BIOS post screen and OS boot are driven through the onboard VGA port.</li> <li>• <b>Offboard</b>—Priority is given to the PCIE Graphics adapter. BIOS post screen and OS boot are driven through the external graphics adapter port.</li> <li>• <b>Onboard VGA Disabled</b>—Priority is given to the PCIE Graphics adapter, and the onboard VGA device is disabled.</li> </ul> <p><b>Note</b> The vKVM does not function when the onboard VGA is disabled.</p>

### Serial Configuration Parameters

Name	Description
<b>Console Redirection</b>	<p>Allows a serial port to be used for console redirection during POST and BIOS booting. After the BIOS has booted and the operating system is responsible for the server, console redirection is irrelevant and has no effect. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—No console redirection occurs during POST.</li> <li>• <b>Enabled</b>—Enables console redirection on serial port A during POST.</li> </ul>
<b>Terminal Type</b>	<p>What type of character formatting is used for console redirection. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>PC-ANSI</b>—The PC-ANSI terminal font is used.</li> <li>• <b>VT100</b>—A supported vt100 video terminal and its character set are used.</li> <li>• <b>VT100+</b>—A supported vt100-plus video terminal and its character set are used.</li> <li>• <b>VT-UTF8</b>—A video terminal with the UTF-8 character set is used.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>



Name	Description
<b>Bits per second</b>	<p>What BAUD rate is used for the serial port transmission speed. If you disable Console Redirection, this option is not available. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>9600</b>—A 9,600 BAUD rate is used.</li> <li>• <b>19200</b>—A 19,200 BAUD rate is used.</li> <li>• <b>38400</b>—A 38,400 BAUD rate is used.</li> <li>• <b>57600</b>—A 57,600 BAUD rate is used.</li> <li>• <b>115200</b>—A 115,200 BAUD rate is used.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>
<b>Flow Control</b>	<p>Whether a handshake protocol is used for flow control. Request to Send / Clear to Send (RTS/CTS) helps to reduce frame collisions that can be introduced by a hidden terminal problem. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>None</b>—No flow control is used.</li> <li>• <b>Hardware RTS/CTS</b>—RTS/CTS is used for flow control.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>
<b>Putty KeyPad</b>	<p>Allows you to change the action of the PuTTY function keys and the top row of the numeric keypad. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>VT100</b>—The function keys generate ESC OP through ESC O[.</li> <li>• <b>LINUX</b>—Mimics the Linux virtual console. Function keys F6 to F12 behave like the default mode, but F1 to F5 generate ESC [[A through ESC [[E.</li> <li>• <b>XTERMR6</b>—Function keys F5 to F12 behave like the default mode. Function keys F1 to F4 generate ESC OP through ESC OS, which are the sequences produced by the top row of the keypad on Digital terminals.</li> <li>• <b>SCO</b>—The function keys F1 to F12 generate ESC [M through ESC [X. The function and shift keys generate ESC [Y through ESC [j. The control and function keys generate ESC [k through ESC [v. The shift, control and function keys generate ESC [w through ESC [{}.</li> <li>• <b>ESCN</b>—The default mode. The function keys match the general behavior of Digital terminals. The function keys generate sequences such as ESC [11~ and ESC [12~.</li> <li>• <b>VT400</b>—The function keys behave like the default mode. The top row of the numeric keypad generates ESC OP through ESC OS.</li> </ul>

Name	Description
<b>Redirection After BIOS POST</b>	<p>Whether BIOS console redirection should be active after BIOS POST is complete and control given to the OS bootloader. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Always Enable</b>—BIOS Legacy console redirection is active during the OS boot and run time.</li> <li>• <b>Bootloader</b>—BIOS Legacy console redirection is disabled before giving control to the OS boot loader.</li> </ul>
<b>Out-of-Band Mgmt Port</b>	<p>Allows you to configure the COM port 0 that can be used for Windows Emergency Management services. ACPI SPCR table is reported based on this setup option. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Configures the COM port 0 as a general purpose port for use with the Windows Operating System.</li> <li>• <b>Enabled</b>—Configures the COM port 0 as a remote management port for Windows Emergency Management services.</li> </ul>

#### LOM and PCIe Slots Configuration Parameters

Name	Description
<b>All Onboard LOM Ports</b>	<p>Whether all LOM ports are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—All LOM ports are disabled.</li> <li>• <b>Enabled</b>—All LOM ports are enabled.</li> </ul>
<b>LOM Port <i>n</i> OptionROM</b>	<p>Whether Option ROM is available on the LOM port designated by <i>n</i>. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Option ROM is not available on LOM port <i>n</i>.</li> <li>• <b>Enabled</b>—Option ROM is available on LOM port <i>n</i>.</li> <li>• <b>UEFI Only</b>—The expansion slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The expansion slot <i>n</i> is available for legacy only.</li> </ul>

Name	Description
<b>All PCIe Slots OptionROM</b>	<p>Whether the server can use Option ROM present in the PCIe Cards. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for all PCIe slots are not available.</li> <li>• <b>Enabled</b>—The Option ROMs for all the PCIe slots are available.</li> <li>• <b>UEFI Only</b>—The Option ROMs for slot <i>n</i> are available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> are available for legacy only.</li> </ul>
<b>PCIe Slot:<i>n</i> OptionROM</b>	<p>Whether the server can use the Option ROMs present in the PCIe Cards. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>
<b>PCIe Slot:<i>n</i> Link Speed</b>	<p>This option allows you to restrict the maximum speed of an adapter card installed in PCIe slot <i>n</i>. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>GEN1</b>—2.5GT/s (gigatransfers per second) is the maximum speed allowed.</li> <li>• <b>GEN2</b>—5GT/s is the maximum speed allowed.</li> <li>• <b>GEN3</b>—8GT/s is the maximum speed allowed.</li> <li>• <b>Disabled</b>—The maximum speed is not restricted.</li> </ul> <p>For example, if you have a 3<sup>rd</sup> generation adapter card in PCIe slot 2 that you want to run at a maximum of 5GT/s instead of the 8GT/s that card supports, set the PCIe Slot 2 Link Speed to <b>GEN2</b>. The system then ignores the card's supported maximum speed of 8GT/s and forces it to run at a maximum of 5 GT/s.</p>

Name	Description
<b>CDN Support for LOM</b>	<p>Whether the Ethernet Network naming convention is according to Consistent Device Naming (CDN) or the traditional way of naming conventions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— OS Ethernet Networking Identifier is named in a default convention as ETH0, ETH1 and so on. By default, CDN option is disabled.</li> <li>• <b>LOMS Only</b>— OS Ethernet Network identifier is named in a consistent device naming (CDN) according to the physical LAN on Motherboard(LOM) port numbering; LOM Port 0, LOM Port 1 and so on.</li> </ul> <p><b>Note</b>     CDN is enabled for LOM ports and works with Windows 2012 or the latest OS only.</p>
<b>CDN Support for VIC</b>	<p>Whether the Ethernet Network naming convention is according to Consistent Device Naming (CDN) or the traditional way of naming conventions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— CDN support for VIC cards is disabled.</li> <li>• <b>Enabled</b>— CDN support is enabled for VIC cards.</li> </ul> <p><b>Note</b>     CDN support for VIC cards work with Windows 2012 or the latest OS only.</p>

## Server Management BIOS Parameters for C22 and C24 Servers

Name	Description
<b>FRB-2 Timer</b>	<p>Whether the FRB2 timer is used by Cisco IMC to recover the system if it hangs during POST. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The FRB2 timer is not used.</li> <li>• <b>Enabled</b>—The FRB2 timer is started during POST and used to recover the system if necessary.</li> </ul>

Name	Description
<b>OS Watchdog Timer</b>	<p>Whether the BIOS programs the watchdog timer with a specified timeout value. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The watchdog timer is not used to track how long the server takes to boot.</li> <li>• <b>Enabled</b>—The watchdog timer tracks how long the server takes to boot. If the server does not boot within the length of time specified in the <b>OS Boot Watchdog Timer Timeout</b> field, the Cisco IMC logs an error and takes the action specified in the <b>OS Boot Watchdog Policy</b> field.</li> </ul>
<b>OS Watchdog Timer Timeout</b>	<p>If OS does not boot within the specified time, OS watchdog timer expires and system takes action according to timer policy. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>5 Minutes</b>—The OS watchdog timer expires 5 minutes after it begins to boot.</li> <li>• <b>10 Minutes</b>—The OS watchdog timer expires 10 minutes after it begins to boot.</li> <li>• <b>15 Minutes</b>—The OS watchdog timer expires 15 minutes after it begins to boot.</li> <li>• <b>20 Minutes</b>—The OS watchdog timer expires 20 minutes after it begins to boot.</li> </ul> <p><b>Note</b> This option is only applicable if you enable the OS Boot Watchdog Timer.</p>
<b>OS Watchdog Timer Policy</b>	<p>What action the system takes if the watchdog timer expires. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Do Nothing</b>—The server takes no action if the watchdog timer expires during OS boot.</li> <li>• <b>Power Down</b>—The server is powered off if the watchdog timer expires during OS boot.</li> <li>• <b>Reset</b>—The server is reset if the watchdog timer expires during OS boot.</li> </ul> <p><b>Note</b> This option is only applicable if you enable the OS Boot Watchdog Timer.</p>

## C220 and C240 Servers

### Main BIOS Parameters for C220 and C240 Servers

Name	Description
TPM Support	<p>TPM (Trusted Platform Module) is a microchip designed to provide basic security-related functions primarily involving encryption keys. This option allows you to control the TPM Security Device support for the system. It can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The server does not use the TPM.</li> <li>• <b>Enabled</b>—The server uses the TPM.</li> </ul> <p><b>Note</b> We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>

### Advanced BIOS Parameters for C220 and C240 Servers

#### Processor Configuration Parameters

Name	Description
Intel Hyper-Threading Technology	<p>Whether the processor uses Intel Hyper-Threading Technology, which allows multithreaded software applications to execute threads in parallel within each processor. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not permit hyperthreading.</li> <li>• <b>Enabled</b>—The processor allows for the parallel execution of multiple threads.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>

Name	Description
<b>Number of Enabled Cores</b>	<p>Allows you to disable one or more of the physical cores on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>All</b>—Enables all physical cores. This also enables Hyper Threading on the associated logical processor cores.</li> <li>• <b>1 through <i>n</i></b>—Specifies the number of physical processor cores that can run on the server. Each physical core has an associated logical core.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Execute Disable</b>	<p>Classifies memory areas on the server to specify where application code can execute. As a result of this classification, the processor disables code execution if a malicious worm attempts to insert code in the buffer. This setting helps to prevent damage, worm propagation, and certain classes of malicious buffer overflow attacks. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not classify memory areas.</li> <li>• <b>Enabled</b>—The processor classifies memory areas.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Intel VT</b>	<p>Whether the processor uses Intel Virtualization Technology (VT), which allows a platform to run multiple operating systems and applications in independent partitions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not permit virtualization.</li> <li>• <b>Enabled</b>—The processor allows multiple operating systems in independent partitions.</li> </ul> <p><b>Note</b> If you change this option, you must power cycle the server before the setting takes effect.</p>
<b>Intel VT-d</b>	<p>Whether the processor uses Intel Virtualization Technology for Directed I/O (VT-d). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not use virtualization technology.</li> <li>• <b>Enabled</b>—The processor uses virtualization technology.</li> </ul>

Name	Description
<b>Intel VT-d Coherency Support</b>	<p>Whether the processor supports Intel VT-d Coherency. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support coherency.</li> <li>• <b>Enabled</b>—The processor uses VT-d Coherency as required.</li> </ul>
<b>Intel VT-d ATS Support</b>	<p>Whether the processor supports Intel VT-d Address Translation Services (ATS). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support ATS.</li> <li>• <b>Enabled</b>—The processor uses VT-d ATS as required.</li> </ul>
<b>CPU Performance</b>	<p>Sets the CPU performance profile for the server. The performance profile consists of the following options:</p> <ul style="list-style-type: none"> <li>• DCU Streamer Prefetcher</li> <li>• DCU IP Prefetcher</li> <li>• Hardware Prefetcher</li> <li>• Adjacent Cache-Line Prefetch</li> </ul> <p>This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enterprise</b>—All options are enabled.</li> <li>• <b>High Throughput</b>—Only the DCU IP Prefetcher is enabled. The rest of the options are disabled.</li> <li>• <b>HPC</b>—All options are enabled. This setting is also known as high performance computing.</li> <li>• <b>Custom</b>—All performance profile options can be configured from the BIOS setup on the server. In addition, the Hardware Prefetcher and Adjacent Cache-Line Prefetch options can be configured in the fields below.</li> </ul>
<b>Hardware Prefetcher</b>	<p>Whether the processor allows the Intel hardware prefetcher to fetch streams of data and instruction from memory into the unified second-level cache when necessary. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The hardware prefetcher is not used.</li> <li>• <b>Enabled</b>—The processor uses the hardware prefetcher when cache issues are detected.</li> </ul>



Name	Description
<b>Adjacent Cache Line Prefetcher</b>	<p>Whether the processor fetches cache lines in even/odd pairs instead of fetching just the required line. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor only fetches the required line.</li> <li>• <b>Enabled</b>— The processor fetches both the required line and its paired line.</li> </ul>
<b>DCU Streamer Prefetch</b>	<p>Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not try to anticipate cache read requirements and only fetches explicitly requested lines.</li> <li>• <b>Enabled</b>—The DCU prefetcher analyzes the cache read pattern and prefetches the next line in the cache if it determines that it may be needed.</li> </ul>
<b>DCU IP Prefetcher</b>	<p>Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not preload any cache data.</li> <li>• <b>Enabled</b>—The DCU IP prefetcher preloads the L1 cache with the data it determines to be the most relevant.</li> </ul>
<b>Direct Cache Access Support</b>	<p>Allows processors to increase I/O performance by placing data from I/O devices directly into the processor cache. This setting helps to reduce cache misses. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Data from I/O devices is not placed directly into the processor cache.</li> <li>• <b>Enabled</b>—Data from I/O devices is placed directly into the processor cache.</li> </ul>

Name	Description
<b>Power Technology</b>	<p>Enables you to configure the CPU power management settings for the following options:</p> <ul style="list-style-type: none"> <li>• Enhanced Intel Speedstep Technology</li> <li>• Intel Turbo Boost Technology</li> <li>• Processor Power State C6</li> </ul> <p>Power Technology can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Custom</b>—The server uses the individual settings for the BIOS parameters mentioned above. You must select this option if you want to change any of these BIOS parameters.</li> <li>• <b>Disabled</b>—The server does not perform any CPU power management and any settings for the BIOS parameters mentioned above are ignored.</li> <li>• <b>Energy Efficient</b>—The server determines the best settings for the BIOS parameters mentioned above and ignores the individual settings for these parameters.</li> </ul>
<b>Enhanced Intel Speedstep Technology</b>	<p>Whether the processor uses Enhanced Intel SpeedStep Technology, which allows the system to dynamically adjust processor voltage and core frequency. This technology can result in decreased average power consumption and decreased average heat production. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor never dynamically adjusts its voltage or frequency.</li> <li>• <b>Enabled</b>—The processor utilizes Enhanced Intel SpeedStep Technology and enables all supported processor sleep states to further conserve power.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>

Name	Description
<b>Intel Turbo Boost Technology</b>	<p>Whether the processor uses Intel Turbo Boost Technology, which allows the processor to automatically increase its frequency if it is running below power, temperature, or voltage specifications. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not increase its frequency automatically.</li> <li>• <b>Enabled</b>—The processor utilizes Turbo Boost Technology if required.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Processor Power State C6</b>	<p>Whether the BIOS sends the C6 report to the operating system. When the OS receives the report, it can transition the processor into the lower C6 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The BIOS does not send the C6 report.</li> <li>• <b>Enabled</b>—The BIOS sends the C6 report, allowing the OS to transition the processor to the C6 low power state.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Processor Power State C1 Enhanced</b>	<p>Whether the CPU transitions to its minimum frequency when entering the C1 state. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The CPU continues to run at its maximum frequency in C1 state.</li> <li>• <b>Enabled</b>—The CPU transitions to its minimum frequency. This option saves the maximum amount of power in C1 state.</li> </ul>
<b>Frequency Floor Override</b>	<p>Whether the CPU is allowed to drop below the maximum non-turbo frequency when idle. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— The CPU can drop below the maximum non-turbo frequency when idle. This option decreases power consumption but may reduce system performance.</li> <li>• <b>Enabled</b>— The CPU cannot drop below the maximum non-turbo frequency when idle. This option improves system performance but may increase power consumption.</li> </ul>

Name	Description
<b>P-STATE Coordination</b>	<p>Allows you to define how BIOS communicates the P-state support model to the operating system. There are 3 models as defined by the Advanced Configuration and Power Interface (ACPI) specification.</p> <ul style="list-style-type: none"> <li>• <b>HW_ALL</b>—The processor hardware is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package).</li> <li>• <b>SW_ALL</b>—The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a physical package), and must initiate the transition on all of the logical processors.</li> <li>• <b>SW_ANY</b>—The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package), and may initiate the transition on any of the logical processors in the domain.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Energy Performance</b>	<p>Allows you to determine whether system performance or energy efficiency is more important on this server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Balanced Energy</b></li> <li>• <b>Balanced Performance</b></li> <li>• <b>Energy Efficient</b></li> <li>• <b>Performance</b></li> </ul>

### Memory Configuration Parameters

Name	Description
<b>Select Memory RAS</b>	<p>How the memory reliability, availability, and serviceability (RAS) is configured for the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Maximum Performance</b>—System performance is optimized.</li> <li>• <b>Mirroring</b>—System reliability is optimized by using half the system memory as backup.</li> <li>• <b>Lockstep</b>—If the DIMM pairs in the server have an identical type, size, and organization and are populated across the SMI channels, you can enable lockstep mode to minimize memory access latency and provide better performance. This option offers better system performance than Mirroring and better reliability than Maximum Performance but lower reliability than Mirroring and lower system performance than Maximum Performance.</li> </ul>
<b>DRAM Clock Throttling</b>	<p>Allows you to tune the system settings between the memory bandwidth and power consumption. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Balanced</b>— DRAM clock throttling is reduced, providing a balance between performance and power.</li> <li>• <b>Performance</b>—DRAM clock throttling is disabled, providing increased memory bandwidth at the cost of additional power.</li> <li>• <b>Energy Efficient</b>—DRAM clock throttling is increased to improve energy efficiency.</li> </ul>
<b>NUMA</b>	<p>Whether the BIOS supports Non-Uniform Memory Access (NUMA). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The BIOS does not support NUMA.</li> <li>• <b>Enabled</b>—The BIOS includes the ACPI tables that are required for NUMA-aware operating systems. If you enable this option, the system must disable Inter-Socket Memory interleaving on some platforms.</li> </ul>

Name	Description
<b>Low Voltage DDR Mode</b>	<p>Whether the system prioritizes low voltage or high frequency memory operations. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Power Saving Mode</b>—The system prioritizes low voltage memory operations over high frequency memory operations. This mode may lower memory frequency in order to keep the voltage low.</li> <li>• <b>Performance Mode</b>—The system prioritizes high frequency operations over low voltage operations.</li> </ul>
<b>DRAM Refresh rate</b>	<p>Allows you to set the rate at which the DRAM cells are refreshed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>1x</b>—DRAM cells are refreshed every 64ms.</li> <li>• <b>2x</b>—DRAM cells are refreshed every 32ms.</li> <li>• <b>3x</b>—DRAM cells are refreshed every 21ms.</li> <li>• <b>4x</b>—DRAM cells are refreshed every 16ms.</li> <li>• <b>Auto</b>—DRAM cells refresh rate is automatically chosen by the BIOS based on the system configuration. This is the recommended setting for this parameter.</li> </ul>
<b>Channel Interleaving</b>	<p>Whether the CPU divides memory blocks and spreads contiguous portions of data across interleaved channels to enable simultaneous read operations. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines what interleaving is done.</li> <li>• <b>1 Way</b>—Some channel interleaving is used.</li> <li>• <b>2 Way</b></li> <li>• <b>3 Way</b></li> <li>• <b>4 Way</b>—The maximum amount of channel interleaving is used.</li> </ul>

Name	Description
<b>Rank Interleaving</b>	<p>Whether the CPU interleaves physical ranks of memory so that one rank can be accessed while another is being refreshed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines what interleaving is done.</li> <li>• <b>1 Way</b>—Some rank interleaving is used.</li> <li>• <b>2 Way</b></li> <li>• <b>4 Way</b></li> <li>• <b>8 Way</b>—The maximum amount of rank interleaving is used.</li> </ul>
<b>Patrol Scrub</b>	<p>Whether the system actively searches for, and corrects, single bit memory errors even in unused portions of the memory on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The system checks for memory ECC errors only when the CPU reads or writes a memory address.</li> <li>• <b>Enabled</b>—The system periodically reads and writes memory searching for ECC errors. If any errors are found, the system attempts to fix them. This option may correct single bit errors before they become multi-bit errors, but it may adversely affect performance when the patrol scrub is running.</li> </ul>
<b>Demand Scrub</b>	<p>Whether the system corrects single bit memory errors encountered when the CPU or I/O makes a demand read. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— Single bit memory errors are not corrected.</li> <li>• <b>Enabled</b>— Single bit memory errors are corrected in memory and the corrected data is set in response to the demand read.</li> </ul>

Name	Description
<b>Altitude</b>	<p>The approximate number of meters above sea level at which the physical server is installed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines the physical elevation.</li> <li>• <b>300 M</b>—The server is approximately 300 meters above sea level.</li> <li>• <b>900 M</b>—The server is approximately 900 meters above sea level.</li> <li>• <b>1500 M</b>—The server is approximately 1500 meters above sea level.</li> <li>• <b>3000 M</b>—The server is approximately 3000 meters above sea level.</li> </ul>

#### QPI Configuration Parameters

Name	Description
<b>QPI Link Frequency Select</b>	<p>The Intel QuickPath Interconnect (QPI) link frequency, in gigatransfers per second (GT/s). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines the QPI link frequency.</li> <li>• <b>6.4 GT/s</b></li> <li>• <b>7.2 GT/s</b></li> <li>• <b>8.0 GT/s</b></li> </ul>



Name	Description
<b>QPI Snoop Mode</b>	<p>The Intel QuickPath Interconnect (QPI) snoop mode. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU automatically recognizes this as Early Snoop mode.</li> <li>• <b>Early Snoop</b>— The distributed cache ring stops can send a snoop probe or a request to another caching agent directly. This mode has lower latency and it is best for workloads that have shared data sets across threads and can benefit from a cache-to-cache transfer, or for workloads that are not NUMA optimized.</li> <li>• <b>Home Snoop</b>— The snoop is always spawned by the home agent (centralized ring stop) for the memory controller. This mode has a higher local latency than early snoop, but it provides extra resources for a larger number of outstanding transactions.</li> <li>• <b>Home Directory Snoop</b>— The home directory is an optional enabled feature that is implemented at both the HA and iMC logic in the processor. The goal of the directory is to filter snoops to the remote sockets and a node controller in scalable platforms and 2S and 4S configurations.</li> <li>• <b>Home Directory Snoop with OSB</b>— In the Opportunistic Snoop Broadcast (OSB) directory mode, the HA could choose to do speculative home snoop broadcast under very lightly loaded conditions even before the directory information has been collected and checked.</li> </ul>

#### Onboard Storage Parameters

Name	Description
<b>Onboard SCU Storage Support</b>	<p>Whether the onboard software RAID controller is available to the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The software RAID controller is not available.</li> <li>• <b>Enabled</b>—The software RAID controller is available.</li> </ul>
<b>Onboard SCU Storage SW Stack</b>	<p>Allows you to choose a pre-boot software stack for an onboard SCU storage controller. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Intel RSTe(1)</b></li> <li>• <b>LSI SW RAID (0)</b></li> </ul> <p><b>Note</b> This configuration parameter is valid only for the C220 servers.</p>

### USB Configuration Parameters

Name	Description
<b>Legacy USB Support</b>	<p>Whether the system supports legacy USB devices. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—USB devices are only available to EFI applications.</li> <li>• <b>Enabled</b>—Legacy USB support is always available.</li> <li>• <b>Auto</b>—Disables legacy USB support if no USB devices are connected.</li> </ul>
<b>Port 60/64 Emulation</b>	<p>Whether the system supports 60h/64h emulation for complete USB keyboard legacy support. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—60h/64 emulation is not supported.</li> <li>• <b>Enabled</b>—60h/64 emulation is supported.</li> </ul> <p>You should select this option if you are using a non-USB aware operating system on the server.</p>
<b>All USB Devices</b>	<p>Whether all physical and virtual USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—All USB devices are disabled.</li> <li>• <b>Enabled</b>—All USB devices are enabled.</li> </ul>
<b>USB Port: Rear</b>	<p>Whether the rear panel USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the rear panel USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the rear panel USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>
<b>USB Port: Front</b>	<p>Whether the front panel USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the front panel USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the front panel USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>

Name	Description
<b>USB Port: Internal</b>	<p>Whether the internal USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the internal USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the internal USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>
<b>USB Port: KVM</b>	<p>Whether the KVM ports are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the KVM keyboard and/or mouse devices. Keyboard and/or mouse will not work in the KVM window.</li> <li>• <b>Enabled</b>—Enables the KVM keyboard and/or mouse devices.</li> </ul>
<b>USB Port: vMedia</b>	<p>Whether the virtual media devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the vMedia devices.</li> <li>• <b>Enabled</b>—Enables the vMedia devices.</li> </ul>
<b>USB Port: SD Card</b>	<p>Whether the SD card drives are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the SD card drives. The SD card drives are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the SD card drives.</li> </ul>

### PCI Configuration Parameters

Name	Description
<b>Memory Mapped I/O Above 4GB</b>	<p>Whether to enable or disable MMIO above 4GB or not. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The server does not map I/O of 64-bit PCI devices to 4GB or greater address space.</li> <li>• <b>Enabled</b>—The server maps I/O of 64-bit PCI devices to 4GB or greater address space.</li> </ul> <p><b>Note</b> PCI devices that are 64-bit compliant but use a legacy option ROM may not function correctly with this setting enabled.</p>

Name	Description
<b>MMCFG BASE</b>	<p>Sets the low base address for PCIe adapters within 4GB. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>1 GB</b></li> <li>• <b>2 GB</b></li> <li>• <b>2.5 GB</b></li> <li>• <b>3 GB</b></li> <li>• <b>Auto</b>— Automatically sets the low base address for PCIe adapters.</li> </ul> <p><b>Note</b> This is valid for C240 servers only.</p>
<b>ASPM Support</b>	<p>Allows you to set the level of ASPM (Active Power State Management) support in the BIOS. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—ASPM support is disabled in the BIOS.</li> <li>• <b>Force L0s</b>—Force all links to L0 standby (L0s) state.</li> <li>• <b>Auto</b>—The CPU determines the power state.</li> </ul>
<b>VGA Priority</b>	<p>Allows you to set the priority for VGA graphics devices if multiple VGA devices are found in the system. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Onboard</b>—Priority is given to the onboard VGA device. BIOS post screen and OS boot are driven through the onboard VGA port.</li> <li>• <b>Offboard</b>—Priority is given to the PCIE Graphics adapter. BIOS post screen and OS boot are driven through the external graphics adapter port.</li> <li>• <b>Onboard VGA Disabled</b>—Priority is given to the PCIE Graphics adapter, and the onboard VGA device is disabled.</li> </ul> <p><b>Note</b> The vKVM does not function when the onboard VGA is disabled.</p>

## Serial Configuration Parameters

Name	Description
<b>Out-of-Band Mgmt Port</b>	<p>Allows you to configure the COM port 0 that can be used for Windows Emergency Management services. ACPI SPCR table is reported based on this setup option. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Configures the COM port 0 as a general purpose port for use with the Windows Operating System.</li> <li>• <b>Enabled</b>—Configures the COM port 0 as a remote management port for Windows Emergency Management services.</li> </ul>
<b>Console Redirection</b>	<p>Allows a serial port to be used for console redirection during POST and BIOS booting. After the BIOS has booted and the operating system is responsible for the server, console redirection is irrelevant and has no effect. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—No console redirection occurs during POST.</li> <li>• <b>COM 0</b>—Enables console redirection on COM port 0 during POST.</li> <li>• <b>COM 1</b>—Enables console redirection on COM port 1 during POST.</li> </ul>
<b>Terminal Type</b>	<p>What type of character formatting is used for console redirection. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>PC-ANSI</b>—The PC-ANSI terminal font is used.</li> <li>• <b>VT100</b>—A supported vt100 video terminal and its character set are used.</li> <li>• <b>VT100+</b>—A supported vt100-plus video terminal and its character set are used.</li> <li>• <b>VT-UTF8</b>—A video terminal with the UTF-8 character set is used.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>

Name	Description
<b>Bits per second</b>	<p>What BAUD rate is used for the serial port transmission speed. If you disable Console Redirection, this option is not available. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>9600</b>—A 9,600 BAUD rate is used.</li> <li>• <b>19200</b>—A 19,200 BAUD rate is used.</li> <li>• <b>38400</b>—A 38,400 BAUD rate is used.</li> <li>• <b>57600</b>—A 57,600 BAUD rate is used.</li> <li>• <b>115200</b>—A 115,200 BAUD rate is used.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>
<b>Flow Control</b>	<p>Whether a handshake protocol is used for flow control. Request to Send / Clear to Send (RTS/CTS) helps to reduce frame collisions that can be introduced by a hidden terminal problem. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>None</b>—No flow control is used.</li> <li>• <b>Hardware RTS/CTS</b>—RTS/CTS is used for flow control.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>
<b>Putty KeyPad</b>	<p>Allows you to change the action of the PuTTY function keys and the top row of the numeric keypad. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>VT100</b>—The function keys generate ESC OP through ESC O[.</li> <li>• <b>LINUX</b>—Mimics the Linux virtual console. Function keys F6 to F12 behave like the default mode, but F1 to F5 generate ESC [[A through ESC [[E.</li> <li>• <b>XTERMR6</b>—Function keys F5 to F12 behave like the default mode. Function keys F1 to F4 generate <b>ESC OP</b> through <b>ESC OS</b>, which are the sequences produced by the top row of the keypad on Digital terminals.</li> <li>• <b>SCO</b>—The function keys F1 to F12 generate ESC [M through ESC [X. The function and shift keys generate ESC [Y through ESC [j. The control and function keys generate ESC [k through ESC [v. The shift, control and function keys generate ESC [w through ESC [{.</li> <li>• <b>ESCN</b>—The default mode. The function keys match the general behavior of Digital terminals. The function keys generate sequences such as ESC [11~ and ESC [12~.</li> <li>• <b>VT400</b>—The function keys behave like the default mode. The top row of the numeric keypad generates ESC OP through ESC OS.</li> </ul>

Name	Description
<b>Redirection After BIOS POST</b>	<p>Whether BIOS console redirection should be active after BIOS POST is complete and control given to the OS bootloader. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Always Enable</b>—BIOS Legacy console redirection is active during the OS boot and run time.</li> <li>• <b>Bootloader</b>—BIOS Legacy console redirection is disabled before giving control to the OS boot loader.</li> </ul>

### LOM and PCIe Slots Configuration Parameters

Name	Description
<b>CDN Support for LOM</b>	<p>Whether the Ethernet Network naming convention is according to Consistent Device Naming (CDN) or the traditional way of naming conventions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— OS Ethernet Networking Identifier is named in a default convention as ETH0, ETH1 and so on. By default, CDN option is disabled.</li> <li>• <b>LOMS Only</b>— OS Ethernet Network identifier is named in a consistent device naming (CDN) according to the physical LAN on Motherboard(LOM) port numbering; LOM Port 0, LOM Port 1 and so on.</li> </ul> <p><b>Note</b> CDN is enabled for LOM ports and works with Windows 2012 or the latest OS only.</p>
<b>CDN Support for VIC</b>	<p>Whether the Ethernet Network naming convention is according to Consistent Device Naming (CDN) or the traditional way of naming conventions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— CDN support for VIC cards is disabled.</li> <li>• <b>Enabled</b>— CDN support is enabled for VIC cards.</li> </ul> <p><b>Note</b> CDN support for VIC cards work with Windows 2012 or the latest OS only.</p>
<b>All Onboard LOM Ports</b>	<p>Whether all LOM ports are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—All LOM ports are disabled.</li> <li>• <b>Enabled</b>—All LOM ports are enabled.</li> </ul>

Name	Description
<b>LOM Port <i>n</i> OptionROM</b>	<p>Whether Option ROM is available on the LOM port designated by <i>n</i>. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>
<b>All PCIe Slots OptionROM</b>	<p>Whether the server can use Option ROM present in the PCIe Cards. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>
<b>PCIe Slot:<i>n</i> OptionROM</b>	<p>Whether the server can use the Option ROMs present in the PCIe Cards. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>
<b>PCIe Mezzanine OptionROM</b>	<p>Whether the PCIe mezzanine slot expansion ROM is available to the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>



Name	Description
<b>PCIe Slot:<i>n</i> Link Speed</b>	<p>This option allows you to restrict the maximum speed of an adapter card installed in PCIe slot <i>n</i>. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>GEN1</b>—2.5GT/s (gigatransfers per second) is the maximum speed allowed.</li> <li>• <b>GEN2</b>—5GT/s is the maximum speed allowed.</li> <li>• <b>GEN3</b>—8GT/s is the maximum speed allowed.</li> <li>• <b>Disabled</b>—The maximum speed is not restricted.</li> </ul> <p>For example, if you have a 3<sup>rd</sup> generation adapter card in PCIe slot 2 that you want to run at a maximum of 5GT/s instead of the 8GT/s that card supports, set the PCIe Slot 2 Link Speed to <b>GEN2</b>. The system then ignores the card's supported maximum speed of 8GT/s and forces it to run at a maximum of 5 GT/s.</p>

## Server Management BIOS Parameters for C220 and C240 Servers

Name	Description
<b>FRB-2 Timer</b>	<p>Whether the FRB2 timer is used by Cisco IMC to recover the system if it hangs during POST. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The FRB2 timer is not used.</li> <li>• <b>Enabled</b>—The FRB2 timer is started during POST and used to recover the system if necessary.</li> </ul>
<b>OS Watchdog Timer</b>	<p>Whether the BIOS programs the watchdog timer with a specified timeout value. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The watchdog timer is not used to track how long the server takes to boot.</li> <li>• <b>Enabled</b>—The watchdog timer tracks how long the server takes to boot. If the server does not boot within the length of time specified in the <b>OS Boot Watchdog Timer Timeout</b> field, the Cisco IMC logs an error and takes the action specified in the <b>OS Boot Watchdog Policy</b> field.</li> </ul>

Name	Description
<b>OS Watchdog Timer Timeout</b>	<p>If OS does not boot within the specified time, OS watchdog timer expires and system takes action according to timer policy. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>5 Minutes</b>—The OS watchdog timer expires 5 minutes after it begins to boot.</li> <li>• <b>10 Minutes</b>—The OS watchdog timer expires 10 minutes after it begins to boot.</li> <li>• <b>15 Minutes</b>—The OS watchdog timer expires 15 minutes after it begins to boot.</li> <li>• <b>20 Minutes</b>—The OS watchdog timer expires 20 minutes after it begins to boot.</li> </ul> <p><b>Note</b> This option is only applicable if you enable the OS Boot Watchdog Timer.</p>
<b>OS Watchdog Timer Policy</b>	<p>What action the system takes if the watchdog timer expires. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Do Nothing</b>—The server takes no action if the watchdog timer expires during OS boot.</li> <li>• <b>Power Down</b>—The server is powered off if the watchdog timer expires during OS boot.</li> <li>• <b>Reset</b>—The server is reset if the watchdog timer expires during OS boot.</li> </ul> <p><b>Note</b> This option is only applicable if you enable the OS Boot Watchdog Timer.</p>

## C460 M4 Servers

### Main Tab for C460 M4 Servers

#### Main BIOS Parameters

Name	Description
<b>Reboot Host Immediately</b> checkbox	Upon checking, reboots the host server immediately. You must check the checkbox after saving changes.

Name	Description
<b>TPM Support</b>	<p>TPM (Trusted Platform Module) is a microchip designed to provide basic security-related functions primarily involving encryption keys. This option allows you to control the TPM Security Device support for the system. It can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The server does not use the TPM.</li> <li>• <b>Enabled</b>—The server uses the TPM.</li> </ul> <p><b>Note</b> We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Power ON Password Support</b> drop-down	<p>This token requires that you set a BIOS password before using the F2 BIOS configuration. If enabled, password needs to be validated before you access BIOS functions such as IO configuration, BIOS set up, and booting to an operating system using BIOS. It can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Support is disabled.</li> <li>• <b>Enabled</b>—Support is enabled.</li> </ul>

#### Actions Area

Name	Description
<b>Save</b> button	<p>Saves the settings for the BIOS parameter and closes the dialog box. If the <b>Reboot Host Immediately</b> check box is checked, the server is rebooted immediately and the new BIOS settings go into effect. Otherwise the changes are saved until the server is manually rebooted.</p>
<b>Reset</b> button	<p>Resets the values for the BIOS parameters on all three tabs to the settings that were in effect when this dialog box was first opened.</p>
<b>Restore Defaults</b> button	<p>Sets the BIOS parameters on all three tabs to their default settings.</p>

## Advanced Tab for C460 M4 Servers

### Reboot Server Option

If you want your changes applied automatically after you click **Save Changes**, check the **Reboot Host Immediately** check box. Cisco IMC immediately reboots the server and applies your changes.

If you want to apply your changes at a later time, clear the **Reboot Host Immediately** check box. Cisco IMC stores the changes and applies them the next time the server reboots.

**Note**

If there are existing BIOS parameter changes pending, Cisco IMC automatically overwrites the stored values with the current settings when you click **Save Changes**.

**Processor Configuration Parameters**

Name	Description
<b>Intel Hyper-Threading Technology</b>	<p>Whether the processor uses Intel Hyper-Threading Technology, which allows multithreaded software applications to execute threads in parallel within each processor. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not permit hyperthreading.</li> <li>• <b>Enabled</b>—The processor allows for the parallel execution of multiple threads.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Number of Enabled Cores</b>	<p>Allows you to disable one or more of the physical cores on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>All</b>—Enables all physical cores. This also enables Hyper Threading on the associated logical processor cores.</li> <li>• <b>1 through n</b>—Specifies the number of physical processor cores that can run on the server. Each physical core has an associated logical core.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Execute Disable</b>	<p>Classifies memory areas on the server to specify where application code can execute. As a result of this classification, the processor disables code execution if a malicious worm attempts to insert code in the buffer. This setting helps to prevent damage, worm propagation, and certain classes of malicious buffer overflow attacks. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not classify memory areas.</li> <li>• <b>Enabled</b>—The processor classifies memory areas.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>

Name	Description
<b>Intel VT</b>	<p>Whether the processor uses Intel Virtualization Technology (VT), which allows a platform to run multiple operating systems and applications in independent partitions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not permit virtualization.</li> <li>• <b>Enabled</b>—The processor allows multiple operating systems in independent partitions.</li> </ul> <p><b>Note</b> If you change this option, you must power cycle the server before the setting takes effect.</p>
<b>Intel VT-d</b>	<p>Whether the processor uses Intel Virtualization Technology for Directed I/O (VT-d). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not use virtualization technology.</li> <li>• <b>Enabled</b>—The processor uses virtualization technology.</li> </ul>
<b>Intel VT-d Interrupt Remapping</b>	<p>Whether the processor supports Intel VT-d Interrupt Remapping. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support remapping.</li> <li>• <b>Enabled</b>—The processor uses VT-d Interrupt Remapping as required.</li> </ul>
<b>Intel VT-d PassThrough DMA</b>	<p>Whether the processor supports Intel VT-d Pass-through DMA. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support pass-through DMA.</li> <li>• <b>Enabled</b>—The processor uses VT-d Pass-through DMA as required.</li> </ul>
<b>Intel VT-d Coherency Support</b>	<p>Whether the processor supports Intel VT-d Coherency. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support coherency.</li> <li>• <b>Enabled</b>—The processor uses VT-d Coherency as required.</li> </ul>
<b>Intel VT-d ATS Support</b>	<p>Whether the processor supports Intel VT-d Address Translation Services (ATS). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support ATS.</li> <li>• <b>Enabled</b>—The processor uses VT-d ATS as required.</li> </ul>

Name	Description
<b>CPU Performance</b>	<p>Sets the CPU performance profile for the server. The performance profile consists of the following options:</p> <ul style="list-style-type: none"> <li>• DCU Streamer Prefetcher</li> <li>• DCU IP Prefetcher</li> <li>• Hardware Prefetcher</li> <li>• Adjacent Cache-Line Prefetch</li> </ul> <p>This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enterprise</b>—All options are enabled.</li> <li>• <b>High Throughput</b>—Only the DCU IP Prefetcher is enabled. The rest of the options are disabled.</li> <li>• <b>HPC</b>—All options are enabled. This setting is also known as high performance computing.</li> <li>• <b>Custom</b>—All performance profile options can be configured from the BIOS setup on the server. In addition, the Hardware Prefetcher and Adjacent Cache-Line Prefetch options can be configured in the fields below.</li> </ul>
<b>Hardware Prefetcher</b>	<p>Whether the processor allows the Intel hardware prefetcher to fetch streams of data and instruction from memory into the unified second-level cache when necessary. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The hardware prefetcher is not used.</li> <li>• <b>Enabled</b>—The processor uses the hardware prefetcher when cache issues are detected.</li> </ul>
<b>Adjacent Cache Line Prefetcher</b>	<p>Whether the processor fetches cache lines in even/odd pairs instead of fetching just the required line. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor only fetches the required line.</li> <li>• <b>Enabled</b>— The processor fetches both the required line and its paired line.</li> </ul>

Name	Description
<b>DCU Streamer Prefetch</b>	<p>Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not try to anticipate cache read requirements and only fetches explicitly requested lines.</li> <li>• <b>Enabled</b>—The DCU prefetcher analyzes the cache read pattern and prefetches the next line in the cache if it determines that it may be needed.</li> </ul>
<b>DCU IP Prefetcher</b>	<p>Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not preload any cache data.</li> <li>• <b>Enabled</b>—The DCU IP prefetcher preloads the L1 cache with the data it determines to be the most relevant.</li> </ul>
<b>Direct Cache Access Support</b>	<p>Allows processors to increase I/O performance by placing data from I/O devices directly into the processor cache. This setting helps to reduce cache misses. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Data from I/O devices is not placed directly into the processor cache.</li> <li>• <b>Enabled</b>—Data from I/O devices is placed directly into the processor cache.</li> </ul>

Name	Description
<b>Power Technology</b>	<p>Enables you to configure the CPU power management settings for the following options:</p> <ul style="list-style-type: none"> <li>• Enhanced Intel Speedstep Technology</li> <li>• Intel Turbo Boost Technology</li> <li>• Processor Power State C6</li> </ul> <p>Power Technology can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Custom</b>—The server uses the individual settings for the BIOS parameters mentioned above. You must select this option if you want to change any of these BIOS parameters.</li> <li>• <b>Disabled</b>—The server does not perform any CPU power management and any settings for the BIOS parameters mentioned above are ignored.</li> <li>• <b>Energy Efficient</b>—The server determines the best settings for the BIOS parameters mentioned above and ignores the individual settings for these parameters.</li> </ul>
<b>Enhanced Intel Speedstep Technology</b>	<p>Whether the processor uses Enhanced Intel SpeedStep Technology, which allows the system to dynamically adjust processor voltage and core frequency. This technology can result in decreased average power consumption and decreased average heat production. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor never dynamically adjusts its voltage or frequency.</li> <li>• <b>Enabled</b>—The processor utilizes Enhanced Intel SpeedStep Technology and enables all supported processor sleep states to further conserve power.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>



Name	Description
<b>Intel Turbo Boost Technology</b>	<p>Whether the processor uses Intel Turbo Boost Technology, which allows the processor to automatically increase its frequency if it is running below power, temperature, or voltage specifications. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not increase its frequency automatically.</li> <li>• <b>Enabled</b>—The processor utilizes Turbo Boost Technology if required.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Processor C3 Report</b>	<p>Whether the BIOS sends the C3 report to the operating system. When the OS receives the report, it can transition the processor into the lower C3 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—BIOS does not send C3 report.</li> <li>• <b>Enabled</b>—BIOS sends the C3 report, allowing the OS to transition the processor to the C3 low power state.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Processor C6 Report</b>	<p>Whether the BIOS sends the C6 report to the operating system. When the OS receives the report, it can transition the processor into the lower C6 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The BIOS does not send the C6 report.</li> <li>• <b>Enabled</b>—The BIOS sends the C6 report, allowing the OS to transition the processor to the C6 low power state.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Processor Power State C1 Enhanced</b>	<p>Whether the CPU transitions to its minimum frequency when entering the C1 state. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The CPU continues to run at its maximum frequency in C1 state.</li> <li>• <b>Enabled</b>—The CPU transitions to its minimum frequency. This option saves the maximum amount of power in C1 state.</li> </ul>

Name	Description
<b>P-STATE Coordination</b>	<p>Allows you to define how BIOS communicates the P-state support model to the operating system. There are 3 models as defined by the Advanced Configuration and Power Interface (ACPI) specification.</p> <ul style="list-style-type: none"> <li>• <b>HW_ALL</b>—The processor hardware is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package).</li> <li>• <b>SW_ALL</b>—The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a physical package), and must initiate the transition on all of the logical processors.</li> <li>• <b>SW_ANY</b>—The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package), and may initiate the transition on any of the logical processors in the domain.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Energy Performance Tuning</b>	<p>Allows you to choose BIOS or Operating System for energy performance bias tuning. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>OS</b>— Chooses OS for energy performance tuning.</li> <li>• <b>BIOS</b>— Chooses BIOS for energy performance tuning.</li> </ul>
<b>Energy Performance</b>	<p>Allows you to determine whether system performance or energy efficiency is more important on this server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Balanced Energy</b></li> <li>• <b>Balanced Performance</b></li> <li>• <b>Energy Efficient</b></li> <li>• <b>Performance</b></li> </ul>

Name	Description
<b>Package C State Limit</b>	<p>The amount of power available to the server components when they are idle. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>C0 state</b>—The server provides all server components with full power at all times. This option maintains the highest level of performance and requires the greatest amount of power.</li> <li>• <b>C1 state</b>—When the CPU is idle, the system slightly reduces the power consumption. This option requires less power than C0 and allows the server to return quickly to high performance mode.</li> <li>• <b>C3 state</b>—When the CPU is idle, the system reduces the power consumption further than with the C1 option. This requires less power than C1 or C0, but it takes the server slightly longer to return to high performance mode.</li> <li>• <b>C6 state</b>—When the CPU is idle, the system reduces the power consumption further than with the C3 option. This option saves more power than C0, C1, or C3, but there may be performance issues until the server returns to full power.</li> <li>• <b>C7 state</b>—When the CPU is idle, the server makes a minimal amount of power available to the components. This option saves the maximum amount of power but it also requires the longest time for the server to return to high performance mode.</li> <li>• <b>No Limit</b>—The server may enter any available C state.</li> </ul>
<b>Extended APIC</b>	<p>Allows you to enable or disable extended APIC support. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>XAPIC</b>—Enables APIC support.</li> <li>• <b>X2APIC</b>—Enables APIC and also enables Intel VT-d and Interrupt Remapping .</li> </ul>
<b>Workload Configuration</b>	<p>Allows you to set a parameter to optimize workload characterization. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Balanced</b>— Chooses balanced option for optimization.</li> <li>• <b>I/O Sensitive</b>— Chooses I/O sensitive option for optimization.</li> </ul> <p><b>Note</b> We recommend you to set the workload configuration to <b>Balanced</b>.</p>

**Memory Configuration Parameters**

Name	Description
<b>Select Memory RAS</b>	<p>How the memory reliability, availability, and serviceability (RAS) is configured for the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Maximum Performance</b>—System performance is optimized.</li> <li>• <b>Mirroring</b>—System reliability is optimized by using half the system memory as backup.</li> <li>• <b>Lockstep</b>—If the DIMM pairs in the server have an identical type, size, and organization and are populated across the SMI channels, you can enable lockstep mode to minimize memory access latency and provide better performance. This option offers better system performance than Mirroring and better reliability than Maximum Performance but lower reliability than Mirroring and lower system performance than Maximum Performance.</li> </ul>
<b>NUMA</b>	<p>Whether the BIOS supports Non-Uniform Memory Access (NUMA). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The BIOS does not support NUMA.</li> <li>• <b>Enabled</b>—The BIOS includes the ACPI tables that are required for NUMA-aware operating systems. If you enable this option, the system must disable Inter-Socket Memory interleaving on some platforms.</li> </ul>
<b>Channel Interleaving</b>	<p>Whether the CPU divides memory blocks and spreads contiguous portions of data across interleaved channels to enable simultaneous read operations. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines what interleaving is done.</li> <li>• <b>1 Way</b>—Some channel interleaving is used.</li> <li>• <b>2 Way</b></li> <li>• <b>3 Way</b></li> <li>• <b>4 Way</b>—The maximum amount of channel interleaving is used.</li> </ul>

Name	Description
<b>Rank Interleaving</b>	<p>Whether the CPU interleaves physical ranks of memory so that one rank can be accessed while another is being refreshed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines what interleaving is done.</li> <li>• <b>1 Way</b>—Some rank interleaving is used.</li> <li>• <b>2 Way</b></li> <li>• <b>4 Way</b></li> <li>• <b>8 Way</b>—The maximum amount of rank interleaving is used.</li> </ul>
<b>Patrol Scrub</b>	<p>Whether the system actively searches for, and corrects, single bit memory errors even in unused portions of the memory on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The system checks for memory ECC errors only when the CPU reads or writes a memory address.</li> <li>• <b>Enabled</b>—The system periodically reads and writes memory searching for ECC errors. If any errors are found, the system attempts to fix them. This option may correct single bit errors before they become multi-bit errors, but it may adversely affect performance when the patrol scrub is running.</li> </ul>
<b>Demand Scrub</b>	<p>Whether the system corrects single bit memory errors encountered when the CPU or I/O makes a demand read. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— Single bit memory errors are not corrected.</li> <li>• <b>Enabled</b>— Single bit memory errors are corrected in memory and the corrected data is set in response to the demand read.</li> </ul>

Name	Description
<b>Altitude</b>	<p>The approximate number of meters above sea level at which the physical server is installed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines the physical elevation.</li> <li>• <b>300 M</b>—The server is approximately 300 meters above sea level.</li> <li>• <b>900 M</b>—The server is approximately 900 meters above sea level.</li> <li>• <b>1500 M</b>—The server is approximately 1500 meters above sea level.</li> <li>• <b>3000 M</b>—The server is approximately 3000 meters above sea level.</li> </ul>

#### QPI Configuration Parameters

Name	Description
<b>QPI Link Frequency Select</b>	<p>The Intel QuickPath Interconnect (QPI) link frequency, in gigatransfers per second (GT/s). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines the QPI link frequency.</li> <li>• <b>6.4 GT/s</b></li> <li>• <b>7.2 GT/s</b></li> <li>• <b>8.0 GT/s</b></li> </ul>
<b>QPI Snoop Mode</b>	<p>The Intel QuickPath Interconnect (QPI) snoop mode. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Home Snoop</b>—The snoop is always spawned by the home agent (centralized ring stop) for the memory controller. This mode has a higher local latency than early snoop, but it provides extra resources for a larger number of outstanding transactions.</li> <li>• <b>Cluster on Die</b>—Enables Cluster On Die. When enabled LLC is split into two parts with an independent caching agent for each. This helps increase the performance in some workloads. This mode is available only for processors that have 10 or more cores. It is the best mode for highly NUMA optimized workloads.</li> <li>• <b>Early Snoop</b>—The distributed cache ring stops can send a snoop probe or a request to another caching agent directly. This mode has lower latency and it is best for workloads that have shared data sets across threads and can benefit from a cache-to-cache transfer, or for workloads that are not NUMA optimized.</li> </ul>

## USB Configuration Parameters

Name	Description
<b>Legacy USB Support</b>	<p>Whether the system supports legacy USB devices. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—USB devices are only available to EFI applications.</li> <li>• <b>Enabled</b>—Legacy USB support is always available.</li> <li>• <b>Auto</b>—Disables legacy USB support if no USB devices are connected.</li> </ul>
<b>Port 60/64 Emulation</b>	<p>Whether the system supports 60h/64h emulation for complete USB keyboard legacy support. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—60h/64 emulation is not supported.</li> <li>• <b>Enabled</b>—60h/64 emulation is supported.</li> </ul> <p>You should select this option if you are using a non-USB aware operating system on the server.</p>
<b>xHCI Mode</b>	<p>Whether the xHCI controller legacy support is enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the xHCI controller legacy support.</li> <li>• <b>Enabled</b>—Enables the xHCI controller legacy support.</li> </ul>

## PCI Configuration Parameters

Name	Description
<b>Memory Mapped I/O Above 4GB</b>	<p>Whether to enable or disable MMIO above 4GB or not. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The server does not map I/O of 64-bit PCI devices to 4GB or greater address space.</li> <li>• <b>Enabled</b>—The server maps I/O of 64-bit PCI devices to 4GB or greater address space.</li> </ul> <p><b>Note</b> PCI devices that are 64-bit compliant but use a legacy option ROM may not function correctly with this setting enabled.</p>

Name	Description
Sriov	<p>Whether SR-IOV (Single Root I/O Virtualization) is enabled or disabled on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—SR-IOV is disabled.</li> <li>• <b>Enabled</b>—SR-IOV is enabled.</li> </ul>

### Serial Configuration Parameters

Name	Description
Out-of-Band Mgmt Port	<p>Allows you to configure the COM port 0 that can be used for Windows Emergency Management services. ACPI SPCR table is reported based on this setup option. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Configures the COM port 0 as a general purpose port for use with the Windows Operating System.</li> <li>• <b>Enabled</b>—Configures the COM port 0 as a remote management port for Windows Emergency Management services.</li> </ul>
Console Redirection	<p>Allows a serial port to be used for console redirection during POST and BIOS booting. After the BIOS has booted and the operating system is responsible for the server, console redirection is irrelevant and has no effect. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—No console redirection occurs during POST.</li> <li>• <b>COM 0</b>—Enables console redirection on COM port 0 during POST.</li> <li>• <b>COM 1</b>—Enables console redirection on COM port 1 during POST.</li> </ul>
Terminal Type	<p>What type of character formatting is used for console redirection. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>PC-ANSI</b>—The PC-ANSI terminal font is used.</li> <li>• <b>VT100</b>—A supported vt100 video terminal and its character set are used.</li> <li>• <b>VT100+</b>—A supported vt100-plus video terminal and its character set are used.</li> <li>• <b>VT-UTF8</b>—A video terminal with the UTF-8 character set is used.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>



Name	Description
<b>Bits per second</b>	<p>What BAUD rate is used for the serial port transmission speed. If you disable Console Redirection, this option is not available. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>9600</b>—A 9,600 BAUD rate is used.</li> <li>• <b>19200</b>—A 19,200 BAUD rate is used.</li> <li>• <b>38400</b>—A 38,400 BAUD rate is used.</li> <li>• <b>57600</b>—A 57,600 BAUD rate is used.</li> <li>• <b>115200</b>—A 115,200 BAUD rate is used.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>
<b>Flow Control</b>	<p>Whether a handshake protocol is used for flow control. Request to Send / Clear to Send (RTS/CTS) helps to reduce frame collisions that can be introduced by a hidden terminal problem. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>None</b>—No flow control is used.</li> <li>• <b>Hardware RTS/CTS</b>—RTS/CTS is used for flow control.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>
<b>Putty KeyPad</b>	<p>Allows you to change the action of the PuTTY function keys and the top row of the numeric keypad. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>VT100</b>—The function keys generate ESC OP through ESC O[.</li> <li>• <b>LINUX</b>—Mimics the Linux virtual console. Function keys F6 to F12 behave like the default mode, but F1 to F5 generate ESC [[A through ESC [[E.</li> <li>• <b>XTERMR6</b>—Function keys F5 to F12 behave like the default mode. Function keys F1 to F4 generate ESC OP through ESC OS, which are the sequences produced by the top row of the keypad on Digital terminals.</li> <li>• <b>SCO</b>—The function keys F1 to F12 generate ESC [M through ESC [X. The function and shift keys generate ESC [Y through ESC [j. The control and function keys generate ESC [k through ESC [v. The shift, control and function keys generate ESC [w through ESC [{}.</li> <li>• <b>ESCN</b>—The default mode. The function keys match the general behavior of Digital terminals. The function keys generate sequences such as ESC [11~ and ESC [12~.</li> <li>• <b>VT400</b>—The function keys behave like the default mode. The top row of the numeric keypad generates ESC OP through ESC OS.</li> </ul>

Name	Description
<b>Redirection After BIOS POST</b>	<p>Whether BIOS console redirection should be active after BIOS POST is complete and control given to the OS bootloader. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Always Enable</b>—BIOS Legacy console redirection is active during the OS boot and run time.</li> <li>• <b>Bootloader</b>—BIOS Legacy console redirection is disabled before giving control to the OS boot loader.</li> </ul>

### LOM and PCIe Slots Configuration Parameters

Name	Description
<b>CDN Support for VIC</b>	<p>Whether the Ethernet Network naming convention is according to Consistent Device Naming (CDN) or the traditional way of naming conventions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— CDN support for VIC cards is disabled.</li> <li>• <b>Enabled</b>— CDN support is enabled for VIC cards.</li> </ul> <p><b>Note</b> CDN support for VIC cards work with Windows 2012 or the latest OS only.</p>
<b>PCI ROM CLP</b>	<p>PCI ROM Command Line Protocol (CLP) controls the execution of different Option ROMs such as PxE and iSCSI that are present in the card. By default, it is disabled.</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>— Enables you to configure execution of different option ROMs such as PxE and iSCSI for an individual ports separately.</li> <li>• <b>Disabled</b>—The default option. You cannot choose different option ROMs. A default option ROM is executed during PCI enumeration.</li> </ul>
<b>PCH SATA Mode</b>	<p>This options allows you to select the PCH SATA mode. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>AHCI</b>—Sets both SATA and sSATA controllers are set to AHCI mode.</li> <li>• <b>Disabled</b>—Disables both SATA and sSATA controllers.</li> <li>• <b>LSI SW Raid</b>— Sets both SATA and sSATA controllers to raid mode for LSI SW Raid</li> </ul>

Name	Description
<b>All Onboard LOM Ports</b>	<p>Whether all LOM ports are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—All LOM ports are disabled.</li> <li>• <b>Enabled</b>—All LOM ports are enabled.</li> </ul>
<b>LOM Port <i>n</i> OptionROM</b>	<p>Whether Option ROM is available on the LOM port designated by <i>n</i>. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>
<b>All PCIe Slots OptionROM</b>	<p>Whether the server can use Option ROM present in the PCIe Cards. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>
<b>PCIe Slot:<i>n</i> OptionROM</b>	<p>Whether the server can use the Option ROMs present in the PCIe Cards. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>

Name	Description
<b>PCIe Slot:MLOM OptionROM</b>	<p>This options allows you to control the Option ROM execution of the PCIe adapter connected to the MLOM slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>—Executes both legacy and UEFI Option ROM.</li> <li>• <b>Disabled</b>—Both legacy and UEFI Option ROM will not be executed.</li> <li>• <b>UEFI Only</b>—Executes only UEFI Option ROM.</li> <li>• <b>Legacy Only</b>—Executes only Legacy Option ROM.</li> </ul>
<b>PCIe Slot:HBA OptionROM</b>	<p>This options allows you to control the Option ROM execution of the PCIe adapter connected to the HBA slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>—Executes both legacy and UEFI Option ROM.</li> <li>• <b>Disabled</b>—Both legacy and UEFI Option ROM will not be executed.</li> <li>• <b>UEFI Only</b>—Executes only UEFI Option ROM.</li> <li>• <b>Legacy Only</b>—Executes only Legacy Option ROM.</li> </ul>
<b>PCIe Slot:N1 OptionROM</b>	<p>This options allows you to control the Option ROM execution of the PCIe adapter connected to the SSD:NVMe1 slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>—Executes both legacy and UEFI Option ROM.</li> <li>• <b>Disabled</b>—Both legacy and UEFI Option ROM will not be executed.</li> <li>• <b>UEFI Only</b>—Executes only UEFI Option ROM.</li> <li>• <b>Legacy Only</b>—Executes only Legacy Option ROM.</li> </ul>
<b>PCIe Slot:N2 OptionROM</b>	<p>This options allows you to control the Option ROM execution of the PCIe adapter connected to the SSD:NVMe2 slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>—Executes both legacy and UEFI Option ROM.</li> <li>• <b>Disabled</b>—Both legacy and UEFI Option ROM will not be executed.</li> <li>• <b>UEFI Only</b>—Executes only UEFI Option ROM.</li> <li>• <b>Legacy Only</b>—Executes only Legacy Option ROM.</li> </ul>

Name	Description
<b>PCIe Slot:N2 OptionROM</b>	<p>This options allows you to control the Option ROM execution of the PCIe adapter connected to the SSD:NVMe2 slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>—Executes both legacy and UEFI Option ROM.</li> <li>• <b>Disabled</b>—Both legacy and UEFI Option ROM will not be executed.</li> <li>• <b>UEFI Only</b>—Executes only UEFI Option ROM.</li> <li>• <b>Legacy Only</b>—Executes only Legacy Option ROM.</li> </ul>
<b>PCIe Slot:HBA Link Speed</b> <b>PCIe SlotHBALinkSpeed</b>	<p>This option allows you to restrict the maximum speed of an adapter card installed in PCIe HBA slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>— System selects the maximum speed allowed.</li> <li>• <b>GEN1</b>—2.5GT/s (gigatransfers per second) is the maximum speed allowed.</li> <li>• <b>GEN2</b>—5GT/s is the maximum speed allowed.</li> <li>• <b>GEN3</b>—8GT/s is the maximum speed allowed.</li> <li>• <b>Disabled</b>—The maximum speed is not restricted.</li> </ul>

**BIOS Configuration Dialog Box Button Bar**



**Important**

The buttons in this dialog box affect all BIOS parameters on all available tabs, not just the parameters on the tab that you are viewing.

Name	Description
<b>Save Changes</b> button	<p>Saves the settings for the BIOS parameters on all three tabs and closes the dialog box.</p> <p>If the <b>Reboot Host Immediately</b> check box is checked, the server is rebooted immediately and the new BIOS settings go into effect. Otherwise the changes are saved until the server is manually rebooted.</p>
<b>Reset Values</b> button	<p>Restores the values for the BIOS parameters on all three tabs to the settings that were in effect when this dialog box was first opened.</p>
<b>Restore Defaults</b> button	<p>Sets the BIOS parameters on all three tabs to their default settings.</p>
<b>Cancel</b> button	<p>Closes the dialog box without making any changes.</p>

## Server Management Tab for C460 M4 Servers

### Reboot Server Option

If you want your changes applied automatically after you click **Save Changes**, check the **Reboot Host Immediately** check box. Cisco IMC immediately reboots the server and applies your changes.

If you want to apply your changes at a later time, clear the **Reboot Host Immediately** check box. Cisco IMC stores the changes and applies them the next time the server reboots.



#### Note

If there are existing BIOS parameter changes pending, Cisco IMC automatically overwrites the stored values with the current settings when you click **Save Changes**.

### Server Management BIOS Parameters

Name	Description
<b>FRB-2 Timer</b>	<p>Whether the FRB2 timer is used by Cisco IMC to recover the system if it hangs during POST. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The FRB2 timer is not used.</li> <li>• <b>Enabled</b>—The FRB2 timer is started during POST and used to recover the system if necessary.</li> </ul>
<b>OS Watchdog Timer</b>	<p>Whether the BIOS programs the watchdog timer with a specified timeout value. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The watchdog timer is not used to track how long the server takes to boot.</li> <li>• <b>Enabled</b>—The watchdog timer tracks how long the server takes to boot. If the server does not boot within the length of time specified in the <b>OS Boot Watchdog Timer Timeout</b> field, the Cisco IMC logs an error and takes the action specified in the <b>OS Boot Watchdog Policy</b> field.</li> </ul>

Name	Description
<p><b>OS Watchdog Timer Timeout</b></p>	<p>If OS does not boot within the specified time, OS watchdog timer expires and system takes action according to timer policy. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>5 Minutes</b>—The OS watchdog timer expires 5 minutes after it begins to boot.</li> <li>• <b>10 Minutes</b>—The OS watchdog timer expires 10 minutes after it begins to boot.</li> <li>• <b>15 Minutes</b>—The OS watchdog timer expires 15 minutes after it begins to boot.</li> <li>• <b>20 Minutes</b>—The OS watchdog timer expires 20 minutes after it begins to boot.</li> </ul> <p><b>Note</b> This option is only applicable if you enable the OS Boot Watchdog Timer.</p>
<p><b>OS Watchdog Timer Policy</b></p>	<p>What action the system takes if the watchdog timer expires. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Do Nothing</b>—The server takes no action if the watchdog timer expires during OS boot.</li> <li>• <b>Power Down</b>—The server is powered off if the watchdog timer expires during OS boot.</li> <li>• <b>Reset</b>—The server is reset if the watchdog timer expires during OS boot.</li> </ul> <p><b>Note</b> This option is only applicable if you enable the OS Boot Watchdog Timer.</p>

**BIOS Configuration Dialog Box Button Bar**



**Important** The buttons in this dialog box affect all BIOS parameters on all available tabs, not just the parameters on the tab that you are viewing.

Name	Description
<p><b>Save Changes</b> button</p>	<p>Saves the settings for the BIOS parameters on all three tabs and closes the dialog box.</p> <p>If the <b>Reboot Host Immediately</b> check box is checked, the server is rebooted immediately and the new BIOS settings go into effect. Otherwise the changes are saved until the server is manually rebooted.</p>
<p><b>Reset Values</b> button</p>	<p>Restores the values for the BIOS parameters on all three tabs to the settings that were in effect when this dialog box was first opened.</p>

Name	Description
Restore Defaults button	Sets the BIOS parameters on all three tabs to their default settings.
Cancel button	Closes the dialog box without making any changes.

## C220 M4 and C240 M4 Servers

### Main Tab for C220M4 and C240M4 Servers

#### Main BIOS Parameters

Name	Description
Reboot Host Immediately checkbox	Upon checking, reboots the host server immediately. You must check the checkbox after saving changes.
TPM Support	<p>TPM (Trusted Platform Module) is a microchip designed to provide basic security-related functions primarily involving encryption keys. This option allows you to control the TPM Security Device support for the system. It can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The server does not use the TPM.</li> <li>• <b>Enabled</b>—The server uses the TPM.</li> </ul> <p><b>Note</b> We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
Power ON Password Support drop-down	<p>This token requires that you set a BIOS password before using the F2 BIOS configuration. If enabled, password needs to be validated before you access BIOS functions such as IO configuration, BIOS set up, and booting to an operating system using BIOS. It can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Support is disabled.</li> <li>• <b>Enabled</b>—Support is enabled.</li> </ul>



**Actions Area**

Name	Description
Save button	Saves the settings for the BIOS parameters and closes the dialog box. If the <b>Reboot Host Immediately</b> check box is checked, the server is rebooted immediately and the new BIOS settings go into effect. Otherwise the changes are saved until the server is manually rebooted.
Reset button	Resets the values for the BIOS parameters on all three tabs to the settings that were in effect when this dialog box was first opened.
Restore Defaults button	Sets the BIOS parameters on all three tabs to their default settings.

## Advanced Tab for C220M4 and C240M4 Servers

**Reboot Server Option**

If you want your changes applied automatically after you click **Save Changes**, check the **Reboot Host Immediately** check box. Cisco IMC immediately reboots the server and applies your changes.

If you want to apply your changes at a later time, clear the **Reboot Host Immediately** check box. Cisco IMC stores the changes and applies them the next time the server reboots.

**Note**


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If there are existing BIOS parameter changes pending, Cisco IMC automatically overwrites the stored values with the current settings when you click **Save Changes**.

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**Processor Configuration Parameters**

Name	Description
<b>Intel Hyper-Threading Technology</b>	Whether the processor uses Intel Hyper-Threading Technology, which allows multithreaded software applications to execute threads in parallel within each processor. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not permit hyperthreading.</li> <li>• <b>Enabled</b>—The processor allows for the parallel execution of multiple threads.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>

Name	Description
<b>Number of Enabled Cores</b>	<p>Allows you to disable one or more of the physical cores on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>All</b>—Enables all physical cores. This also enables Hyper Threading on the associated logical processor cores.</li> <li>• <b>1 through <i>n</i></b>—Specifies the number of physical processor cores that can run on the server. Each physical core has an associated logical core.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Execute Disable</b>	<p>Classifies memory areas on the server to specify where application code can execute. As a result of this classification, the processor disables code execution if a malicious worm attempts to insert code in the buffer. This setting helps to prevent damage, worm propagation, and certain classes of malicious buffer overflow attacks. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not classify memory areas.</li> <li>• <b>Enabled</b>—The processor classifies memory areas.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Intel VT</b>	<p>Whether the processor uses Intel Virtualization Technology (VT), which allows a platform to run multiple operating systems and applications in independent partitions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not permit virtualization.</li> <li>• <b>Enabled</b>—The processor allows multiple operating systems in independent partitions.</li> </ul> <p><b>Note</b> If you change this option, you must power cycle the server before the setting takes effect.</p>
<b>Intel VT-d</b>	<p>Whether the processor uses Intel Virtualization Technology for Directed I/O (VT-d). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not use virtualization technology.</li> <li>• <b>Enabled</b>—The processor uses virtualization technology.</li> </ul>

Name	Description
<b>Intel VT-d Interrupt Remapping</b>	<p>Whether the processor supports Intel VT-d Interrupt Remapping. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support remapping.</li> <li>• <b>Enabled</b>—The processor uses VT-d Interrupt Remapping as required.</li> </ul>
<b>Intel VT-d PassThrough DMA</b>	<p>Whether the processor supports Intel VT-d Pass-through DMA. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support pass-through DMA.</li> <li>• <b>Enabled</b>—The processor uses VT-d Pass-through DMA as required.</li> </ul>
<b>Intel VT-d Coherency Support</b>	<p>Whether the processor supports Intel VT-d Coherency. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support coherency.</li> <li>• <b>Enabled</b>—The processor uses VT-d Coherency as required.</li> </ul>
<b>Intel VT-d ATS Support</b>	<p>Whether the processor supports Intel VT-d Address Translation Services (ATS). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support ATS.</li> <li>• <b>Enabled</b>—The processor uses VT-d ATS as required.</li> </ul>

Name	Description
<b>CPU Performance</b>	<p>Sets the CPU performance profile for the server. The performance profile consists of the following options:</p> <ul style="list-style-type: none"> <li>• DCU Streamer Prefetcher</li> <li>• DCU IP Prefetcher</li> <li>• Hardware Prefetcher</li> <li>• Adjacent Cache-Line Prefetch</li> </ul> <p>This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enterprise</b>—All options are enabled.</li> <li>• <b>High Throughput</b>—Only the DCU IP Prefetcher is enabled. The rest of the options are disabled.</li> <li>• <b>HPC</b>—All options are enabled. This setting is also known as high performance computing.</li> <li>• <b>Custom</b>—All performance profile options can be configured from the BIOS setup on the server. In addition, the Hardware Prefetcher and Adjacent Cache-Line Prefetch options can be configured in the fields below.</li> </ul>
<b>Hardware Prefetcher</b>	<p>Whether the processor allows the Intel hardware prefetcher to fetch streams of data and instruction from memory into the unified second-level cache when necessary. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The hardware prefetcher is not used.</li> <li>• <b>Enabled</b>—The processor uses the hardware prefetcher when cache issues are detected.</li> </ul>
<b>Adjacent Cache Line Prefetcher</b>	<p>Whether the processor fetches cache lines in even/odd pairs instead of fetching just the required line. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor only fetches the required line.</li> <li>• <b>Enabled</b>— The processor fetches both the required line and its paired line.</li> </ul>

Name	Description
<b>DCU Streamer Prefetch</b>	<p>Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not try to anticipate cache read requirements and only fetches explicitly requested lines.</li> <li>• <b>Enabled</b>—The DCU prefetcher analyzes the cache read pattern and prefetches the next line in the cache if it determines that it may be needed.</li> </ul>
<b>DCU IP Prefetcher</b>	<p>Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not preload any cache data.</li> <li>• <b>Enabled</b>—The DCU IP prefetcher preloads the L1 cache with the data it determines to be the most relevant.</li> </ul>
<b>Direct Cache Access Support</b>	<p>Allows processors to increase I/O performance by placing data from I/O devices directly into the processor cache. This setting helps to reduce cache misses. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Data from I/O devices is not placed directly into the processor cache.</li> <li>• <b>Enabled</b>—Data from I/O devices is placed directly into the processor cache.</li> </ul>

Name	Description
<b>Power Technology</b>	<p>Enables you to configure the CPU power management settings for the following options:</p> <ul style="list-style-type: none"> <li>• Enhanced Intel Speedstep Technology</li> <li>• Intel Turbo Boost Technology</li> <li>• Processor Power State C6</li> </ul> <p>Power Technology can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Custom</b>—The server uses the individual settings for the BIOS parameters mentioned above. You must select this option if you want to change any of these BIOS parameters.</li> <li>• <b>Disabled</b>—The server does not perform any CPU power management and any settings for the BIOS parameters mentioned above are ignored.</li> <li>• <b>Energy Efficient</b>—The server determines the best settings for the BIOS parameters mentioned above and ignores the individual settings for these parameters.</li> </ul>
<b>Enhanced Intel Speedstep Technology</b>	<p>Whether the processor uses Enhanced Intel SpeedStep Technology, which allows the system to dynamically adjust processor voltage and core frequency. This technology can result in decreased average power consumption and decreased average heat production. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor never dynamically adjusts its voltage or frequency.</li> <li>• <b>Enabled</b>—The processor utilizes Enhanced Intel SpeedStep Technology and enables all supported processor sleep states to further conserve power.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>

Name	Description
<b>Intel Turbo Boost Technology</b>	<p>Whether the processor uses Intel Turbo Boost Technology, which allows the processor to automatically increase its frequency if it is running below power, temperature, or voltage specifications. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not increase its frequency automatically.</li> <li>• <b>Enabled</b>—The processor utilizes Turbo Boost Technology if required.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Processor C3 Report</b>	<p>Whether the BIOS sends the C3 report to the operating system. When the OS receives the report, it can transition the processor into the lower C3 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—BIOS does not send C3 report.</li> <li>• <b>Enabled</b>—BIOS sends the C3 report, allowing the OS to transition the processor to the C3 low power state.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Processor C6 Report</b>	<p>Whether the BIOS sends the C6 report to the operating system. When the OS receives the report, it can transition the processor into the lower C6 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The BIOS does not send the C6 report.</li> <li>• <b>Enabled</b>—The BIOS sends the C6 report, allowing the OS to transition the processor to the C6 low power state.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Processor Power State C1 Enhanced</b>	<p>Whether the CPU transitions to its minimum frequency when entering the C1 state. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The CPU continues to run at its maximum frequency in C1 state.</li> <li>• <b>Enabled</b>—The CPU transitions to its minimum frequency. This option saves the maximum amount of power in C1 state.</li> </ul>

Name	Description
<b>P-STATE Coordination</b>	<p>Allows you to define how BIOS communicates the P-state support model to the operating system. There are 3 models as defined by the Advanced Configuration and Power Interface (ACPI) specification.</p> <ul style="list-style-type: none"> <li>• <b>HW_ALL</b>—The processor hardware is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package).</li> <li>• <b>SW_ALL</b>—The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a physical package), and must initiate the transition on all of the logical processors.</li> <li>• <b>SW_ANY</b>—The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package), and may initiate the transition on any of the logical processors in the domain.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Energy Performance Tuning</b>	<p>Allows you to choose BIOS or Operating System for energy performance bias tuning. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>OS</b>— Chooses OS for energy performance tuning.</li> <li>• <b>BIOS</b>— Chooses BIOS for energy performance tuning.</li> </ul>
<b>Energy Performance</b>	<p>Allows you to determine whether system performance or energy efficiency is more important on this server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Balanced Energy</b></li> <li>• <b>Balanced Performance</b></li> <li>• <b>Energy Efficient</b></li> <li>• <b>Performance</b></li> </ul>



Name	Description
<b>Package C State Limit</b>	<p>The amount of power available to the server components when they are idle. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>C0 state</b>—The server provides all server components with full power at all times. This option maintains the highest level of performance and requires the greatest amount of power.</li> <li>• <b>C1 state</b>—When the CPU is idle, the system slightly reduces the power consumption. This option requires less power than C0 and allows the server to return quickly to high performance mode.</li> <li>• <b>C3 state</b>—When the CPU is idle, the system reduces the power consumption further than with the C1 option. This requires less power than C1 or C0, but it takes the server slightly longer to return to high performance mode.</li> <li>• <b>C6 state</b>—When the CPU is idle, the system reduces the power consumption further than with the C3 option. This option saves more power than C0, C1, or C3, but there may be performance issues until the server returns to full power.</li> <li>• <b>C7 state</b>—When the CPU is idle, the server makes a minimal amount of power available to the components. This option saves the maximum amount of power but it also requires the longest time for the server to return to high performance mode.</li> <li>• <b>No Limit</b>—The server may enter any available C state.</li> </ul>
<b>Extended APIC</b>	<p>Allows you to enable or disable extended APIC support. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>XAPIC</b>—Enables APIC support.</li> <li>• <b>X2APIC</b>—Enables APIC and also enables Intel VT-d and Interrupt Remapping .</li> </ul>
<b>Workload Configuration</b>	<p>Allows you to set a parameter to optimize workload characterization. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Balanced</b>— Chooses balanced option for optimization.</li> <li>• <b>I/O Sensitive</b>— Chooses I/O sensitive option for optimization.</li> </ul> <p><b>Note</b> We recommend you to set the workload configuration to <b>Balanced</b>.</p>

**Memory Configuration Parameters**

Name	Description
<b>Select Memory RAS</b>	<p>How the memory reliability, availability, and serviceability (RAS) is configured for the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Maximum Performance</b>—System performance is optimized.</li> <li>• <b>Mirroring</b>—System reliability is optimized by using half the system memory as backup.</li> <li>• <b>Lockstep</b>—If the DIMM pairs in the server have an identical type, size, and organization and are populated across the SMI channels, you can enable lockstep mode to minimize memory access latency and provide better performance. This option offers better system performance than Mirroring and better reliability than Maximum Performance but lower reliability than Mirroring and lower system performance than Maximum Performance.</li> </ul>
<b>NUMA</b>	<p>Whether the BIOS supports Non-Uniform Memory Access (NUMA). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The BIOS does not support NUMA.</li> <li>• <b>Enabled</b>—The BIOS includes the ACPI tables that are required for NUMA-aware operating systems. If you enable this option, the system must disable Inter-Socket Memory interleaving on some platforms.</li> </ul>
<b>Channel Interleaving</b>	<p>Whether the CPU divides memory blocks and spreads contiguous portions of data across interleaved channels to enable simultaneous read operations. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines what interleaving is done.</li> <li>• <b>1 Way</b>—Some channel interleaving is used.</li> <li>• <b>2 Way</b></li> <li>• <b>3 Way</b></li> <li>• <b>4 Way</b>—The maximum amount of channel interleaving is used.</li> </ul>

Name	Description
<b>Rank Interleaving</b>	<p>Whether the CPU interleaves physical ranks of memory so that one rank can be accessed while another is being refreshed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines what interleaving is done.</li> <li>• <b>1 Way</b>—Some rank interleaving is used.</li> <li>• <b>2 Way</b></li> <li>• <b>4 Way</b></li> <li>• <b>8 Way</b>—The maximum amount of rank interleaving is used.</li> </ul>
<b>Patrol Scrub</b>	<p>Whether the system actively searches for, and corrects, single bit memory errors even in unused portions of the memory on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The system checks for memory ECC errors only when the CPU reads or writes a memory address.</li> <li>• <b>Enabled</b>—The system periodically reads and writes memory searching for ECC errors. If any errors are found, the system attempts to fix them. This option may correct single bit errors before they become multi-bit errors, but it may adversely affect performance when the patrol scrub is running.</li> </ul>
<b>Demand Scrub</b>	<p>Whether the system corrects single bit memory errors encountered when the CPU or I/O makes a demand read. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— Single bit memory errors are not corrected.</li> <li>• <b>Enabled</b>— Single bit memory errors are corrected in memory and the corrected data is set in response to the demand read.</li> </ul>

Name	Description
<b>Altitude</b>	<p>The approximate number of meters above sea level at which the physical server is installed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines the physical elevation.</li> <li>• <b>300 M</b>—The server is approximately 300 meters above sea level.</li> <li>• <b>900 M</b>—The server is approximately 900 meters above sea level.</li> <li>• <b>1500 M</b>—The server is approximately 1500 meters above sea level.</li> <li>• <b>3000 M</b>—The server is approximately 3000 meters above sea level.</li> </ul>

#### QPI Configuration Parameters

Name	Description
<b>QPI Link Frequency Select</b>	<p>The Intel QuickPath Interconnect (QPI) link frequency, in gigatransfers per second (GT/s). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines the QPI link frequency.</li> <li>• <b>6.4 GT/s</b></li> <li>• <b>7.2 GT/s</b></li> <li>• <b>8.0 GT/s</b></li> </ul>

Name	Description
<b>QPI Snoop Mode</b>	<p>The Intel QuickPath Interconnect (QPI) snoop mode. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU automatically recognizes this as Early Snoop mode.</li> <li>• <b>Early Snoop</b>—The distributed cache ring stops can send a snoop probe or a request to another caching agent directly. This mode has lower latency and it is best for workloads that have shared data sets across threads and can benefit from a cache-to-cache transfer, or for workloads that are not NUMA optimized.</li> <li>• <b>Home Snoop</b>—The snoop is always spawned by the home agent (centralized ring stop) for the memory controller. This mode has a higher local latency than early snoop, but it provides extra resources for a larger number of outstanding transactions.</li> <li>• <b>Home Directory Snoop</b>— The home directory is an optional enabled feature that is implemented at both the HA and iMC logic in the processor. The goal of the directory is to filter snoops to the remote sockets and a node controller in scalable platforms and 2S and 4S configurations.</li> <li>• <b>Home Directory Snoop with OSB</b>— In the Opportunistic Snoop Broadcast (OSB) directory mode, the HA could choose to do speculative home snoop broadcast under very lightly loaded conditions even before the directory information has been collected and checked.</li> <li>• <b>Cluster on Die</b>—Enables Cluster On Die. When enabled LLC is split into two parts with an independent caching agent for each. This helps increase the performance in some workloads. This mode is available only for processors that have 10 or more cores. It is the best mode for highly NUMA optimized workloads.</li> </ul>

#### USB Configuration Parameters

Name	Description
<b>Legacy USB Support</b>	<p>Whether the system supports legacy USB devices. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—USB devices are only available to EFI applications.</li> <li>• <b>Enabled</b>—Legacy USB support is always available.</li> <li>• <b>Auto</b>—Disables legacy USB support if no USB devices are connected.</li> </ul>

Name	Description
<b>Port 60/64 Emulation</b>	<p>Whether the system supports 60h/64h emulation for complete USB keyboard legacy support. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—60h/64 emulation is not supported.</li> <li>• <b>Enabled</b>—60h/64 emulation is supported.</li> </ul> <p>You should select this option if you are using a non-USB aware operating system on the server.</p>
<b>xHCI Mode</b>	<p>Whether the xHCI controller legacy support is enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the xHCI controller legacy support.</li> <li>• <b>Enabled</b>—Enables the xHCI controller legacy support.</li> </ul>
<b>All USB Devices</b>	<p>Whether all physical and virtual USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—All USB devices are disabled.</li> <li>• <b>Enabled</b>—All USB devices are enabled.</li> </ul>
<b>USB Port: Rear</b>	<p>Whether the rear panel USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the rear panel USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the rear panel USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>
<b>USB Port: Front</b>	<p>Whether the front panel USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the front panel USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the front panel USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>
<b>USB Port: Internal</b>	<p>Whether the internal USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the internal USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the internal USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>

Name	Description
<b>USB Port: KVM</b>	Whether the KVM ports are enabled or disabled. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the KVM keyboard and/or mouse devices. Keyboard and/or mouse will not work in the KVM window.</li> <li>• <b>Enabled</b>—Enables the KVM keyboard and/or mouse devices.</li> </ul>
<b>USB Port: vMedia</b>	Whether the virtual media devices are enabled or disabled. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the vMedia devices.</li> <li>• <b>Enabled</b>—Enables the vMedia devices.</li> </ul>

#### PCI Configuration Parameters

Name	Description
<b>Memory Mapped I/O Above 4GB</b>	Whether to enable or disable MMIO above 4GB or not. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The server does not map I/O of 64-bit PCI devices to 4GB or greater address space.</li> <li>• <b>Enabled</b>—The server maps I/O of 64-bit PCI devices to 4GB or greater address space.</li> </ul> <p><b>Note</b> PCI devices that are 64-bit compliant but use a legacy option ROM may not function correctly with this setting enabled.</p>
<b>Sriov</b>	Whether SR-IOV (Single Root I/O Virtualization) is enabled or disabled on the server. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—SR-IOV is disabled.</li> <li>• <b>Enabled</b>—SR-IOV is enabled.</li> </ul>

## Serial Configuration Parameters

Name	Description
<b>Out-of-Band Mgmt Port</b>	<p>Allows you to configure the COM port 0 that can be used for Windows Emergency Management services. ACPI SPCR table is reported based on this setup option. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Configures the COM port 0 as a general purpose port for use with the Windows Operating System.</li> <li>• <b>Enabled</b>—Configures the COM port 0 as a remote management port for Windows Emergency Management services.</li> </ul>
<b>Console Redirection</b>	<p>Allows a serial port to be used for console redirection during POST and BIOS booting. After the BIOS has booted and the operating system is responsible for the server, console redirection is irrelevant and has no effect. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—No console redirection occurs during POST.</li> <li>• <b>COM 0</b>—Enables console redirection on COM port 0 during POST.</li> <li>• <b>COM 1</b>—Enables console redirection on COM port 1 during POST.</li> </ul>
<b>Terminal Type</b>	<p>What type of character formatting is used for console redirection. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>PC-ANSI</b>—The PC-ANSI terminal font is used.</li> <li>• <b>VT100</b>—A supported vt100 video terminal and its character set are used.</li> <li>• <b>VT100+</b>—A supported vt100-plus video terminal and its character set are used.</li> <li>• <b>VT-UTF8</b>—A video terminal with the UTF-8 character set is used.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>



Name	Description
<b>Bits per second</b>	<p>What BAUD rate is used for the serial port transmission speed. If you disable Console Redirection, this option is not available. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>9600</b>—A 9,600 BAUD rate is used.</li> <li>• <b>19200</b>—A 19,200 BAUD rate is used.</li> <li>• <b>38400</b>—A 38,400 BAUD rate is used.</li> <li>• <b>57600</b>—A 57,600 BAUD rate is used.</li> <li>• <b>115200</b>—A 115,200 BAUD rate is used.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>
<b>Flow Control</b>	<p>Whether a handshake protocol is used for flow control. Request to Send / Clear to Send (RTS/CTS) helps to reduce frame collisions that can be introduced by a hidden terminal problem. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>None</b>—No flow control is used.</li> <li>• <b>Hardware RTS/CTS</b>—RTS/CTS is used for flow control.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>
<b>Putty KeyPad</b>	<p>Allows you to change the action of the PuTTY function keys and the top row of the numeric keypad. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>VT100</b>—The function keys generate ESC OP through ESC O[.</li> <li>• <b>LINUX</b>—Mimics the Linux virtual console. Function keys F6 to F12 behave like the default mode, but F1 to F5 generate ESC [[A through ESC [[E.</li> <li>• <b>XTERMR6</b>—Function keys F5 to F12 behave like the default mode. Function keys F1 to F4 generate ESC OP through ESC OS, which are the sequences produced by the top row of the keypad on Digital terminals.</li> <li>• <b>SCO</b>—The function keys F1 to F12 generate ESC [M through ESC [X. The function and shift keys generate ESC [Y through ESC [j. The control and function keys generate ESC [k through ESC [v. The shift, control and function keys generate ESC [w through ESC [{}.</li> <li>• <b>ESCN</b>—The default mode. The function keys match the general behavior of Digital terminals. The function keys generate sequences such as ESC [11~ and ESC [12~.</li> <li>• <b>VT400</b>—The function keys behave like the default mode. The top row of the numeric keypad generates ESC OP through ESC OS.</li> </ul>

Name	Description
<b>Redirection After BIOS POST</b>	<p>Whether BIOS console redirection should be active after BIOS POST is complete and control given to the OS bootloader. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Always Enable</b>—BIOS Legacy console redirection is active during the OS boot and run time.</li> <li>• <b>Bootloader</b>—BIOS Legacy console redirection is disabled before giving control to the OS boot loader.</li> </ul>

### LOM and PCIe Slots Configuration Parameters

Name	Description
<b>CDN Support for VIC</b>	<p>Whether the Ethernet Network naming convention is according to Consistent Device Naming (CDN) or the traditional way of naming conventions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— CDN support for VIC cards is disabled.</li> <li>• <b>Enabled</b>— CDN support is enabled for VIC cards.</li> </ul> <p><b>Note</b> CDN support for VIC cards work with Windows 2012 or the latest OS only.</p>
<b>PCI ROM CLP</b>	<p>PCI ROM Command Line Protocol (CLP) controls the execution of different Option ROMs such as PxE and iSCSI that are present in the card. By default, it is disabled.</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>— Enables you to configure execution of different option ROMs such as PxE and iSCSI for an individual ports separately.</li> <li>• <b>Disabled</b>—The default option. You cannot choose different option ROMs. A default option ROM is executed during PCI enumeration.</li> </ul>
<b>PCH SATA Mode</b>	<p>This options allows you to select the PCH SATA mode. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>AHCI</b>—Sets both SATA and sSATA controllers are set to AHCI mode.</li> <li>• <b>Disabled</b>—Disables both SATA and sSATA controllers.</li> <li>• <b>LSI SW Raid</b>— Sets both SATA and sSATA controllers to raid mode for LSI SW Raid</li> </ul>

Name	Description
<b>All Onboard LOM Ports</b>	Whether all LOM ports are enabled or disabled. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—All LOM ports are disabled.</li> <li>• <b>Enabled</b>—All LOM ports are enabled.</li> </ul>
<b>LOM Port <i>n</i> OptionROM</b>	Whether Option ROM is available on the LOM port designated by <i>n</i> . This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>
<b>All PCIe Slots OptionROM</b>	Whether the server can use Option ROM present in the PCIe Cards. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>
<b>PCIe Slot:<i>n</i> OptionROM</b>	Whether the server can use the Option ROMs present in the PCIe Cards. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>

Name	Description
<b>PCIe Slot:MLOM OptionROM</b>	<p>This options allows you to control the Option ROM execution of the PCIe adapter connected to the MLOM slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>—Executes both legacy and UEFI Option ROM.</li> <li>• <b>Disabled</b>—Both legacy and UEFI Option ROM will not be executed.</li> <li>• <b>UEFI Only</b>—Executes only UEFI Option ROM.</li> <li>• <b>Legacy Only</b>—Executes only Legacy Option ROM.</li> </ul>
<b>PCIe Slot:HBA OptionROM</b>	<p>This options allows you to control the Option ROM execution of the PCIe adapter connected to the HBA slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>—Executes both legacy and UEFI Option ROM.</li> <li>• <b>Disabled</b>—Both legacy and UEFI Option ROM will not be executed.</li> <li>• <b>UEFI Only</b>—Executes only UEFI Option ROM.</li> <li>• <b>Legacy Only</b>—Executes only Legacy Option ROM.</li> </ul>
<b>PCIe Slot:N1 OptionROM</b>	<p>This options allows you to control the Option ROM execution of the PCIe adapter connected to the SSD:NVMe1 slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>—Executes both legacy and UEFI Option ROM.</li> <li>• <b>Disabled</b>—Both legacy and UEFI Option ROM will not be executed.</li> <li>• <b>UEFI Only</b>—Executes only UEFI Option ROM.</li> <li>• <b>Legacy Only</b>—Executes only Legacy Option ROM.</li> </ul>
<b>PCIe Slot:N2 OptionROM</b>	<p>This options allows you to control the Option ROM execution of the PCIe adapter connected to the SSD:NVMe2 slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>—Executes both legacy and UEFI Option ROM.</li> <li>• <b>Disabled</b>—Both legacy and UEFI Option ROM will not be executed.</li> <li>• <b>UEFI Only</b>—Executes only UEFI Option ROM.</li> <li>• <b>Legacy Only</b>—Executes only Legacy Option ROM.</li> </ul>

Name	Description
<b>PCIe Slot:HBA Link Speed</b> <b>PCIe SlotHBALinkSpeed</b>	<p>This option allows you to restrict the maximum speed of an adapter card installed in PCIe HBA slot. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>— System selects the maximum speed allowed.</li> <li>• <b>GEN1</b>—2.5GT/s (gigatransfers per second) is the maximum speed allowed.</li> <li>• <b>GEN2</b>—5GT/s is the maximum speed allowed.</li> <li>• <b>GEN3</b>—8GT/s is the maximum speed allowed.</li> <li>• <b>Disabled</b>—The maximum speed is not restricted.</li> </ul>

### BIOS Configuration Dialog Box Button Bar



#### Important

The buttons in this dialog box affect all BIOS parameters on all available tabs, not just the parameters on the tab that you are viewing.

Name	Description
<b>Save Changes</b> button	<p>Saves the settings for the BIOS parameters on all three tabs and closes the dialog box.</p> <p>If the <b>Reboot Host Immediately</b> check box is checked, the server is rebooted immediately and the new BIOS settings go into effect. Otherwise the changes are saved until the server is manually rebooted.</p>
<b>Reset Values</b> button	Restores the values for the BIOS parameters on all three tabs to the settings that were in effect when this dialog box was first opened.
<b>Restore Defaults</b> button	Sets the BIOS parameters on all three tabs to their default settings.
<b>Cancel</b> button	Closes the dialog box without making any changes.

## Server Management Tab for C220M4 and C240M4 Servers

### Reboot Server Option

If you want your changes applied automatically after you click **Save Changes**, check the **Reboot Host Immediately** check box. Cisco IMC immediately reboots the server and applies your changes.

If you want to apply your changes at a later time, clear the **Reboot Host Immediately** check box. Cisco IMC stores the changes and applies them the next time the server reboots.

**Note**

If there are existing BIOS parameter changes pending, Cisco IMC automatically overwrites the stored values with the current settings when you click **Save Changes**.

**Server Management BIOS Parameters**

Name	Description
<b>FRB-2 Timer</b>	<p>Whether the FRB2 timer is used by Cisco IMC to recover the system if it hangs during POST. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The FRB2 timer is not used.</li> <li>• <b>Enabled</b>—The FRB2 timer is started during POST and used to recover the system if necessary.</li> </ul>
<b>OS Watchdog Timer</b>	<p>Whether the BIOS programs the watchdog timer with a specified timeout value. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The watchdog timer is not used to track how long the server takes to boot.</li> <li>• <b>Enabled</b>—The watchdog timer tracks how long the server takes to boot. If the server does not boot within the length of time specified in the <b>OS Boot Watchdog Timer Timeout</b> field, the Cisco IMC logs an error and takes the action specified in the <b>OS Boot Watchdog Policy</b> field.</li> </ul>
<b>OS Watchdog Timer Timeout</b>	<p>If OS does not boot within the specified time, OS watchdog timer expires and system takes action according to timer policy. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>5 Minutes</b>—The OS watchdog timer expires 5 minutes after it begins to boot.</li> <li>• <b>10 Minutes</b>—The OS watchdog timer expires 10 minutes after it begins to boot.</li> <li>• <b>15 Minutes</b>—The OS watchdog timer expires 15 minutes after it begins to boot.</li> <li>• <b>20 Minutes</b>—The OS watchdog timer expires 20 minutes after it begins to boot.</li> </ul> <p><b>Note</b> This option is only applicable if you enable the OS Boot Watchdog Timer.</p>

Name	Description
<b>OS Watchdog Timer Policy</b>	<p>What action the system takes if the watchdog timer expires. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Do Nothing</b>—The server takes no action if the watchdog timer expires during OS boot.</li> <li>• <b>Power Down</b>—The server is powered off if the watchdog timer expires during OS boot.</li> <li>• <b>Reset</b>—The server is reset if the watchdog timer expires during OS boot.</li> </ul> <p><b>Note</b> This option is only applicable if you enable the OS Boot Watchdog Timer.</p>

### BIOS Configuration Dialog Box Button Bar



#### Important

The buttons in this dialog box affect all BIOS parameters on all available tabs, not just the parameters on the tab that you are viewing.

Name	Description
<b>Save Changes</b> button	<p>Saves the settings for the BIOS parameters on all three tabs and closes the dialog box.</p> <p>If the <b>Reboot Host Immediately</b> check box is checked, the server is rebooted immediately and the new BIOS settings go into effect. Otherwise the changes are saved until the server is manually rebooted.</p>
<b>Reset Values</b> button	Restores the values for the BIOS parameters on all three tabs to the settings that were in effect when this dialog box was first opened.
<b>Restore Defaults</b> button	Sets the BIOS parameters on all three tabs to their default settings.
<b>Cancel</b> button	Closes the dialog box without making any changes.

# C3160 Servers

## Main BIOS Parameters for C3160 Servers

### Main BIOS Parameters

Name	Description
<b>Reboot Host Immediately</b> checkbox	Upon checking, reboots the host server immediately. You must check the checkbox after saving changes.
<b>TPM Support</b>	<p>TPM (Trusted Platform Module) is a microchip designed to provide basic security-related functions primarily involving encryption keys. This option allows you to control the TPM Security Device support for the system. It can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The server does not use the TPM.</li> <li>• <b>Enabled</b>—The server uses the TPM.</li> </ul> <p><b>Note</b> We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>

## Advanced BIOS Parameters for C3160 Servers

### Processor Configuration Parameters

Name	Description
<b>Intel Hyper-Threading Technology</b>	<p>Whether the processor uses Intel Hyper-Threading Technology, which allows multithreaded software applications to execute threads in parallel within each processor. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not permit hyperthreading.</li> <li>• <b>Enabled</b>—The processor allows for the parallel execution of multiple threads.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>



Name	Description
<b>Number of Enabled Cores</b>	<p>Allows you to disable one or more of the physical cores on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>All</b>—Enables all physical cores. This also enables Hyper Threading on the associated logical processor cores.</li> <li>• <b>1 through <i>n</i></b>—Specifies the number of physical processor cores that can run on the server. Each physical core has an associated logical core.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Execute Disable</b>	<p>Classifies memory areas on the server to specify where application code can execute. As a result of this classification, the processor disables code execution if a malicious worm attempts to insert code in the buffer. This setting helps to prevent damage, worm propagation, and certain classes of malicious buffer overflow attacks. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not classify memory areas.</li> <li>• <b>Enabled</b>—The processor classifies memory areas.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p>
<b>Intel VT</b>	<p>Whether the processor uses Intel Virtualization Technology (VT), which allows a platform to run multiple operating systems and applications in independent partitions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not permit virtualization.</li> <li>• <b>Enabled</b>—The processor allows multiple operating systems in independent partitions.</li> </ul> <p><b>Note</b> If you change this option, you must power cycle the server before the setting takes effect.</p>
<b>Intel VT-d</b>	<p>Whether the processor uses Intel Virtualization Technology for Directed I/O (VT-d). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not use virtualization technology.</li> <li>• <b>Enabled</b>—The processor uses virtualization technology.</li> </ul>

Name	Description
<b>Intel VT-d Coherency Support</b>	<p>Whether the processor supports Intel VT-d Coherency. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support coherency.</li> <li>• <b>Enabled</b>—The processor uses VT-d Coherency as required.</li> </ul>
<b>Intel VT-d ATS Support</b>	<p>Whether the processor supports Intel VT-d Address Translation Services (ATS). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not support ATS.</li> <li>• <b>Enabled</b>—The processor uses VT-d ATS as required.</li> </ul>
<b>CPU Performance</b>	<p>Sets the CPU performance profile for the server. The performance profile consists of the following options:</p> <ul style="list-style-type: none"> <li>• DCU Streamer Prefetcher</li> <li>• DCU IP Prefetcher</li> <li>• Hardware Prefetcher</li> <li>• Adjacent Cache-Line Prefetch</li> </ul> <p>This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Enterprise</b>—All options are enabled.</li> <li>• <b>High Throughput</b>—Only the DCU IP Prefetcher is enabled. The rest of the options are disabled.</li> <li>• <b>HPC</b>—All options are enabled. This setting is also known as high performance computing.</li> <li>• <b>Custom</b>—All performance profile options can be configured from the BIOS setup on the server. In addition, the Hardware Prefetcher and Adjacent Cache-Line Prefetch options can be configured in the fields below.</li> </ul>
<b>Hardware Prefetcher</b>	<p>Whether the processor allows the Intel hardware prefetcher to fetch streams of data and instruction from memory into the unified second-level cache when necessary. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The hardware prefetcher is not used.</li> <li>• <b>Enabled</b>—The processor uses the hardware prefetcher when cache issues are detected.</li> </ul>

Name	Description
<b>Adjacent Cache Line Prefetcher</b>	<p>Whether the processor fetches cache lines in even/odd pairs instead of fetching just the required line. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor only fetches the required line.</li> <li>• <b>Enabled</b>— The processor fetches both the required line and its paired line.</li> </ul>
<b>DCU Streamer Prefetch</b>	<p>Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not try to anticipate cache read requirements and only fetches explicitly requested lines.</li> <li>• <b>Enabled</b>—The DCU prefetcher analyzes the cache read pattern and prefetches the next line in the cache if it determines that it may be needed.</li> </ul>
<b>DCU IP Prefetcher</b>	<p>Whether the processor uses the DCU IP Prefetch mechanism to analyze historical cache access patterns and preload the most relevant lines in the L1 cache. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not preload any cache data.</li> <li>• <b>Enabled</b>—The DCU IP prefetcher preloads the L1 cache with the data it determines to be the most relevant.</li> </ul>
<b>Direct Cache Access Support</b>	<p>Allows processors to increase I/O performance by placing data from I/O devices directly into the processor cache. This setting helps to reduce cache misses. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Data from I/O devices is not placed directly into the processor cache.</li> <li>• <b>Enabled</b>—Data from I/O devices is placed directly into the processor cache.</li> </ul>

Name	Description
<b>Power Technology</b>	<p>Enables you to configure the CPU power management settings for the following options:</p> <ul style="list-style-type: none"> <li>• Enhanced Intel Speedstep Technology</li> <li>• Intel Turbo Boost Technology</li> <li>• Processor Power State C6</li> </ul> <p>Power Technology can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Custom</b>—The server uses the individual settings for the BIOS parameters mentioned above. You must select this option if you want to change any of these BIOS parameters.</li> <li>• <b>Disabled</b>—The server does not perform any CPU power management and any settings for the BIOS parameters mentioned above are ignored.</li> <li>• <b>Energy Efficient</b>—The server determines the best settings for the BIOS parameters mentioned above and ignores the individual settings for these parameters.</li> </ul>
<b>Enhanced Intel Speedstep Technology</b>	<p>Whether the processor uses Enhanced Intel SpeedStep Technology, which allows the system to dynamically adjust processor voltage and core frequency. This technology can result in decreased average power consumption and decreased average heat production. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor never dynamically adjusts its voltage or frequency.</li> <li>• <b>Enabled</b>—The processor utilizes Enhanced Intel SpeedStep Technology and enables all supported processor sleep states to further conserve power.</li> </ul> <p>We recommend that you contact your operating system vendor to make sure the operating system supports this feature.</p> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>

Name	Description
<p><b>Intel Turbo Boost Technology</b></p>	<p>Whether the processor uses Intel Turbo Boost Technology, which allows the processor to automatically increase its frequency if it is running below power, temperature, or voltage specifications. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The processor does not increase its frequency automatically.</li> <li>• <b>Enabled</b>—The processor utilizes Turbo Boost Technology if required.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<p><b>Processor Power State C6</b></p>	<p>Whether the BIOS sends the C6 report to the operating system. When the OS receives the report, it can transition the processor into the lower C6 power state to decrease energy usage while maintaining optimal processor performance. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The BIOS does not send the C6 report.</li> <li>• <b>Enabled</b>—The BIOS sends the C6 report, allowing the OS to transition the processor to the C6 low power state.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<p><b>Processor Power State C1 Enhanced</b></p>	<p>Whether the CPU transitions to its minimum frequency when entering the C1 state. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The CPU continues to run at its maximum frequency in C1 state.</li> <li>• <b>Enabled</b>—The CPU transitions to its minimum frequency. This option saves the maximum amount of power in C1 state.</li> </ul>
<p><b>Frequency Floor Override</b></p>	<p>Whether the CPU is allowed to drop below the maximum non-turbo frequency when idle. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— The CPU can drop below the maximum non-turbo frequency when idle. This option decreases power consumption but may reduce system performance.</li> <li>• <b>Enabled</b>— The CPU cannot drop below the maximum non-turbo frequency when idle. This option improves system performance but may increase power consumption.</li> </ul>

Name	Description
<b>P-STATE Coordination</b>	<p>Allows you to define how BIOS communicates the P-state support model to the operating system. There are 3 models as defined by the Advanced Configuration and Power Interface (ACPI) specification.</p> <ul style="list-style-type: none"> <li>• <b>HW_ALL</b>—The processor hardware is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package).</li> <li>• <b>SW_ALL</b>—The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a physical package), and must initiate the transition on all of the logical processors.</li> <li>• <b>SW_ANY</b>—The OS Power Manager (OSPM) is responsible for coordinating the P-state among logical processors with dependencies (all logical processors in a package), and may initiate the transition on any of the logical processors in the domain.</li> </ul> <p><b>Note</b> <b>Power Technology</b> must be set to <b>Custom</b> or the server ignores the setting for this parameter.</p>
<b>Energy Performance</b>	<p>Allows you to determine whether system performance or energy efficiency is more important on this server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Balanced Energy</b></li> <li>• <b>Balanced Performance</b></li> <li>• <b>Energy Efficient</b></li> <li>• <b>Performance</b></li> </ul>

### Memory Configuration Parameters

Name	Description
<b>Select Memory RAS</b>	<p>How the memory reliability, availability, and serviceability (RAS) is configured for the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Maximum Performance</b>—System performance is optimized.</li> <li>• <b>Mirroring</b>—System reliability is optimized by using half the system memory as backup.</li> <li>• <b>Lockstep</b>—If the DIMM pairs in the server have an identical type, size, and organization and are populated across the SMI channels, you can enable lockstep mode to minimize memory access latency and provide better performance. This option offers better system performance than Mirroring and better reliability than Maximum Performance but lower reliability than Mirroring and lower system performance than Maximum Performance.</li> </ul>
<b>DRAM Clock Throttling</b>	<p>Allows you to tune the system settings between the memory bandwidth and power consumption. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Balanced</b>— DRAM clock throttling is reduced, providing a balance between performance and power.</li> <li>• <b>Performance</b>—DRAM clock throttling is disabled, providing increased memory bandwidth at the cost of additional power.</li> <li>• <b>Energy Efficient</b>—DRAM clock throttling is increased to improve energy efficiency.</li> </ul>
<b>NUMA</b>	<p>Whether the BIOS supports Non-Uniform Memory Access (NUMA). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The BIOS does not support NUMA.</li> <li>• <b>Enabled</b>—The BIOS includes the ACPI tables that are required for NUMA-aware operating systems. If you enable this option, the system must disable Inter-Socket Memory interleaving on some platforms.</li> </ul>

Name	Description
<b>Low Voltage DDR Mode</b>	<p>Whether the system prioritizes low voltage or high frequency memory operations. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Power Saving Mode</b>—The system prioritizes low voltage memory operations over high frequency memory operations. This mode may lower memory frequency in order to keep the voltage low.</li> <li>• <b>Performance Mode</b>—The system prioritizes high frequency operations over low voltage operations.</li> </ul>
<b>DRAM Refresh rate</b>	<p>Allows you to set the rate at which the DRAM cells are refreshed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>1x</b>—DRAM cells are refreshed every 64ms.</li> <li>• <b>2x</b>—DRAM cells are refreshed every 32ms.</li> <li>• <b>3x</b>—DRAM cells are refreshed every 21ms.</li> <li>• <b>4x</b>—DRAM cells are refreshed every 16ms.</li> <li>• <b>Auto</b>—DRAM cells refresh rate is automatically chosen by the BIOS based on the system configuration. This is the recommended setting for this parameter.</li> </ul>
<b>Channel Interleaving</b>	<p>Whether the CPU divides memory blocks and spreads contiguous portions of data across interleaved channels to enable simultaneous read operations. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines what interleaving is done.</li> <li>• <b>1 Way</b>—Some channel interleaving is used.</li> <li>• <b>2 Way</b></li> <li>• <b>3 Way</b></li> <li>• <b>4 Way</b>—The maximum amount of channel interleaving is used.</li> </ul>



Name	Description
<b>Rank Interleaving</b>	<p>Whether the CPU interleaves physical ranks of memory so that one rank can be accessed while another is being refreshed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines what interleaving is done.</li> <li>• <b>1 Way</b>—Some rank interleaving is used.</li> <li>• <b>2 Way</b></li> <li>• <b>4 Way</b></li> <li>• <b>8 Way</b>—The maximum amount of rank interleaving is used.</li> </ul>
<b>Patrol Scrub</b>	<p>Whether the system actively searches for, and corrects, single bit memory errors even in unused portions of the memory on the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The system checks for memory ECC errors only when the CPU reads or writes a memory address.</li> <li>• <b>Enabled</b>—The system periodically reads and writes memory searching for ECC errors. If any errors are found, the system attempts to fix them. This option may correct single bit errors before they become multi-bit errors, but it may adversely affect performance when the patrol scrub is running.</li> </ul>
<b>Demand Scrub</b>	<p>Whether the system corrects single bit memory errors encountered when the CPU or I/O makes a demand read. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— Single bit memory errors are not corrected.</li> <li>• <b>Enabled</b>— Single bit memory errors are corrected in memory and the corrected data is set in response to the demand read.</li> </ul>

Name	Description
<b>Altitude</b>	<p>The approximate number of meters above sea level at which the physical server is installed. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines the physical elevation.</li> <li>• <b>300 M</b>—The server is approximately 300 meters above sea level.</li> <li>• <b>900 M</b>—The server is approximately 900 meters above sea level.</li> <li>• <b>1500 M</b>—The server is approximately 1500 meters above sea level.</li> <li>• <b>3000 M</b>—The server is approximately 3000 meters above sea level.</li> </ul>

#### QPI Configuration Parameters

Name	Description
<b>QPI Link Frequency Select</b>	<p>The Intel QuickPath Interconnect (QPI) link frequency, in gigatransfers per second (GT/s). This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Auto</b>—The CPU determines the QPI link frequency.</li> <li>• <b>6.4 GT/s</b></li> <li>• <b>7.2 GT/s</b></li> <li>• <b>8.0 GT/s</b></li> </ul>

#### SATA Configuration Parameters

Name	Description
<b>SATA Mode</b>	<p>Mode of operation of Serial Advanced Technology Attachment (SATA) Solid State Drives (SSD).</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— All SATA ports is disabled, and drivers are not enumerated.</li> <li>• <b>IDE Mode</b>— Mode of operation follows previous hardware standards of Integrated Drive Electronics (IDE) interface</li> <li>• <b>AHCI Mode</b>—The default mode. Drives operate according to newer standard of Advance Host Controller Interface(AHCI).</li> </ul>

## USB Configuration Parameters

Name	Description
<b>Legacy USB Support</b>	<p>Whether the system supports legacy USB devices. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—USB devices are only available to EFI applications.</li> <li>• <b>Enabled</b>—Legacy USB support is always available.</li> <li>• <b>Auto</b>—Disables legacy USB support if no USB devices are connected.</li> </ul>
<b>Port 60/64 Emulation</b>	<p>Whether the system supports 60h/64h emulation for complete USB keyboard legacy support. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—60h/64 emulation is not supported.</li> <li>• <b>Enabled</b>—60h/64 emulation is supported.</li> </ul> <p>You should select this option if you are using a non-USB aware operating system on the server.</p>
<b>All USB Devices</b>	<p>Whether all physical and virtual USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—All USB devices are disabled.</li> <li>• <b>Enabled</b>—All USB devices are enabled.</li> </ul>
<b>USB Port: Rear</b>	<p>Whether the rear panel USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the rear panel USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the rear panel USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>
<b>USB Port: Internal</b>	<p>Whether the internal USB devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the internal USB ports. Devices connected to these ports are not detected by the BIOS and operating system.</li> <li>• <b>Enabled</b>—Enables the internal USB ports. Devices connected to these ports are detected by the BIOS and operating system.</li> </ul>

Name	Description
<b>USB Port: KVM</b>	<p>Whether the KVM ports are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the KVM keyboard and/or mouse devices. Keyboard and/or mouse will not work in the KVM window.</li> <li>• <b>Enabled</b>—Enables the KVM keyboard and/or mouse devices.</li> </ul>
<b>USB Port: vMedia</b>	<p>Whether the virtual media devices are enabled or disabled. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Disables the vMedia devices.</li> <li>• <b>Enabled</b>—Enables the vMedia devices.</li> </ul>

### PCI Configuration Parameters

Name	Description
<b>PCI ROM CLP</b>	<p>PCI ROM Command Line Protocol (CLP) controls the execution of different Option ROMs such as PxE and iSCSI that are present in the card. By default, it is disabled.</p> <ul style="list-style-type: none"> <li>• <b>Enabled</b>— Enables you to configure execution of different option ROMs such as PxE and iSCSI for an individual ports separately.</li> <li>• <b>Disabled</b>—The default option. You cannot choose different option ROMs. A default option ROM is executed during PCI enumeration.</li> </ul>
<b>ASPM Support</b>	<p>Allows you to set the level of ASPM (Active Power State Management) support in the BIOS. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—ASPM support is disabled in the BIOS.</li> <li>• <b>Force L0s</b>—Force all links to L0 standby (L0s) state.</li> <li>• <b>Auto</b>—The CPU determines the power state.</li> </ul>

**Serial Configuration Parameters**

Name	Description
<p><b>Out-of-Band Mgmt Port</b></p>	<p>Allows you to configure the COM port 0 that can be used for Windows Emergency Management services. ACPI SPCR table is reported based on this setup option. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—Configures the COM port 0 as a general purpose port for use with the Windows Operating System.</li> <li>• <b>Enabled</b>—Configures the COM port 0 as a remote management port for Windows Emergency Management services.</li> </ul>
<p><b>Console Redirection</b></p>	<p>Allows a serial port to be used for console redirection during POST and BIOS booting. After the BIOS has booted and the operating system is responsible for the server, console redirection is irrelevant and has no effect. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—No console redirection occurs during POST.</li> <li>• <b>COM 0</b>—Enables console redirection on COM port 0 during POST.</li> <li>• <b>COM 1</b>—Enables console redirection on COM port 1 during POST.</li> </ul>
<p><b>Terminal Type</b></p>	<p>What type of character formatting is used for console redirection. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>PC-ANSI</b>—The PC-ANSI terminal font is used.</li> <li>• <b>VT100</b>—A supported vt100 video terminal and its character set are used.</li> <li>• <b>VT100+</b>—A supported vt100-plus video terminal and its character set are used.</li> <li>• <b>VT-UTF8</b>—A video terminal with the UTF-8 character set is used.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>

Name	Description
<b>Bits per second</b>	<p>What BAUD rate is used for the serial port transmission speed. If you disable Console Redirection, this option is not available. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>9600</b>—A 9,600 BAUD rate is used.</li> <li>• <b>19200</b>—A 19,200 BAUD rate is used.</li> <li>• <b>38400</b>—A 38,400 BAUD rate is used.</li> <li>• <b>57600</b>—A 57,600 BAUD rate is used.</li> <li>• <b>115200</b>—A 115,200 BAUD rate is used.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>
<b>Flow Control</b>	<p>Whether a handshake protocol is used for flow control. Request to Send / Clear to Send (RTS/CTS) helps to reduce frame collisions that can be introduced by a hidden terminal problem. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>None</b>—No flow control is used.</li> <li>• <b>Hardware RTS/CTS</b>—RTS/CTS is used for flow control.</li> </ul> <p><b>Note</b> This setting must match the setting on the remote terminal application.</p>
<b>Putty KeyPad</b>	<p>Allows you to change the action of the PuTTY function keys and the top row of the numeric keypad. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>VT100</b>—The function keys generate ESC OP through ESC O[.</li> <li>• <b>LINUX</b>—Mimics the Linux virtual console. Function keys F6 to F12 behave like the default mode, but F1 to F5 generate ESC [[A through ESC [[E.</li> <li>• <b>XTERMR6</b>—Function keys F5 to F12 behave like the default mode. Function keys F1 to F4 generate <b>ESC OP</b> through <b>ESC OS</b>, which are the sequences produced by the top row of the keypad on Digital terminals.</li> <li>• <b>SCO</b>—The function keys F1 to F12 generate ESC [M through ESC [X. The function and shift keys generate ESC [Y through ESC [j. The control and function keys generate ESC [k through ESC [v. The shift, control and function keys generate ESC [w through ESC [{.</li> <li>• <b>ESCN</b>—The default mode. The function keys match the general behavior of Digital terminals. The function keys generate sequences such as ESC [11~ and ESC [12~.</li> <li>• <b>VT400</b>—The function keys behave like the default mode. The top row of the numeric keypad generates ESC OP through ESC OS.</li> </ul>

Name	Description
<b>Redirection After BIOS POST</b>	<p>Whether BIOS console redirection should be active after BIOS POST is complete and control given to the OS bootloader. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Always Enable</b>—BIOS Legacy console redirection is active during the OS boot and run time.</li> <li>• <b>Bootloader</b>—BIOS Legacy console redirection is disabled before giving control to the OS boot loader.</li> </ul>

### LOM and PCIe Slots Configuration Parameters

Name	Description
<b>CDN Support for VIC set CdnEnable</b>	<p>Whether the Ethernet Network naming convention is according to Consistent Device Naming (CDN) or the traditional way of naming conventions. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— OS Ethernet Networking Identifier is named in a default convention as ETH0, ETH1 and so on. By default, CDN option is disabled.</li> <li>• <b>LOMS Only</b>— OS Ethernet Network identifier is named in a consistent device naming (CDN) according to the physical LAN on Motherboard(LOM) port numbering; LOM Port 0, LOM Port 1 and so on.</li> </ul> <p><b>Note</b> CDN is enabled for LOM ports and works with Windows 2012 or the latest OS only.</p>
<b>All PCIe Slots OptionROM</b>	<p>Whether the server can use Option ROM present in the PCIe Cards. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for all PCIe slots are not available.</li> <li>• <b>Enabled</b>—The Option ROMs for all the PCIe slots are available.</li> <li>• <b>UEFI Only</b>—The Option ROMs for slot <i>n</i> are available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> are available for legacy only.</li> </ul>

Name	Description
<b>PCIe Slot:<i>n</i> OptionROM</b>	<p>Whether the server can use the Option ROMs present in the PCIe Cards. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The Option ROM for slot <i>n</i> is not available.</li> <li>• <b>Enabled</b>—The Option ROM for slot <i>n</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>n</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The Option ROM for slot <i>n</i> is available for legacy only.</li> </ul>
<b>PCIe Mezzanine OptionROM</b>	<p>Whether the PCIe mezzanine slot expansion ROM is available to the server. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Disabled</b>— The Option ROM for slot <i>M</i> is not available.</li> <li>• <b>Enabled</b>— The Option ROM for slot <i>M</i> is available.</li> <li>• <b>UEFI Only</b>—The Option ROM for slot <i>M</i> is available for UEFI only.</li> <li>• <b>Legacy Only</b>—The expansion slot for slot <i>M</i> is available for legacy only.</li> </ul>
<b>SIOC1 Link Speed</b>	<p>System IO Controller 1 (SIOC1) add-on slot 1 link speed.</p> <ul style="list-style-type: none"> <li>• <b>GEN1</b>— Link speed can reach up to first generation.</li> <li>• <b>GEN2</b>—The default link speed. Link speed can reach up to second generation.</li> <li>• <b>GEN3</b>— Link speed can reach up to third generation.</li> <li>• <b>Disabled</b>—Slot is disabled, and the card is not enumerated.</li> </ul>
<b>SIOC2 Link Speed</b>	<p>System IO Controller 2 (SIOC2) add-on slot 2 link speed.</p> <ul style="list-style-type: none"> <li>• <b>GEN1</b>— Link speed can reach up to first generation.</li> <li>• <b>GEN2</b>—The default link speed. Link speed can reach up to second generation.</li> <li>• <b>GEN3</b>— Link speed can reach up to third generation.</li> <li>• <b>Disabled</b>—Slot is disabled, and the card is not enumerated.</li> </ul>



Name	Description
<b>Mezz Link Speed</b> <b>set PcieSlotMLinkSpeed</b>	Mezz link speed. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>GEN 1</b>— Link speed can reach up to first generation.</li> <li>• <b>GEN 2</b>— Link speed can reach up to second generation.</li> <li>• <b>GEN 3</b>—The default link speed. Link speed can reach up to third generation.</li> <li>• <b>Disabled</b>—Slot is disabled, and the card is not enumerated.</li> </ul>

## Server Management Tab for C3160 Servers

Name	Description
<b>FRB-2 Timer</b>	Whether the FRB2 timer is used by Cisco IMC to recover the system if it hangs during POST. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The FRB2 timer is not used.</li> <li>• <b>Enabled</b>—The FRB2 timer is started during POST and used to recover the system if necessary.</li> </ul>
<b>OS Watchdog Timer</b>	Whether the BIOS programs the watchdog timer with a specified timeout value. This can be one of the following: <ul style="list-style-type: none"> <li>• <b>Disabled</b>—The watchdog timer is not used to track how long the server takes to boot.</li> <li>• <b>Enabled</b>—The watchdog timer tracks how long the server takes to boot. If the server does not boot within the length of time specified in the <b>OS Boot Watchdog Timer Timeout</b> field, the Cisco IMC logs an error and takes the action specified in the <b>OS Boot Watchdog Policy</b> field.</li> </ul>

Name	Description
<b>OS Watchdog Timer Timeout</b>	<p>If OS does not boot within the specified time, OS watchdog timer expires and system takes action according to timer policy. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>5 Minutes</b>—The OS watchdog timer expires 5 minutes after it begins to boot.</li> <li>• <b>10 Minutes</b>—The OS watchdog timer expires 10 minutes after it begins to boot.</li> <li>• <b>15 Minutes</b>—The OS watchdog timer expires 15 minutes after it begins to boot.</li> <li>• <b>20 Minutes</b>—The OS watchdog timer expires 20 minutes after it begins to boot.</li> </ul> <p><b>Note</b> This option is only applicable if you enable the OS Boot Watchdog Timer.</p>
<b>OS Watchdog Timer Policy</b>	<p>What action the system takes if the watchdog timer expires. This can be one of the following:</p> <ul style="list-style-type: none"> <li>• <b>Do Nothing</b>—The server takes no action if the watchdog timer expires during OS boot.</li> <li>• <b>Power Down</b>—The server is powered off if the watchdog timer expires during OS boot.</li> <li>• <b>Reset</b>—The server is reset if the watchdog timer expires during OS boot.</li> </ul> <p><b>Note</b> This option is only applicable if you enable the OS Boot Watchdog Timer.</p>