

HP ROM-Based Setup Utility User Guide

Abstract

This document details how to access and use the HP ROM-Based Setup Utility that is embedded in the system ROM of all HP ProLiant Generation 2 through 8 servers. All options and available responses are defined. This document is for the person who installs, administers, and troubleshoots servers and storage systems.



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1 Introduction

Overview

HP ProLiant Generation 2 through 8 servers include a configuration utility that is embedded in the system ROM. This ROM-Based Setup Utility (RBSU) performs a wide range of configuration activities that may include:

- Configuring system devices and installed options
- Displaying system information
- Selecting the primary boot controller
- Configuring online spare memory

RBSU is available in two interfaces: a menu-driven interface and a BIOS Serial Command Console (CLI) interface. Depending on the server model, options in the menu-driven interface vary slightly.

NOTE: Throughout the RBSU menus, the RBSU attempts to display the proper marketing name for installed PCI devices. If the RBSU does not recognize a device, it assigns a generic label to the device, such as an `Unknown PCI Device`. This generic labeling does not affect the functionality or operation of the device.

Running RBSU

1. To open the RBSU, reboot the server and press **F9** when prompted during the startup sequence.

NOTE: Depending on your environment, the menu-driven or the CLI interface is displayed.

2. Modify configuration settings as needed.
 - To navigate through and modify settings in the menu-driven interface, use the keystrokes defined in the following table.

Key	Action
Up or down arrow	Highlight a menu option.
Enter	Select a highlighted menu option.
F1	See online help about a selected submenu option.
Esc	Go back to the previous utility screen.

- To modify settings in the CLI, enter the appropriate commands.
3. When all changes are complete, exit the RBSU and restart the server.
 - To exit the menu-driven RBSU, press **Esc** until the main menu is displayed. Then, at the main menu, press **F10**. The server automatically restarts.
 - To exit the CLI interface, enter the `exit` command. Then, restart the server.

Using this guide

RBSU is described as follows in this guide:

- Chapter 1: [“Introduction” \(page 9\)](#)
- Chapter 2: [“RBSU menu-driven interface, version 3.xx or later \(G6, G7, and Gen8 servers\)” \(page 11\)](#)
- Chapter 3: [“RBSU menu-driven interface, version 2.xx \(G5 and earlier servers\)” \(page 157\)](#)
- Chapter 4: [“RBSU BIOS Serial Console \(CLI\)” \(page 188\)](#)
- Chapter 5: [“RBSU configuration flows \(manual and scripted\)” \(page 199\)](#)
- Chapter 6: [“ROM-based utilities” \(page 204\)](#)

2 RBSU menu-driven interface, version 3.xx or later (G6, G7, and Gen8 servers)

NOTE: The RBSU for G6, G7, and Gen8 servers contain many of the same tasks, but some features differ slightly or are unique offerings dependent on the server model. In this document, if a feature is unique to a specific server model or processor type, a clarifying note is included in the section that describes the feature.

The following G6 servers do not use RBSU version 3.xx:

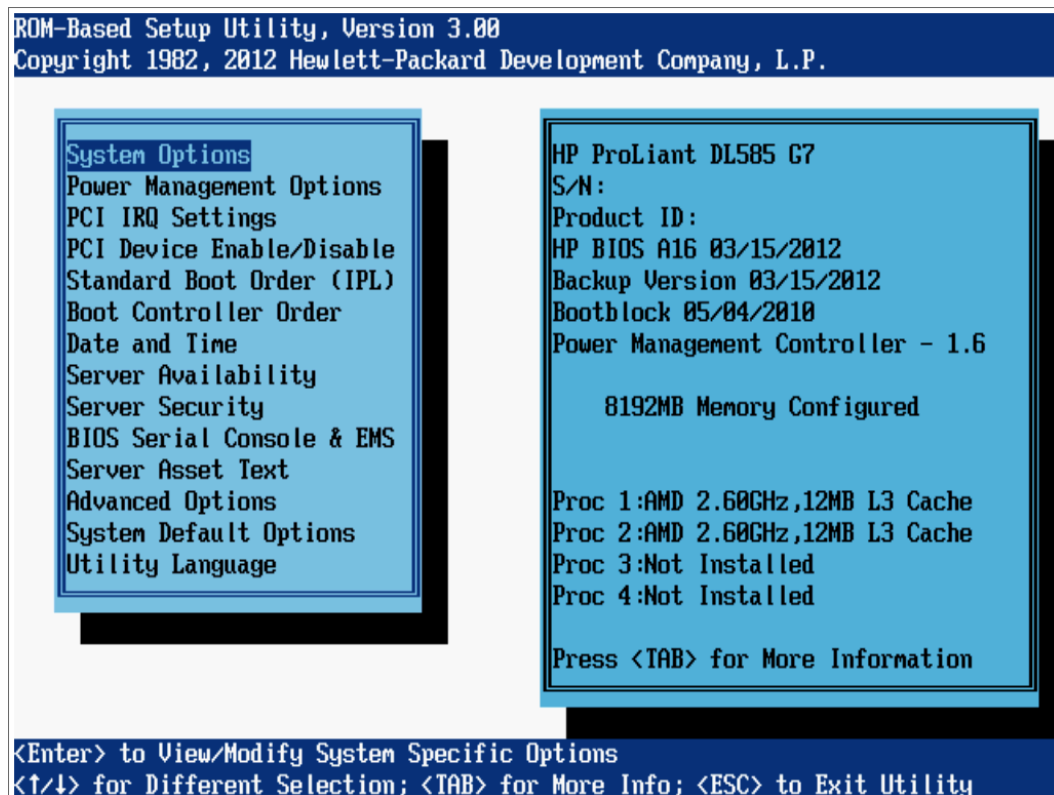
- DL385 G6
- DL785 G6
- DL585 G6

For RBSU information for these G6 servers, see “RBSU menu-driven interface, version 2.xx (G5 and earlier servers)” (page 157).

RBSU main menu

In the RBSU main menu, the left-hand side of the screen lists configuration menus and settings to view or modify. On the right-hand side of the screen, a window displays basic server information, including the server model, serial number, BIOS version, backup BIOS version, memory installed, and processors installed.

Each RBSU sub-menu and its options are described in this chapter.



System Options menu

The **System Options** menu options control basic I/O server configuration.

Depending on your server model, options may include:

- [“Embedded NICs” \(page 16\)](#)
- [“NIC Personality Options” \(page 17\)](#)
- [“Advanced Memory Protection” \(page 18\)](#)
- [“USB Options” \(page 19\)](#)
- [“Processor Options” \(page 24\)](#)
- [“Remote Console Mode” \(page 38\)](#)
- [“NUMLOCK Power-On State” \(page 40\)](#)
- [“SATA Controller Options \(Gen8 servers with SATA controllers\)” \(page 41\)](#)
- [“HP Smart Array B320i RAID Configuration” \(page 43\)](#)

Serial Port options

Depending on your server model, options may include:

- [“Embedded Serial Port” \(page 12\)](#)
- [“Virtual Serial Port” \(page 14\)](#)
- [“Embedded Serial Port Connector” \(page 15\)](#)

Embedded Serial Port

The Embedded Serial Port option assigns the logical COM port number and associated default resources to the selected physical serial port. This setting may be overwritten by the operating system.

Options include:

- **COM 1** (default for all servers except blades)
- **COM 2** (default for blade servers)
- **COM 3**
- **Disabled**

NOTE: The COM ports listed and the default setting vary depending on the server model.

Sy	Embedded Serial Port
Po	Virtual Serial Port
PC	
PC	
St	COM 1; IRQ4; IO: 3F8h-3FFh
Bo	COM 2; IRQ3; IO: 2F8h-2FFh
Da	Disabled
Serv	
Server	Security
BIOS	Serial Console & EMS
Server	Asset Text
Advanced	Options
System	Default Options
Utility	Language

COM 1; IRQ4; IO: 3F8h-3FFh

HP ProLiant DL585 G7 S/N: Product ID: HP BIOS A16 03/17/2012 Backup Version 03/17/2012 Bootblock 05/04/2010 Power Management Controller - 1.6 8192MB Memory Configured Proc 1:AMD 2.40GHz,12MB L3 Cache Proc 2:AMD 2.40GHz,12MB L3 Cache Proc 3:Not Installed Proc 4:Not Installed Press <TAB> for More Information

<↑/↓> Changes Configuration Selection
<Enter> Saves Selection; <ESC> to Cancel

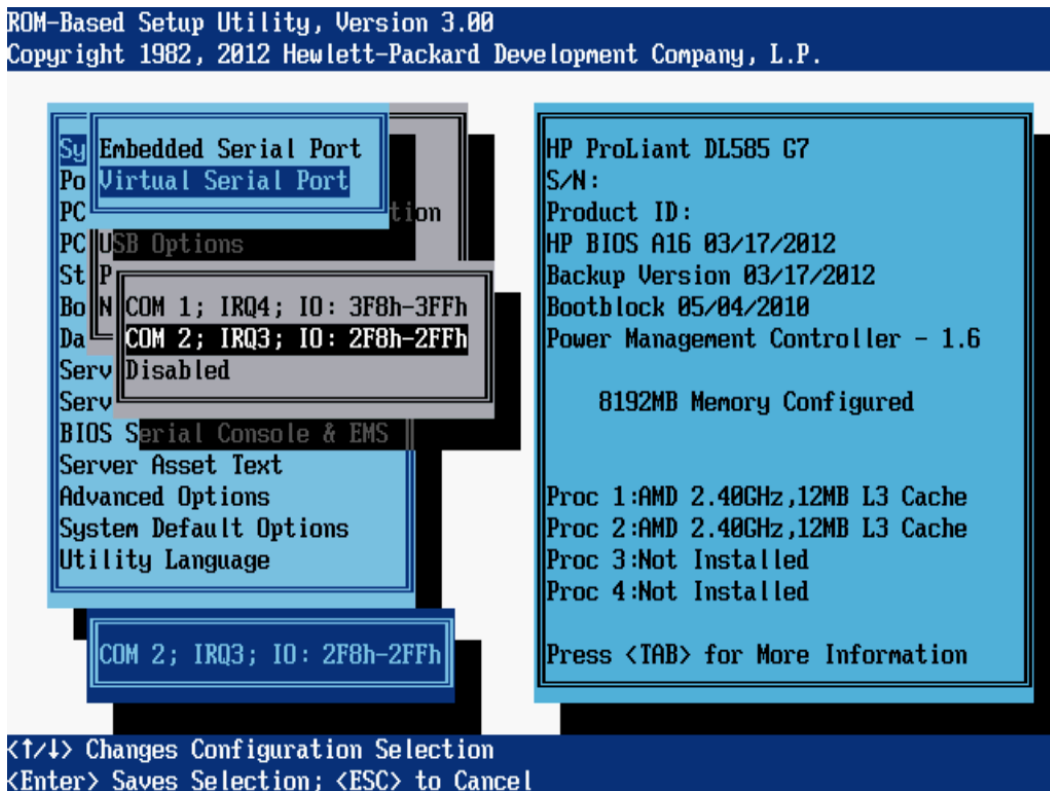
Virtual Serial Port

The Virtual Serial Port option assigns the logical COM port number and associated default resources used by the VSP. The VSP enables the iLO Management Controller to appear as a physical serial port to support the BIOS Serial Console and the OS serial console.

Options include:

- **COM 1** (default for blade servers)
- **COM 2** (default for all servers except blades)
- **COM 3**
- **Disabled**

NOTE: The COM ports listed and the default setting vary depending on the server model.



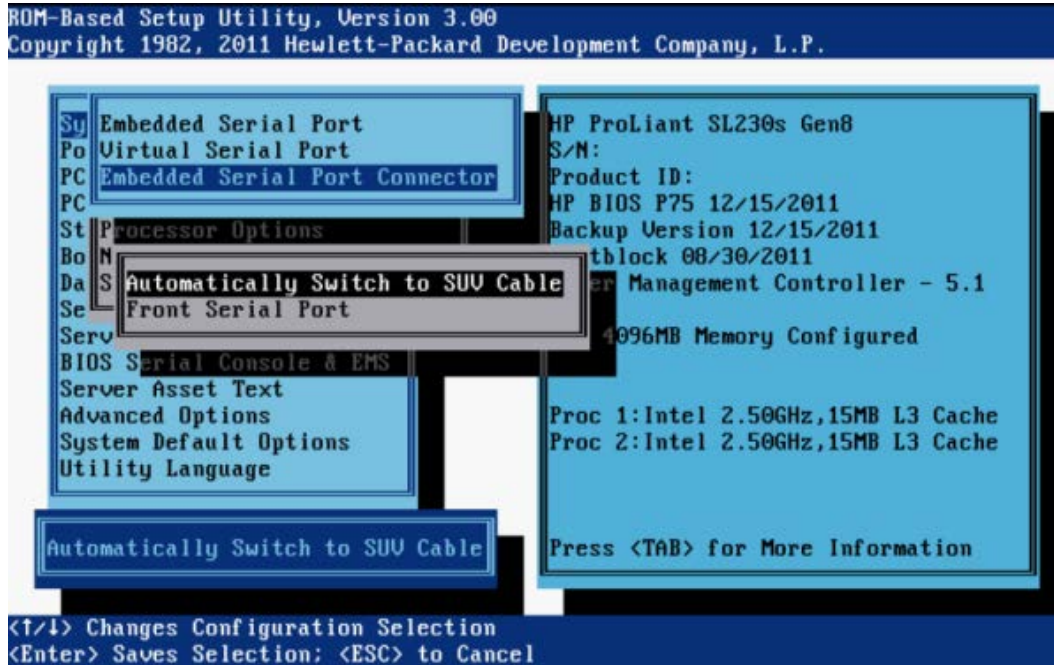
For more information on iLO configurations, see the iLO user documentation on the Documentation CD or the HP website (<http://h17007.www1.hp.com/us/en/enterprise/servers/management/ilo/index.aspx>).

NOTE: This option is available only on some Gen8 servers.

This Embedded Serial Port Connector option controls how the system uses the embedded front serial port.

Options include:

- **Automatically Switch to SUV Cable** (default)—Functions via the front serial port when the SUV cable is not attached, but automatically switches to the SUV cable if it is attached.
- **Front Serial Port**—Disables auto-switching and always have the embedded serial port function via the front serial port.



Embedded NICs

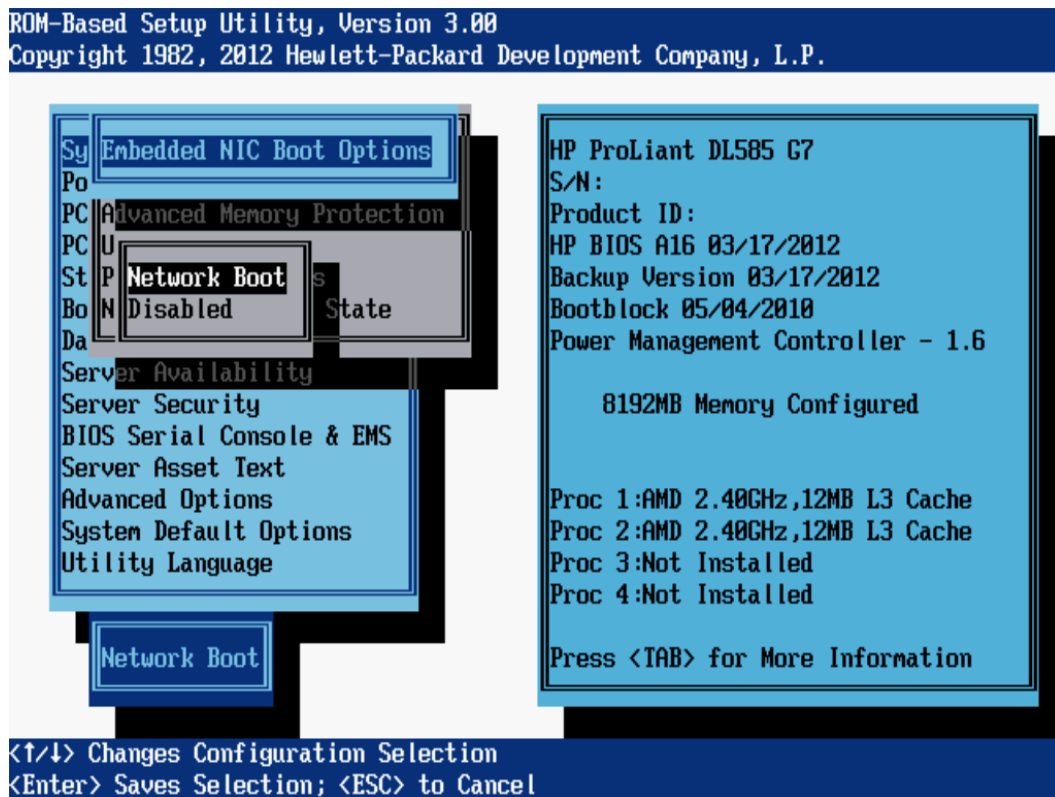
These boot options enable or disable network boot for embedded NICs. These settings provide no functionality if an embedded NIC is not installed.

NOTE:

- When enabling Network Boot support for an embedded NIC, the NIC will not show up in the Standard Boot Order (IPL) until the next reboot.
- For Gen8 servers, this option is for the embedded LOM or FlexibleLOM.
- Not every NIC Port is bootable on every FlexibleLOM. Because of this, the RBSU menu may offer a network boot option that does nothing. To determine which ports are bootable, see the NIC user documentation.
- The display differs slightly, based on the number of embedded NICs.

After reading the note message, press any key to display the following settings:

- **Network Boot**
- **Disabled**



NIC Personality Options

NOTE:

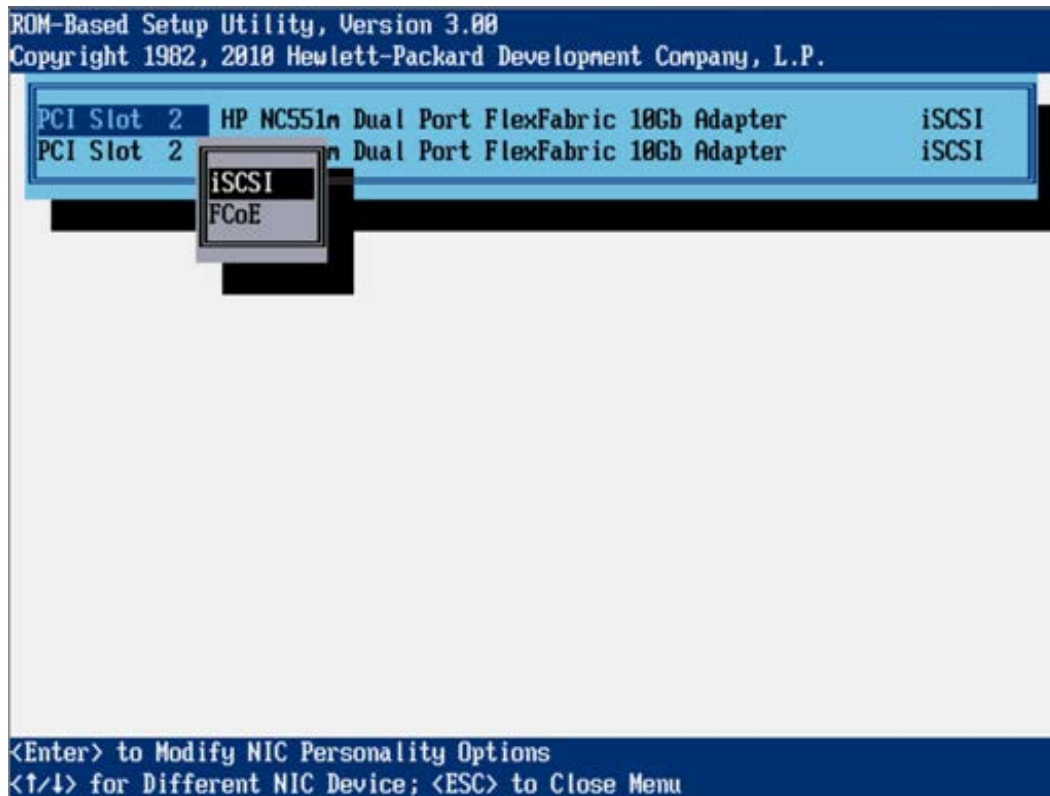
- This option is supported only on select HP CNA devices.
- HP Virtual Connect profile settings take precedence over the NIC Personality option settings.

For some systems with a Converged Network Adapter (CNA), the protocols can be configured using the NIC Personality Options. (CNAs are sometimes referred to as FlexFabric Adapters.) If an adapter that is supported for use with this option is not present, this menu option does not appear.

Before configuring protocol settings, certain CNAs require the Network Boot option to be enabled. If the protocol settings are configured without enabling network boot for these adapters, the protocol settings may not be saved. After the server reboots and the protocol settings are active, the Network Boot option can be disabled. For information on enabling network boot, see [“Embedded NICs” \(page 16\)](#).

Options include:

- **iSCSI** (default)
- **FCoE**

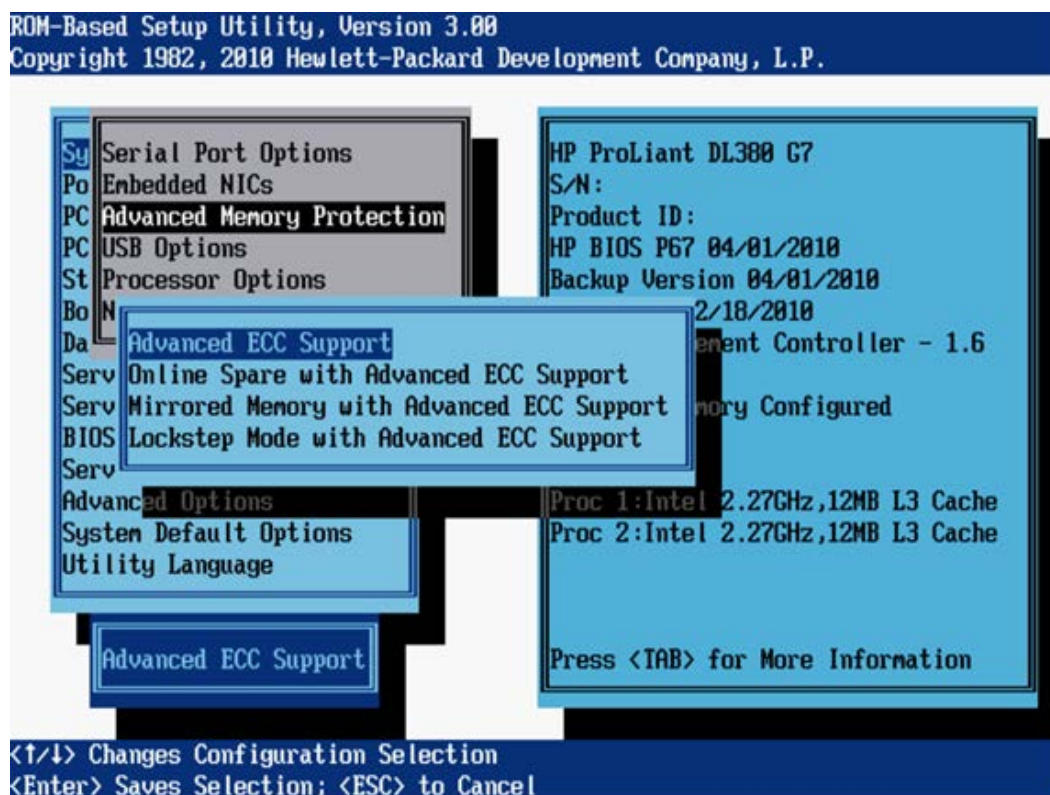


Advanced Memory Protection

Advanced Memory Protection provides additional memory protection beyond ECC (error checking and correcting), including:

Option	Description	Servers supported
Advanced ECC Support (default)	Provides the largest memory capacity to the OS.	G7 servers: All Gen8 servers: All
Online Spare with Advanced ECC Support	Enables the system to automatically map out a group of memory that is receiving excessive correctable memory errors. This memory is replaced by a spare group of memory.	G7 servers: All Gen8 servers: All
Mirrored Memory with Advanced ECC Support	Provides maximum protection against uncorrectable memory errors that would otherwise result in system failure.	G7 servers: Some models Gen8 servers: Not an available option
Lockstep Mode with Advanced ECC Support (Intel servers)	Provides maximum data protection by enabling multiple-bit memory errors to be corrected in certain instances not otherwise possible in Advanced ECC mode.	G7 servers: Some models Gen8 servers: Not an available option. For more information about lockstep mode, see "Memory Channel Mode" (page 141) .

For more information on Advanced Memory Protection, see the HP ProLiant Server Memory website (<http://h18004.www1.hp.com/products/servers/technology/memoryprotection.html>).



USB Options

Depending on your server model, options may include:

- “USB Control” (page 20)
- “USB 2.0 Controller” (page 21)
- “USB Boot Support” (page 22)
- “Removable Flash Media Boot Sequence” (page 23)

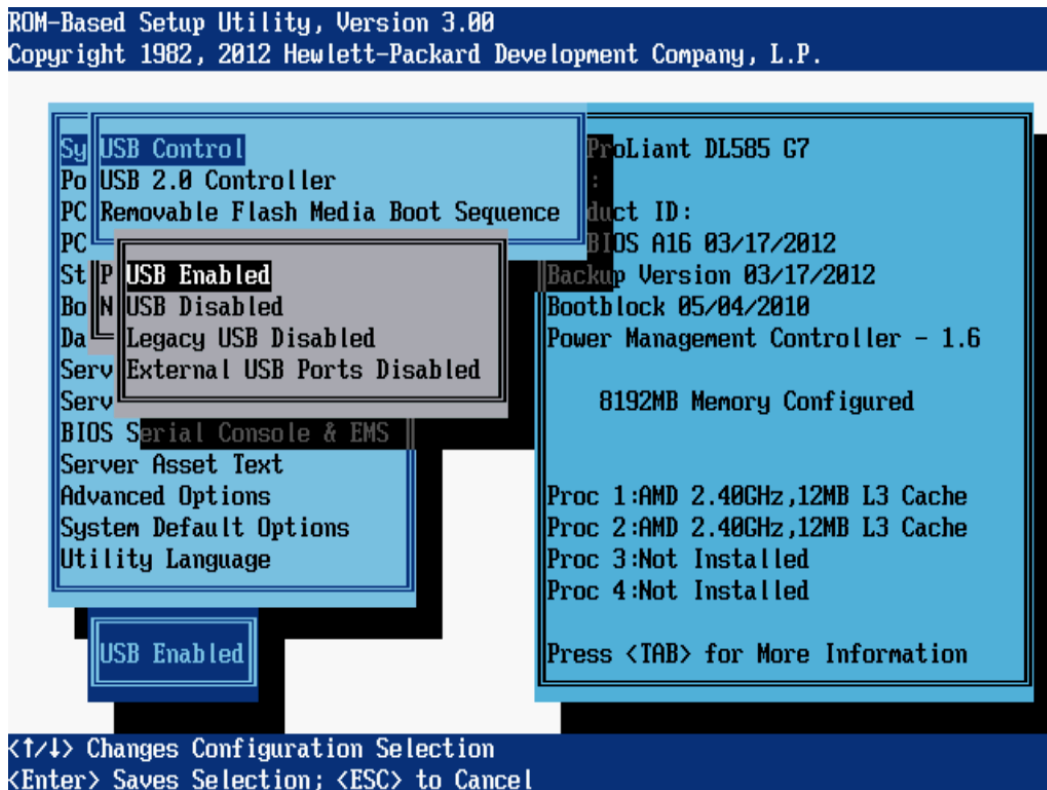
USB Control

The USB Control option determines how USB ports and embedded devices operate at startup. Depending on your server model, options may include the following:

Option	Description	Servers supported
USB Enabled (default)	All USB ports and embedded devices are enabled.	G7 servers: AllGen8 servers: All
USB Disabled	All USB ports and embedded devices are disabled. NOTE: Disabling USB ports can prevent iLO virtual media devices from mounting.	G7 servers: AllGen8 servers: Not an available option.
Legacy USB Disabled	All USB ports are enabled under a USB-aware OS, but USB is not supported during POST or RBSU. Legacy USB Disabled also disables iLO3 virtual devices.	G7 servers: AllGen8 servers: Not an available option.
External USB Port Disabled	All external USB ports are disabled. Under this option, embedded USB devices still have full support under the ROM and OS.	G7 servers: AllGen8 servers: All

- ❗ **IMPORTANT:** Disabling Legacy USB Support removes the ability to use a USB keyboard and mouse in a pre-boot environment. iLO Virtual Devices used for remote access, including virtual CD, floppy, keyboard, and mouse are also disabled. RBSU cannot be used to re-enable functionality.

After reading the warning message, press any key to display the available settings.

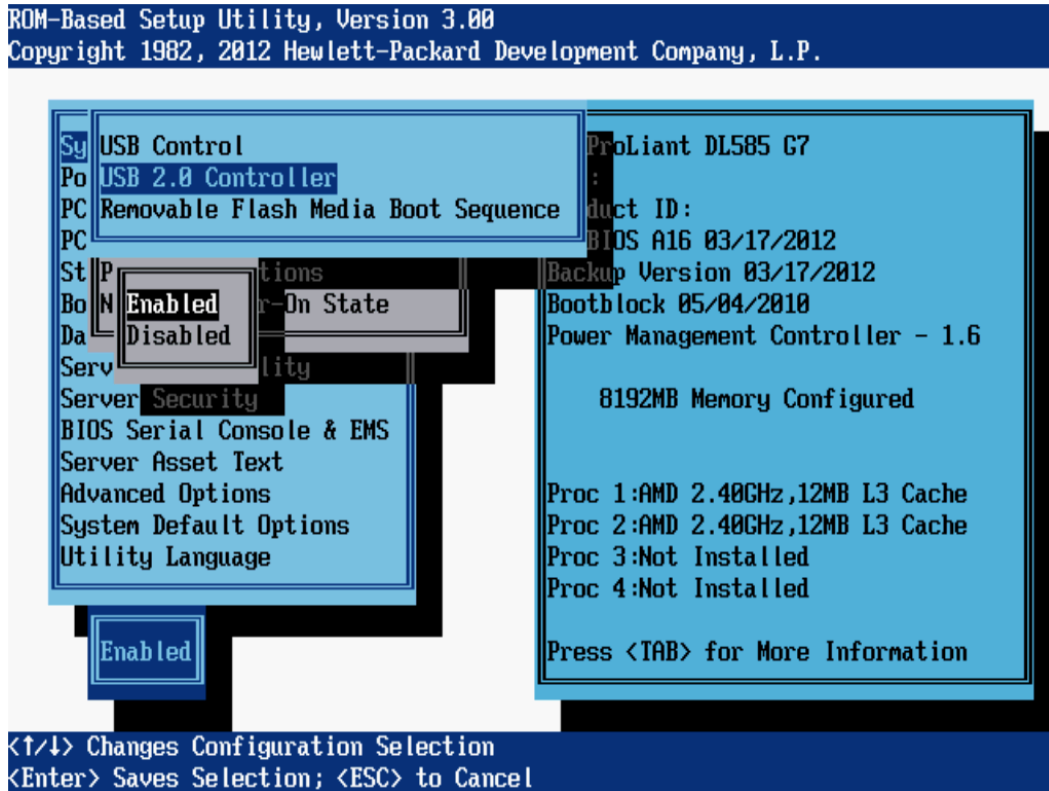


NOTE: This option is available on servers with AMD processors.

The USB 2.0 EHCI Controller option is a toggle setting that enables or disables the high-speed USB 2.0 controller.

Options include:

- **Enabled** (default)
- **Disabled**

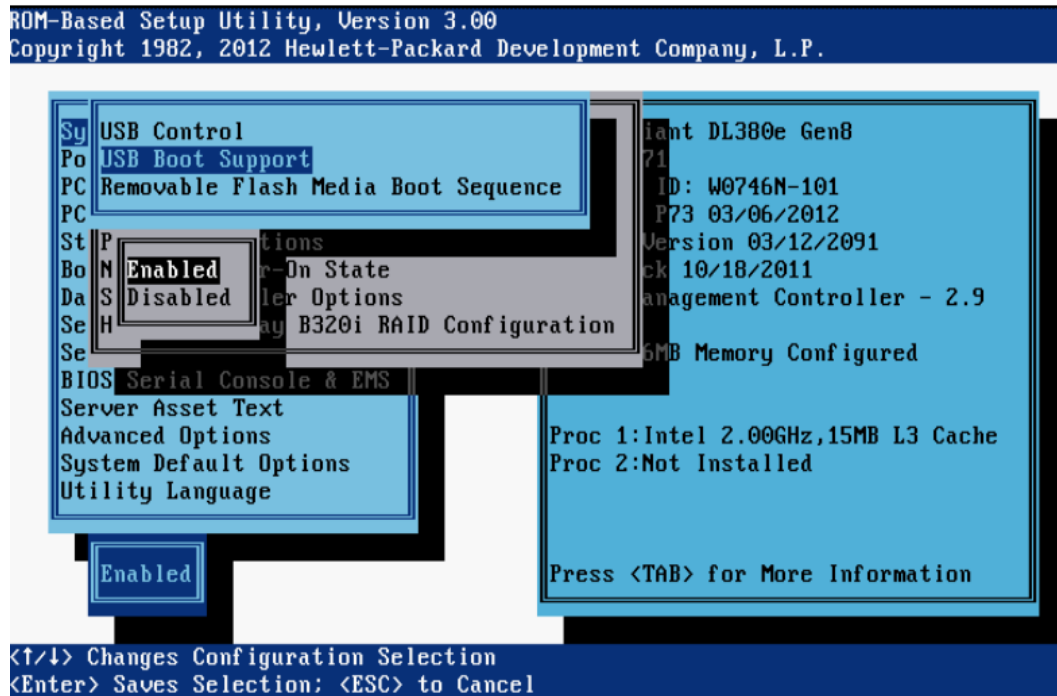


NOTE: This option is available on Gen8 servers.

USB Boot Support controls whether the system boots from USB devices connected to the server. When disabled, this option also disables booting of iLO virtual media.

Options include:

- **Enabled** (default)
- **Disabled**

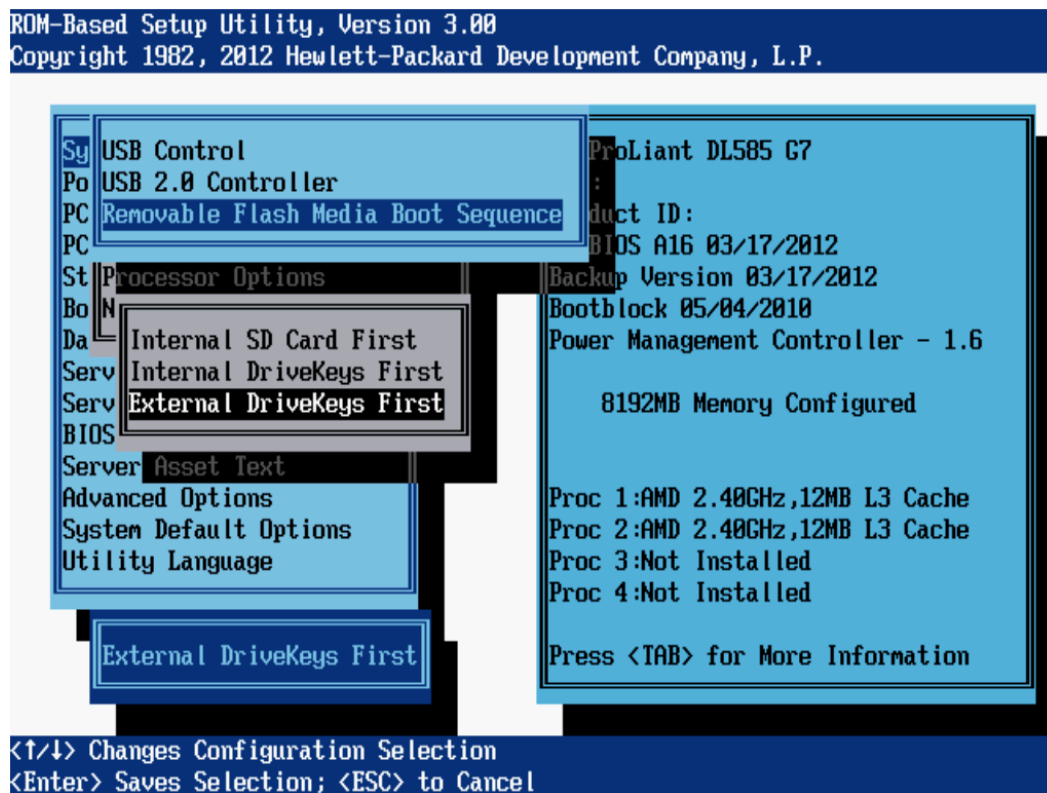


Removable Flash Media Boot Sequence

This option enables the user to select which USB port or SD card slot the system searches first when enumerating boot devices. The option does not override the device boot order selected in the Standard Boot Order (IPL) option.

Options include:

- **Internal SD Card First**
- **Internal DriveKeys First**
- **External DriveKeys First** (default)



Processor Options

Depending on your server model, options may include:

- [“No-Execute Memory Protection” \(page 25\)](#)
- [“No-Execute Page Protection” \(page 26\)](#)
- [“Intel Virtualization Technology” \(page 27\)](#)
- [“AMD V \(AMD Virtualization\)” \(page 28\)](#)
- [“Intel Hyperthreading Options” \(page 29\)](#)
- [“Enhanced Processor Core Disable \(Intel Core Select\)” \(page 30\)](#)
- [“Processor Core Disable \(AMD Core Select\)” \(page 32\)](#)
- [“Intel Turbo Boost Technology \(Gen8 servers\)” \(page 33\)](#)
- [“Intel Turbo Boost Technology \(G7 servers\)” \(page 34\)](#)
- [“AMD Core Performance Boost” \(page 35\)](#)
- [“Intel VT-d” \(page 36\)](#)
- [“AMD-Vi \(IOMMU\)” \(page 37\)](#)

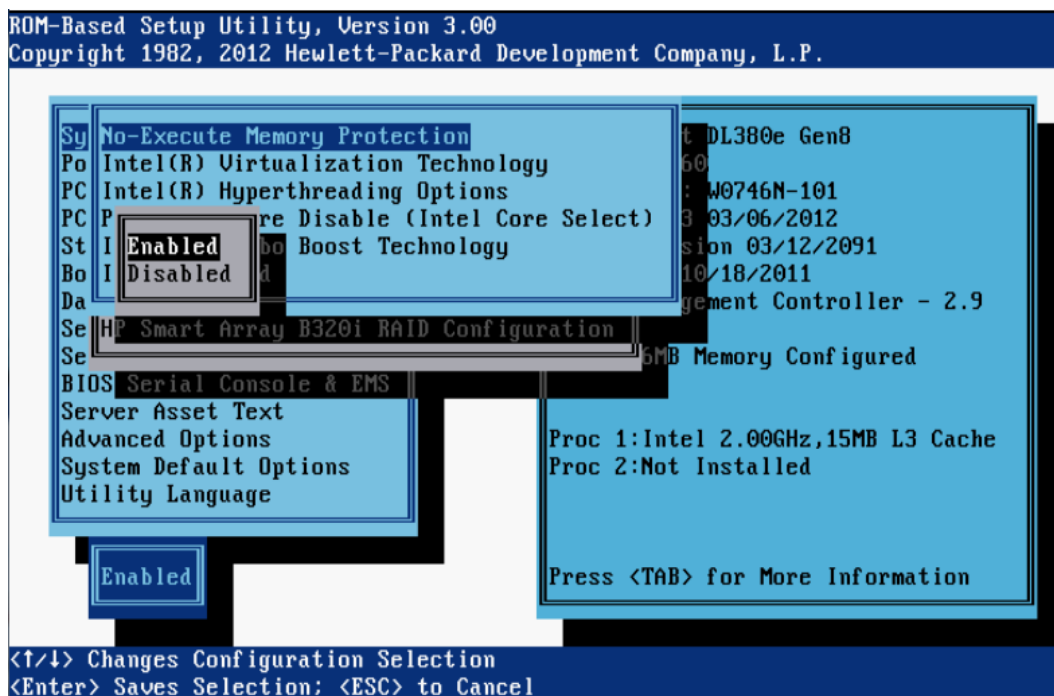
NOTE: This option is available on servers with Intel processors.

No-Execute Memory Protection enables the hardware portion of a feature that protects systems against malicious code and viruses. When used in combination with an OS that supports this feature, certain memory locations are marked as “not for executable code”. Viruses that attempt to insert and execute code from non-executable memory locations are intercepted and an exception is raised.

Options include:

- **Enabled** (default)
- **Disabled**

NOTE: When using hypervisors such as VMware ESX/ESXi and Windows Hyper-V, be sure to enable this option.



No-Execute Page Protection

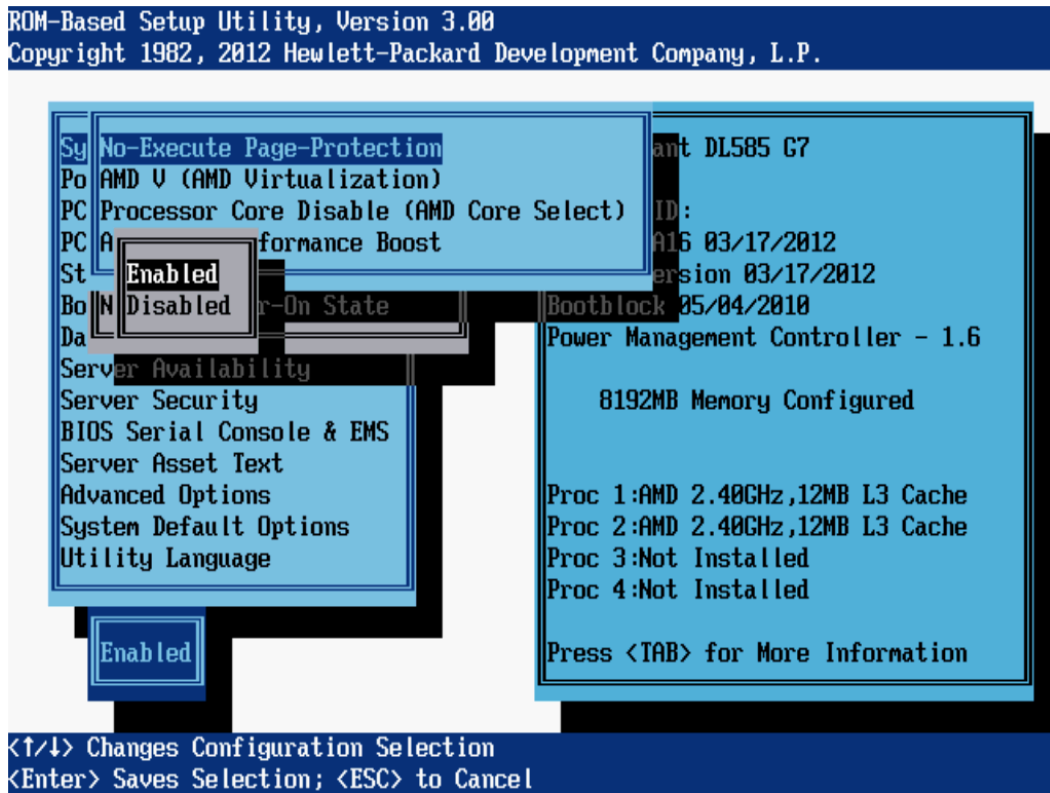
NOTE: This option is available on servers with AMD processors.

No-Execute Page Protection enables the hardware portion of a feature that protects systems against malicious code and viruses. When used in combination with an OS that supports this feature, certain memory locations are marked as not for executable code. Viruses that attempt to insert and execute code from non-executable memory locations are intercepted and an exception is raised.

Options include:

- **Enabled** (default)
- **Disabled**

NOTE: When using hypervisors such as VMware ESX/ESXi and Windows Hyper-V, be sure to enable this option.

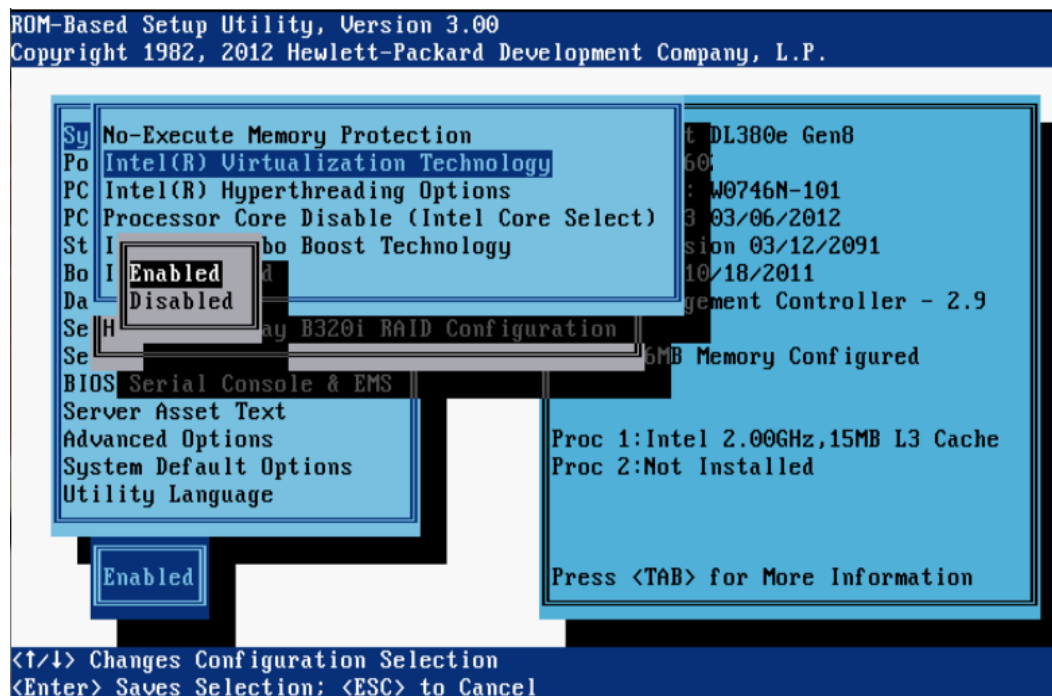


NOTE: This option is available on servers with Intel processors.

When enabled, a hypervisor supporting this feature can use extra hardware capabilities provided by Intel.

Options include:

- **Enabled** (default)
- **Disabled**



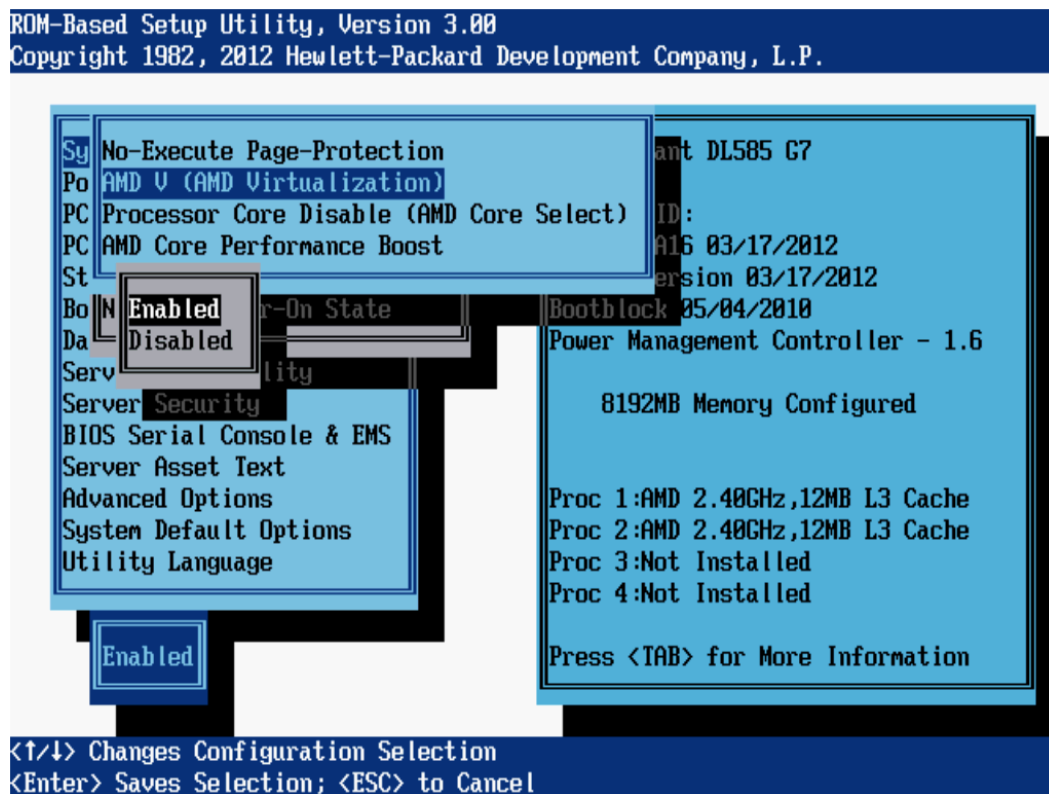
AMD V (AMD Virtualization)

NOTE: This option is available on servers with AMD processors.

When enabled, a hypervisor supporting this feature can use extra hardware capabilities provided by AMD.

Options include:

- **Enabled** (default)
- **Disabled**



Intel Hyperthreading Options

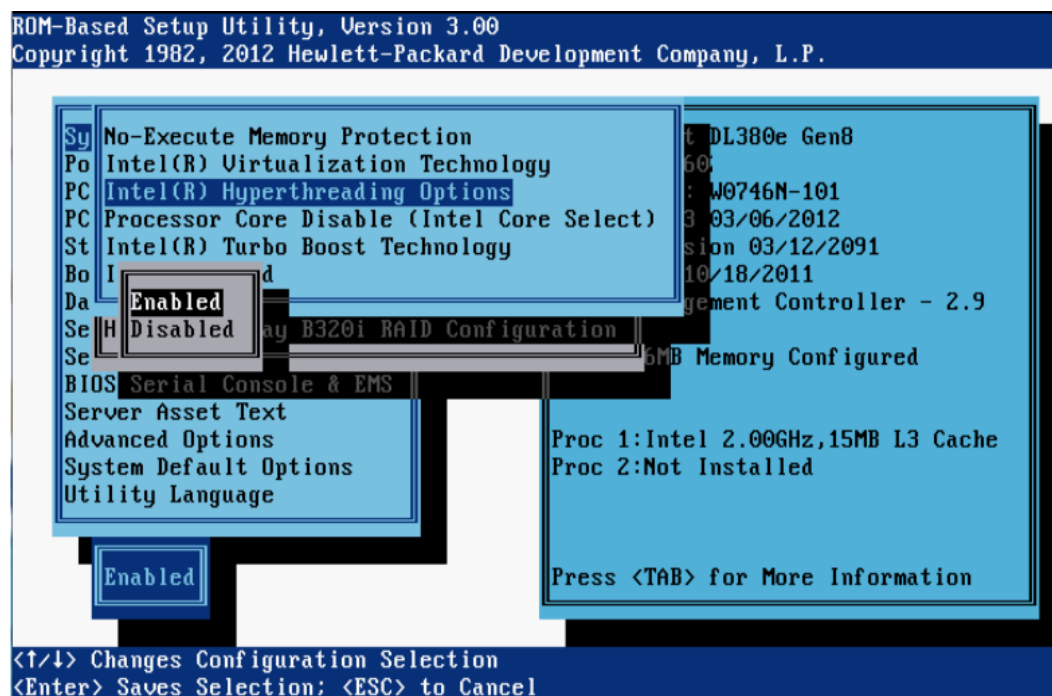
NOTE: This option is available on servers with Intel processors.

Intel Hyperthreading Options is a toggle setting that allows Intel Hyperthreading Technology to be enabled or disabled. Intel Hyperthreading delivers two logical processors that can execute multiple tasks simultaneously using the shared hardware resources of a single processor core. The option is supported through the system BIOS.

NOTE: Hyperthreading is not supported on all processors. For more information, see the documentation for your processor model.

Options include:

- **Enabled** (default)
- **Disabled**



Enhanced Processor Core Disable (Intel Core Select)

NOTE: This option is available on some G7 and Gen8 servers with Intel processors.

The Enhanced Processor Core Disable option allows you to specify the number of cores to enable per processor socket, in multiples of 2. Unused cores are disabled.

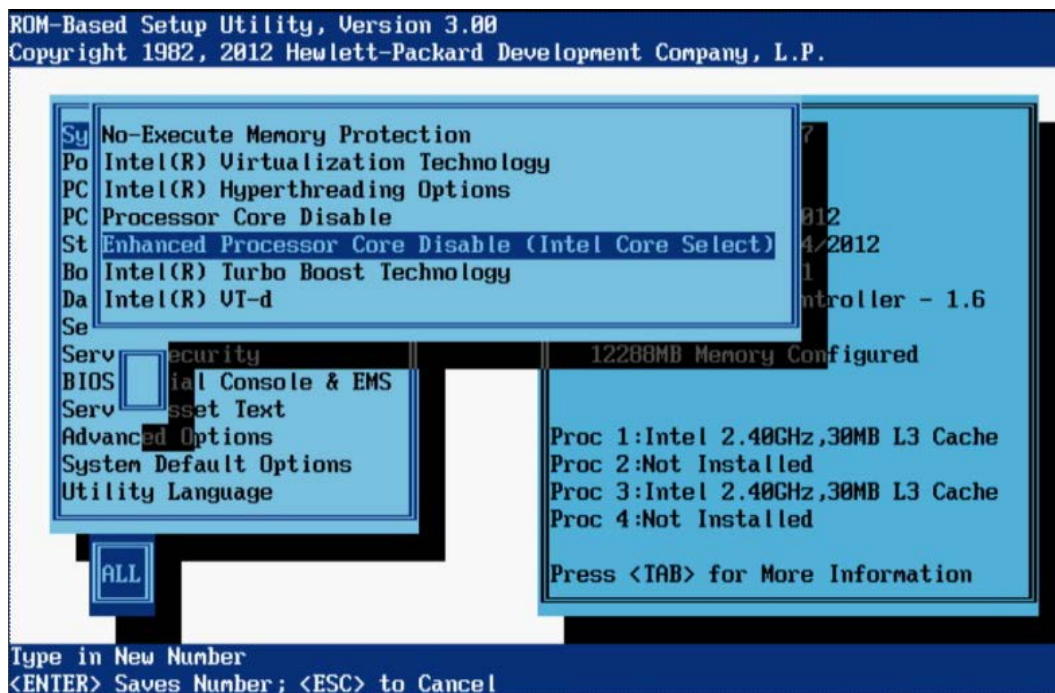
Depending on the applications used, controlling the number of cores to enable has the following benefits:

- Reduces processor power usage and improves overall performance
- Improves overall performance for applications that benefit from higher performance cores rather than from additional processing cores
- Addresses issues with software licensed on a per-core basis. Software licensing issues with enabling or disabling processor core count may exist. For more information, see your software licensing agreement and user documentation.

After reading the window with additional information about this option, press any key to display the box in which to enter the number of cores to enable per processor socket.

Options include:

- **All** (default)
- User-defined entry, in multiples of 2



Processor Core Disable (Intel Core Select) (G7 and Gen8 servers)

NOTE: This option is available on some G7 and Gen8 servers with Intel processors.

The Processor Core Disable option allows you to specify the number of cores to enable per processor socket. Unused cores are disabled.

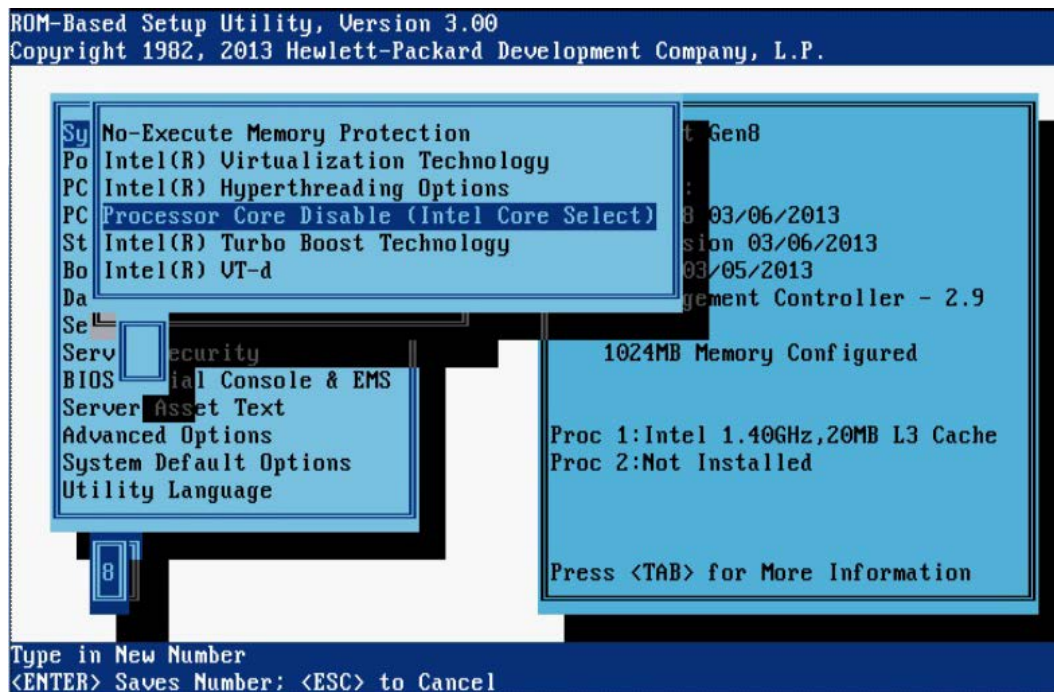
Depending on the applications used, controlling the number of cores to enable has the following benefits:

- Reduces processor power usage and improves overall performance
- Improves overall performance for applications that benefit from higher performance cores rather than from additional processing cores
- Addresses issues with software licensed on a per-core basis. Software licensing issues with enabling or disabling processor core count may exist. For more information, see your software licensing agreement and user documentation.

After reading the window with additional information about this option, press any key to display the box in which to enter the number of cores to enable per processor socket.

Options include:

- **All** (default)
- **One Core Enabled** (on G7 servers)
- **Half Cores Enabled** (on G7 servers)
- User-defined entry, 1–n, where n represents the maximum number of cores for that processor socket



Processor Core Disable (AMD Core Select)

NOTE: This feature is available on G7 and Gen8 servers with AMD processors.

The Processor Core Disable option allows you to specify the number of cores to enable per processor socket, in multiples of four. Unused cores are disabled.

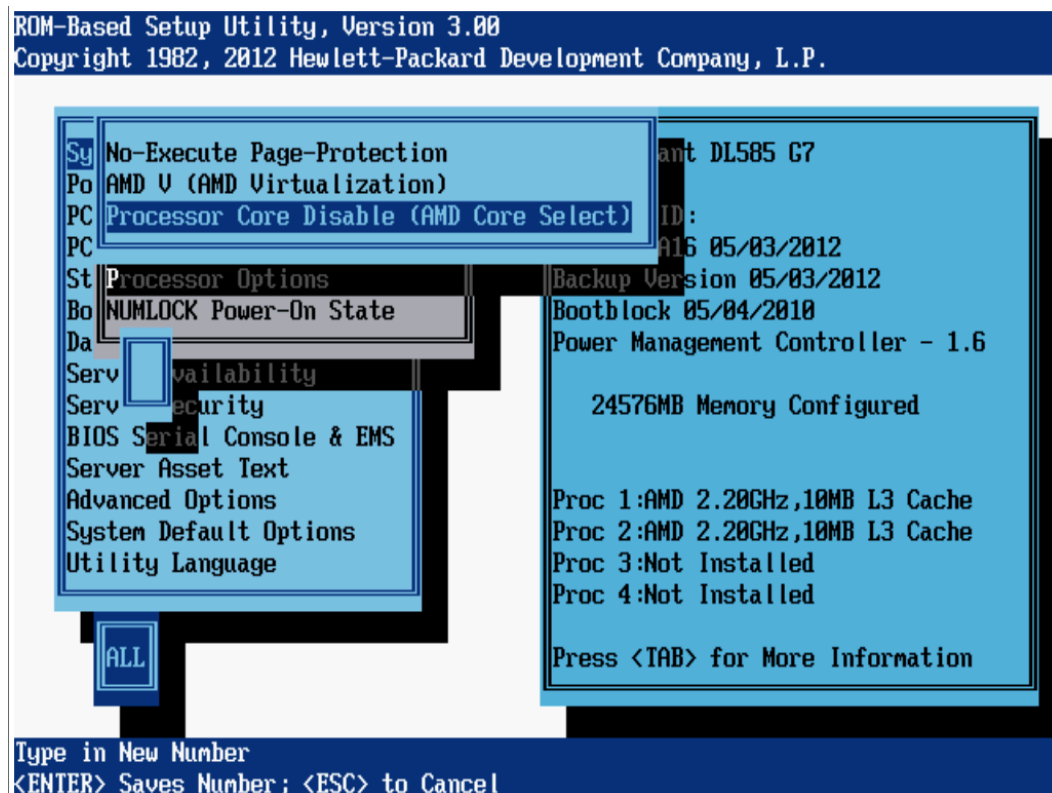
Depending on the applications used, controlling the number of cores to enable has the following benefits:

- Reduces processor power usage and improves overall performance
- Improves overall performance for applications that benefit from higher performance cores rather than from additional processing cores
- Addresses issues with software licensed on a per-core basis. Software licensing issues with enabling or disabling processor core count may exist. For more information, see your software licensing agreement and user documentation.

After reading the window with additional information about this option, press any key to display the box in which to enter the number of cores to leave enabled.

Options include:

- **All** (default)
- User-defined entry, in multiples of 4



Intel Turbo Boost Technology

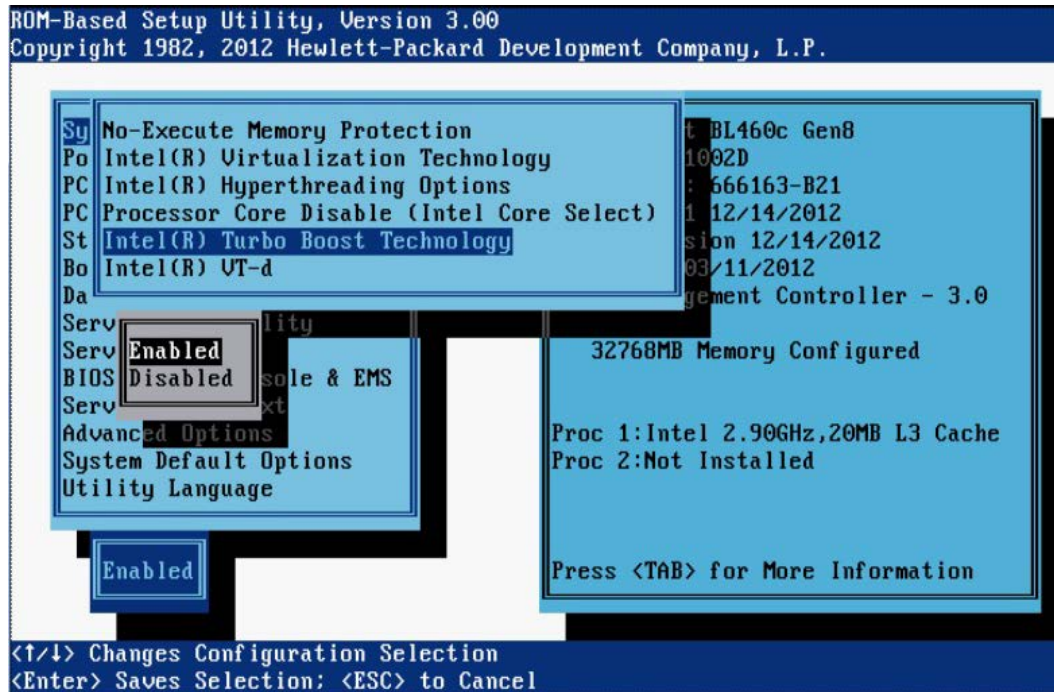
Intel Turbo Boost Technology enables a processor that has available power headroom and is under temperature specification to transition to a higher frequency than the rated speed. Disabling this feature reduces power usage but also reduces the maximum achievable system performance under some workloads.

NOTE: This option is available on Gen8 servers with Intel processors.

Intel Turbo Boost Technology enables a processor that has available power headroom and is under temperature specification to transition to a higher frequency than the rated speed. Disabling this feature reduces power usage but also reduces the maximum achievable system performance under some workloads.

Options include:

- **Enabled** (default)
- **Disabled**

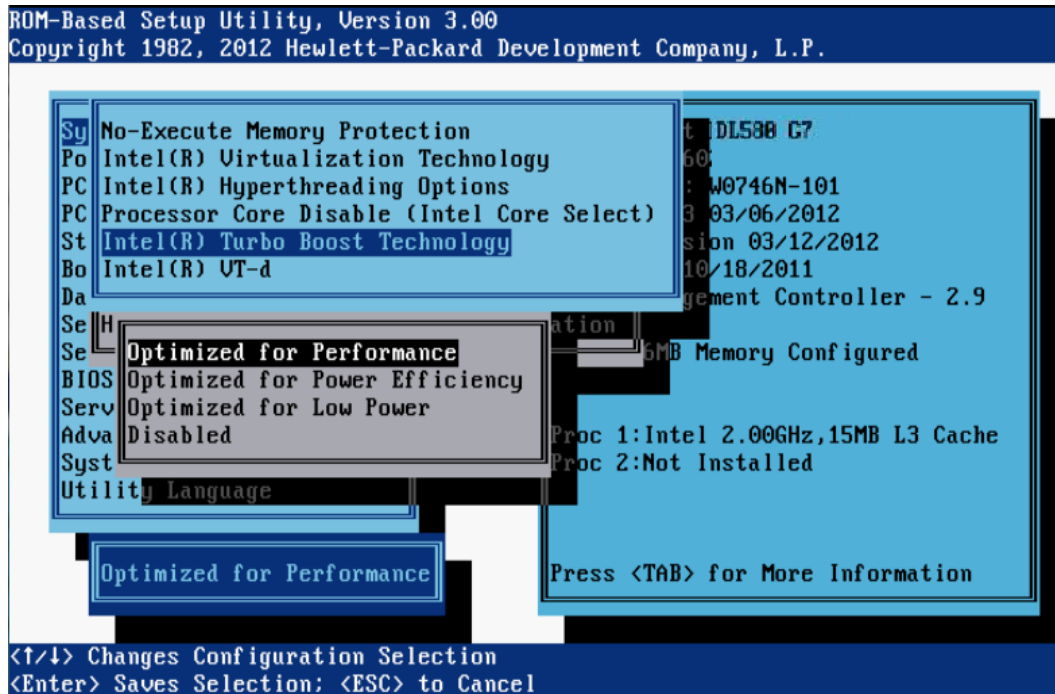


NOTE: This option is available on G7 servers with Intel processors.

Turbo Boost Technology is a processor feature which enables the processor to transition to a higher frequency than the processor's rated speed if the processor has available power headroom and is within temperature specifications. This option enables the customer to customize Turbo Mode operation based on their platform environment.

Options include:

- **Optimized for Performance** (default)—The turbo state can be engaged at any time when maximum performance is preferred.
- **Optimized for Power Efficiency**—The turbo state cannot be engaged until after maximum performance is needed for an extended period of time.
- **Optimized for Low Power**—Low-voltage (LV) DIMMs are configured to operate at 1.35V until the turbo state is needed. When the turbo state engages, the system BIOS configures the DIMMs to operate at 1.5V for increased performance.
- **Optimized for Low Power**—
- **Disabled**

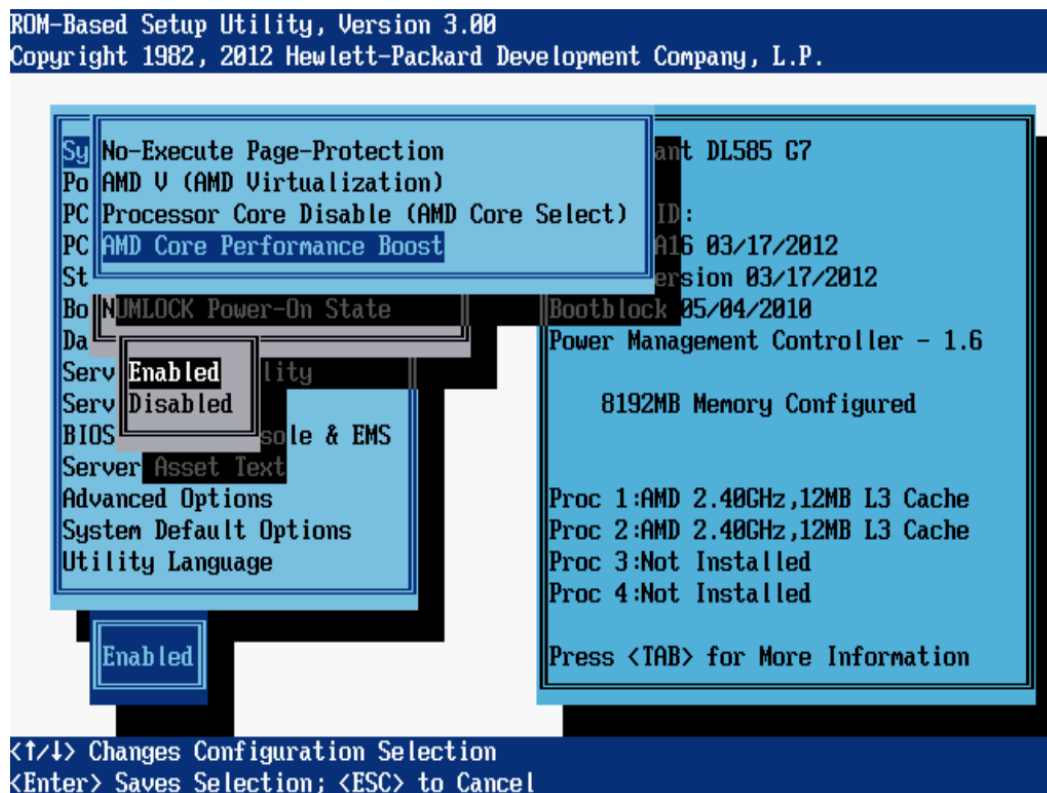


NOTE: This option is available on some servers with AMD processors. For more information, see the documentation for your processor model.

If supported by your processor, AMD Core Performance Boost enables the processor to transition to a higher frequency than the processor's rated speed if the processor has available power headroom and is within temperature specifications. Disabling this feature reduces power usage, but also reduces the maximum achievable system performance under some workloads.

Options include:

- **Enabled** (default)
- **Disabled**

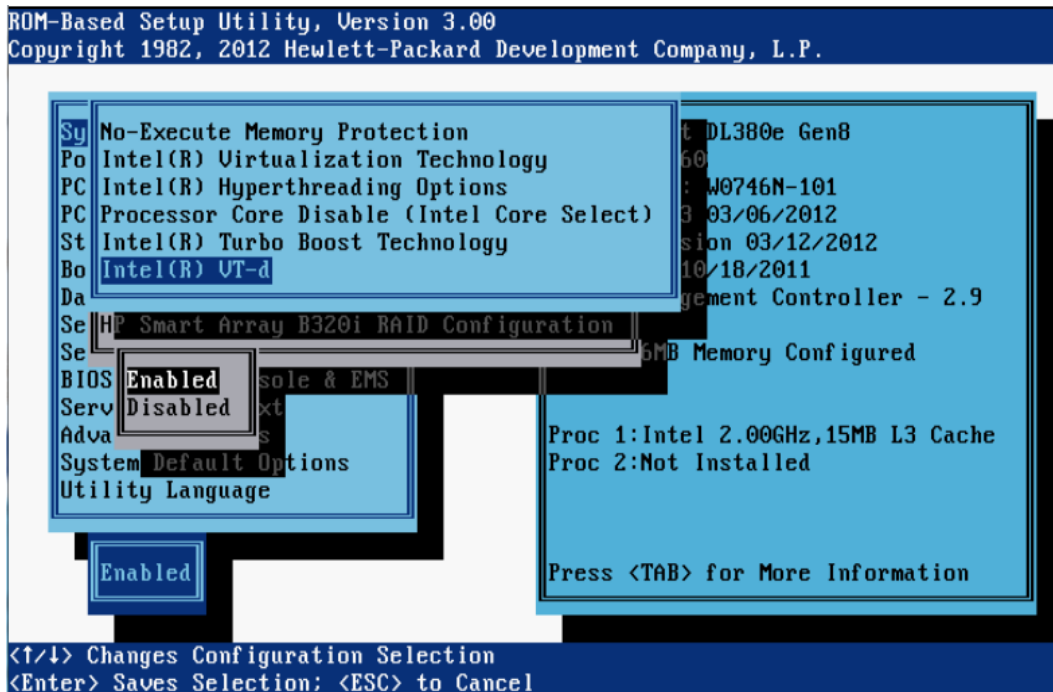


NOTE: This option is available on some servers with Intel processors. For more information, see the documentation for your processor model.

When enabled, a Virtual Machine Manager supporting this feature can use hardware capabilities provided by the Intel Virtualization Technology for Directed I/O.

Options include:

- **Enabled** (default)
- **Disabled**



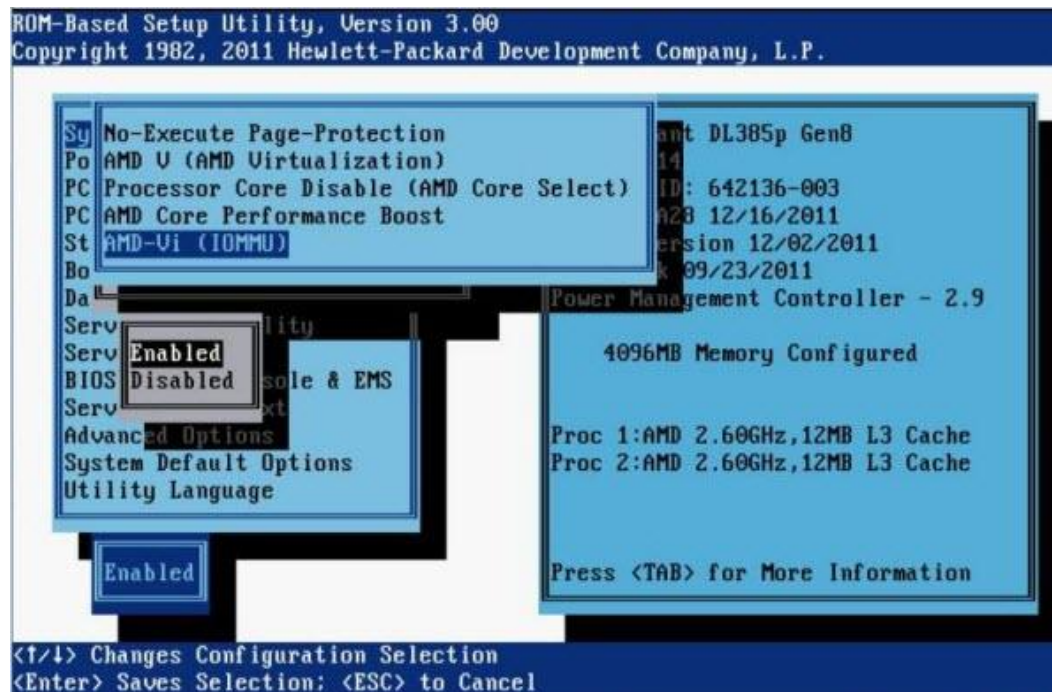
AMD-Vi (IOMMU)

NOTE: This option is available on some Gen8 servers with AMD processors. For more information, see the documentation for your processor model.

When enabled, a Virtual Machine Manager supporting this feature can use hardware capabilities provided by the AMD I/O Memory Management Unit (IOMMU).

Options include:

- **Enabled** (default)
- **Disabled**



Remote Console Mode

NOTE: This option is available only on HP ProLiant ws460c Blade Workstations. It is not available on other server blades.

The Remote Console Mode option controls whether the system console image is displayed through an embedded video controller or mezzanine graphics adapter.

Options include:

- **User Mode**—Video displays through the embedded video controller during POST, but switches to the mezzanine graphics adapter for OS boot to display the Windows desktop. In this mode, the Windows console can only be viewed using remote protocols (for example, using Microsoft Remote Desktop Connection). Because the embedded video controller is inactive after the operating system starts, the Windows desktop is not visible on the Local I/O Connector or through iLO. The screen displays a message stating that the blade is in User Mode.
- **Admin Mode**—Video displays through the embedded video controller during POST and OS boot. In this mode, the mezzanine graphics adapter is disabled.

In Admin Mode, the boot console and the Windows desktop generated by the embedded video controller can be viewed by using one of the following:

- A monitor connected to the Local I/O Connector video signal
- The iLO Remote Console by pointing your browser to the iLO IP address
- Remote desktop connection

- **Setup Mode**—Video is displayed on the embedded video controller during POST and OS boot. In this mode, the mezzanine graphics adapter is enabled. Setup Mode is similar to Admin Mode, but in Setup Mode, both the embedded video controller and the mezzanine graphics adapter are visible to the Windows operating system. Visibility of the mezzanine graphics adapter enables the Windows operating system to install the mezzanine graphics adapter driver.

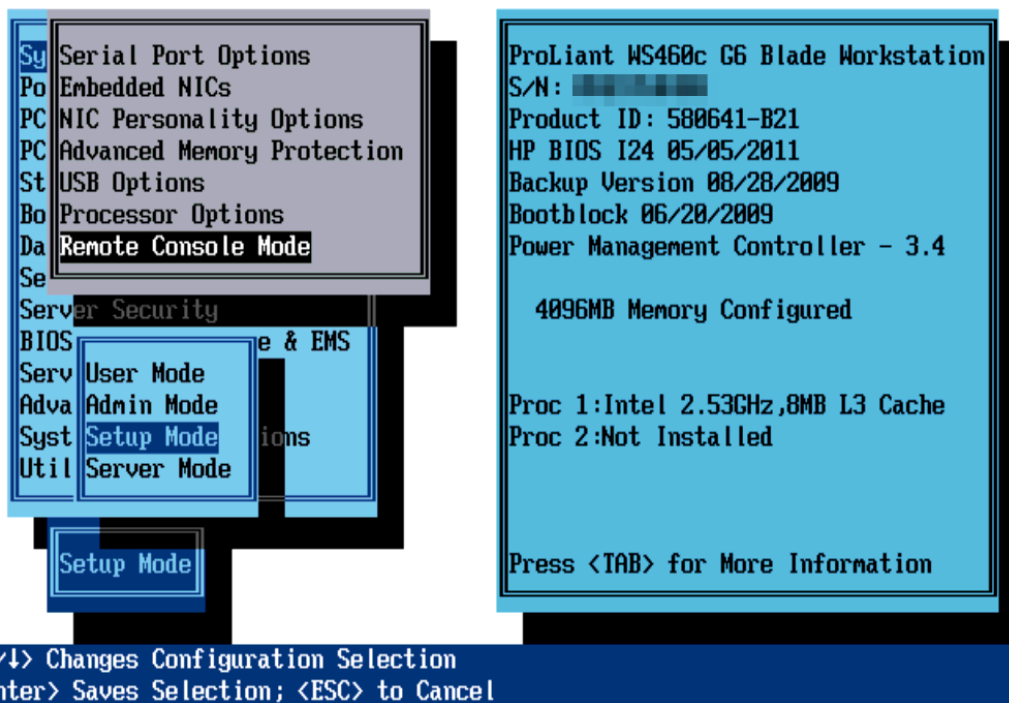
In Setup Mode, the Windows desktop can be viewed by using:

- A monitor connected to the Local I/O Connector video signal
- The iLO Remote Console by pointing your browser to the iLO IP address
- Remote desktop connection.

- **Server Mode**—System reverts back to server operation, system and NIC ID's match that of a server. In this mode, the embedded video controller generates the boot console during POST and then generates the Windows desktop. The mezzanine graphics adapter is not visible to any Windows operating systems and is not used.

In Server Mode, the boot console and the Windows desktop generated by the embedded video controller can be viewed by using:

- A monitor connected to the Local I/O Connector video signal
- The iLO Remote Console by pointing your browser to the iLO IP address
- Remote desktop connection



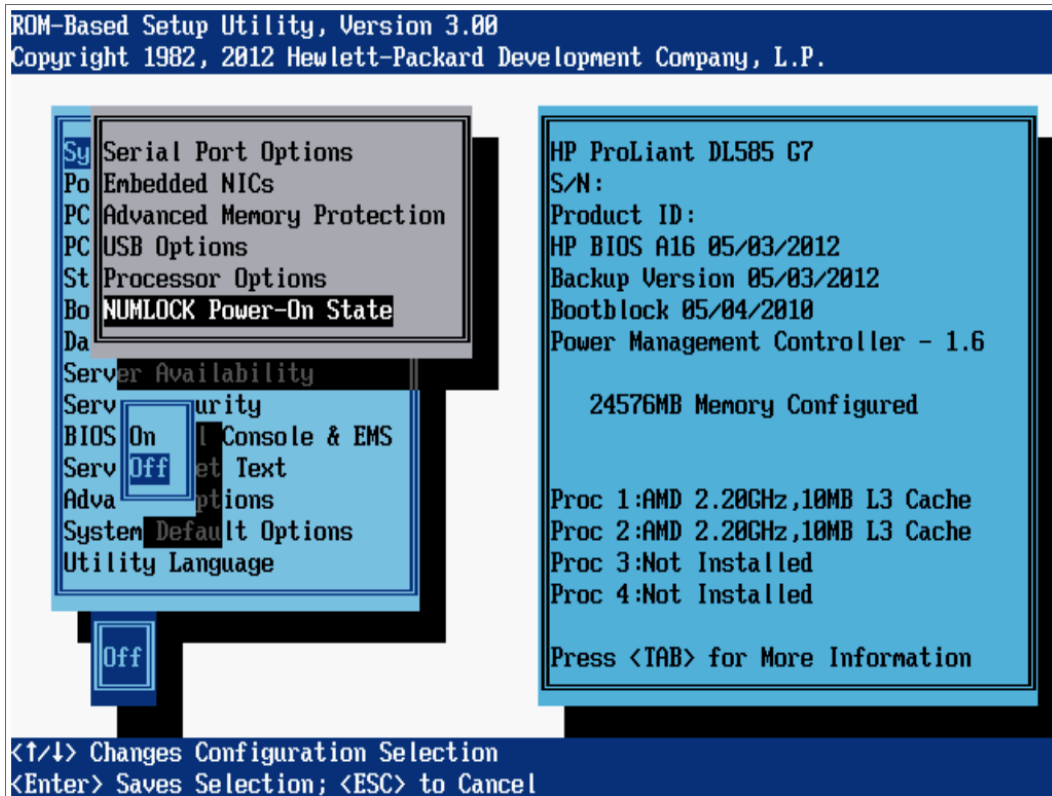
NUMLOCK Power-On State

NOTE: This option is not supported on blade servers.

The NUMLOCK Power-On State option is a toggle setting that enables or disables the power-up state of the NUMLOCK key. When the NUMLOCK key is enabled, it is active when the machine powers up.

Options include:

- **On**
- **Off** (default)



SATA Controller Options (Gen8 servers with SATA controllers)

NOTE: These SATA controller options are not supported on BL460, BL465, and DL385 servers)

Depending on your server model, options may include:

- “Embedded SATA Configuration” (page 41)
- “Drive Write Cache” (page 42)
- “HP Smart Array B320i RAID Configuration” (page 43)

Embedded SATA Configuration

NOTE: This option is available only on server models that support Dynamic Smart Array. For more information, see the *HP Dynamic Smart Array RAID Controller User Guide* at <http://h20000.www2.hp.com/bc/docs/support/SupportManual/c03326739/c03326739.pdf>.

This option configures the embedded SATA ports, either for optical drives or when connecting SATA drives directly.



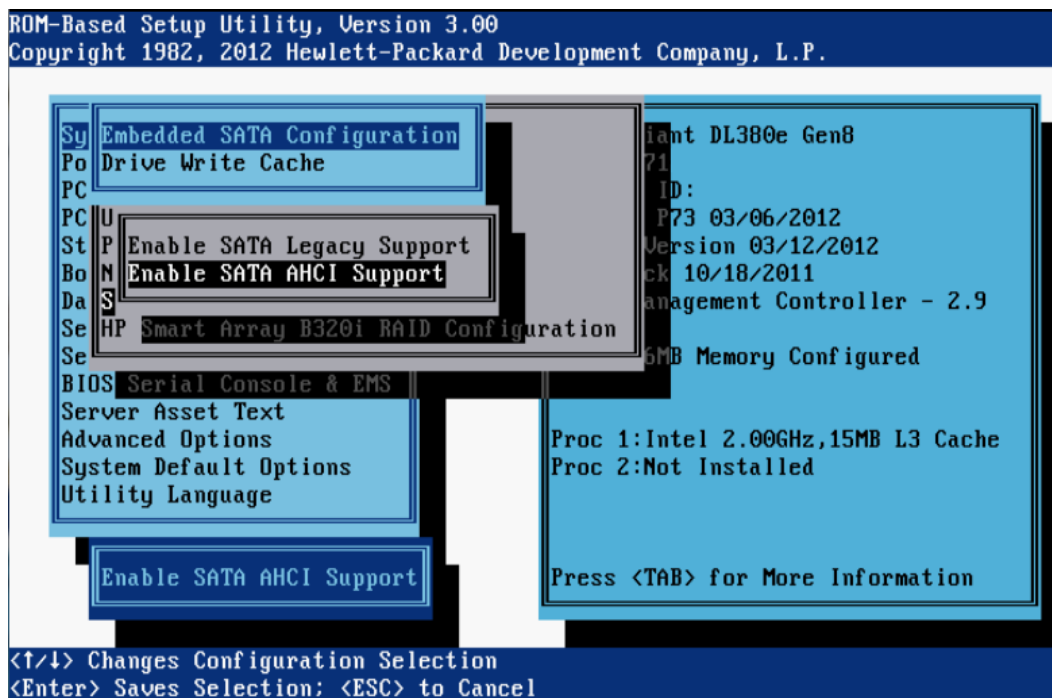
CAUTION:

- Changing this setting may result in data loss or data corruption on existing drives.
- Back up all drives before enabling this feature.
- Enable SATA AHCI support only after consulting the OS documentation to ensure that base media drivers support this feature.

After the pressing any key to clear the warning, the following options are displayed:

- **Enable SATA Legacy Support**
- **Enable SATA AHCI Support**

The default setting for this option is dependent on the server model.





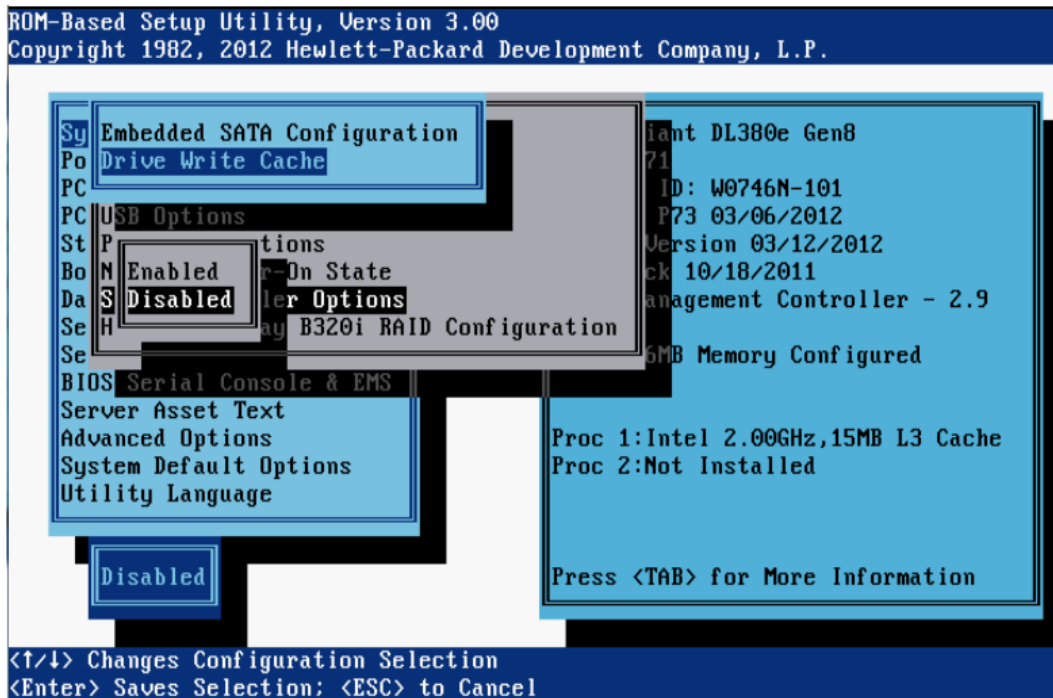
IMPORTANT:

- This option is not visible if SATA SW RAID is enabled.
- Enabling Drive Write Cache may result in data loss or data corruption if an unexpected power loss occurs.

Drive Write Cache controls the behavior of the Drive Write Cache in the ATA hard drive. This feature provides greater drive performance.

After reading the warning message, press any key to display the following settings:

- **Enabled** (default)
- **Disabled**



HP Smart Array B320i RAID Configuration

NOTE: This option is available only on server models that support Dynamic Smart Array. For more information, see the *HP Dynamic Smart Array RAID Controller User Guide* on the HP website (<http://h20000.www2.hp.com/bc/docs/support/SupportManual/c03326739/c03326739.pdf>).



IMPORTANT:

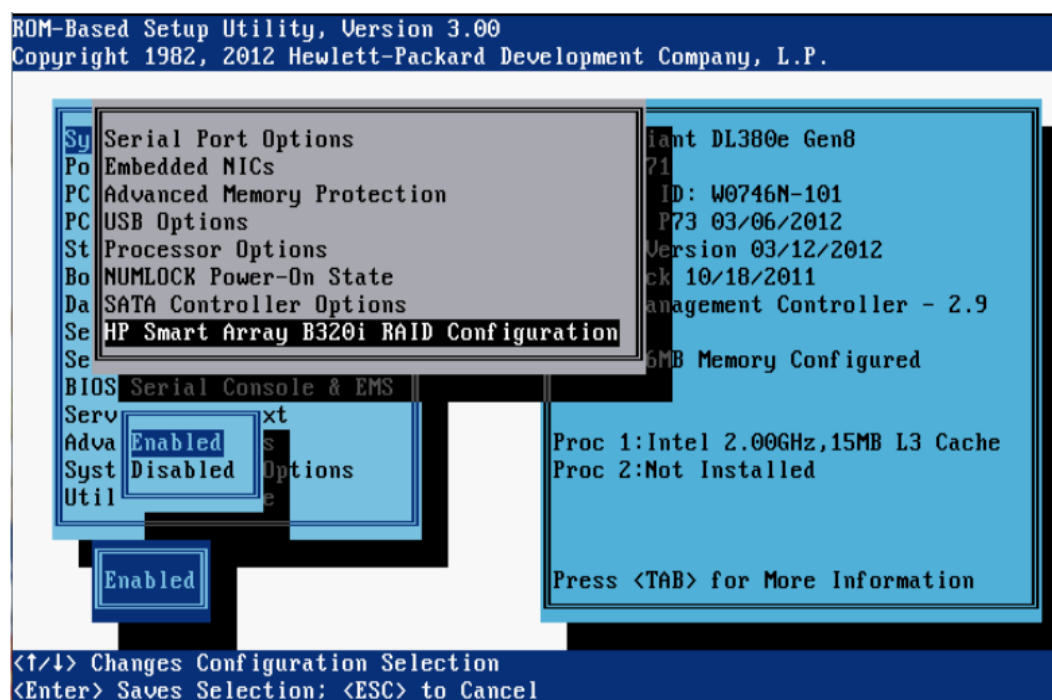
- Changing this setting may result in data loss or data corruption on existing drives.
- Back up all drives before enabling this feature.

This option controls HP Dynamic RAID support on the SAS controller (embedded or optionally purchased on a daughter card).

After reading the warning message, press any key to display the following settings:

- **Enabled**
- **Disabled**

NOTE: The default setting for this option is dependent on the server model.



Power Management Options menu

The Power Management Options menu includes the following options:

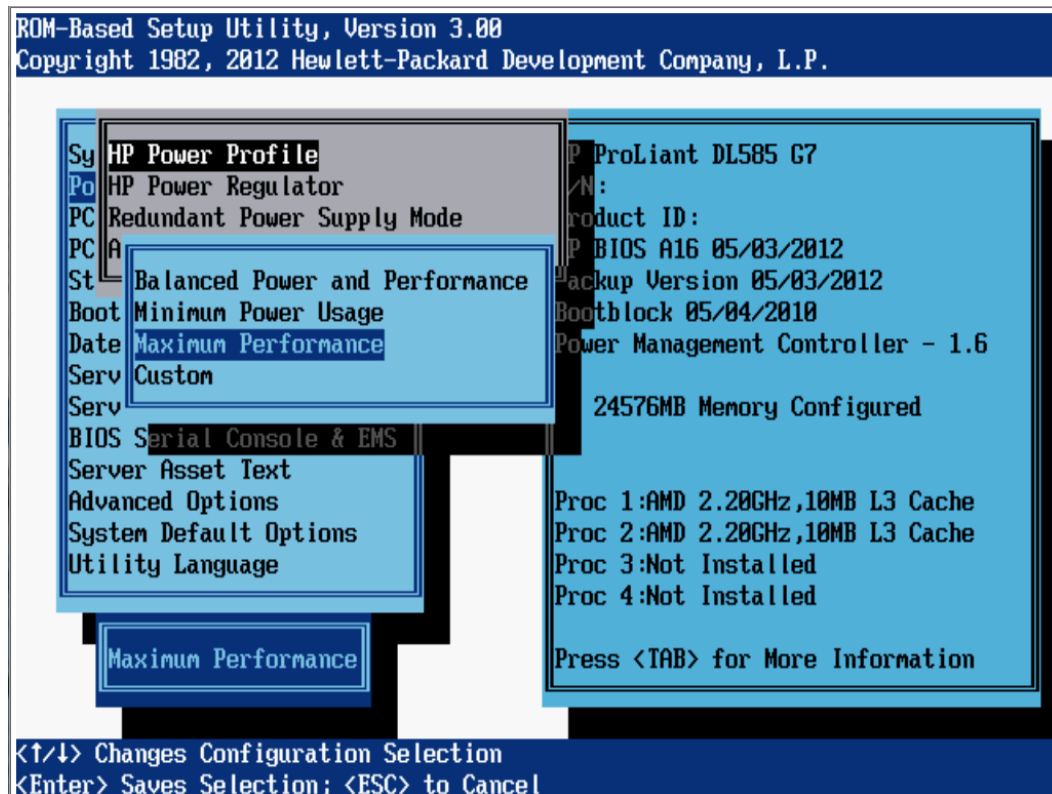
- “HP Power Profile” (page 44)
- “HP Power Regulator” (page 45)
- “Redundant Power Supply Mode” (page 46)
- “Advanced Power Management Options” (page 47)

NOTE: When using the Intelligent Provisioning Quick Configs options available for Gen8 servers, you can set a basic policy for performance versus power usage without having to configure individual settings through RBSU menus. For more information, see [“Intelligent Provisioning Quick Configs settings and corresponding RBSU settings”](#) (page 209).

HP Power Profile

This option enables the user to select the appropriate power profile based on power and performance characteristics. The following options are available:

- **Balanced Power and Performance** (default)—Provides the optimum settings to maximize power savings with minimal performance impact for most operating systems and applications.
- **Minimum Power Usage**—Enables power reduction mechanisms that may affect performance negatively. This mode guarantees a lower maximum power usage by the system.
- **Maximum Performance**—Disables all power management options that may affect performance negatively.
- **Custom**—Provides the opportunity to configure settings for your environment.



HP Power Regulator

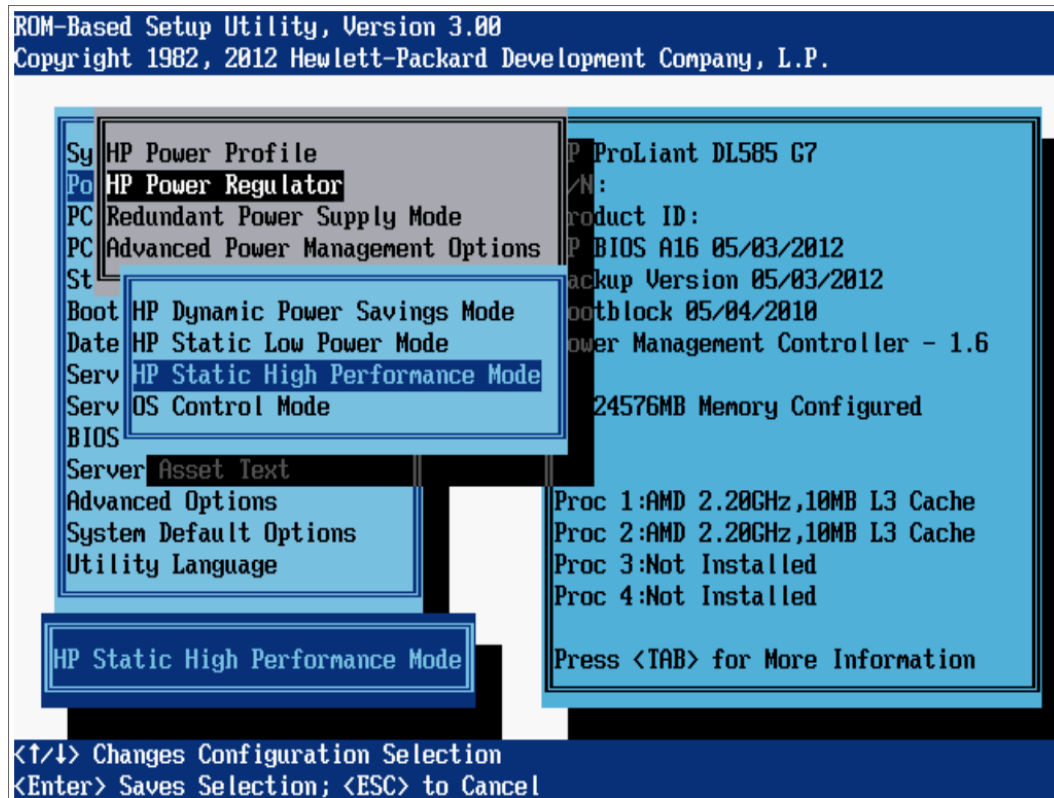
This feature configures the Power Regulator for ProLiant support.

Options include:

- **HP Dynamic Power Savings Mode** (default)—Automatically varies processor speed and power usage based on processor use, reduces overall power consumption with little or no impact to performance, and does not require OS support.
- **HP Static Low Power Mode**—Reduces processor speed and power usage, guarantees a lower maximum power usage for the system, and provides a high impact on performance in environments with higher processor utilization.
- **HP Static High Performance Mode**—Processors run in the maximum power and performance state, regardless of the OS power management policy.
- **OS Control Mode**—Processors run in the maximum power and performance state, unless the OS enables a power management policy.

NOTE: Certain processors support only one power state and operate at their initialized frequency, regardless of the Power Regulator setting.

After reading the note message, press any key to display the available settings.



Redundant Power Supply Mode

NOTE: This feature is not available on SL and BL server models.

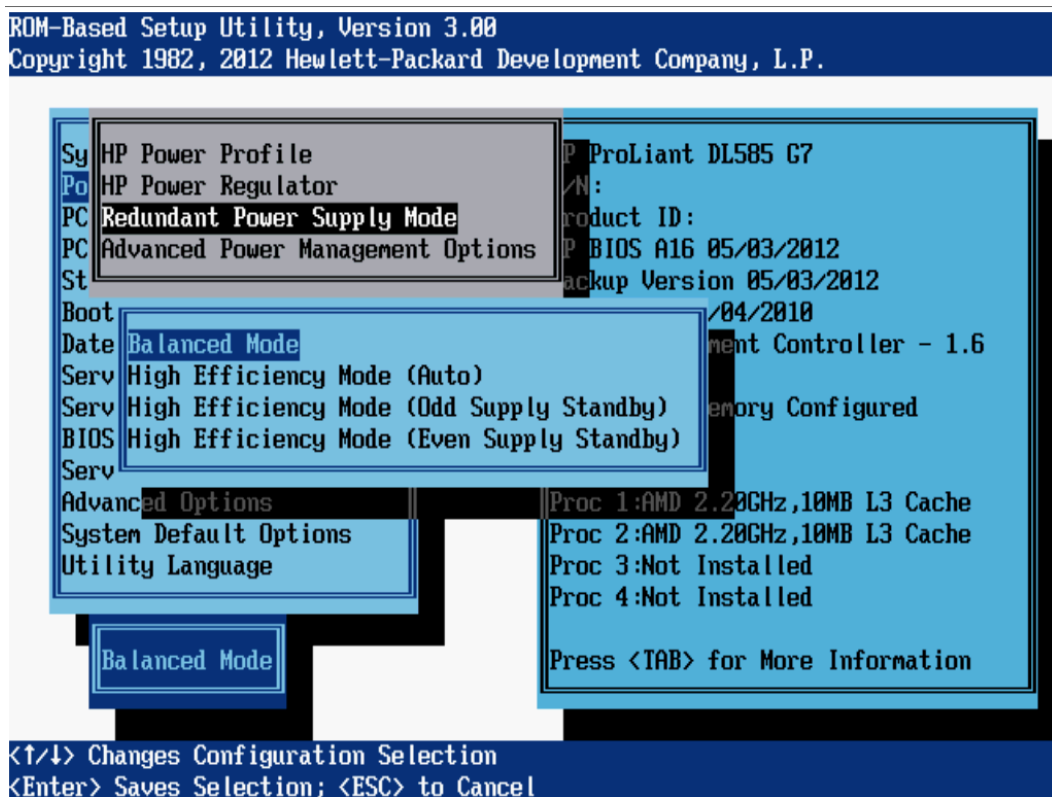
This feature enables the user to configure how the system manages power delivery to power supplies in redundant power supply configurations.

Options include:

- **Balanced Mode** (default)—Shares the power delivery between all installed power supplies.

NOTE: Power delivery may not be equal between all power supplies.

- **High Efficiency Mode (Auto)**—Delivers full power to one of the power supplies and places the other power supplies on standby at a lower power-usage level. A semi-random distribution is achieved, because the Auto option chooses between the odd or even power supply based on the server's serial number.
- **High Efficiency Mode (Odd Supply Standby)**—Delivers full power to the even-numbered power supplies and places the odd-numbered power supplies on standby at a lower power-usage level.
- **High Efficiency Mode (Even Supply Standby)**—Delivers full power to the odd-numbered power supplies and places the even-numbered power supplies on standby at a lower power-usage level.



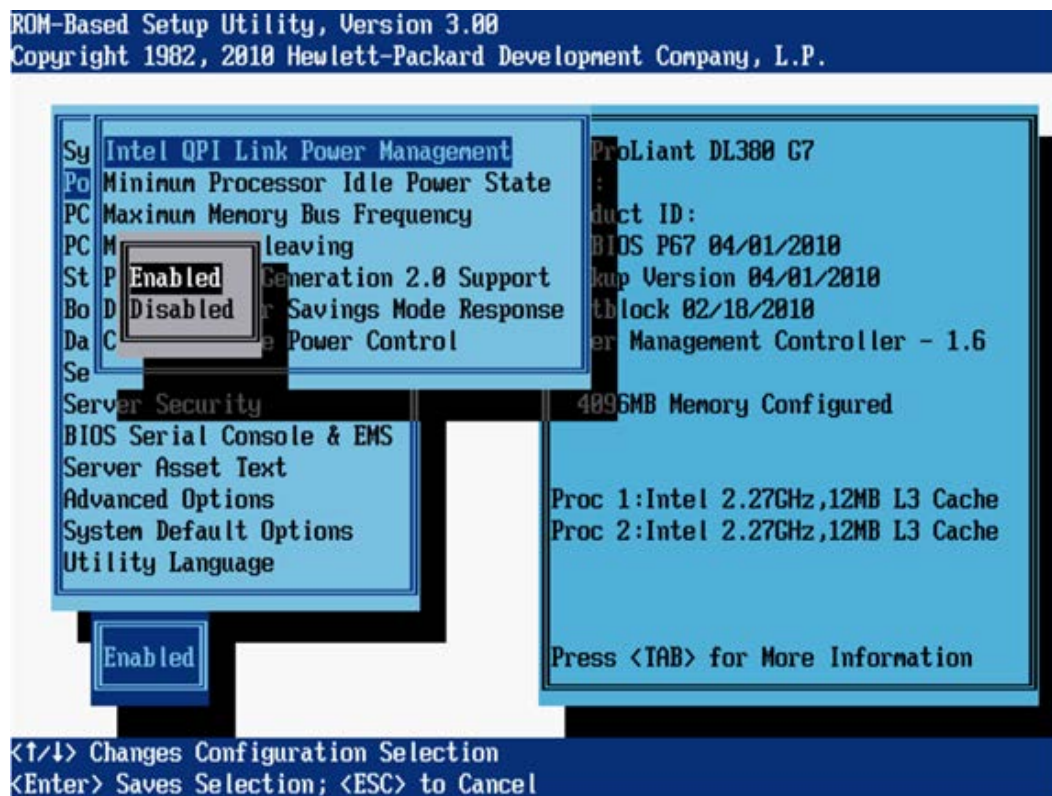
Advanced Power Management Options

Depending on your server model, options may include:

- [“Intel QPI Link Power Management” \(page 48\)](#)
- [“Intel QPI Link Frequency” \(page 49\)](#)
- [“QPI Bandwidth Optimization \(RTID\)” \(page 50\)](#)
- [“Minimum Processor Idle Power Core State” \(page 51\)](#)
- [“Minimum Processor Idle Power Core C6 State” \(page 52\)](#)
- [“Minimum Processor Idle Power C1e State” \(page 53\)](#)
- [“Minimum Processor Idle Power Package State” \(page 54\)](#)
- [“Minimum Processor Idle Power State” \(page 55\)](#)
- [“Energy/Performance Bias” \(page 56\)](#)
- [“Maximum Memory Bus Frequency” \(page 57\)](#)
- [“Channel Interleaving” \(page 58\)](#)
- [“Memory Interleaving” \(page 59\)](#)
- [“PCI Express Generation 2.0 Support” \(page 60\)](#)
- [“PCIe Gen 3 Control \(for select devices\)” \(page 61\)](#)
- [“Maximum PCI Express Speed” \(page 62\)](#)
- [“Dynamic Power Savings Mode Response” \(page 63\)](#)
- [“Collaborative Power Control” \(page 64\)](#)
- [“Power Capping Support” \(page 65\)](#)
- [“ACPI SLIT Preferences” \(page 66\)](#)
- [“DIMM Idle Power Saving Mode” \(page 67\)](#)
- [“DIMM Voltage Preference” \(page 68\)](#)
- [“Memory Power Savings Mode” \(page 69\)](#)
- [“HyperTransport Frequency” \(page 70\)](#)
- [“Dynamic Power Capping Functionality” \(page 71\)](#)

This feature places the Quick Path Interconnect links into a low power state when the links are not being used. This reduces power usage with minimal performance impact.

- **Enabled** (default)
- **Disabled**

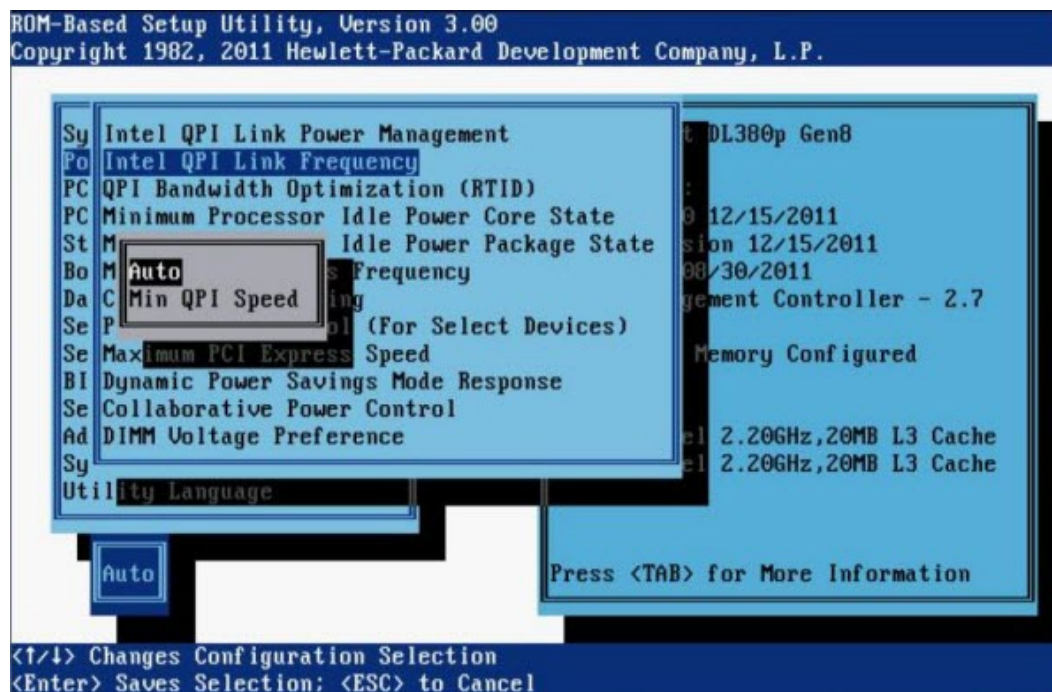


NOTE: This option is available on Gen8 servers with multiple Intel processors.

This option enables you to set the QPI Link frequency to a low speed. Running at a lower frequency may reduce power consumption, but may also impact system performance.

Options include:

- **Auto** (default)
- **Min QPI Speed**



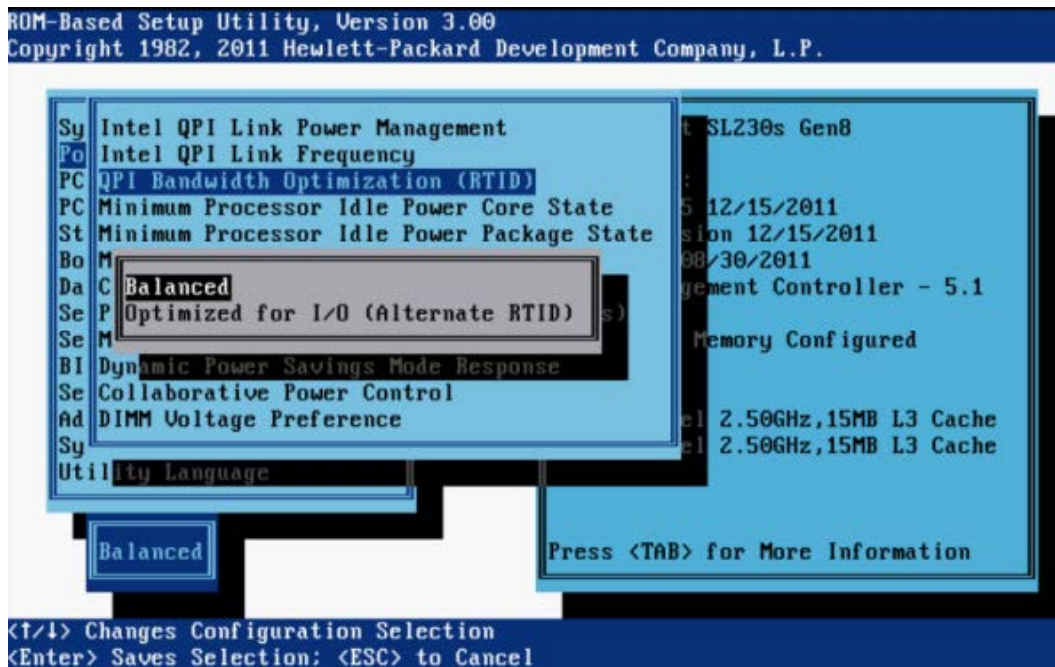
NOTE: This option is available on Gen8 servers with Intel processors.

The QPI link between two processors has been tuned to provide the best performance for all known applications.

Options include:

- **Balanced** (default)—Provides the best performance for nearly all conventional customer applications and benchmarks.
- **Optimized for I/O**—Increases bandwidth from I/O devices such as GPUs that rely on direct access to system memory. This setting can have a negative effect on system performance.

NOTE: Setting this option to **Optimized for I/O** can have a negative impact on memory and system performance.



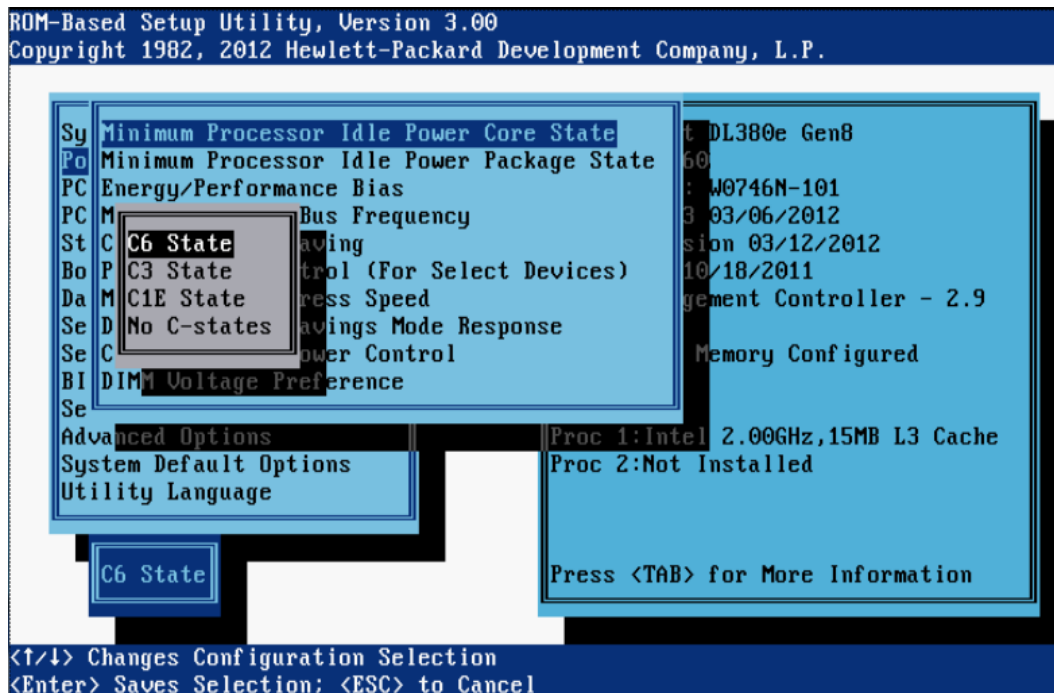
Minimum Processor Idle Power Core State

NOTE: This option is available on servers with Intel processors.

This feature selects the lowest processor idle power state (C-state) supported by the OS. The higher the C-state, the lower the power usage of the idle power state. C6 is the lowest power idle state supported by the processor.

Options include:

- **C6 State** (default)
- **C3 State**
- **C1E State**
- **No C-states**



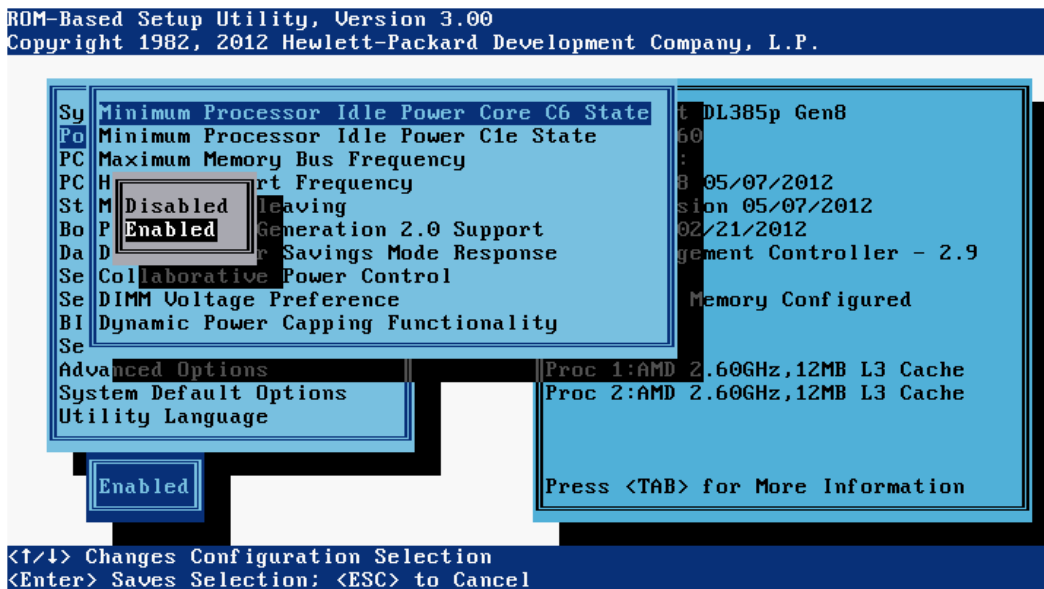
Minimum Processor Idle Power Core C6 State

NOTE: This option is available on Gen8 servers with AMD processors.

This option enables individual cores of a processor to enter C6 state when the operating system requests a low power C-State. This state consumes less power and allows other cores in the processor to enter a higher performance boost state.

Options include:

- **Enabled** (default)
- **Disabled**



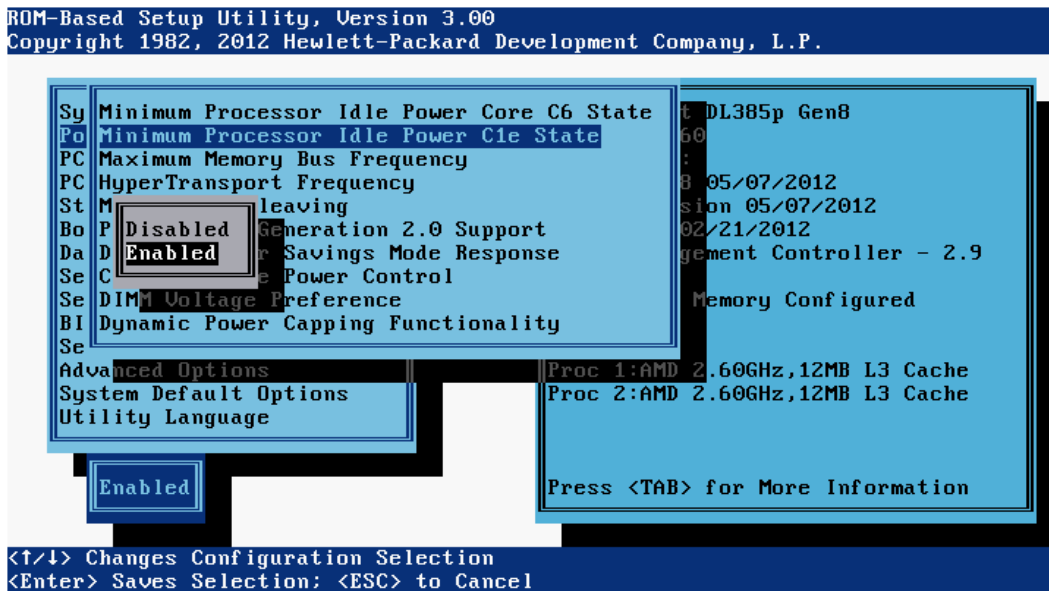
Minimum Processor Idle Power C1e State

NOTE: This option is available on Gen8 servers with AMD processors.

This option enables the processor to enter a reduced power C1e state when all cores of a processor have entered a low power C-state. Enabling this feature results in substantial power savings in most configurations.

Options include:

- **Enabled** (default)
- **Disabled**



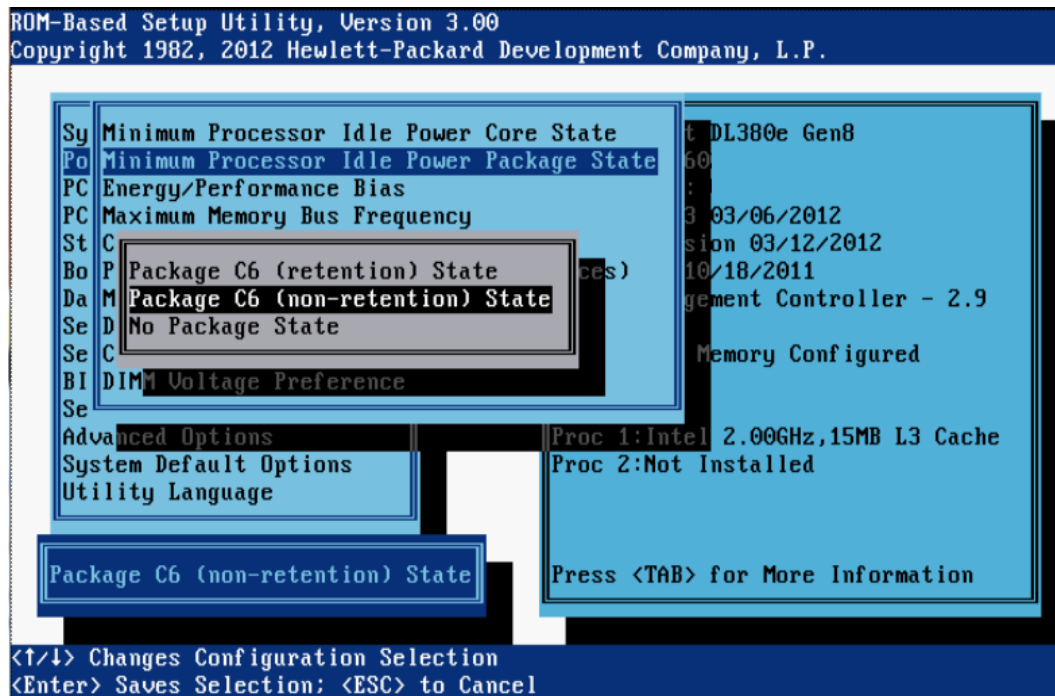
Minimum Processor Idle Power Package State

NOTE: This option is available on servers with Intel processors.

This feature selects the lowest processor idle power state (C-state). The processor automatically transitions into package C-states based on the Core C-states that cores on the processor have transitioned to. The higher the package C-state, the lower the power usage of that idle package state. Package C6 (non-retention) is the lowest power idle package state supported by the processor.

Options include:

- **Package C3 State** (On G7 and earlier servers) / **Package C6 (retention) State** (On Gen8 servers)
- **Package C6 State** (On G7 and earlier servers) (default) / **Package C6 (non-retention) State** (On Gen8 servers)
- **No Package State**



Minimum Processor Idle Power State

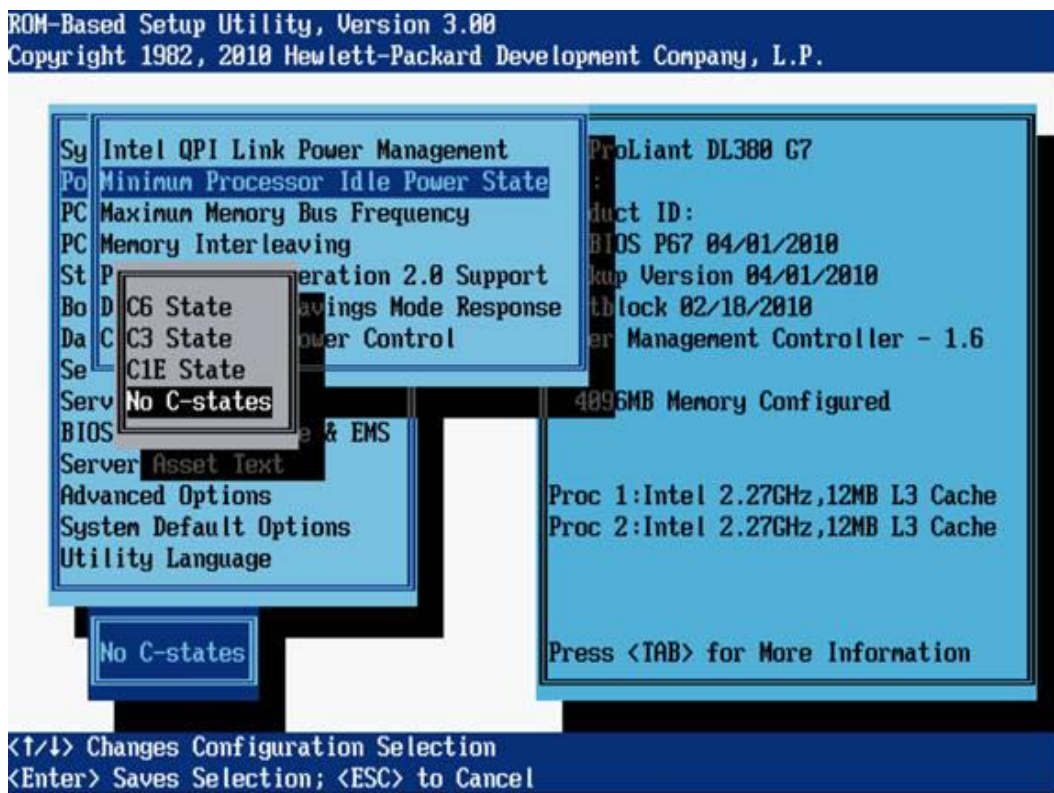
NOTE: This option is available on G7 servers with AMD processors.

This feature selects the lowest processor idle power state (C-state) supported by the OS. The higher the C-state, the lower the power usage of the idle power state. The lowest power idle state supported by the processor is C6.

Options may include:

- **C6 State** (default)
- **C3 State**
- **C1E State**
- **No C-states**

NOTE: Available options and the system default may vary depending on server model.

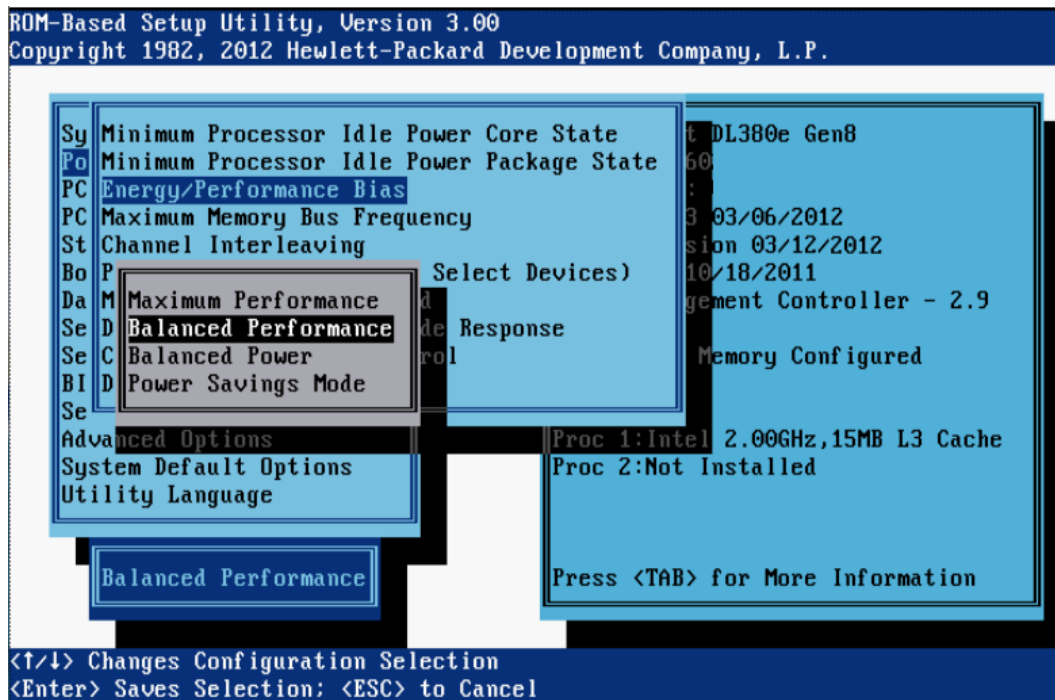


NOTE: This option is available on Gen8 servers with Intel processors.

This option configures several processor subsystems to optimize processor performance and power usage.

Options include:

- **Maximum Performance**—Provides the highest performance and lowest latency, but should be used only in environments that are not sensitive to power consumption.
- **Balanced Performance** (default) — Provides the optimum balance between power efficiency and performance and is recommended for most environments.
- **Balanced Power**—Provides optimum power efficiency based on server utilization.
- **Power Savings Mode**—Available for use in environments that are power sensitive and are willing to accept reduced performance.



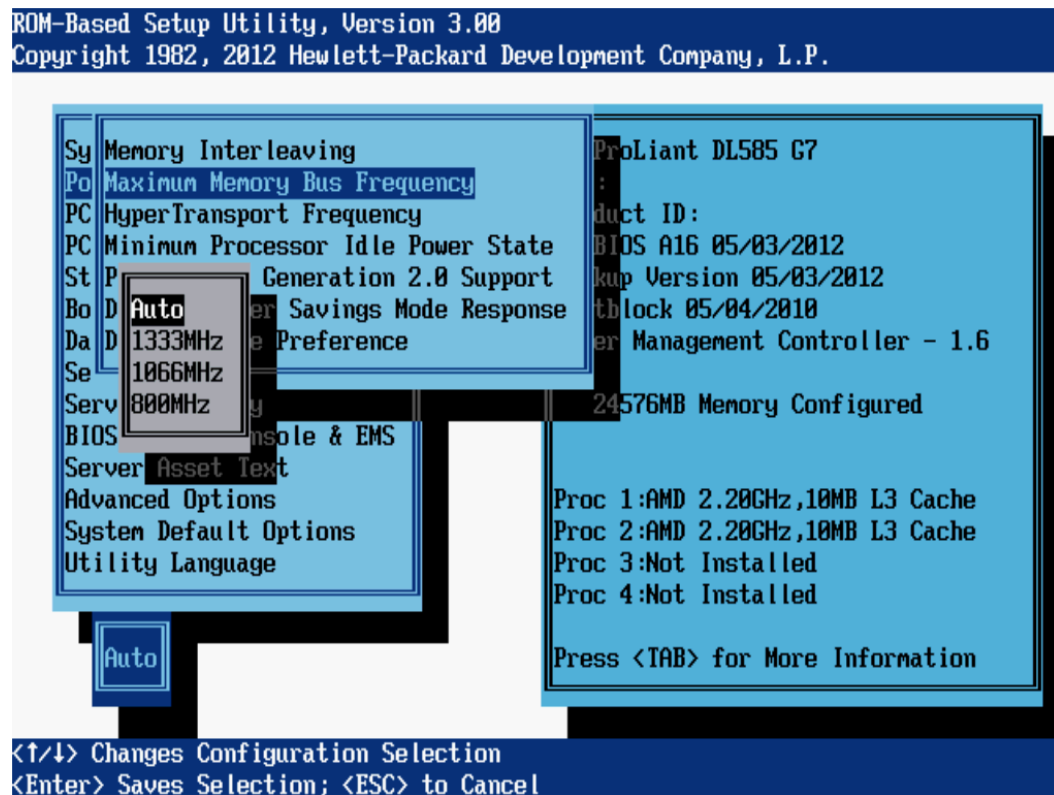
Maximum Memory Bus Frequency

This feature enables you to configure the system to run memory at a lower maximum speed than what is supported by the installed processor and DIMM configuration. Setting this option to **Auto** configures the system to run memory at the maximum speed supported by the system configuration.

Options include:

- **Auto** (default)
- **1333MHz**
- **1066MHz**
- **800MHz**

NOTE: Options vary depending on the installed processor.

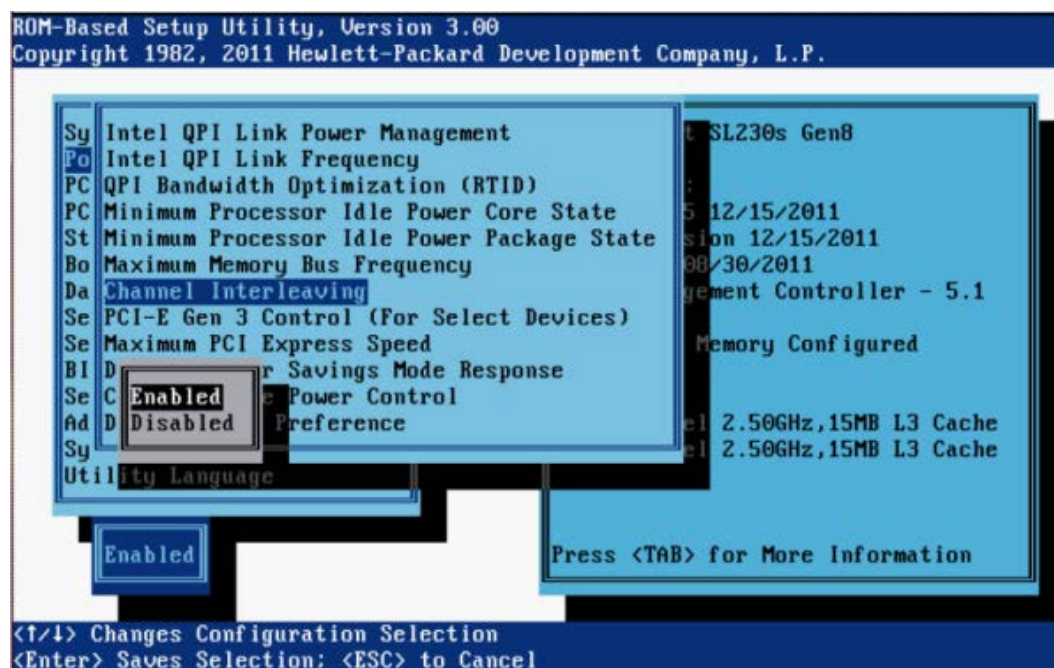


NOTE: This option is available on servers with Intel processors.

This feature modifies the level of interleaving for the memory system configuration. Typically, higher levels of memory interleaving result in maximum performance. However, reducing the level of interleaving can result in power savings.

Options include:

- **Enabled** (default)
- **Disabled**



Memory Interleaving

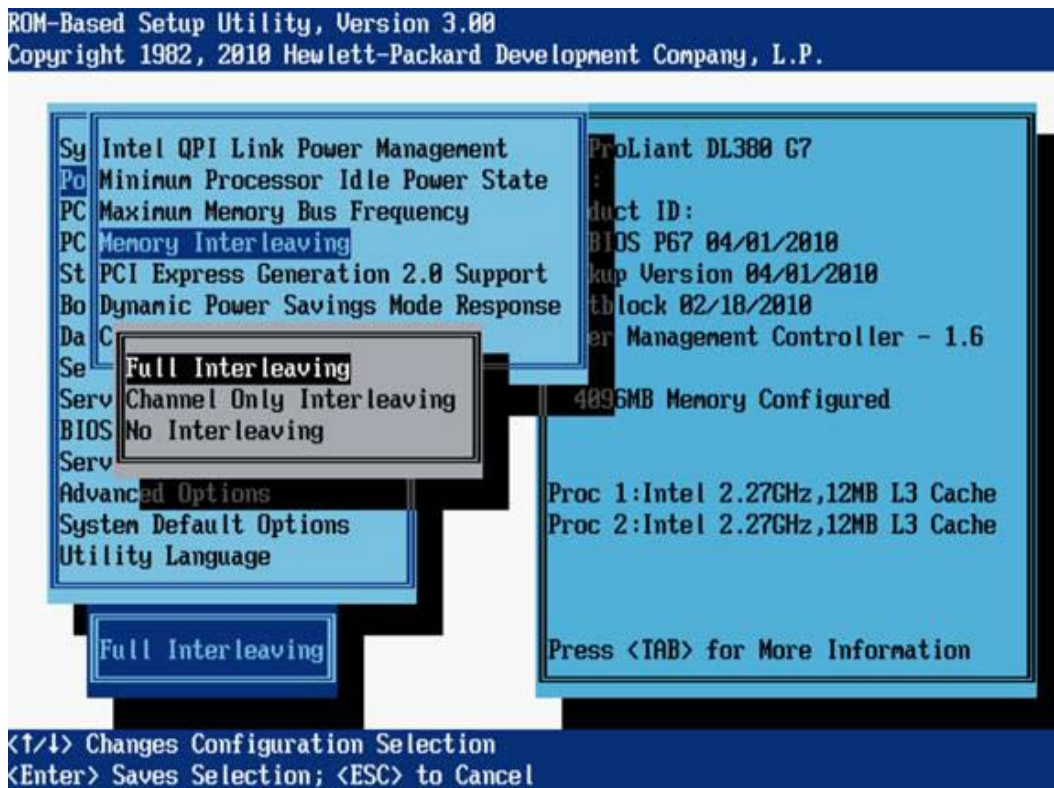
This feature modifies the level of interleaving for the memory system configuration. Typically, higher levels of memory interleaving result in maximum performance. However, reducing the level of interleaving can result in power savings.

For AMD systems, the following options are available:

- **No Interleaving**
- **Channel Interleaving** (default)

For Intel systems, the following options are available:

- **Full Interleaving** (default)
- **Channel Only Interleaving**
- **No Interleaving**



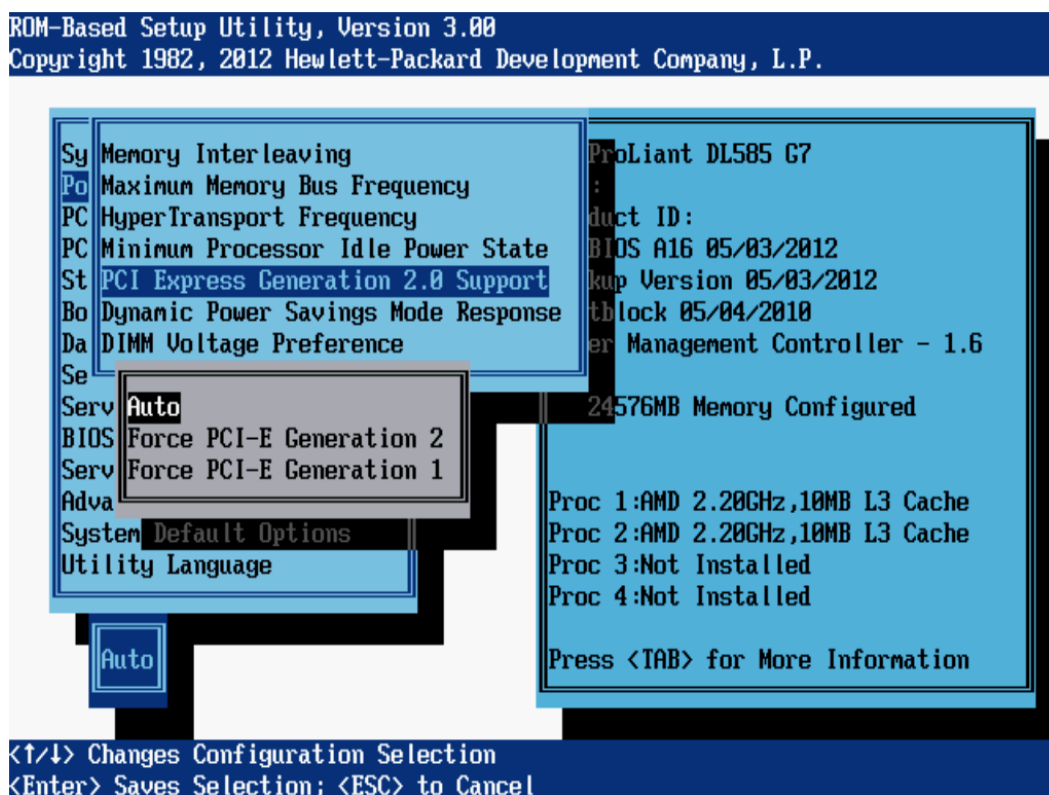
NOTE: This option is available on servers with AMD processors.

This feature controls PCIe Generation 1 or PCIe Generation 2 support and can be used to reduce system power usage. In addition, this feature can be used to work around issues with devices that claim PCIe 2.0 support but do not adhere to the PCIe 2.0 specification.

Options include:

- **Auto** (default)
- **Force PCI-E Generation 2**
- **Force PCI-E Generation 1**

❗ **IMPORTANT:** PCIe Generation 1 devices may not function properly when the PCI Express speed is forced to PCIe Generation 2. Before changing this option, see the QuickSpecs and user documentation for all expansion cards.



PCIe Gen 3 Control (for select devices)

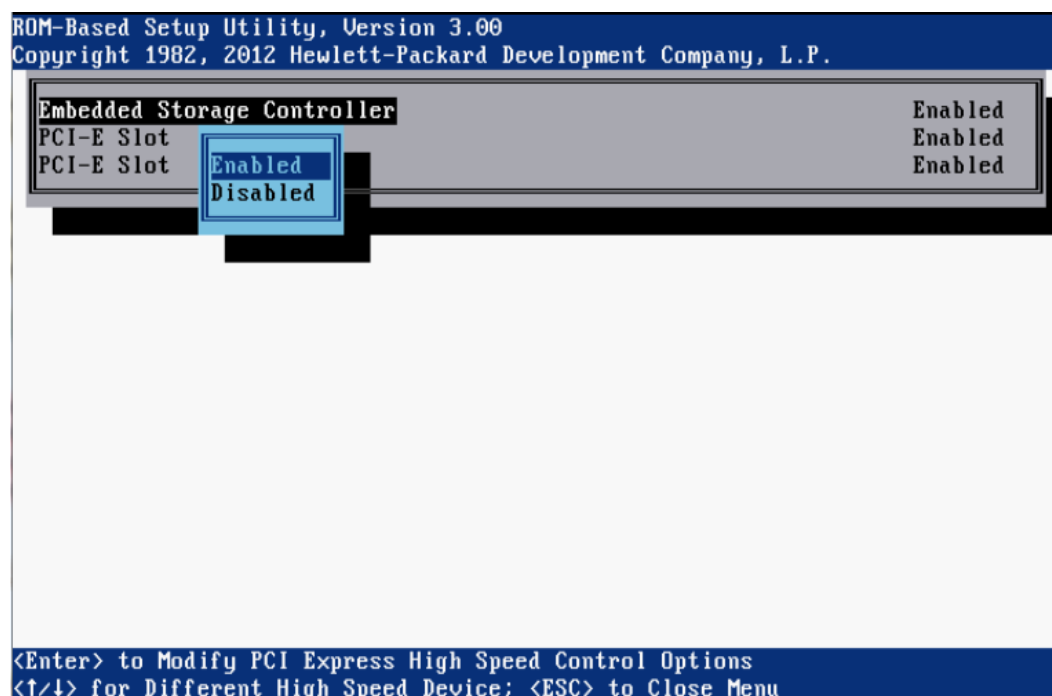
NOTE: This option is available on Gen8 servers with Intel processors.

This option controls the maximum supported speed of individual PCI Express links for embedded devices and for devices installed in PCIe slots. Enabling PCIe Generation 3 Control permits the device to run at full speed.

NOTE: This option works in conjunction with the Maximum PCI Express Speed option. When setting the PCIe Generation 3 Control to **Enabled**, the Maximum PCI Express Speed option must be set to **Maximum Supported**. For more information about the Maximum PCI Express Speed option, see [“Maximum PCI Express Speed” \(page 62\)](#).

After selecting the embedded device or PCIe slot to configure, the following options are presented:

- **Enabled** (default)
- **Disabled**



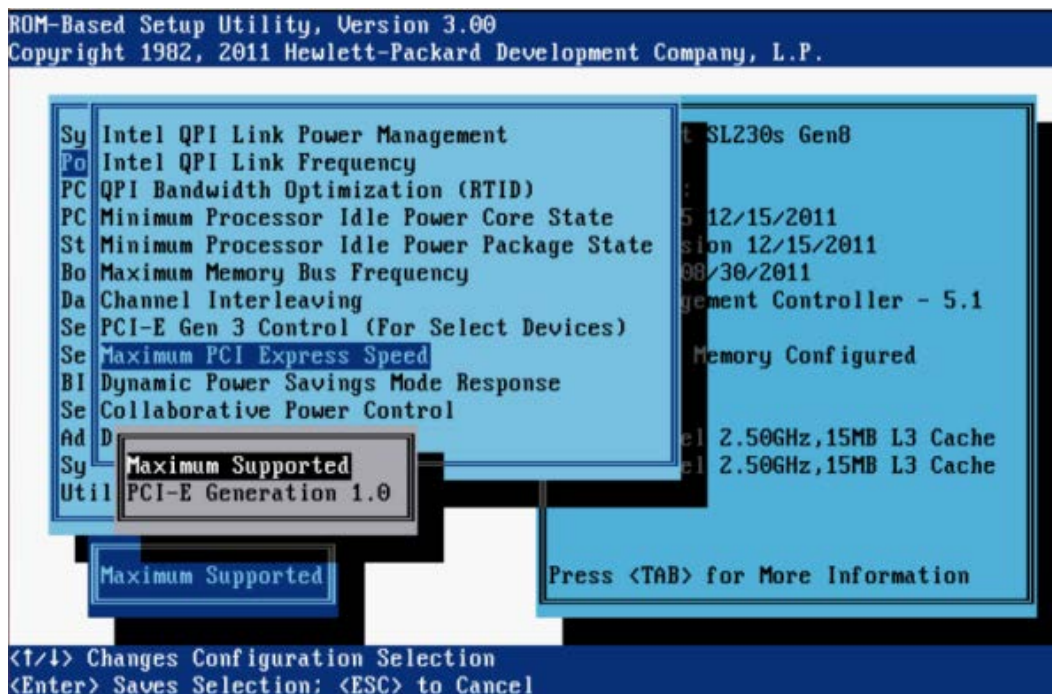
NOTE: This option is available on Gen8 servers with Intel processors.

This option enables lowering the maximum PCIe speed at which the server allows PCIe devices to operate and may be useful in addressing issues with problematic PCIe devices. If a PCIe device does not run properly at its design speed, lowering the speed in which the device is running may address the problem.

NOTE: This option works in conjunction with the PCIe Gen 3 Control setting. When setting the PCIe Gen 3 Control to **Enabled**, this Maximum PCI Express Speed option must be set to **Maximum Supported**. For more information about the PCIe Gen 3 Control settings, see “[PCIe Gen 3 Control \(for select devices\)](#)” (page 61).

Options include:

- **Maximum Supported** (default)—Configures the platform to run at the maximum speed supported by the platform or the PCIe device (whichever is lower).
- **PCIe Generation 1.0**—Configures the platform to run at the lowest speed possible in the PCIe links, which is PCIe Generation 1.0. When setting this option to PCIe Generation 1.0, performance of high-end cards such as 10GbE NIC Cards and I/O Accelerators may be affected.

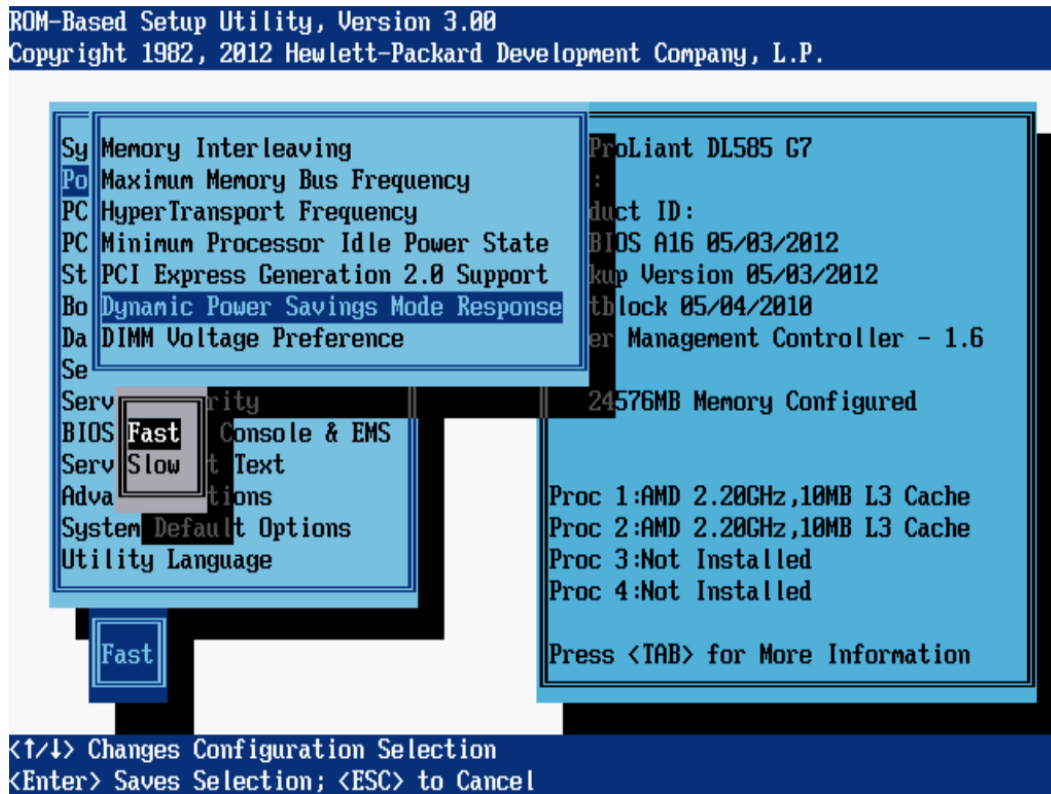


Dynamic Power Savings Mode Response

The Dynamic Power Savings Mode Response feature enables the System ROM to control processor performance and power state depending on the processor workload. This option configures the response time for switching between these states.

Options include:

- **Fast** (default)—Optimal for workloads that require a low latency response to an increase in processor demand.
- **Slow**—Optimal for workloads where a longer latency response to increased processing demand is an acceptable tradeoff for reduced power consumption. Depending on the processor workload, selecting this option may negatively impact performance.

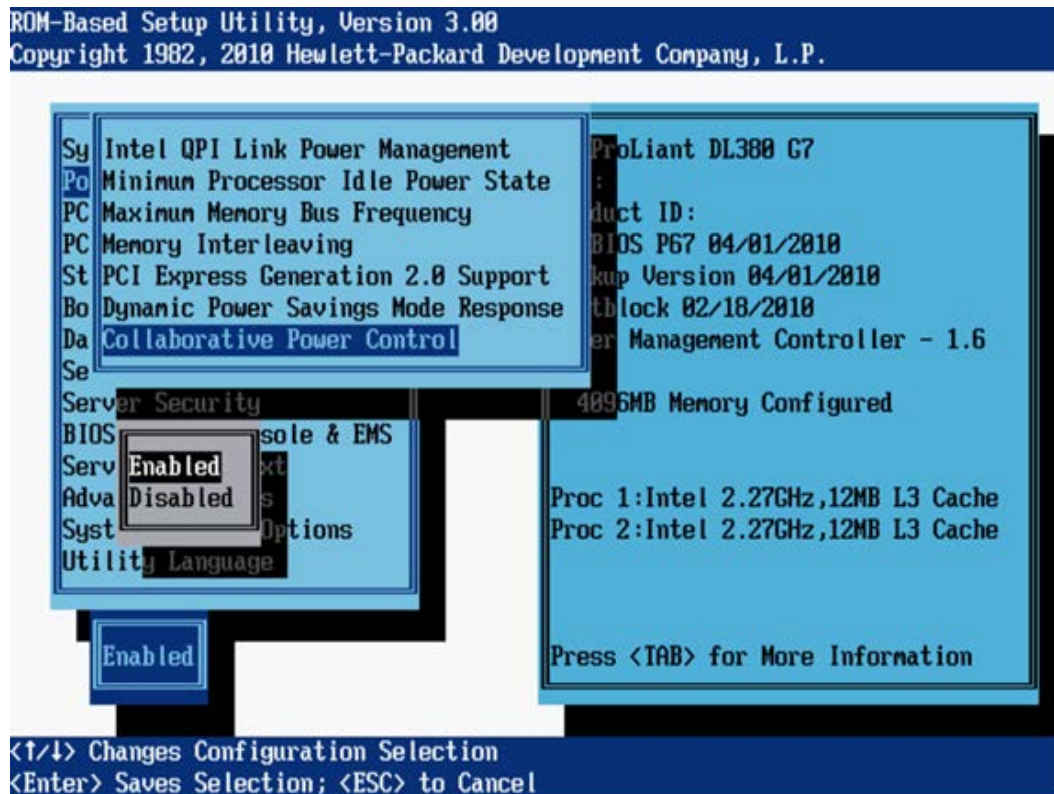


NOTE: This option is available on G7 and Gen8 servers with Intel processors and on Gen8 servers with AMD processors.

For operating systems that support the Processor Clocking Control Interface (PCCI), enabling this option allows the operating system to request processor frequency changes even when the server has the Power Regulator option configured for Dynamic Power Savings Mode. For operating systems that do not support the PCC Interface or when the Power Regulator is not configured for Dynamic Power Savings Mode, this option has no impact on system operation.

Options include:

- **Enabled** (default)
- **Disabled**

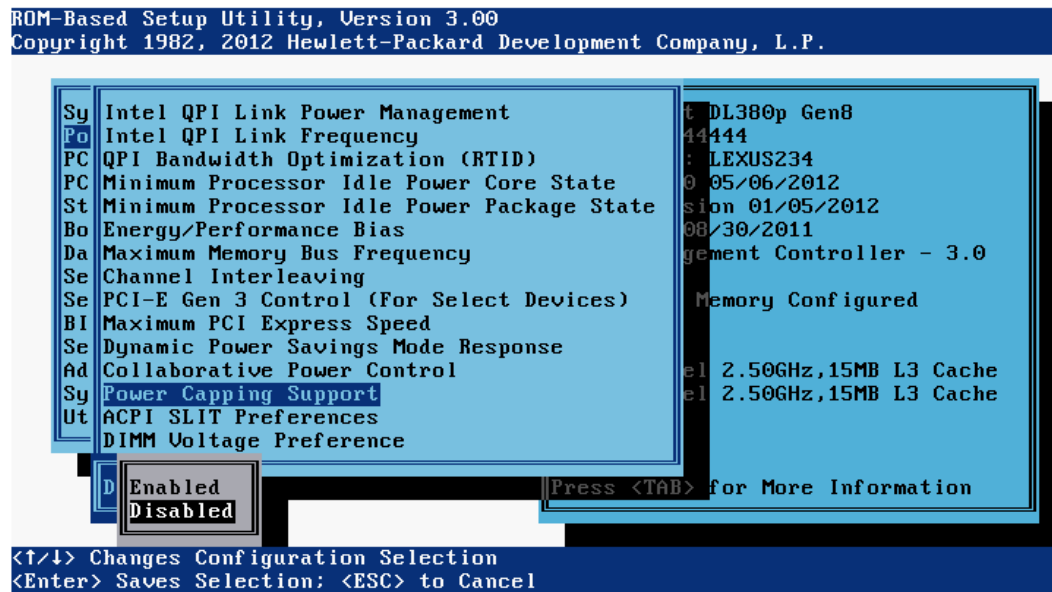


NOTE: This option is available on Gen8 servers with Intel processors.

This option applies power cappings if configured via iLO.

Options include:

- **Enabled** (default)
- **Disabled**

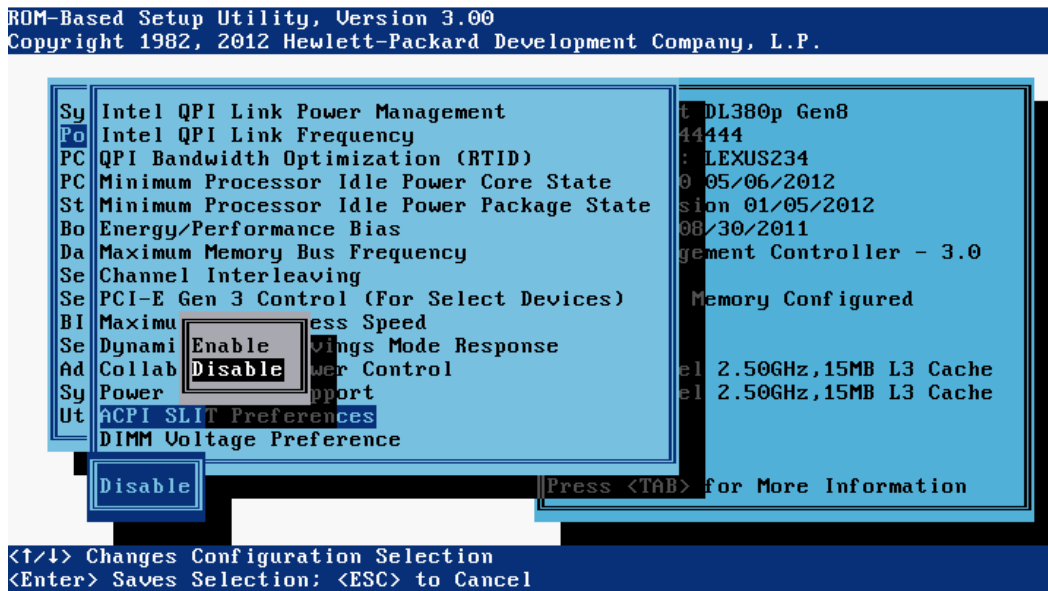


NOTE: This option is available on Gen8 servers with Intel processors.

ACPI SLIT (System Locality Information Table) describes the relative access times between processors, memory subsystems, and I/O subsystems. Operating systems that support SLIT can improve performance by allocating resources and workloads more efficiently.

Options include:

- **Enable**
- **Disable** (default)

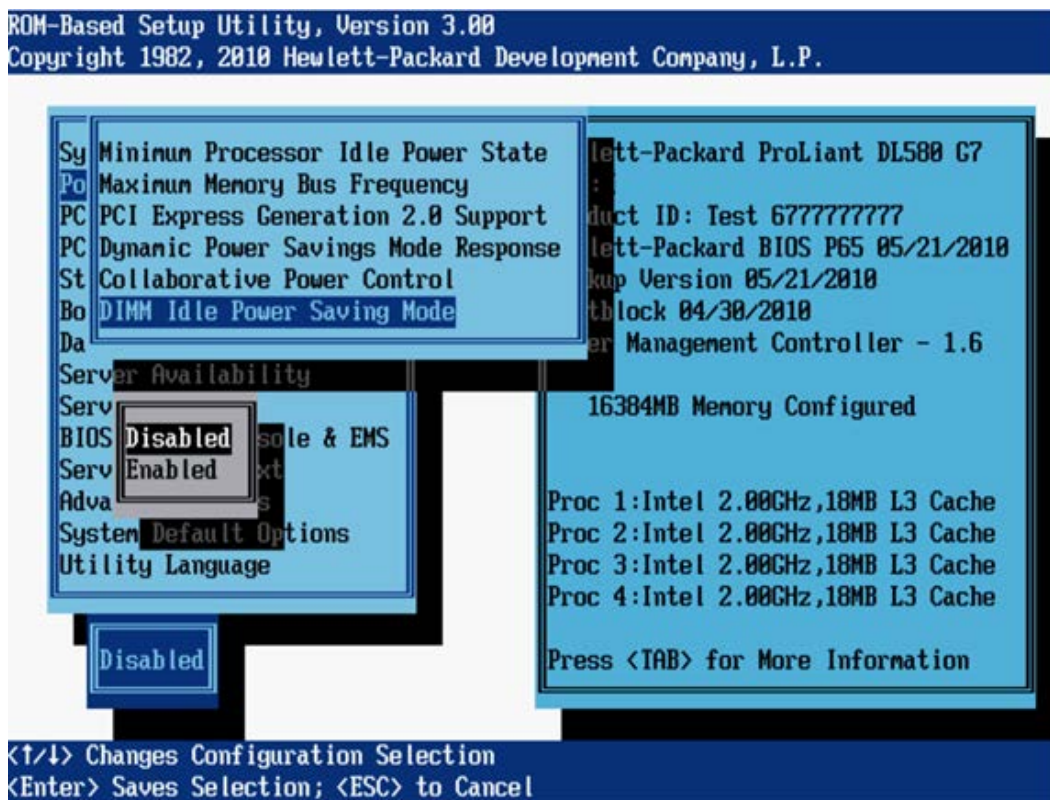


NOTE: This option is available on select G7 servers.

The DIMM Idle Power Saving Mode option provides the capability to enable or disable power throttling for the DIMMs installed in the system. Enabling this option allows DIMMs that support idle power saving features to enter a low power mode when idle. In some applications, this can reduce overall system power consumption, but may also slightly reduce overall memory performance due to the increased latency associated with transitions into and out of idle power saving mode. When disabled, this option prevents installed DIMMs from entering a lower power mode when idle. Be sure that all installed DIMMs support DIMM idle power saving features before selecting the Enabled option. Such support has been verified for all HP DIMMs supported on these platforms.

Options include:

- **Enabled** (default)
- **Disabled**

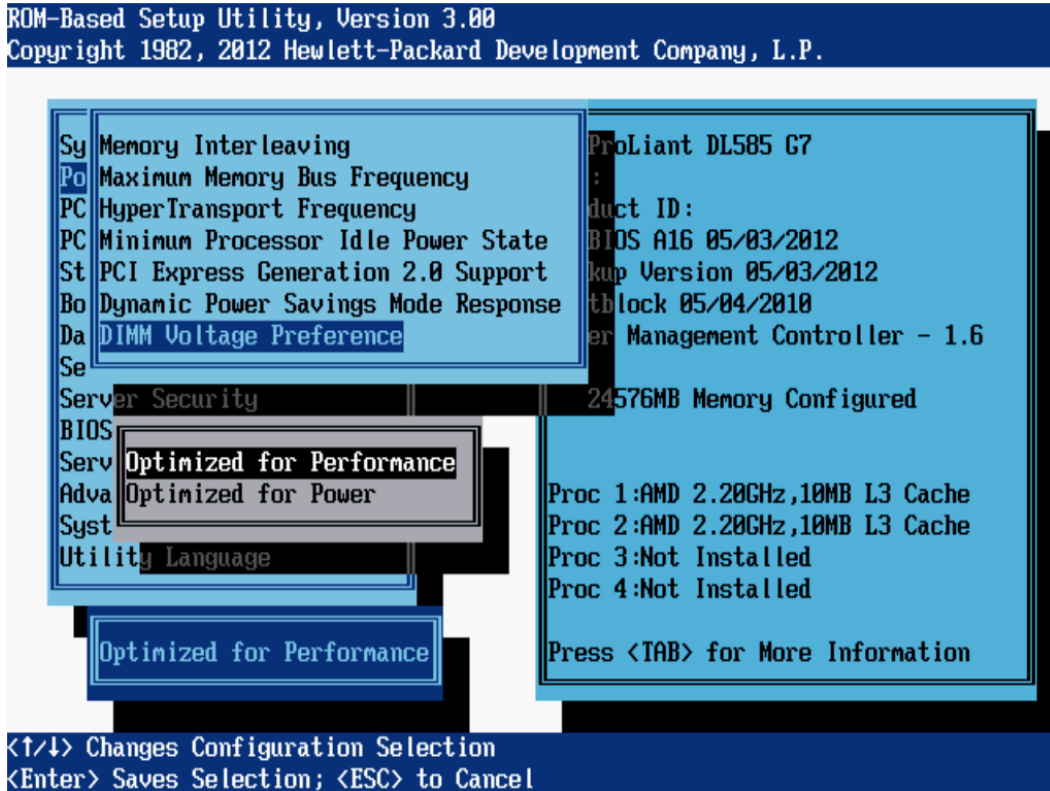


DIMM Voltage Preference

Gen8 systems support both LV-DIMMs (1.35V) and 1.5V-only DIMMs. LV-DIMMs can switch to 1.5V capacity in turbo mode. At 1.35V, they can match the performance of 1.5V DIMMs in most situations, but in some limited configurations, must switch to 1.5V for maximum speed.

Options include:

- **Optimized for Performance** (default)—This sets the voltage for a system with all low voltage DIMMs to 1.5V only if that provides a performance advantage. Otherwise, the DIMMs are left at 1.35V.
- **Optimized for Power**—Low voltage DIMMs run at 1.35V, even if this requires memory to run at a lower frequency. The system does not allow 1.35V operation unless all installed DIMMs in the system are low voltage DIMMs.

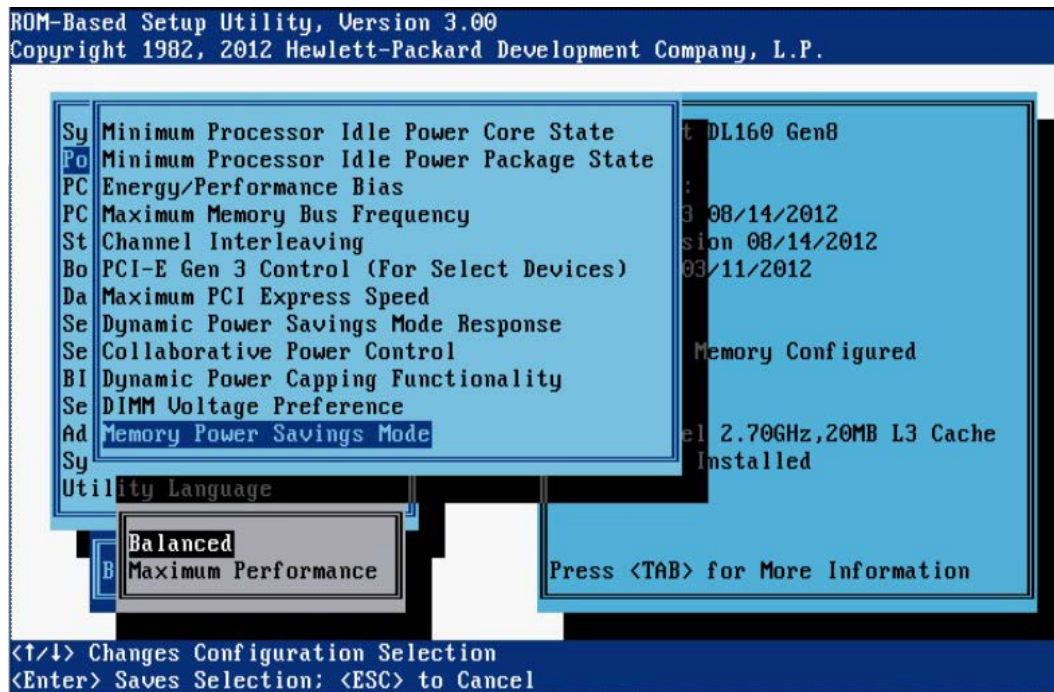


Memory Power Savings Mode

This option configures several memory parameters to optimize memory performance and power usage.

Options include:

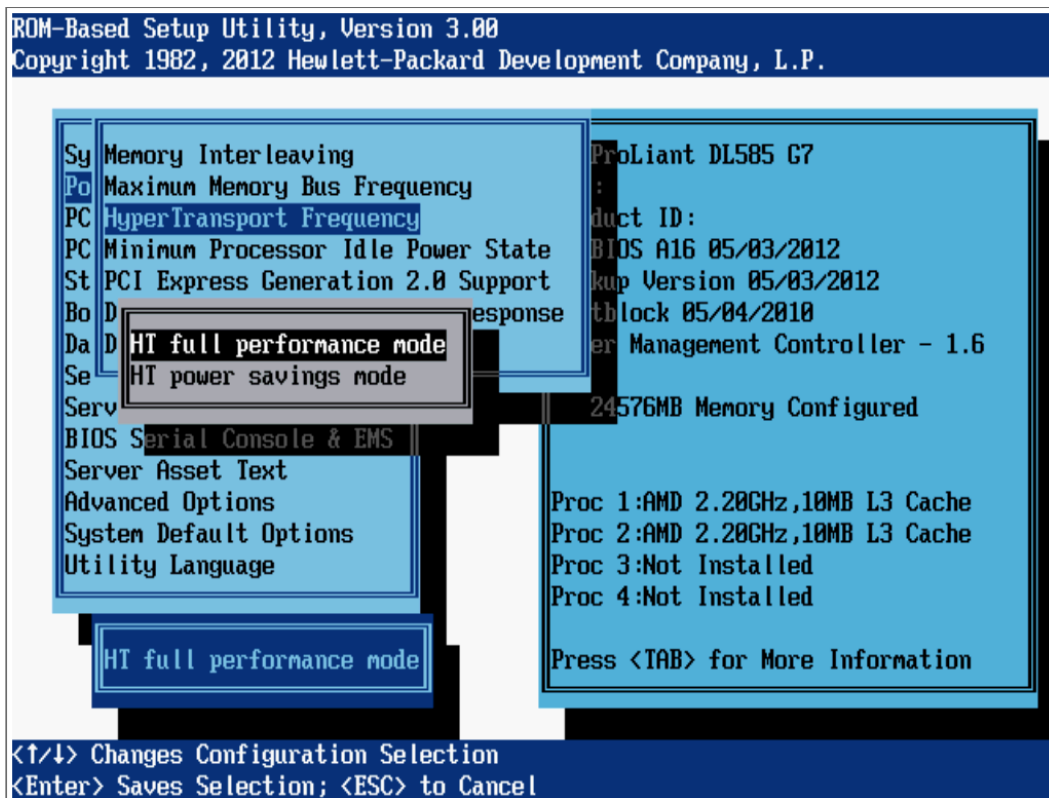
- **Balanced** (default)—Provides optimum power efficiency. Recommended for most environments.
- **Maximum Performance** —Provides optimum memory performance. This setting should be used in environments that require the highest performance and/or lowest latency, but are not sensitive to power consumption.



HyperTransport Frequency

NOTE: This option is available on servers with AMD processors.

This option enables you to select the operating speed of the HyperTransport link. Running in HT power savings mode may result in lower power consumption but may impact overall system performance.



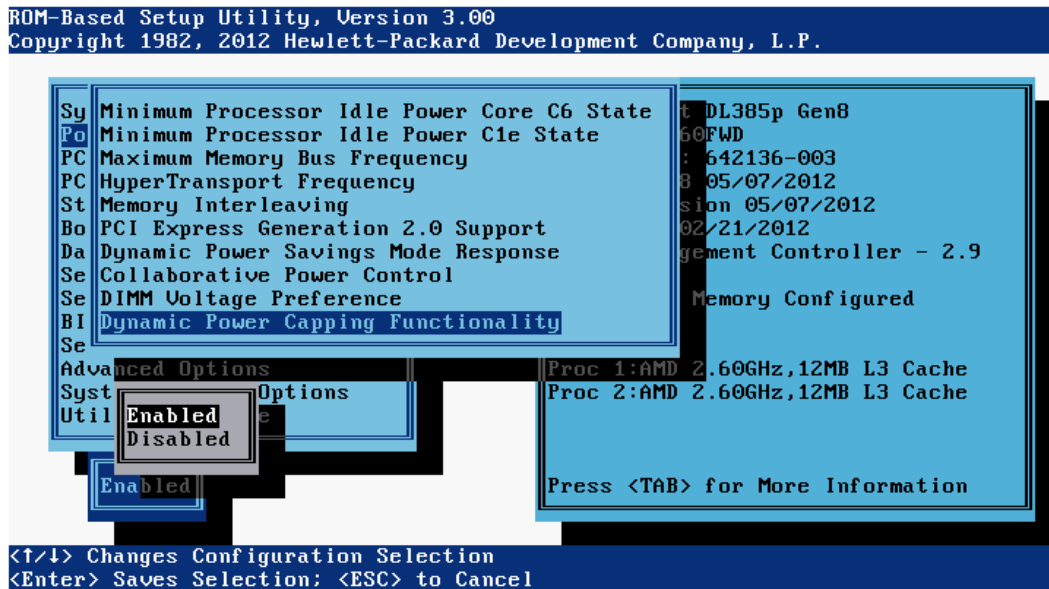
Dynamic Power Capping Functionality

NOTE: This option is available on Gen8 servers.

This option controls whether the System ROM Power Calibration is run during the boot process.

Options include:

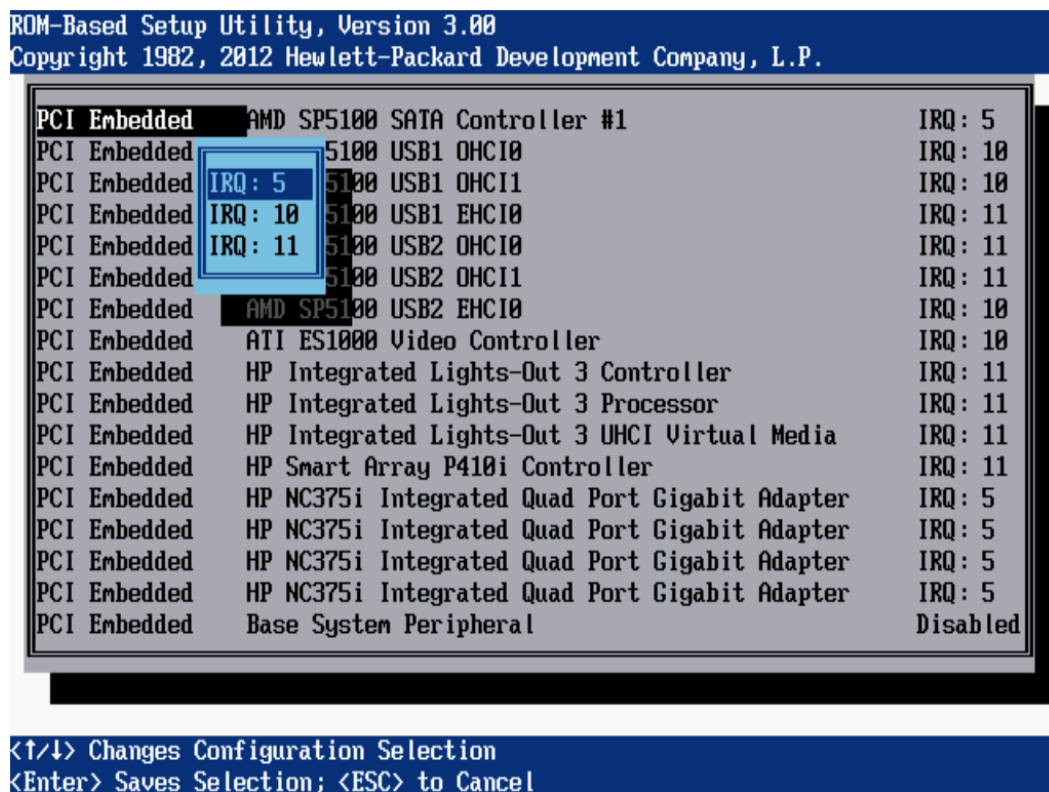
- **Enabled** (default)—The System ROM Power Calibration is executed during the boot process.
- **Disabled**—The System ROM Power Calibration will not be executed during the boot process. Boot time will be faster, but you will no longer be able to configure Dynamic Power Capping via iLO.



PCI IRQ Settings menu

These PCI IRQ options configure the legacy IRQ for embedded and slot-based PCI/PCIe devices. Multiple devices can share one IRQ.

To change the IRQ assignment for a device, highlight the device and press the **Enter** key. A menu is displayed with options to change the IRQ and disable the device.

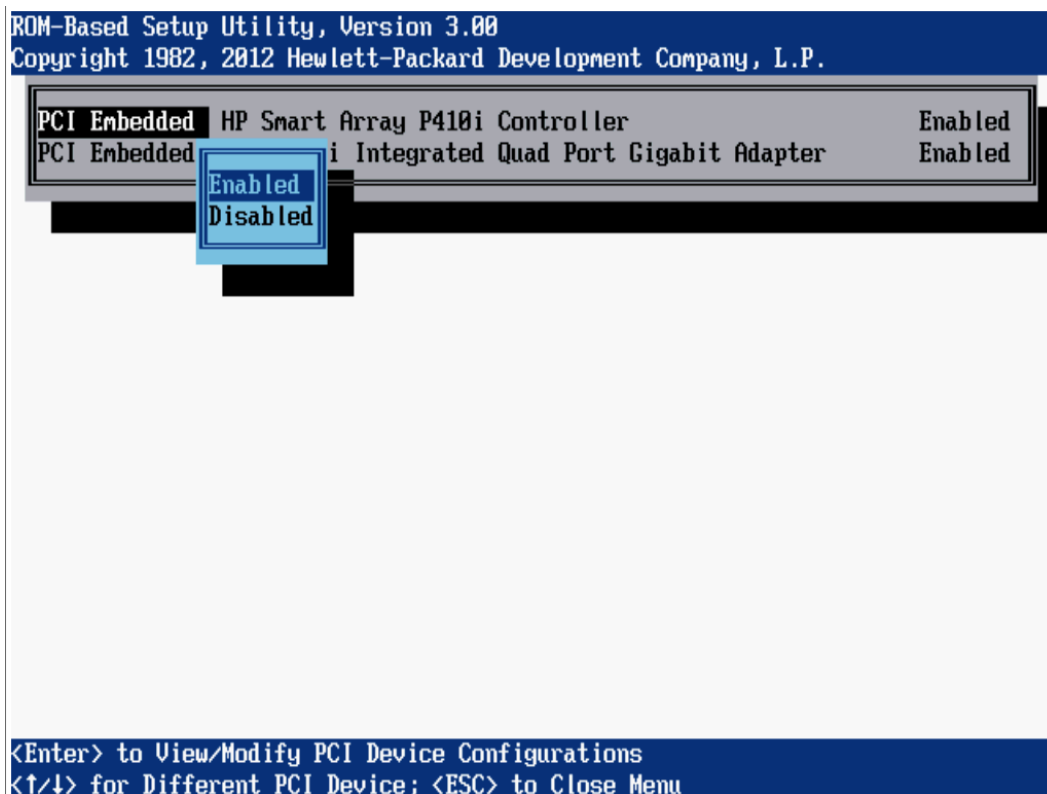


PCI Device Enable/Disable menu

These options enable and disable embedded and add-in devices. Disabling devices reallocates the resources (memory, I/O, and, in some cases, option ROM space and power) that would normally be allocated to the device.

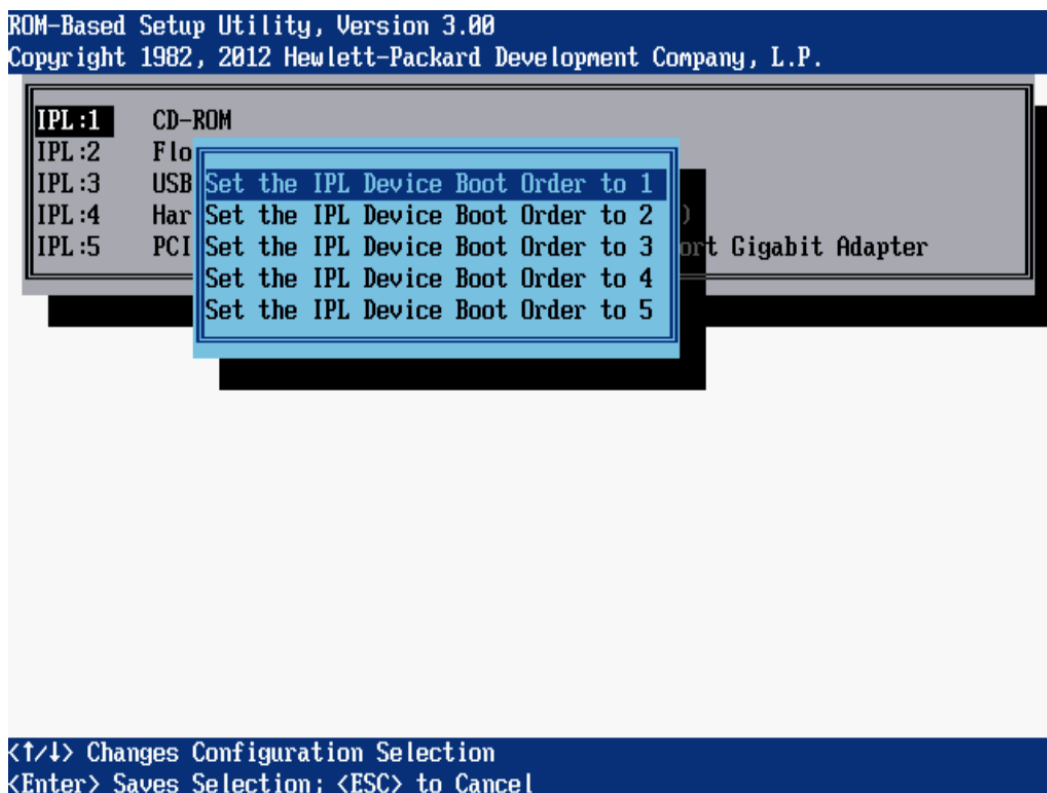
By default, all devices are **Enabled**.

NOTE: Only IRQs that are modified in RBSU retain the change during the next reboot. IRQs on PCI devices that have not been modified are subject to change during reboot.



Standard Boot Order (IPL) menu

The Standard Boot Order (IPL) option configures the Initial IPL device and controls the search order the server uses to look for a bootable device.



NOTE: If you enable or disable a device, restart the server. Changes do not take effect until after reboot.

The following table describes devices and their default boot order settings.

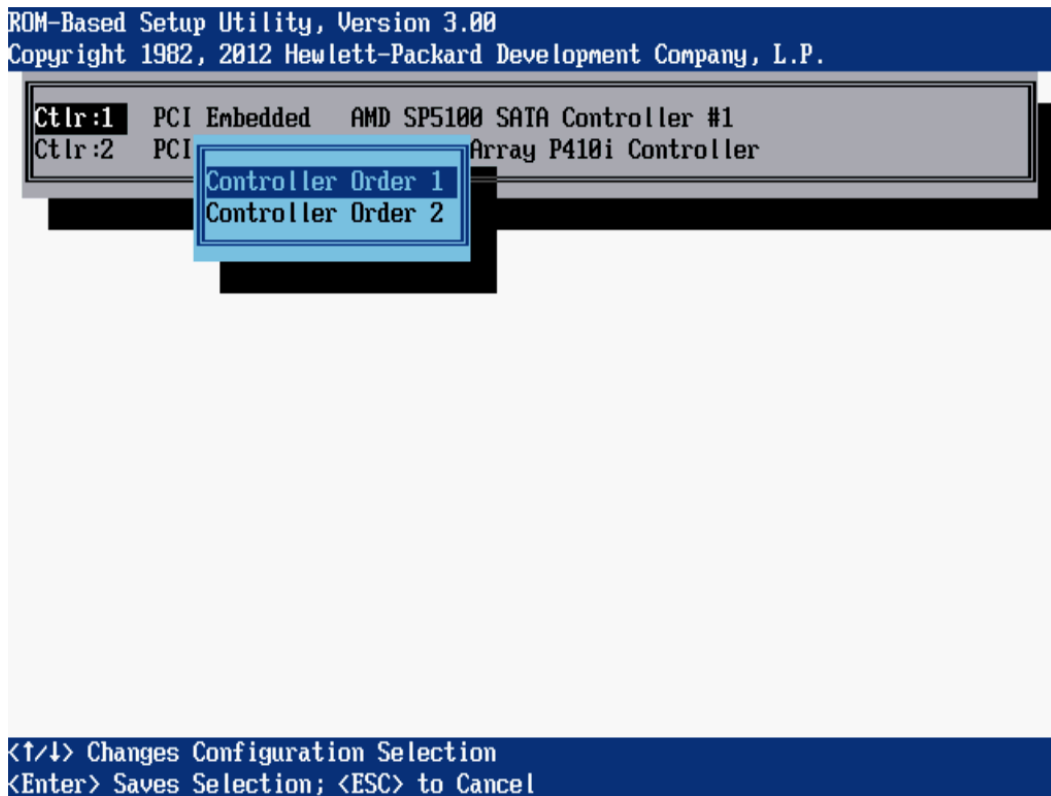
Device	Default boot order setting
IPL:1 CD-ROM	Set the IPL Device Boot Order to 1
IPL:2 Floppy Drive (A :)	Set the IPL Device Boot Order to 2
IPL:3 USB Drive Key (C :)	Set the IPL Device Boot Order to 3
IPL:4 Hard Drive C :	Set the IPL Device Boot Order to 4
IPL:5 PCI Embedded Adapter Port 1	Set the IPL Device Boot Order to 5

Boot Controller Order menu

The Boot Controller Order option selects which of the installed mass storage device controllers is used as the primary boot controller. The server attempts to boot the drives attached to each storage controller in the order presented in this list.

By default, the primary boot controller is set to controller 1.

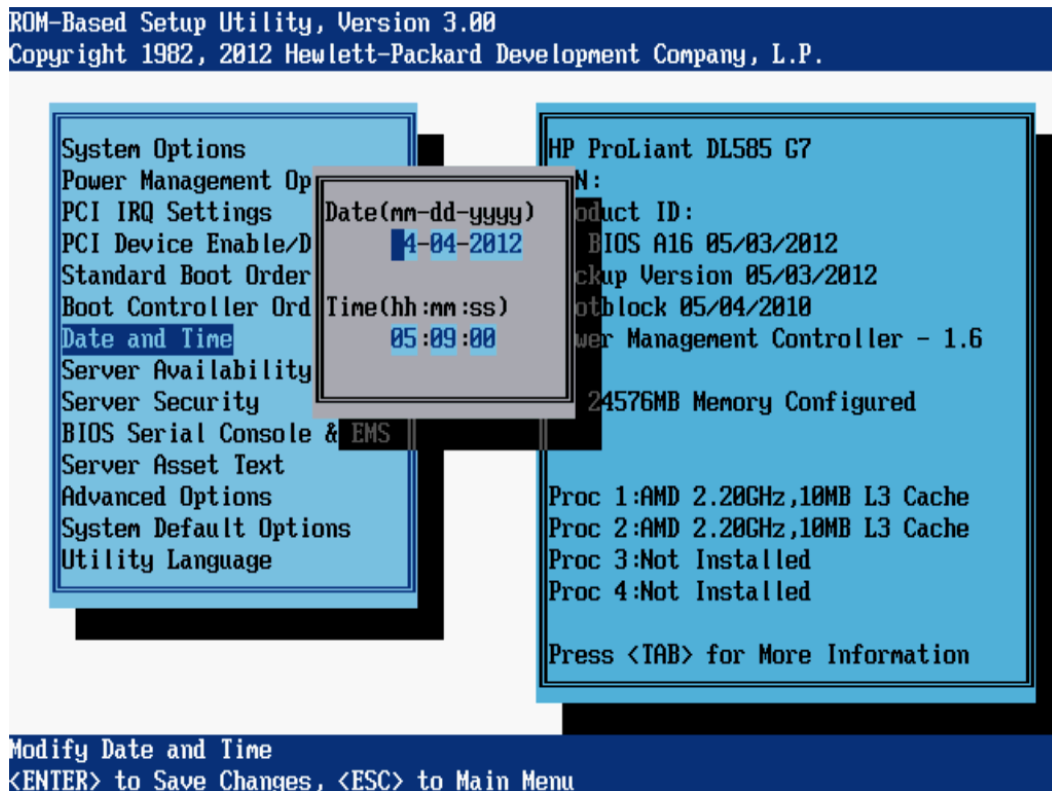
NOTE: Changes made to the Boot Controller Order in the ORCA Utility are reflected in this menu. For more information about ORCA, see the *Configuring Arrays on HP Smart Array Controllers Reference Guide* at <http://h20000.www2.hp.com/bc/docs/support/SupportManual/c00729544/c00729544.pdf>.



- ⓘ **IMPORTANT:** PCI devices that have been disabled in the PCI Devices menu might still be visible on the Boot Controller Order screen.

Date and Time menu

The Date and Time option sets the system time and date. Enter the date in a month-day-year (mm-dd-yyyy) format. Enter the time in an hour-minute-second (hh:mm:ss) format.



Server Availability menu

The Server Availability menu includes options that configure the Automatic Server Recovery (ASR) features:

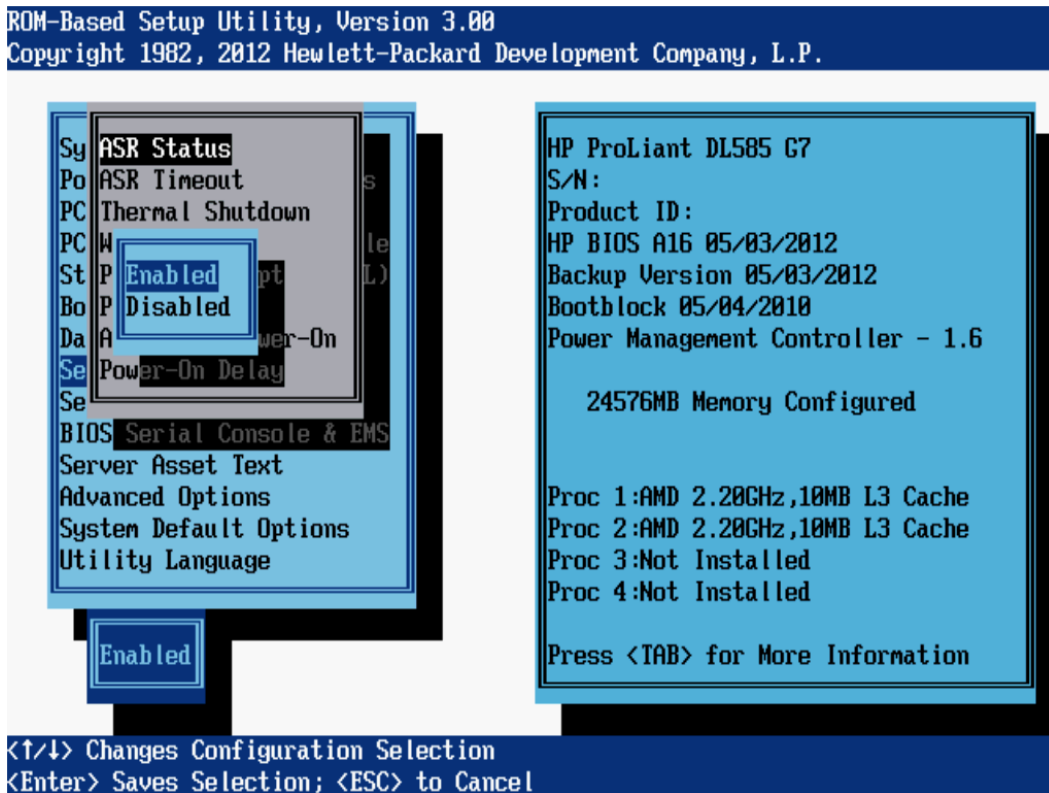
- “ASR Status” (page 77)
- “ASR Timeout” (page 78)
- “Thermal Shutdown” (page 79)
- “Wake-On LAN” (page 80)
- “POST F1 Prompt” (page 81)
- “Power Button” (page 171)
- “Automatic Power-On (G7 servers)” (page 83)
- “Automatic Power-On (Gen8 servers)” (page 84)
- “Power-On Delay” (page 85)

ASR Status

The ASR Status option is a toggle setting that either enables or disables ASR (Automatic Server Recovery).

Options include:

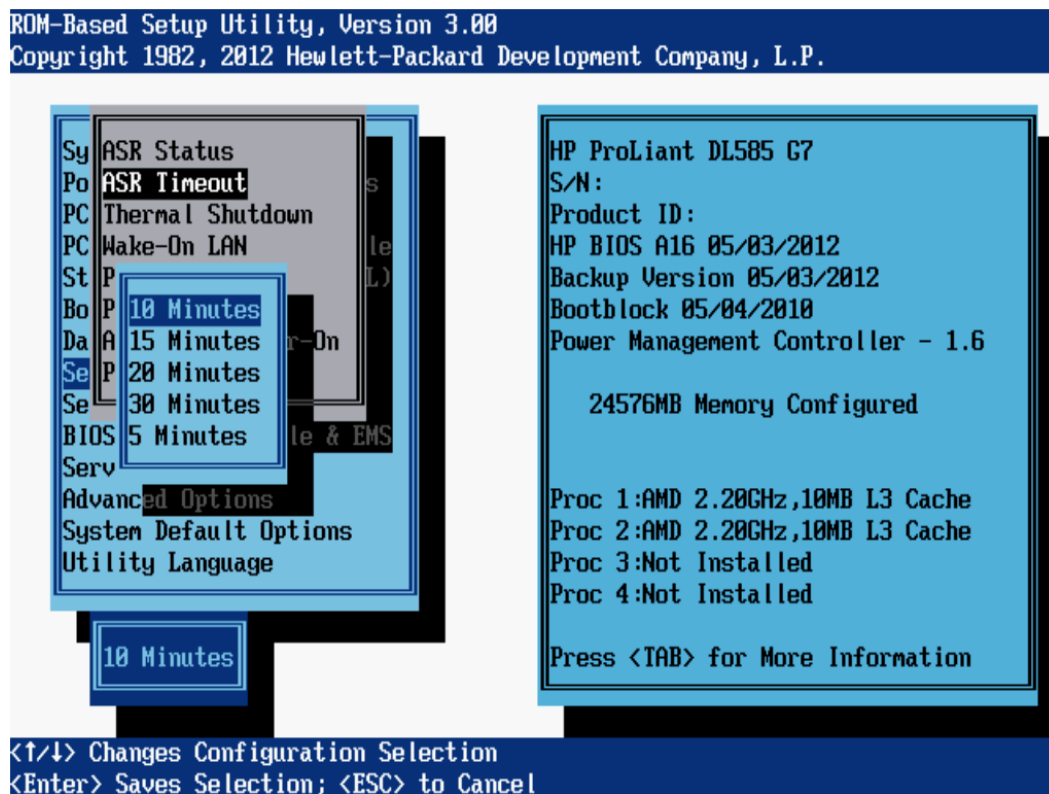
- **Enabled** (default)
- **Disabled**



ASR Timeout

The ASR Timeout option sets a timeout limit for resetting an unresponsive server. When the server has not responded in the selected amount of time, the server automatically resets. The following time increments are available:

- **10 Minutes** (default)
- **15 Minutes**
- **20 Minutes**
- **30 Minutes**
- **5 Minutes**

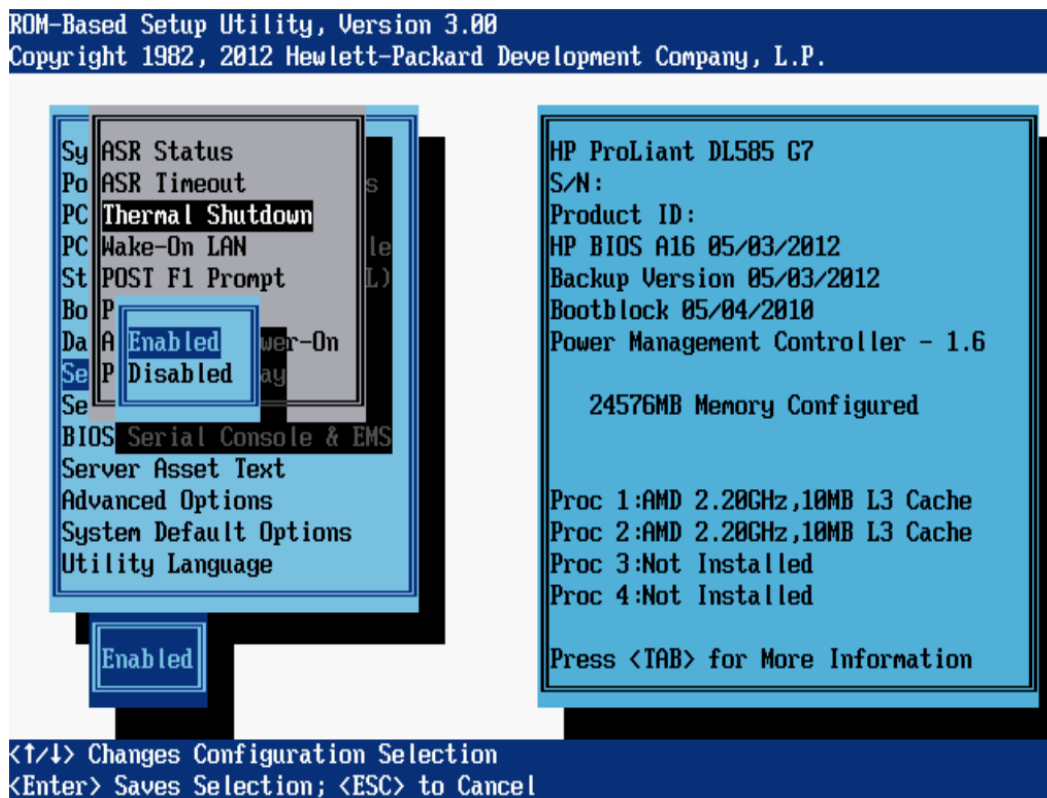


Thermal Shutdown

The Thermal Shutdown option is a toggle setting that determines when the server automatically powers down due to dangerous temperatures.

Options include:

- **Enabled** (default)—The Advanced System Management driver initiates a graceful system shutdown when the temperature reaches a critical level.
- **Disabled**—The Advanced System Management driver ignores thermal events and abruptly shuts down the system when the temperature reaches a critical level.



Wake-On LAN

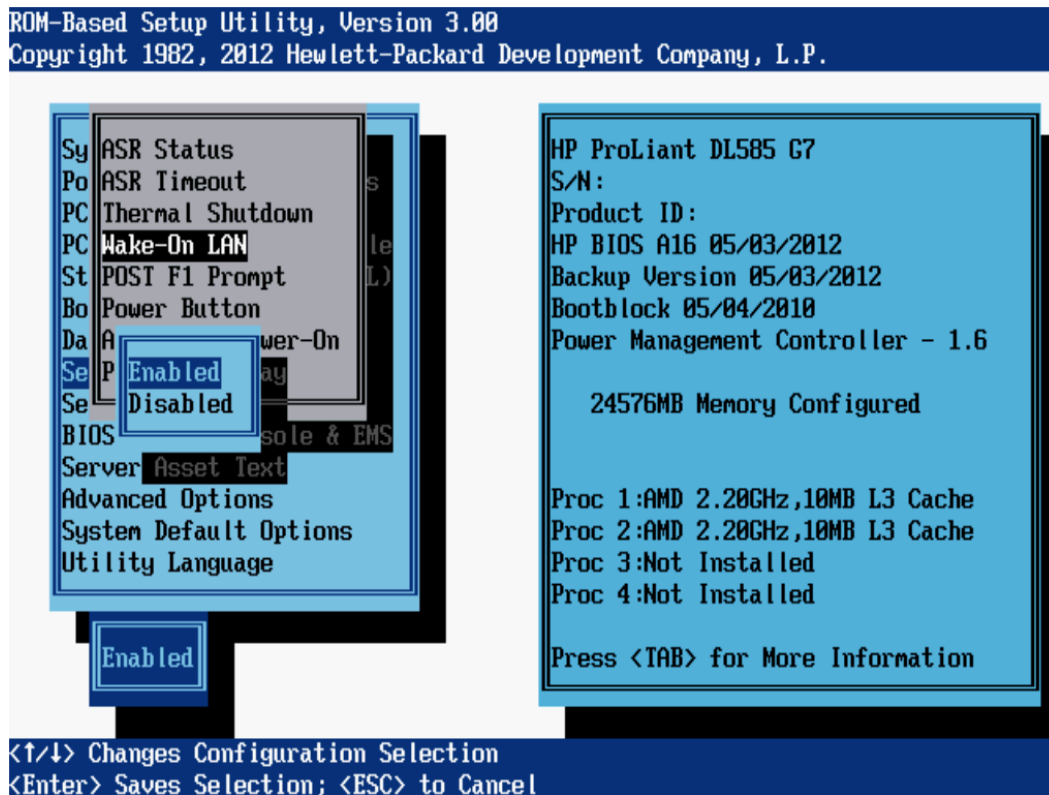
The Wake-On LAN option is a toggle setting that enables or disables the Wake-On LAN feature. When enabled, the server can be powered up remotely using a network controller.

- ❗ **IMPORTANT:** When enabling Wake-On LAN, be sure to remove all power cords before adding or removing any adapters. Some adapters cause the system to power on when they are added or removed.

After reading the note message, press any key to display the following settings:

- **Enabled**
- **Disabled**

NOTE: The default setting varies, depending on the server model.



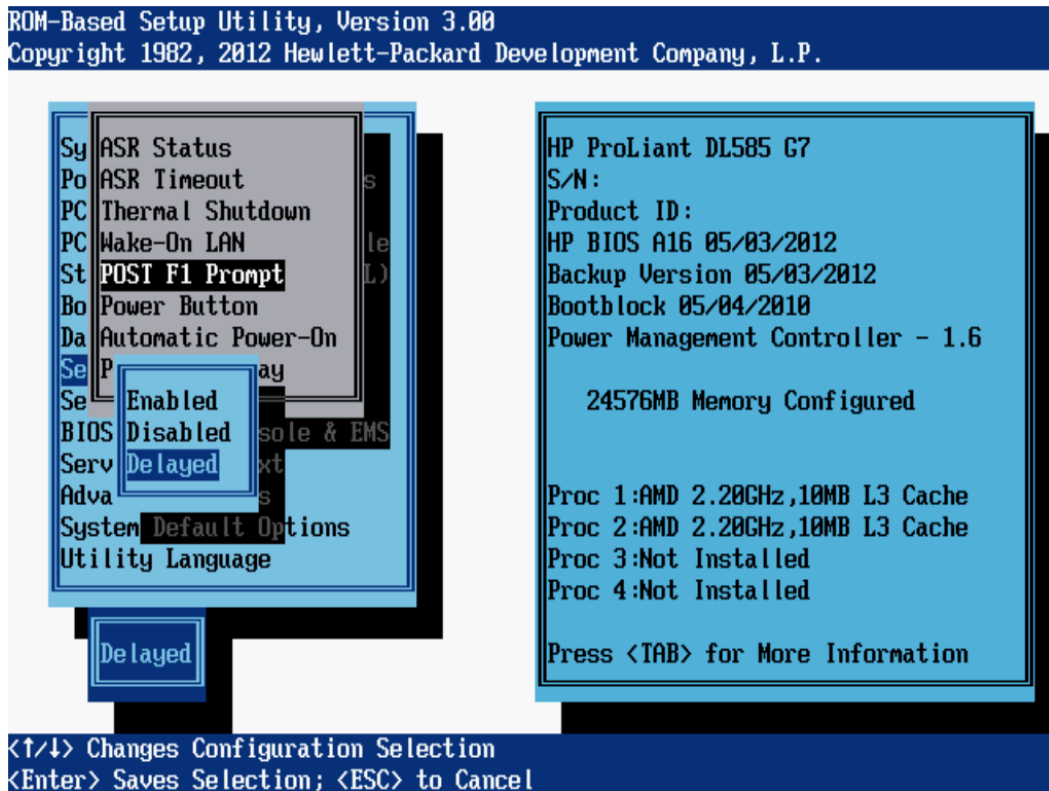
POST F1 Prompt

The POST F1 Prompt option is a toggle setting that configures the server so the F1 key must be pressed to proceed when an error occurs during the power-up sequence. A series of system tests execute during POST, with errors handled in one of the following ways:

- If errors occur that allow the system to continue operating, the system continues to boot but posts a message.
- If critical components fail or are missing, the server attempts to boot. If it can boot, it posts a message and an F1 prompt.
- If the system cannot run with the missing or failed components, it halts until those components are replaced.

Options include:

- **Enabled**—If an error occurs during startup, the system stops at the F1 prompt. Boot continues only after the F1 key is pressed.
- **Disabled**—If an error occurs during startup, the F1 prompt is not displayed and the system continues to boot the OS.
- **Delayed** (default)—If an error occurs during startup, the system pauses for 20 seconds at the F1 prompt and then continues to boot the OS.



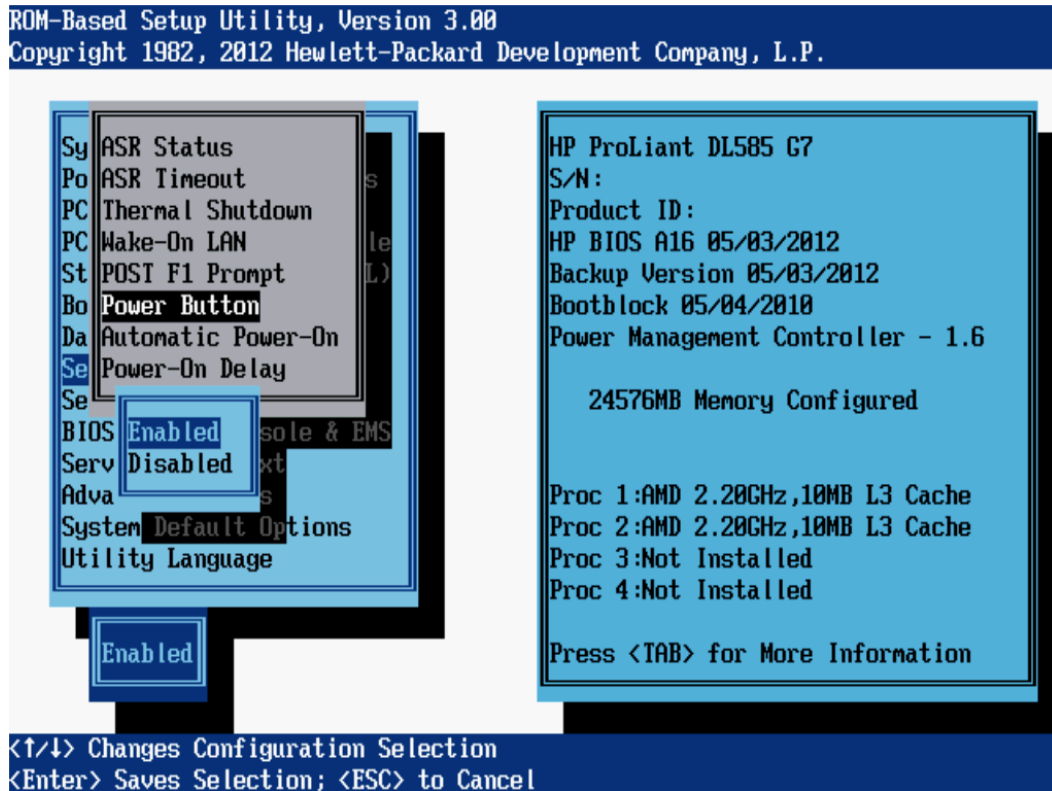
Power Button

The Power Button option is a toggle setting that enables or disables the momentary power button.

NOTE: This Power Button feature does not override the 4-second hold-down of the physical server power button.

Options include:

- **Enabled** (default)
- **Disabled**



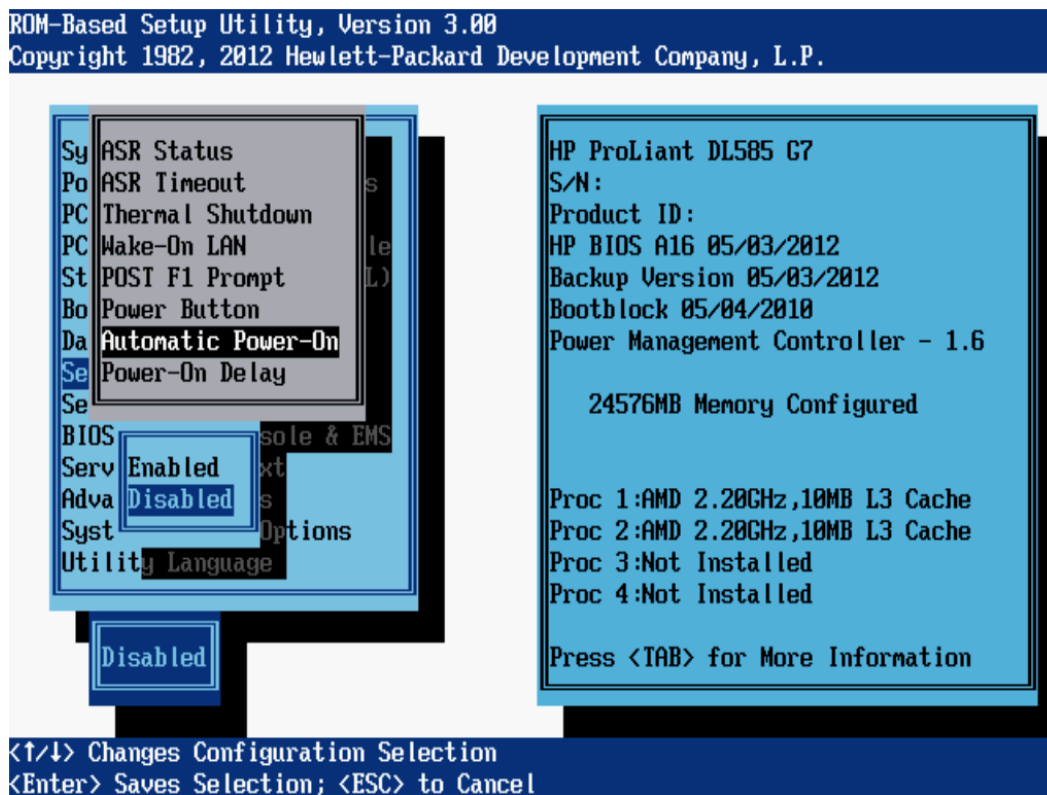
Automatic Power-On (G7 servers)

NOTE: This option is not available for blade servers.

The Automatic Power-On feature enables the server to automatically power on when auxiliary power is applied to the server.

Options include:

- **Enabled**
- **Disabled** (default)

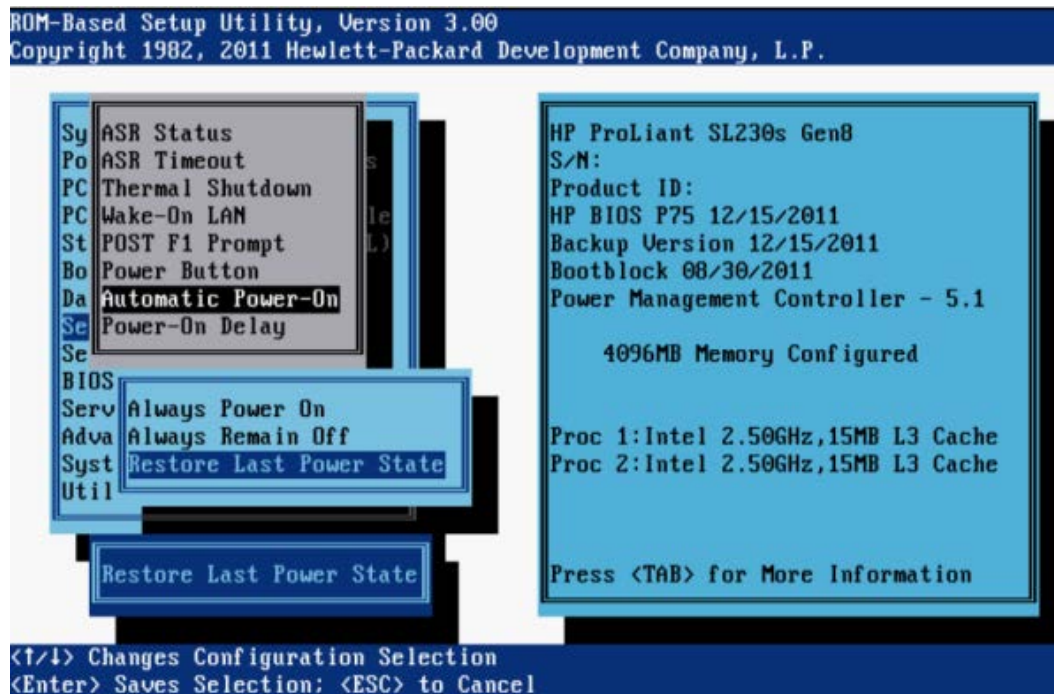


Automatic Power-On (Gen8 servers)

This feature determines the power state to achieve when power returns to a system that had experienced an unexpected power outage. Options include:

- **Always Power On**—The system returns to the On state when AC power is restored, even if the system had been in the Off state when power was lost.
- **Always Remain Off**—The system returns to the Off state when AC power is restored, even if the system had been in the On state when power was lost.
- **Restore Last Power State**—The system returns to the previous power state (On or Off) when AC power is restored.

NOTE: Available options and default values vary depending on server model.

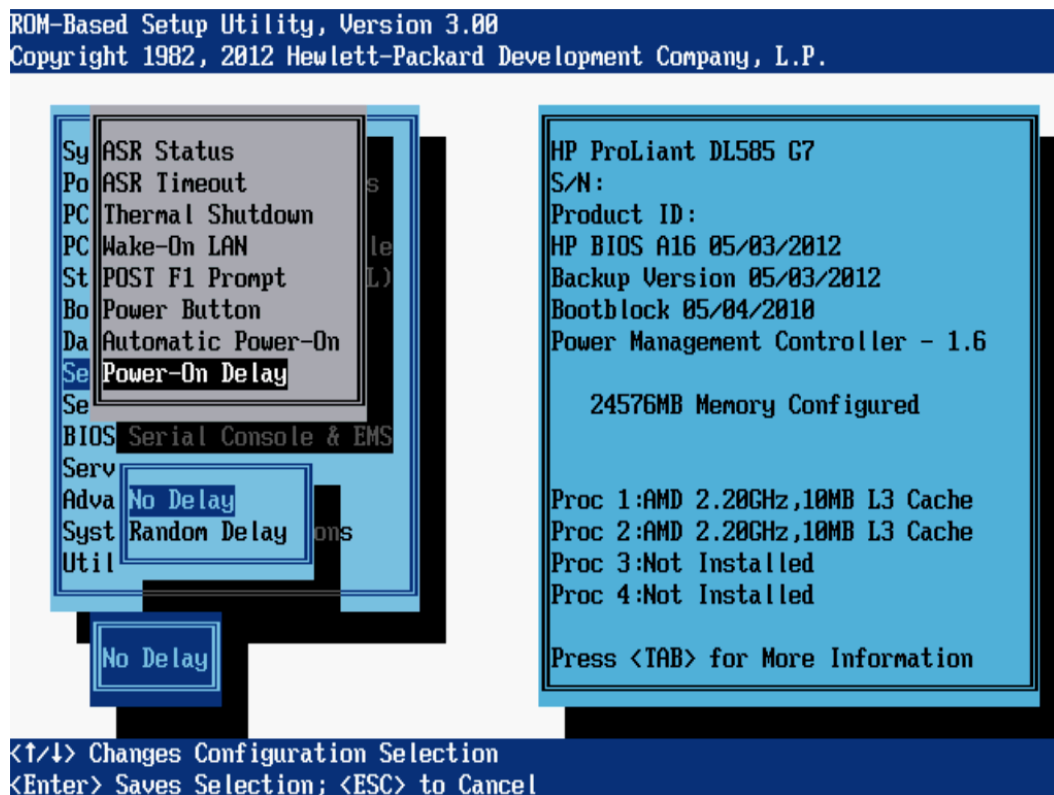


Power-On Delay

When multiple servers power up after a power loss, the Power-On Delay feature allows you to delay the server from powering on, to prevent power usage spikes. Pressing the power button, Wake-on LAN, RTC wake-up, and iLO Virtual Power Button events override any delay setting and immediately power on the server.

Depending on the system, options may include:

- **No Delay** (default)
- **Random Delay** (up to two minutes)
- **15 Second Delay**
- **30 Second Delay**
- **45 Second Delay**
- **60 Second Delay**



Server Security menu

The Server Security menu includes options that control access to the server and its utilities:

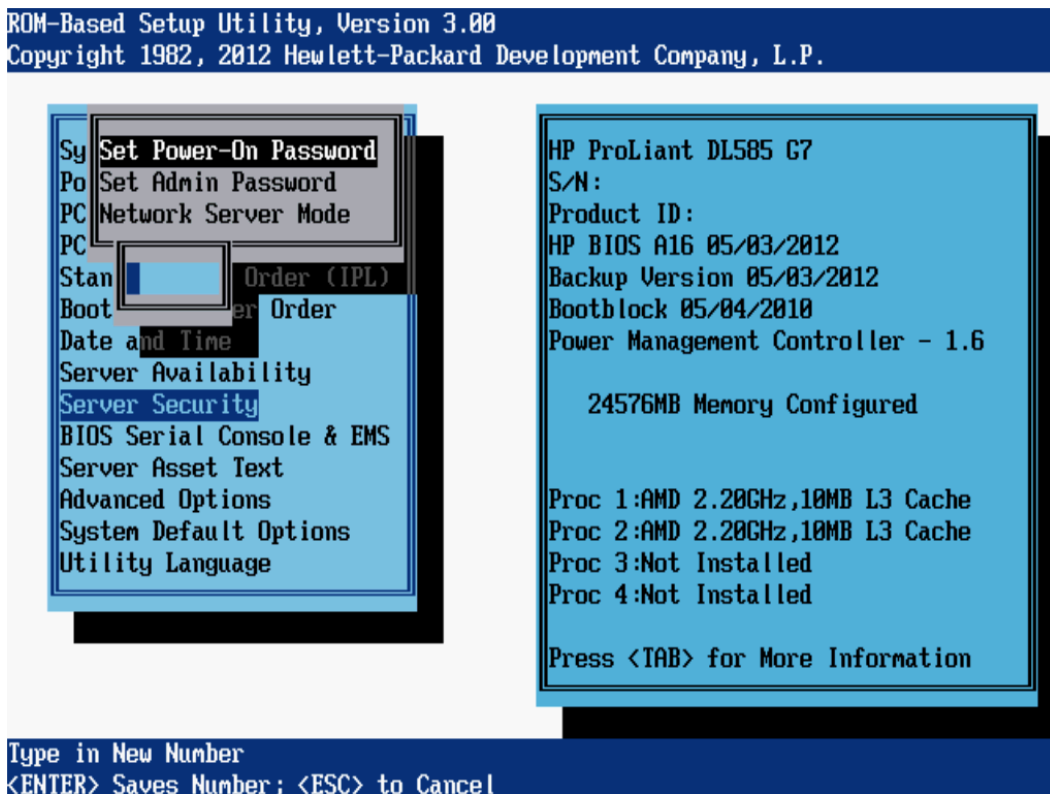
- “Set Power-On Password” (page 86)
- “Set Admin Password” (page 87)
- “Network Server Mode” (page 88)
- “Intelligent Provisioning (F10 Prompt)” (page 89)
- “Trusted Platform Module” (page 90)

Set Power-On Password

The Set Power-On Password option sets a password that controls access to the server during power-up. The server cannot be powered up until the correct password is entered. To disable or clear the password, enter the password followed by a / (slash) when prompted to enter the password. To disable or clear the password, enter the password followed by a / (slash) when prompted to enter the password.

Password requirements:

- Seven characters maximum.
- Can be any combination of numbers, letters, and special characters.

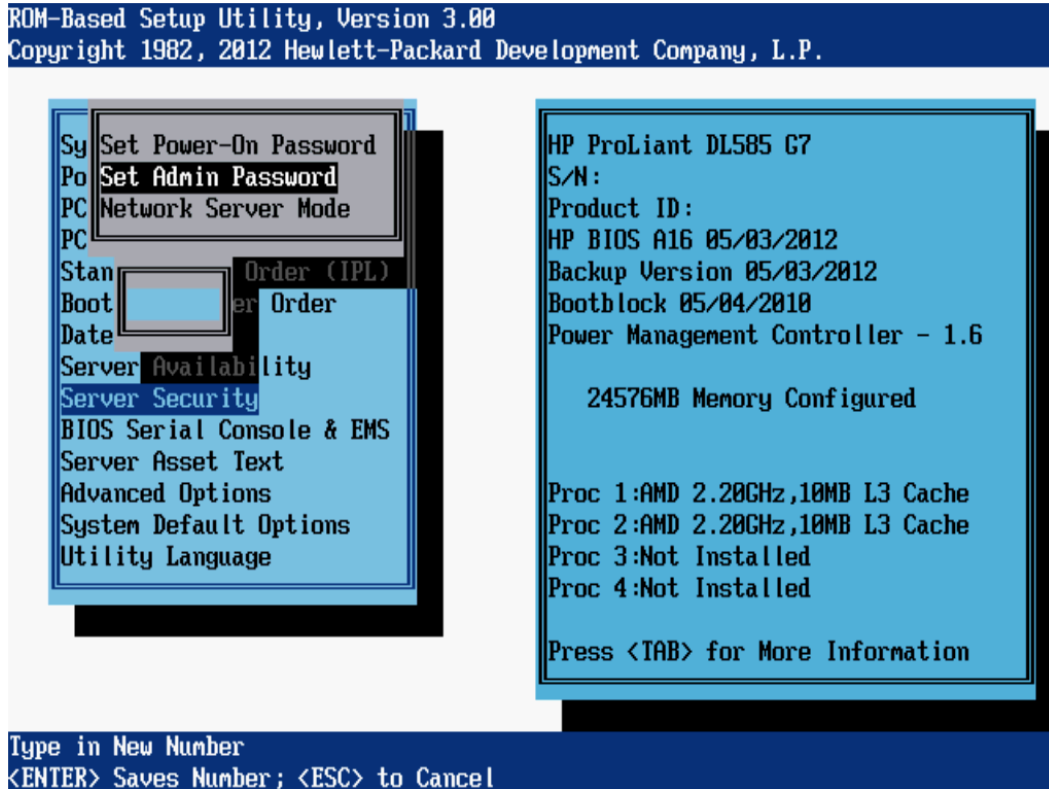


Set Admin Password

The Set Admin Password option sets a password to control access to the RBSU and the System Maintenance Menu during POST. If set, this password must be entered when F9 or F10 is pressed during POST. To disable or clear the password, enter the password followed by a / (slash) when prompted to enter the password.

Password requirements:

- Seven characters maximum.
- Can be any combination of numbers, letters, and special characters.



Network Server Mode

NOTE: This option is available on HP ProLiant DL360 G7, DL380 G7, and DL585 G7 servers. Gen8 servers do not support Network Server Mode.

The Network Server Mode option is a toggle setting that sets the server to operate in network server mode. This feature works in conjunction with the power-on password.

When set to Disabled, the server operates normally. When it is set to Enabled, the following actions occur:

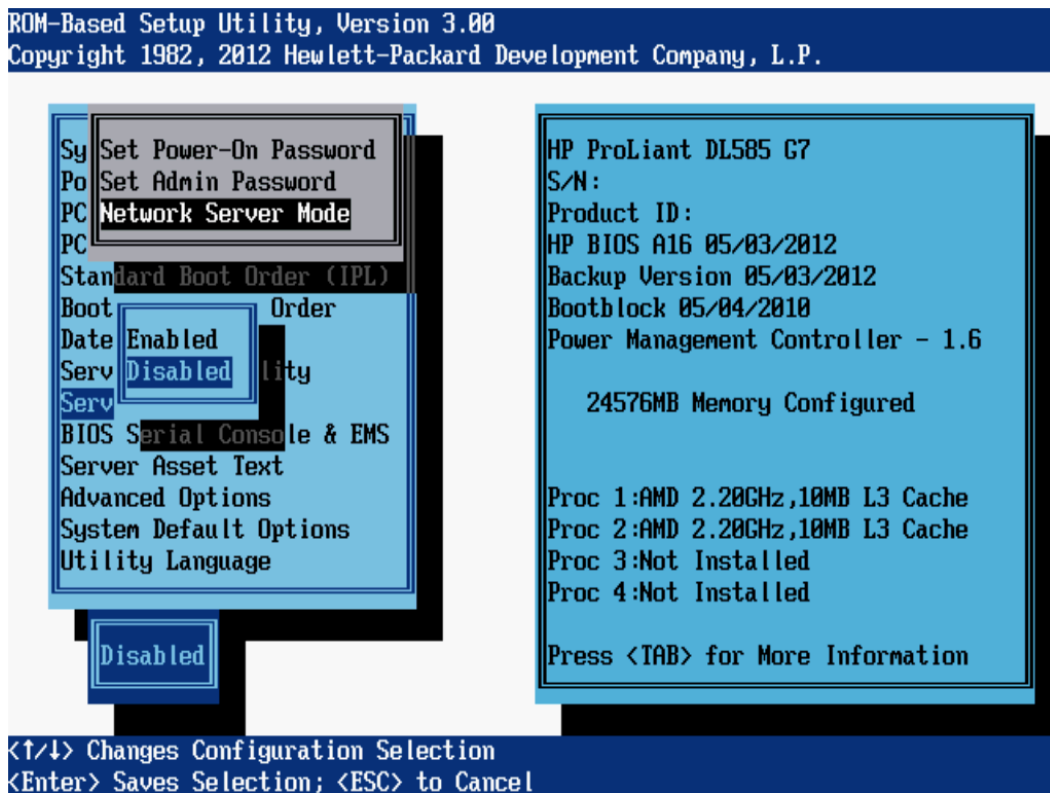
- The local keyboard remains locked until the power-on password is entered.
- The power-on password prompt is bypassed.
- When a diskette is in the diskette drive, the server does not start unless the power-on password is entered locally.

Options include:

- **Enabled**—Disables the server keyboard port.
- **Disabled** (default)



IMPORTANT: Network server mode cannot be enabled until the power-on password has been established.



Intelligent Provisioning (F10 Prompt)

NOTE: This option is available on Gen8 servers.

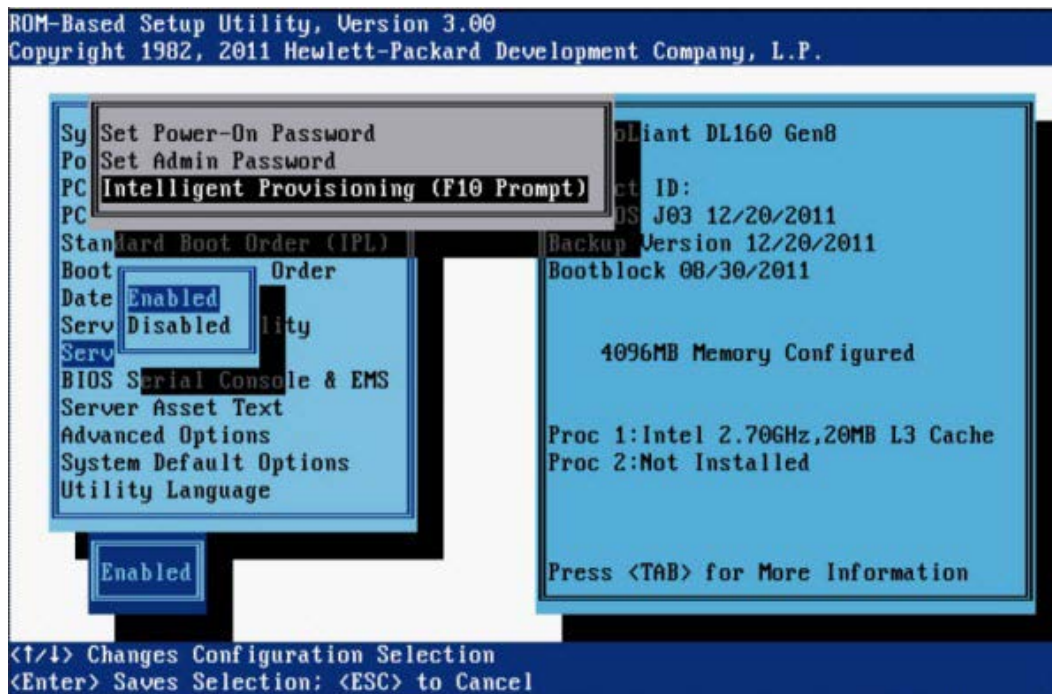
This option controls access to Intelligent Provisioning. When disabled, this option prevents the user from entering the Intelligent Provisioning environment. This option must be enabled to use Intelligent Provisioning functionality.

The following methods for accessing Intelligent Provisioning are affected by this RBSU setting:

- During the server startup process, by pressing F10 when prompted.
- In the BIOS Serial Console, by pressing ESC+0 when prompted.
- In the Boot Menu, by selecting the option for a One Time Boot to Intelligent Provisioning.

Options include:

- **Enabled** (default)—All methods for accessing Intelligent Provisioning are enabled.
- **Disabled**—All methods for accessing Intelligent Provisioning are disabled. The prompts are displayed, but the message indicates that the Intelligent Provisioning function is disabled.



Trusted Platform Module

For servers configured with an optional TPM, the following configuration options are available:

- “TPM Functionality” (page 90)
- “TPM Visibility” (page 91)
- “TPM Expansion ROM Measuring” (page 92)
- “TPM Clear” (page 93)

❗ **IMPORTANT:** TPM menus appear only if the TPM kit is installed.

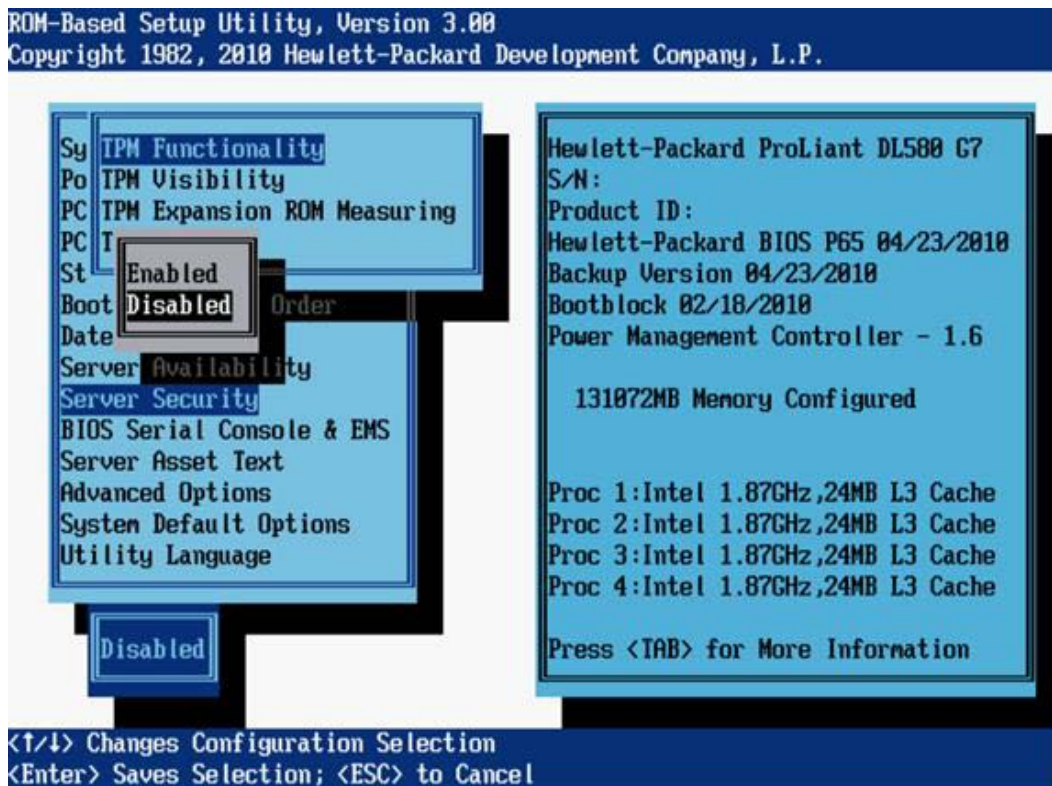
TPM Functionality

This option controls Trusted Platform Module functionality at startup. Options include:

- **Enabled**—Enables the TPM and BIOS secure startup. The TPM is fully functional in this mode.
- **Disabled** (default)—Disables the BIOS secure startup but still allows the TPM to be visible to the operating system. The TPM functionality is limited, but can respond to most commands in this mode. Selecting **Disabled** may prevent the server from booting to a TPM-aware operating system.

⚠ **CAUTION:** A TPM locks all data access if proper procedures are not followed for modifying the server, including: updating system or option firmware, replacing hardware such as the system board and hard drive, or modifying TPM OS settings.

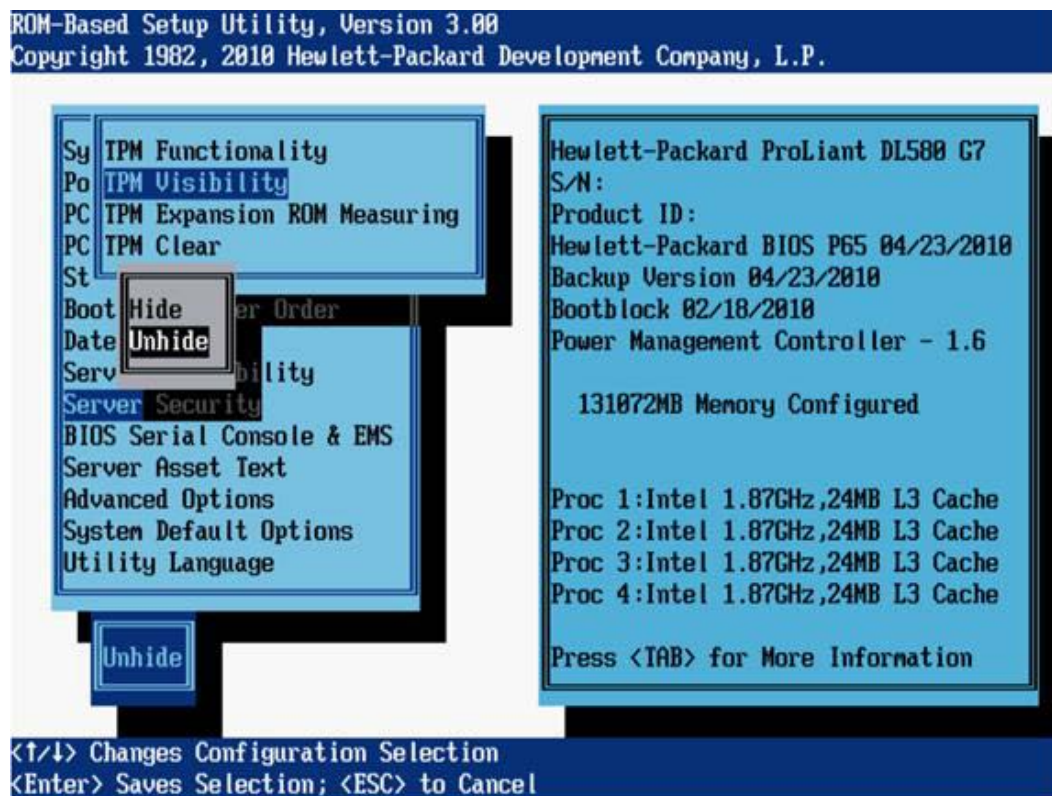
For information on installing and enabling the TPM module option, see the user documents for your server model and the *Data security in HP ProLiant servers using the Trusted Platform Module and Microsoft Windows BitLocker Drive Encryption* white paper: <http://h20000.www2.hp.com/bc/docs/support/SupportManual/c01681891/c01681891.pdf>.



TPM Visibility

The TPM Visibility option provides the ability to hide the TPM from the operating system. Options include:

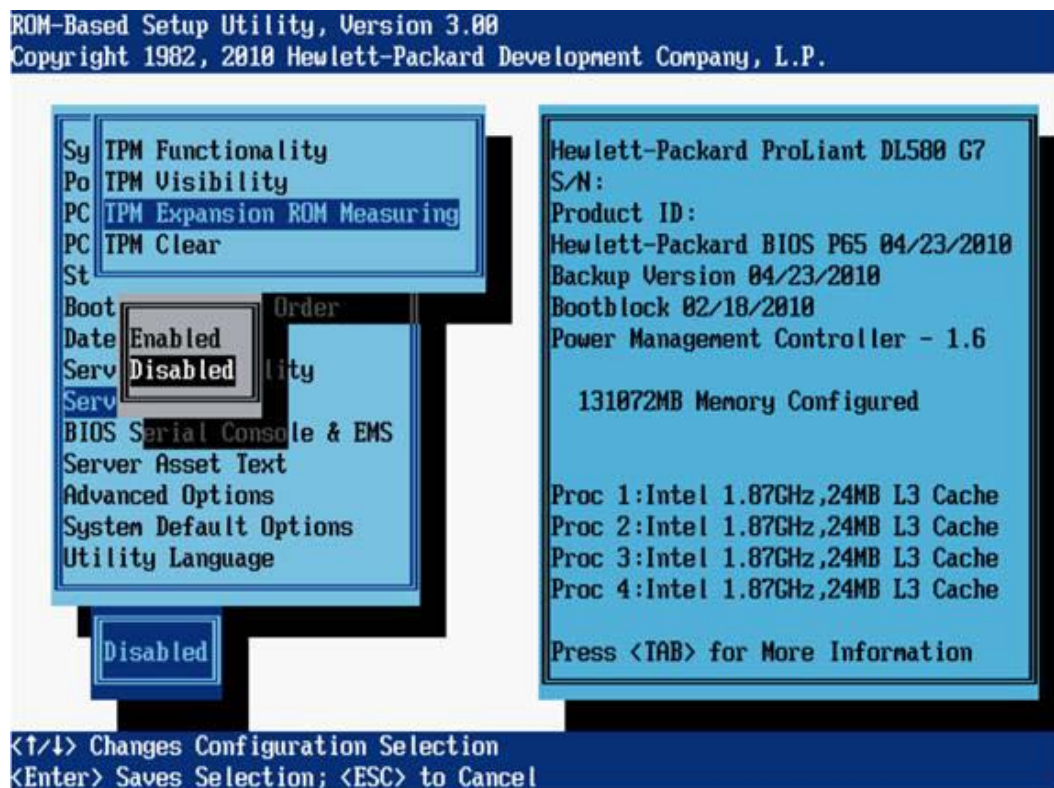
- **Hide**—BIOS secure startup is disabled and the TPM does not respond to any commands from any software. Hiding the TPM may prevent the server from booting to a TPM-aware operating system. This option is intended to be used to remove the TPM feature from the system without removing the actual hardware.
- **Unhide** (default)—The TPM is visible to the operating system.



TPM Expansion ROM Measuring

TPM Expansion ROM Measuring enables the BIOS to measure the optional PCI or PCIe expansion ROM code and store that measurement in the TPM. On subsequent reboots, operating systems or validation software applications that utilize the measurements stored in the TPM can use this data to detect modifications to PCI or PCIe expansion ROM versions. Options include:

- **Enabled**
- **Disabled** (default)

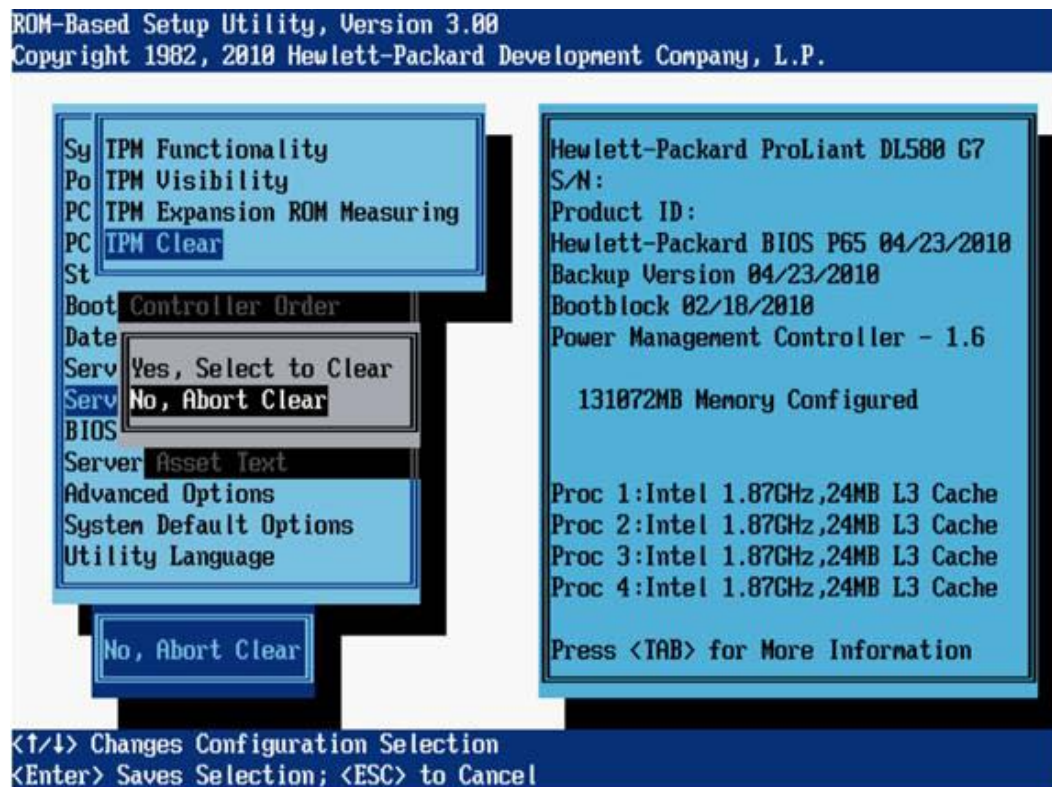


TPM Clear

The TPM Clear option allows the user to reset the TPM to factory settings, clearing any assigned passwords, keys, or ownership data. Options include:

- **Yes, Select to Clear**
- **No, Abort Clear** (default)

❗ **IMPORTANT:** Clearing the TPM may prevent the server from booting to a TPM-aware operating system.



BIOS Serial Console & EMS menu

NOTE: Some languages or characters may require a specific emulation mode.

Through BIOS Serial Console and EMS console redirection, you can view POST error messages and run RBSU remotely through a serial connection to the server COM port or iLO Virtual Serial port. The remote server does not require a keyboard or mouse.

For more information about the BIOS Serial Console, see [“RBSU BIOS Serial Console \(CLI\)” \(page 188\)](#).

The following menu options are available:

- [“BIOS Serial Console Port” \(page 95\)](#)
- [“BIOS Serial Console Baud Rate” \(page 96\)](#)
- [“EMS Console” \(page 97\)](#)
- [“BIOS Interface Mode” \(page 98\)](#)

BIOS Serial Console Port

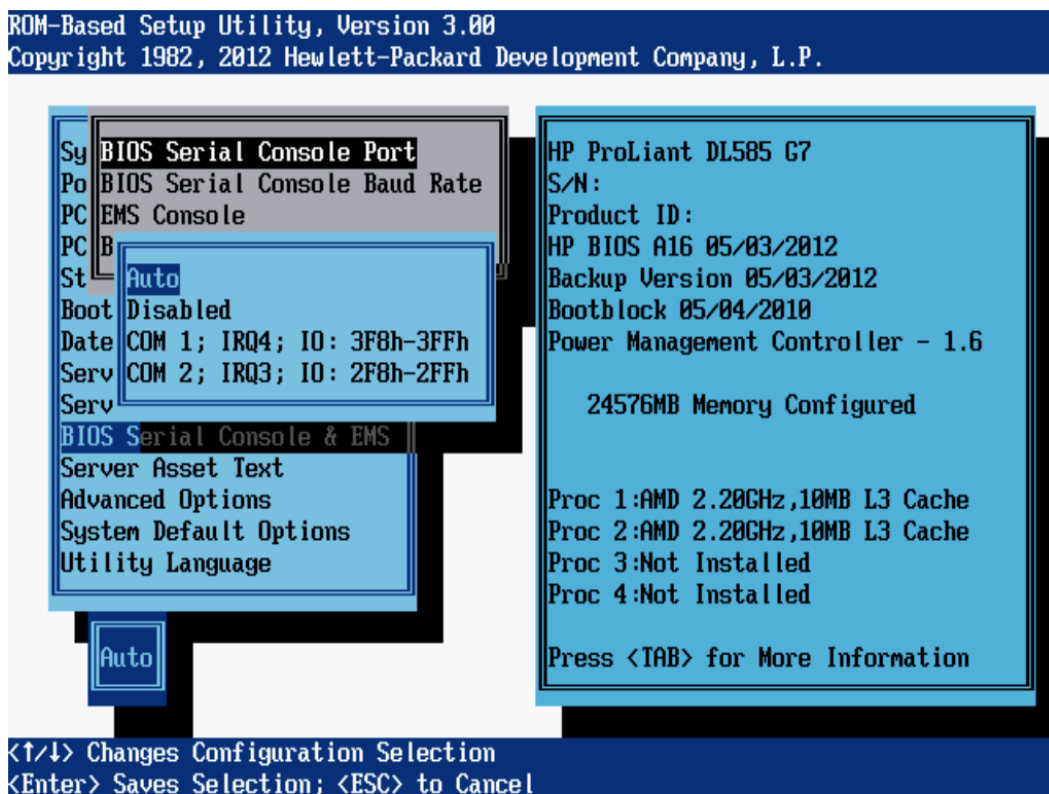
This BIOS Serial Console Port feature controls if and how video and keystrokes are redirected through the serial port prior to OS startup.

- ❗ **IMPORTANT:** This feature may interfere with non-terminal devices attached to the serial port. In this case, disable the BIOS Serial Console. This feature is not supported under RBSU on Japanese systems.

Options include:

- **Auto** (default for newer servers)—The server checks for the presence of a VT100 compatible client running at 9600 Baud connected to the server and automatically enables the BIOS Serial Console if one is found. This eliminates the need to run RBSU with a local keyboard and monitor attached to enable the BIOS Serial Console feature.
- **Disabled** (default for older servers)
- **COM 1**
- **COM 2**

NOTE: Connect a null modem cable to the serial port/COM port on which BIOS Serial Console is enabled.

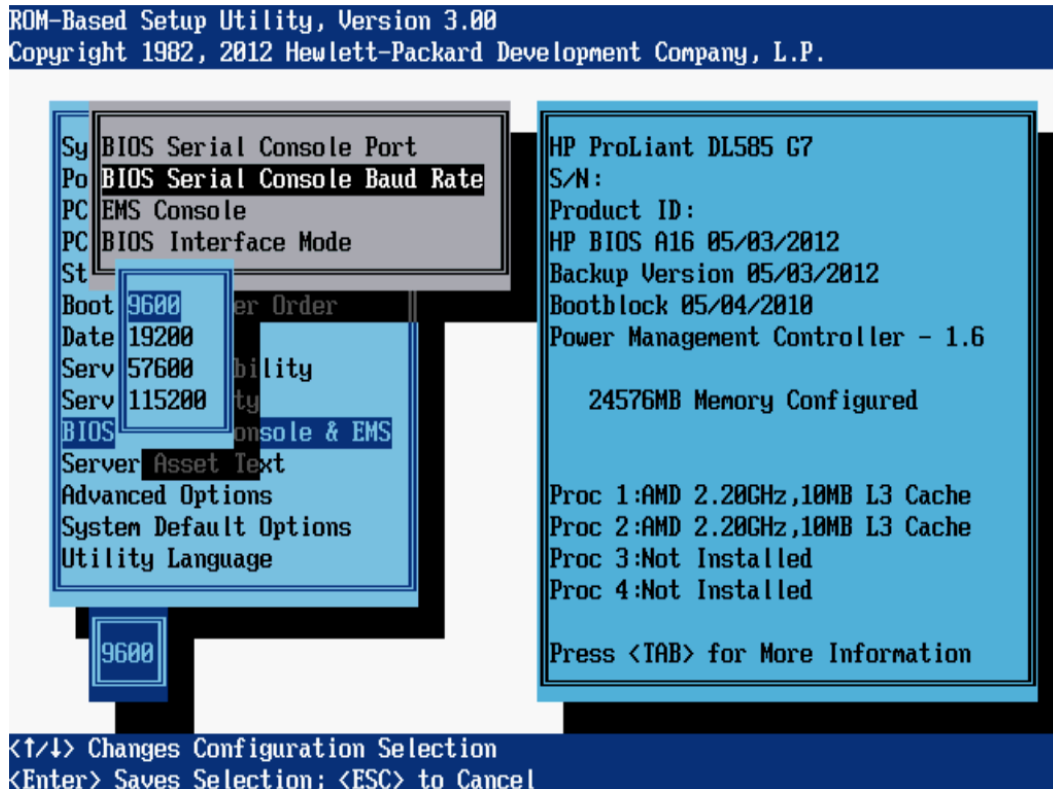


BIOS Serial Console Baud Rate

The BIOS Serial Console Baud Rate option controls transfer rate at which data is transmitted through the serial port.

Options include:

- **9600** (default)
- **19200**
- **57600**
- **115200**



EMS Console

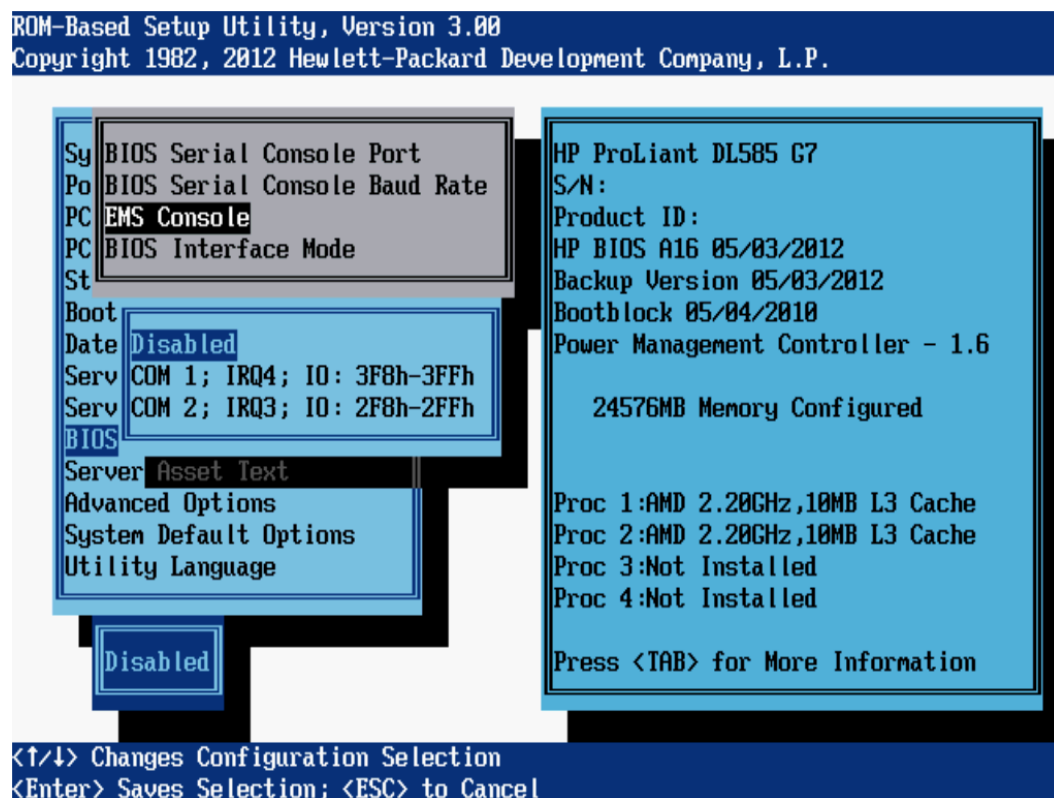
The EMS Console option is a Microsoft Windows Server 2003 feature that enables the Emergency Management Console to be redirected through a specified serial port.

Options include:

- **Disabled** (default for all servers except blades)
- **COM1** (default for blade servers)
- **COM2**

NOTE:

- When using iLO, select the value assigned to the Virtual Serial Port ("[Virtual Serial Port](#)" ([page 14](#))).
- When redirecting EMS through a physical serial port, select the value assigned to the Embedded Serial Port ("[Embedded Serial Port](#)" ([page 12](#))).



EMS provides input/output support for all Microsoft Windows kernel components: the loader, setup, recovery console, OS kernel, blue screens, and the Special Administration Console. The Special Administration Console is a text mode management console available after Windows Server 2003 OS has initialized. For more information on EMS, go to the Microsoft website (www.microsoft.com).

Microsoft enables EMS in the OS, but EMS must also be enabled in the ROM. When enabled, EMS assumes the serial port for redirection and may cause interference with other devices attached to the serial port. To avoid interference, EMS is disabled in the system ROM by default on HP ProLiant ML and DL servers. If EMS is disabled in Windows Server 2003, perform the following steps to update the `boot.ini` file:

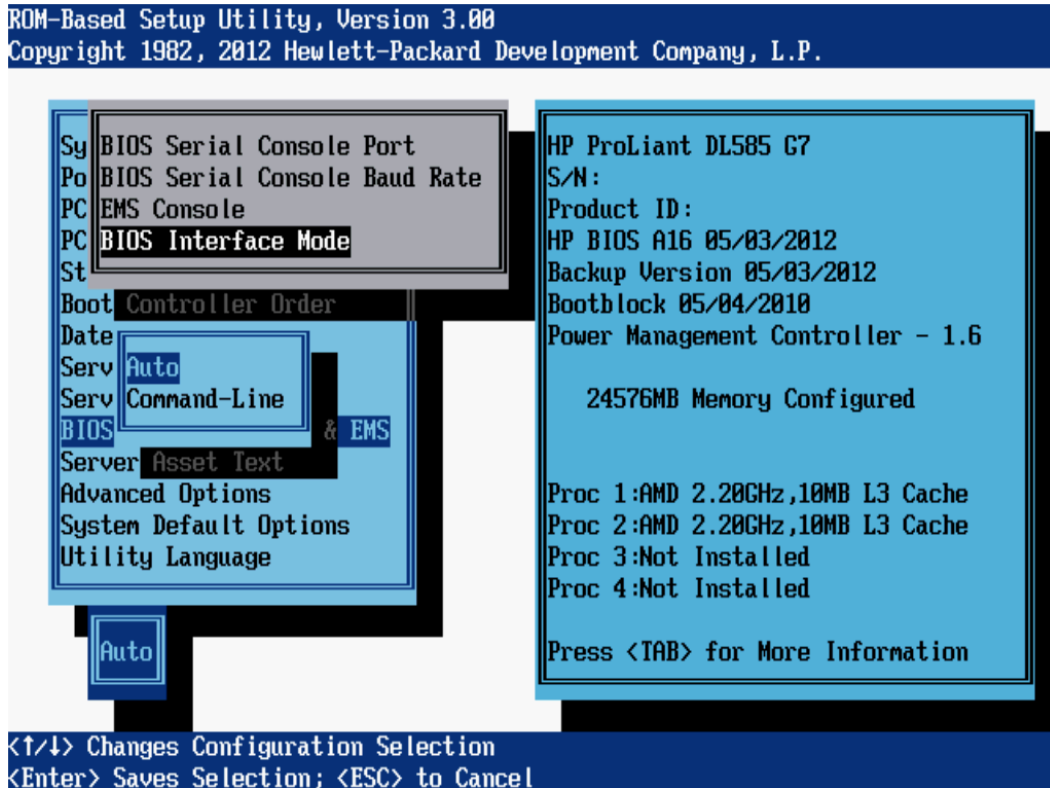
1. Enable EMS in RBSU.
2. Run `bootcfg/ems on/id 1`.
3. Reboot.

BIOS Interface Mode

This BIOS Interface Mode option determines whether the menu-driven mode or the command line interface mode is displayed for ROM-based utilities.

Options include:

- **Auto** (default)—Enables CLI mode automatically for ROM embedded utilities, if the system detects a console connection through the serial port instead of the keyboard.
- **Command-Line**—CLI mode is always enabled for ROM embedded utilities.



Server Asset Text menu

The Server Asset Text menu includes options that customize the system-specific text for the server. The following menu options are available:

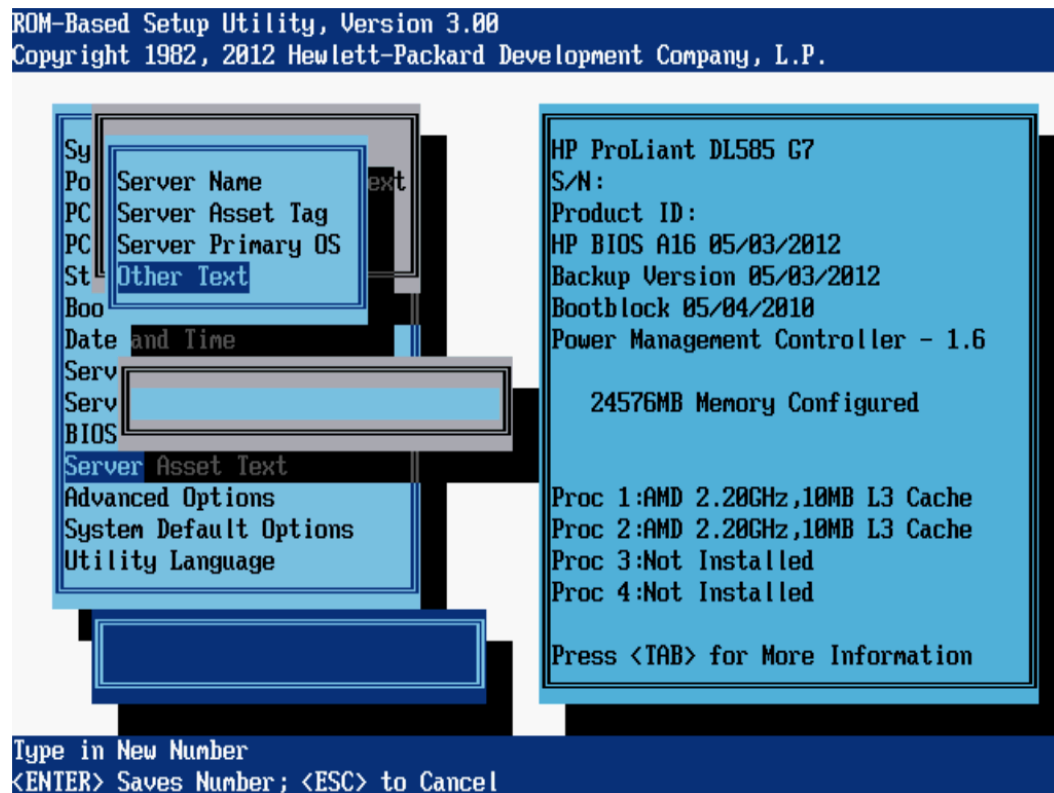
- “Server Info Text” (page 99)
- “Administrator Info Text” (page 100)
- “Service Contact Text” (page 101)
- “Custom POST Message” (page 102)

Server Info Text

These options define reference information for the server administrator, which is displayed in Insight Manager.

- **Server Name**—Identifies the server.
- **Server Asset Tag**—Identifies the server asset number.
- **Server Primary OS**—Describes the primary OS of the server.
- **Other Text**—Additional text describing the server.

NOTE: Each of these options can display a maximum of 14 characters. By default, all values are blank.

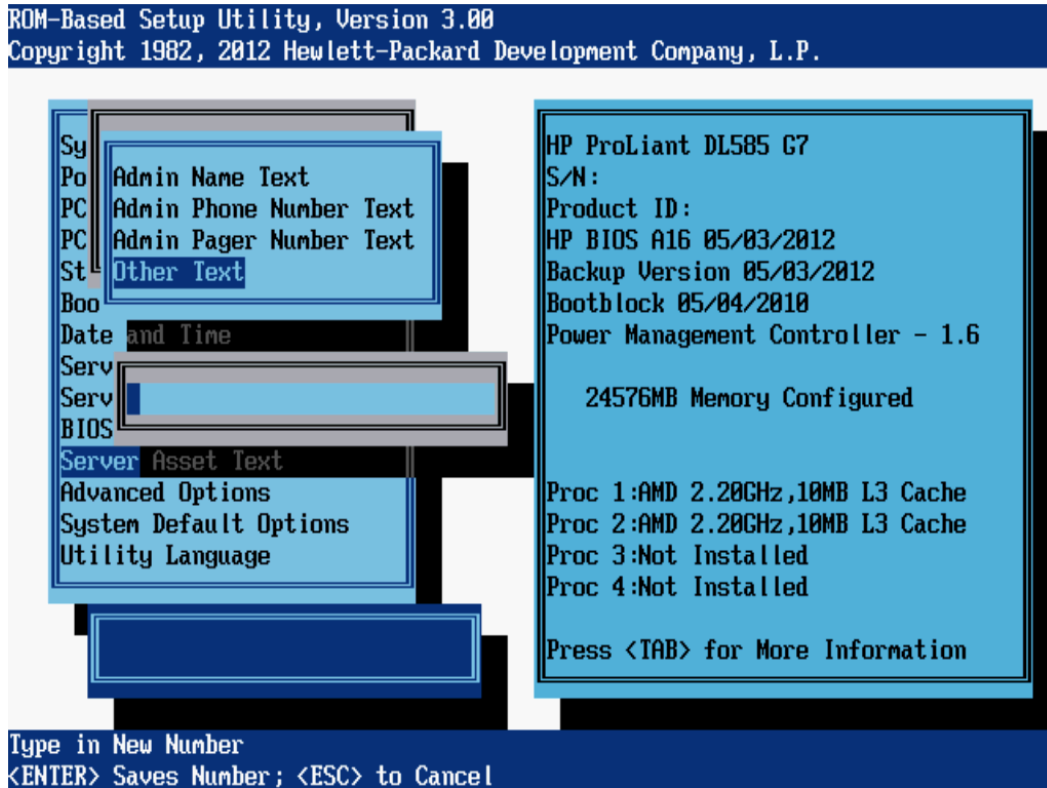


Administrator Info Text

These options define reference information for the server administrator, which is displayed in Insight Manager.

- **Admin Name Text**—Defines the server administrator name.
- **Admin Phone Number Text**—Defines the server administrator phone number.
- **Admin Pager Number Text**—Defines the server administrator pager number.
- **Other Text**—Defines additional text relating to the server administrator.

NOTE: The number of characters allowed for each entry varies depending on server model. By default, all values are blank.

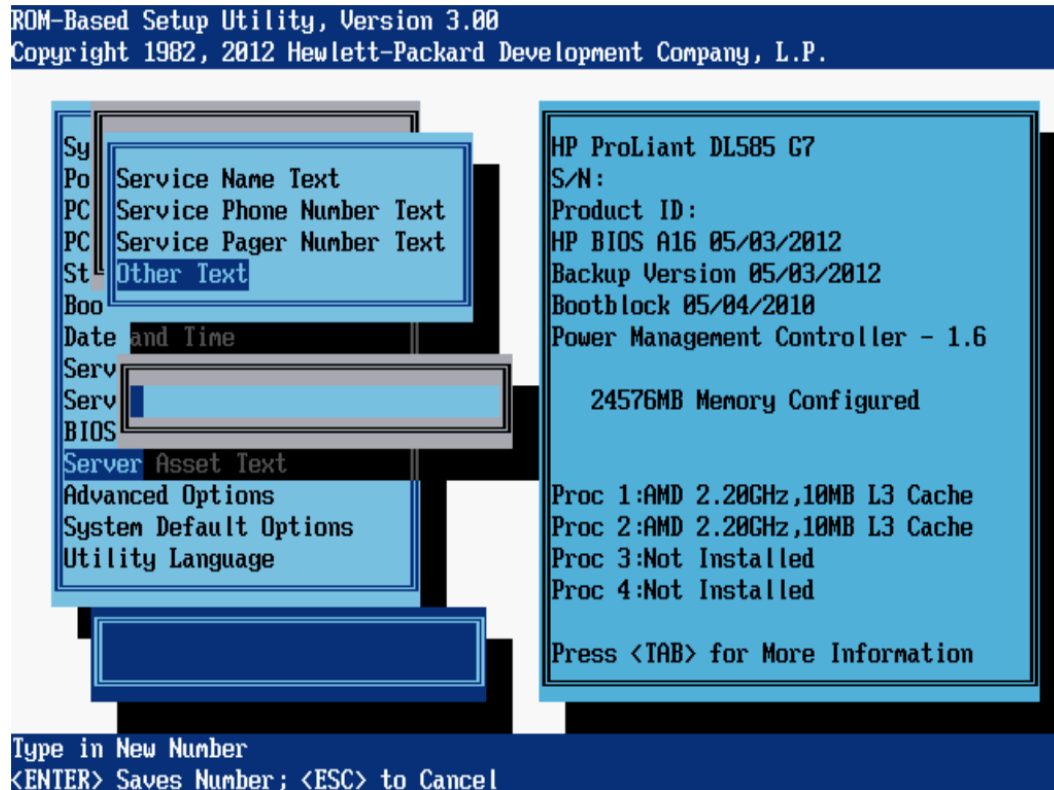


Service Contact Text

These options define reference information for the server administrator, which is displayed in Insight Manager.

- **Service Name Text**—Defines a two-line description for the service contact name.
- **Service Phone Number Text**—Defines two lines of text for the service contact phone number.
- **Service Pager Number Text**—Defines two lines of text for the service contact pager number.
- **Other Text**—Defines two lines of additional text relating to the service contact.

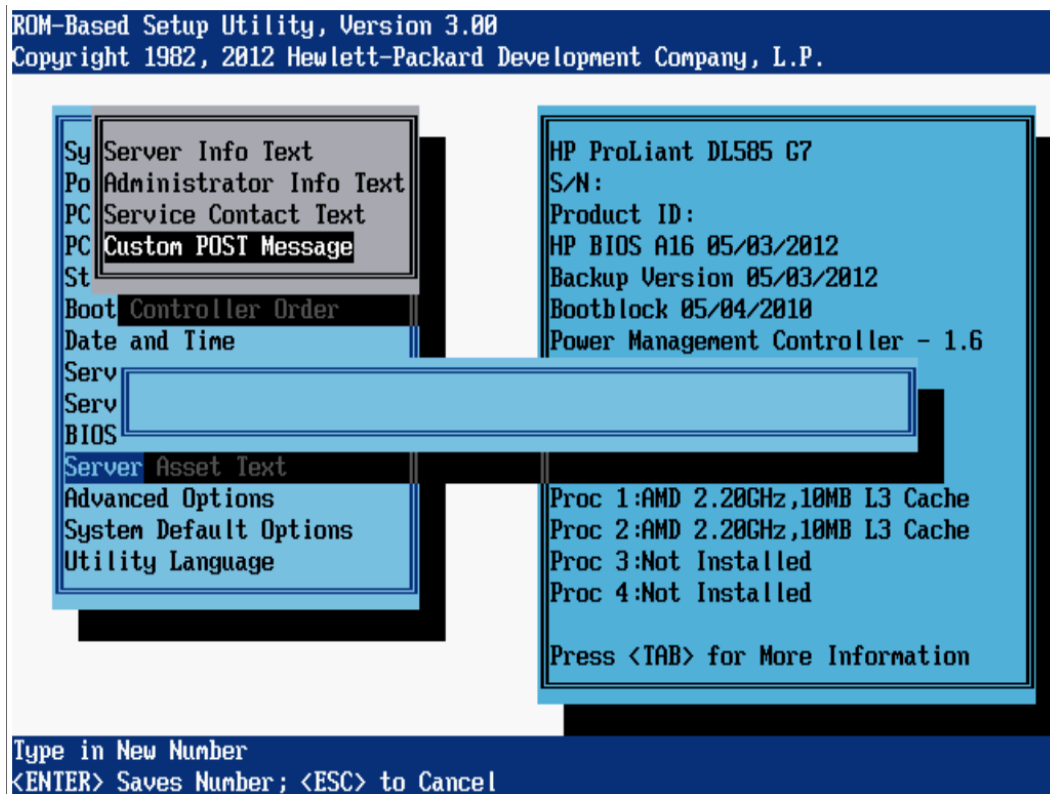
NOTE: The number of characters allowed for each entry varies depending on server model. By default, all values are blank.



Custom POST Message

The Custom POST Message option enables the user to enter a custom message to display during POST.

A maximum of 60 characters is supported. By default, this value is blank.



Advanced Options menu

The Advanced Options menu includes the following options:

- [“Advanced System ROM Options” \(page 103\)](#)
- [“Video Options” \(page 120\)](#)
- [“Power Supply Requirements Override” \(page 121\)](#)
- [“Thermal Configuration” \(page 122\)](#)
- [“Service Options” \(page 123\)](#)
- [“Advanced Performance Tuning Options” \(page 125\)](#)
- [“One Terabyte Memory Limit” \(page 147\)](#)
- [“Drive Write Cache” \(page 148\)](#)
- [“Asset Tag Protection” \(page 149\)](#)
- [“Embedded SATA RAID” \(page 151\)](#)

NOTE: Menu options may differ from those in this document, depending on specific server options.

Advanced System ROM Options

- [“Option ROM Loading Sequence” \(page 104\)](#)
- [“MPS Table Mode” \(page 105\)](#)
- [“ROM Selection” \(page 106\)](#)
- [“NMI Debug Button” \(page 107\)](#)
- [“Virtual Install Disk” \(page 108\)](#)
- [“PCI Bus Padding Options” \(page 109\)](#)
- [“Memory Mapped I/O Options” \(page 110\)](#)
- [“Address Mode 44-bit” \(page 111\)](#)
- [“Power-On Logo” \(page 112\)](#)
- [“F11 Boot Menu Prompt” \(page 113\)](#)
- [“SR-IOV” \(page 150\)](#)
- [“Consistent Device Naming” \(page 114\)](#)
- [“Network Boot Retry Support” \(page 115\)](#)
- [“Hide Option ROM Messages” \(page 116\)](#)
- [“PCIe Slot6 Training Speed” \(page 117\)](#)
- [“Reset on Boot Device Not Found” \(page 118\)](#)
- [“HP Option ROM Prompting” \(page 119\)](#)

Option ROM Loading Sequence

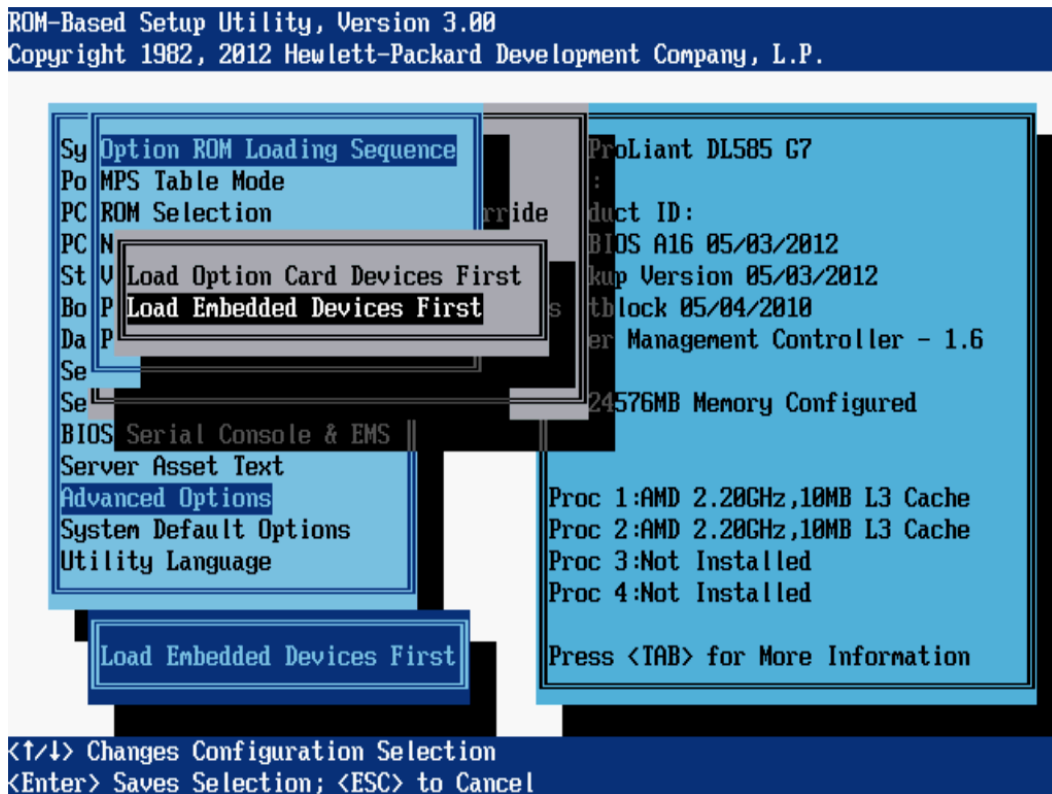
NOTE: This option is available on G7 servers.

This feature controls whether the option ROM for embedded devices or expansion boards loads first. This feature addresses issues such as when the PXE option ROM for the embedded NIC does not load because of a lack of available option ROM space.

CAUTION: Changing this option restores the Standard Boot Order (IPL) to the default settings.

After reading the warning message, press any key to display the following settings:

- **Load Option Card Devices First**
- **Load Embedded Devices First** (default)



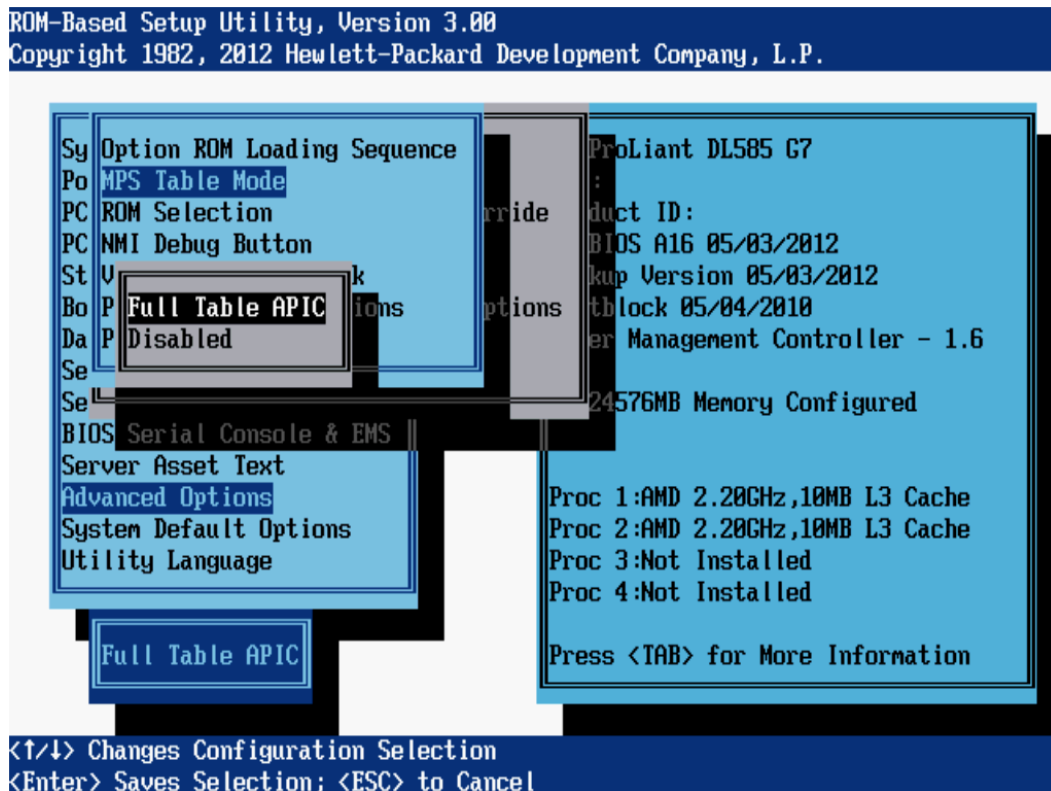
MPS Table Mode

MPS Table Mode (Multi Processor Specification Table/APIC) is used to interrupt routing. Certain unsupported operating systems may require disabling the MPS Table.

- ❗ **IMPORTANT:** This setting is pre-selected. You can override the default setting at this menu, but successful OS operation is dependent upon the correct (default) setting.

Options include:

- **Full Table APIC** (default)
- **Disabled**

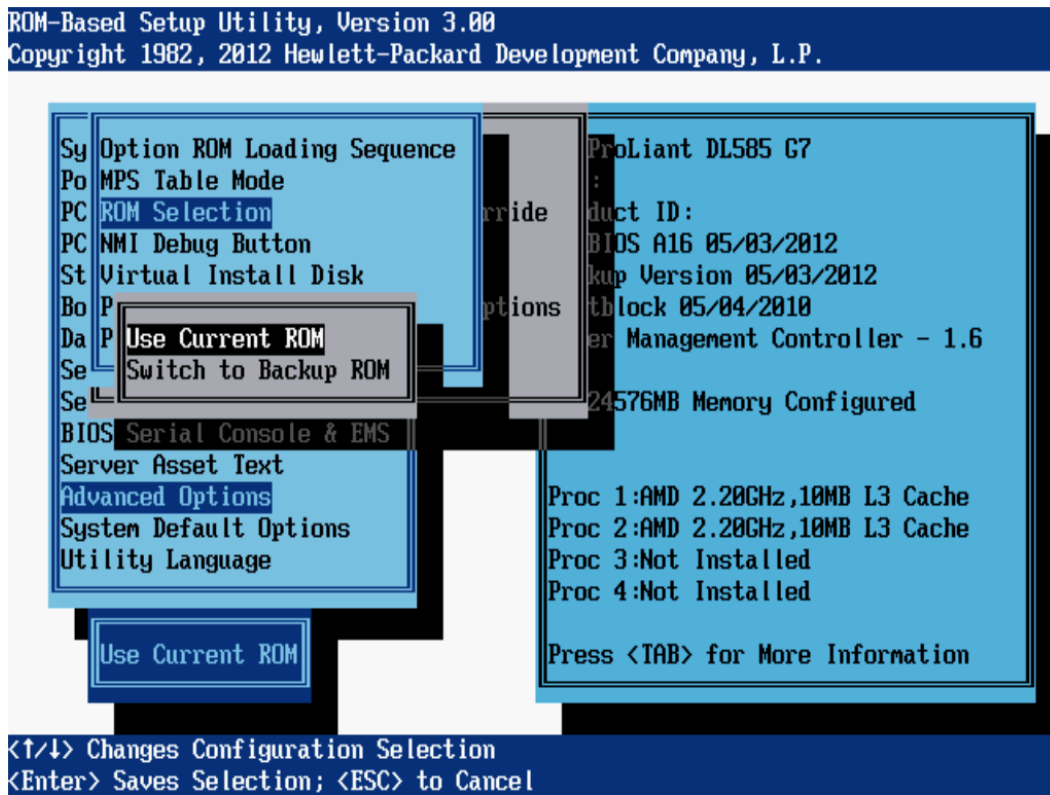


ROM Selection

The ROM Selection option toggles the server ROM between the current ROM and the backup ROM. This option is supported only on servers with redundant ROMs.

Options include:

- **Use Current ROM** (default)
- **Switch to Backup ROM**



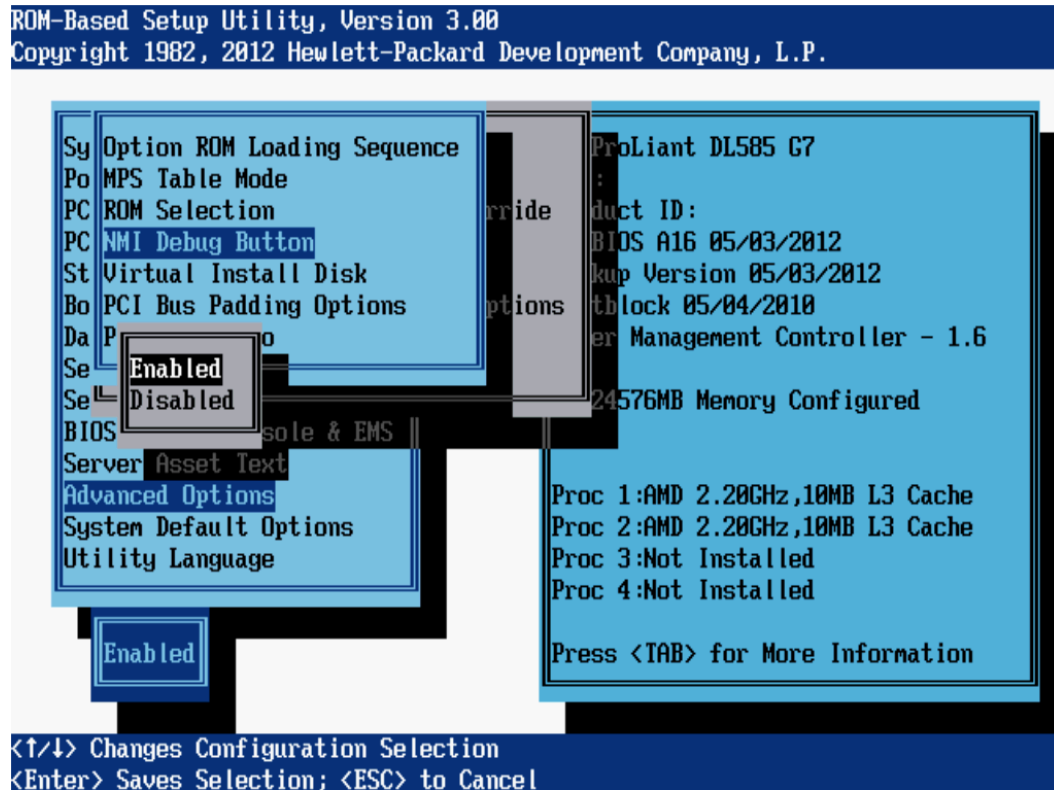
NMI Debug Button

The NMI Debug Button option is a toggle setting that allows you to enable debug functionality when the system has experienced a software lock-up. The NMI Debug Button generates an NMI to enable the use of the operating system debugger.

CAUTION: When enabled, pressing the NMI Debug Button on the system board during normal operation halts the system.

Options include:

- **Enabled** (default)
- **Disabled**



Virtual Install Disk

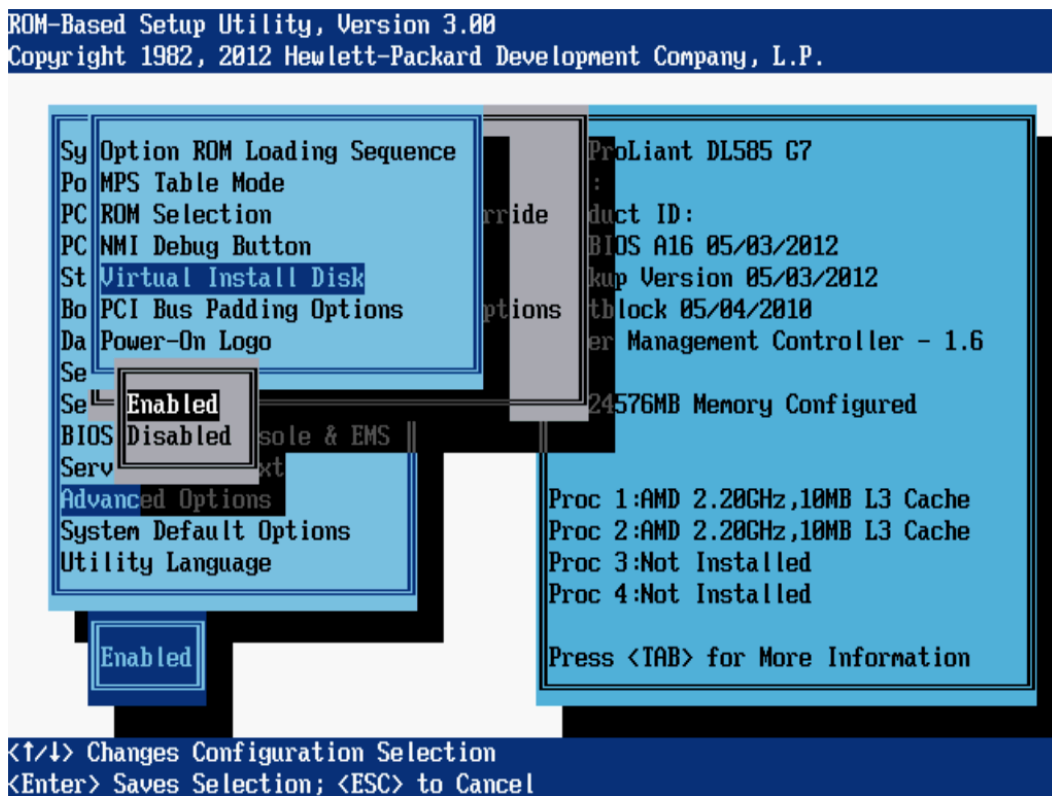
This option controls the Virtual Install Disk. The Virtual Install Disk may contain drivers specific to the server that an operating system may use during installation. When the Virtual Install Disk option is enabled, Microsoft Windows Server automatically locates required drivers and installs them, eliminating the need for user intervention and the requirement that a driver be present on external media during OS installation. In some cases, the Virtual Install Disk remains visible from the installed OS as a read only drive. During manual installations using Intelligent Provisioning, this feature is automatically enabled.

To further optimize the system, HP recommends updating boot drivers to the latest versions after the OS installation.

Options include:

- **Enabled**—This feature operates differently in Gen8 and G7 environments:
 - Gen8 environments: Makes visible a read-only virtual disk (256MB)
 - G7 environments: Makes visible a read-only virtual floppy (1.44MB)
- **Disabled** (default)

NOTE: When Intelligent Provisioning software is updated, this Virtual Install Disk is automatically updated.



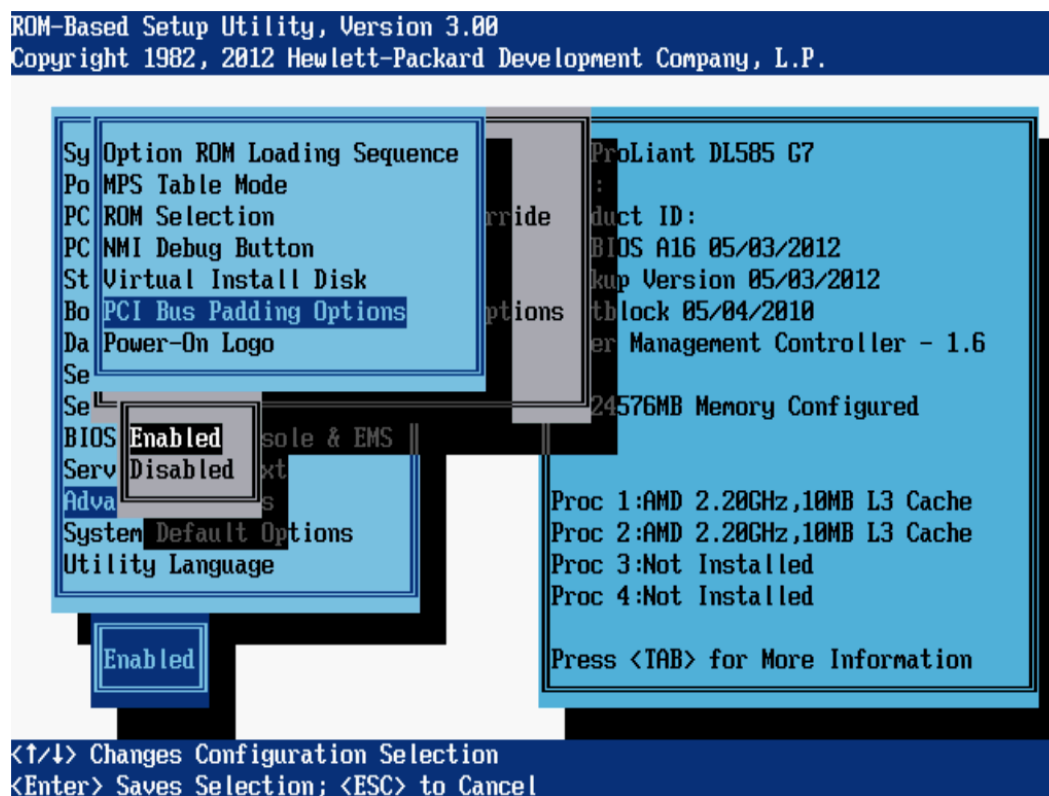
PCI Bus Padding Options

This option allows the user to disable the default PCI Bus padding where each expansion slot is provided with an extra PCI Bus number. By default, the System ROM pads bus numbers for slots such that adding expansion cards does not affect the bus numbering of devices in the system. Disabling this option works around issues with certain expansion cards.

HP recommends disabling this option only when you encounter a specific issue.

Options include:

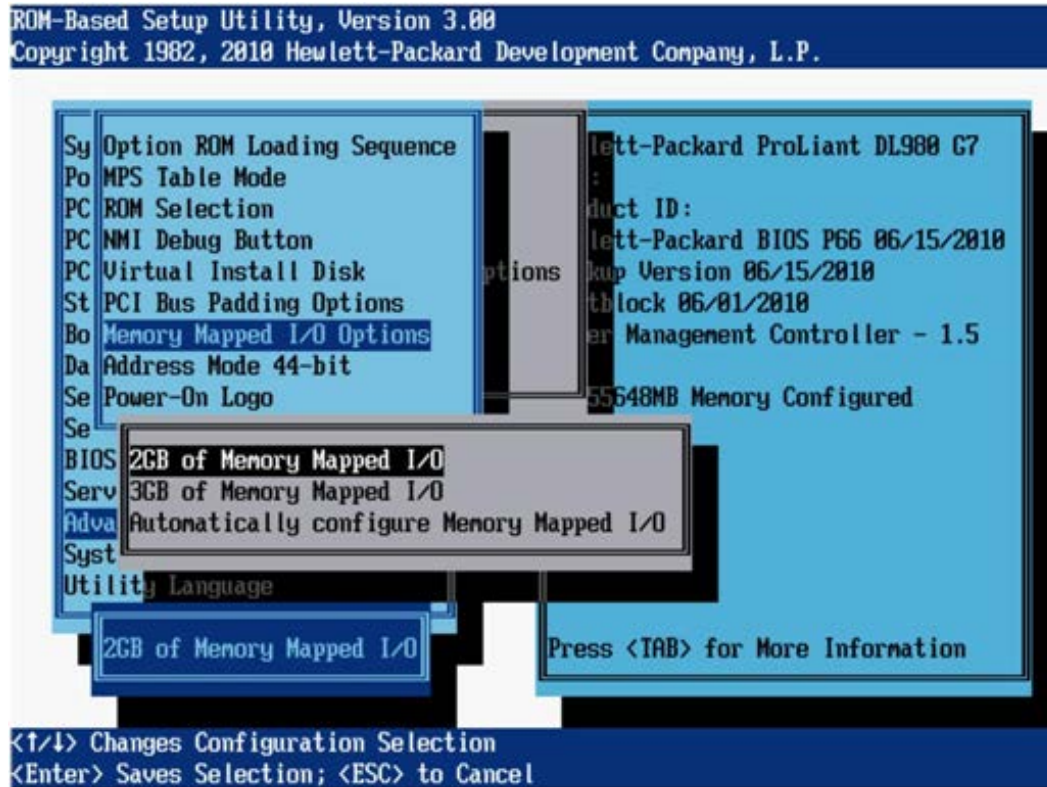
- **Enabled** (default)
- **Disabled**



NOTE: This option is available only on some G7 servers.

The following menu options allow the user to select the amount of Memory Mapped I/O:

- **2GB of Memory Mapped I/O** (default)
- **3GB of Memory Mapped I/O**
- **Automatic**—The system ROM configures either 2GB or 3GB depending on the amount of Memory Mapped I/O the system requires.



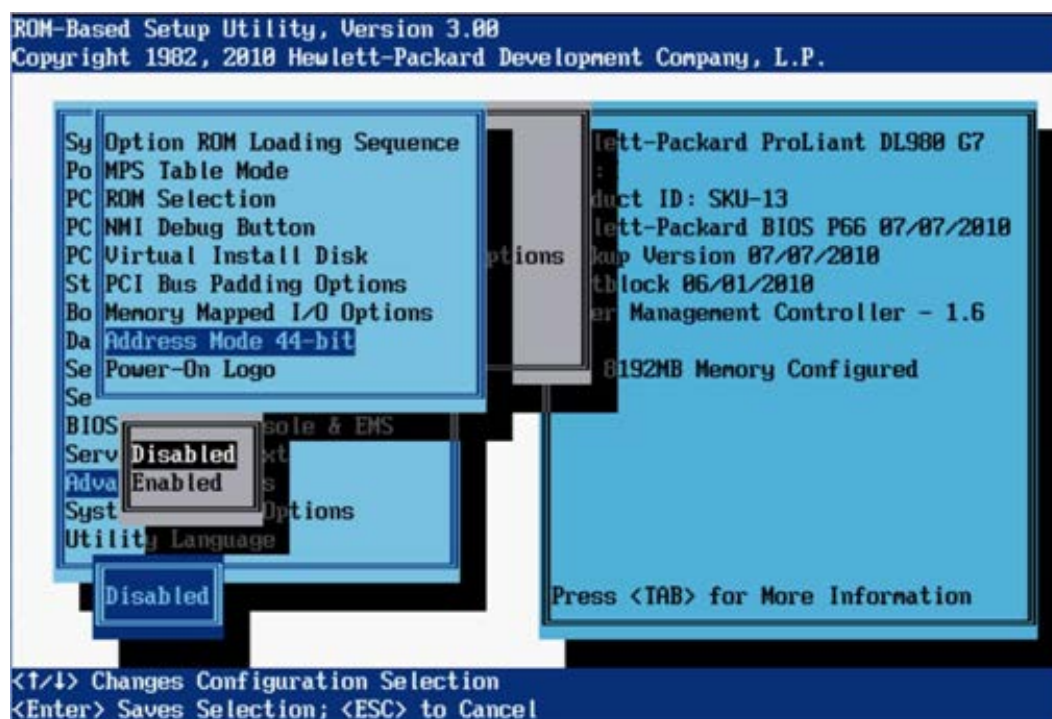
NOTE: This option is available only on DL980 G7 servers.

Enabling this option allows memory to be addressed with 44 bits, allowing for configuration of a large memory configuration, such as servers with more than 1 TB of memory. Verify that the OS supports 44-bit addressing capability before enabling this option.

When this option is disabled, some installed memory in the system may not be configured; therefore, it will not be recognized by the OS. This impact varies depending on the system memory configuration.

Options include:

- **Disabled** (default)—only 40-bits are used.
- **Enabled**

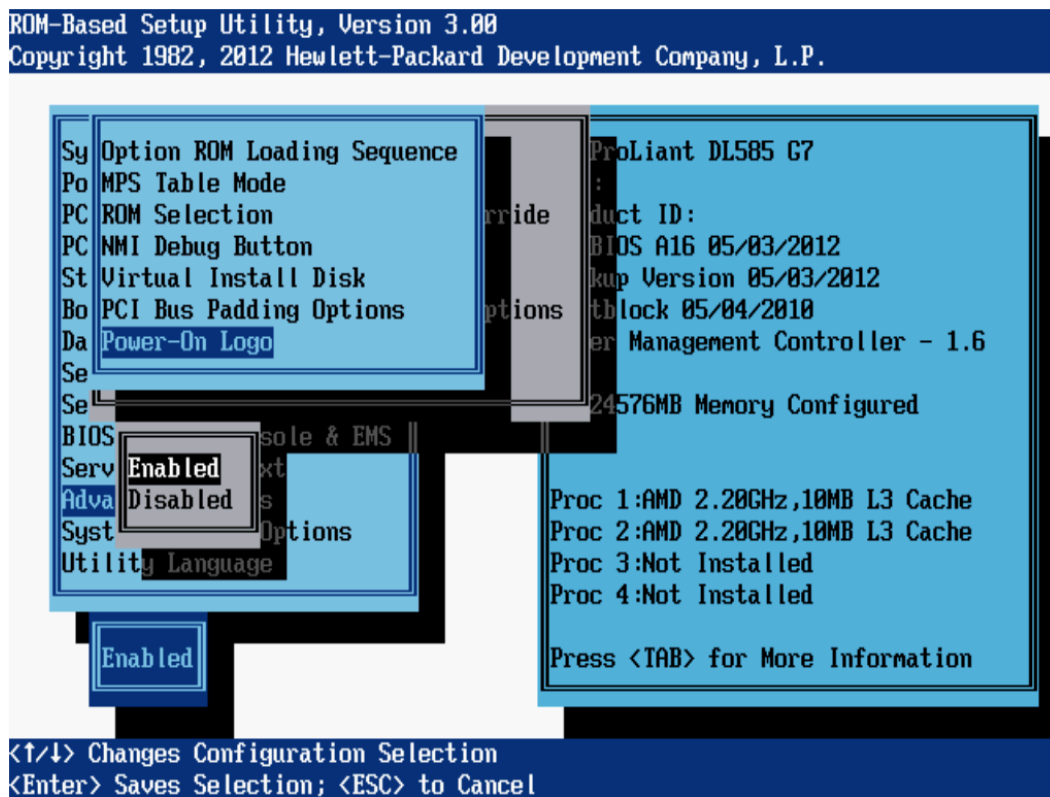


Power-On Logo

This option controls the display of the logo during system boot. This is an aesthetic modification only and does not affect the system boot times.

Options include:

- **Enabled** (default)
- **Disabled**



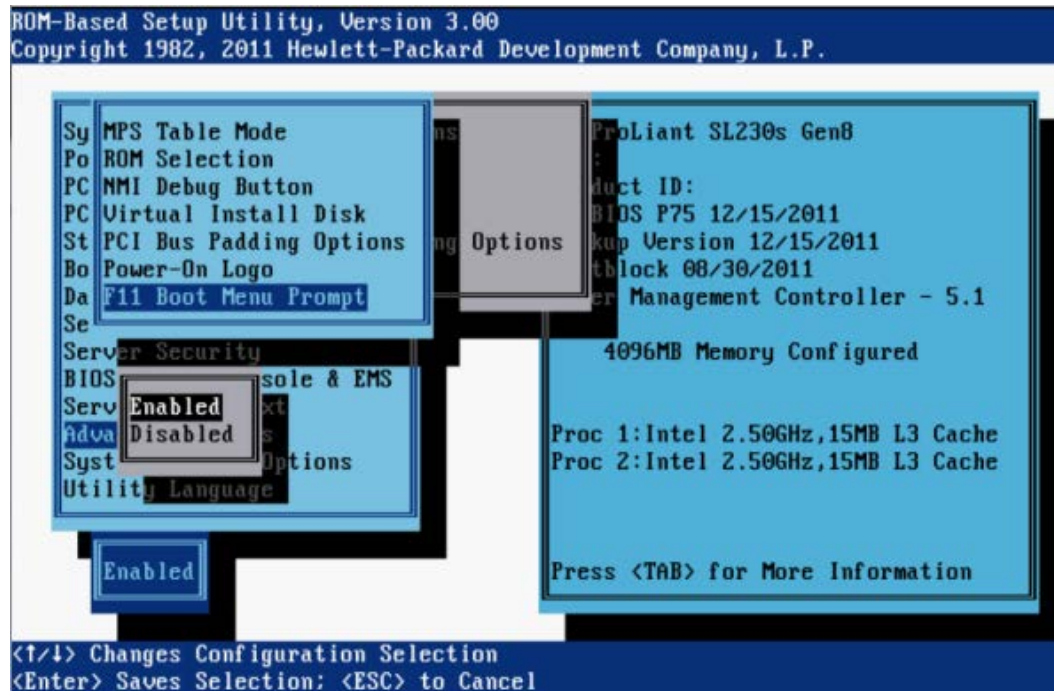
F11 Boot Menu Prompt

NOTE: This option is available on Gen8 servers with Intel processors.

This option allows the disabling of the POST One Time Boot F11 Prompt.

Options include:

- **Enabled** (default)
- **Disabled**



Consistent Device Naming

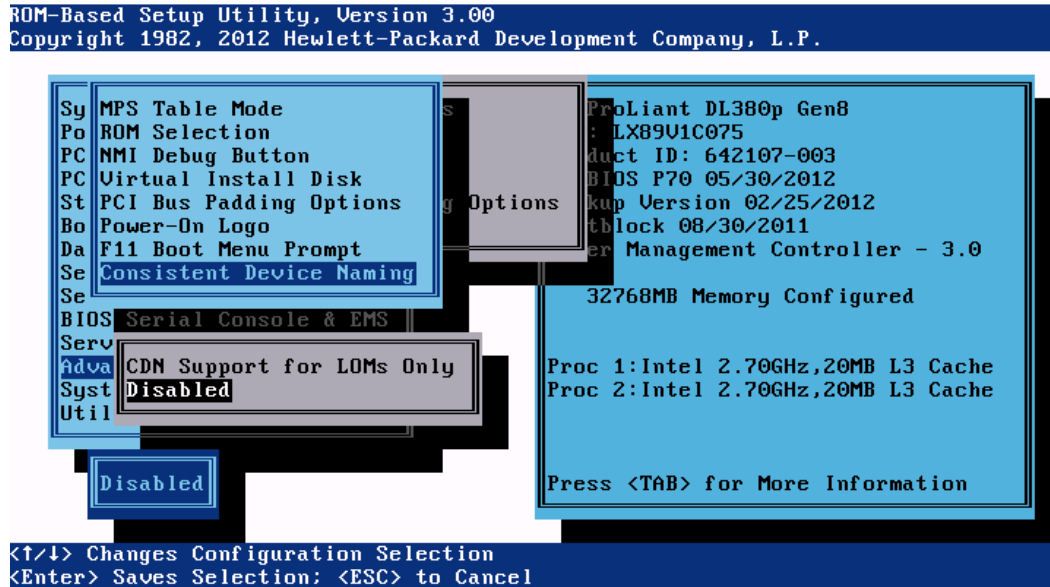
NOTE: This option is available on Gen8 servers.

This option controls names assigned to devices.

Options include:

- **CDN Support for LOMs only**—Embedded NICs and FlexibleLOM (not NICs installed in expansion slots) are named based on their location in the system
- **Disabled** (default)—All NIC ports are named based on their location in the system.

NOTE: Existing NIC connections retain their names until reinstalled under the OS environment.



NOTE: This option is available only on Gen8 servers.

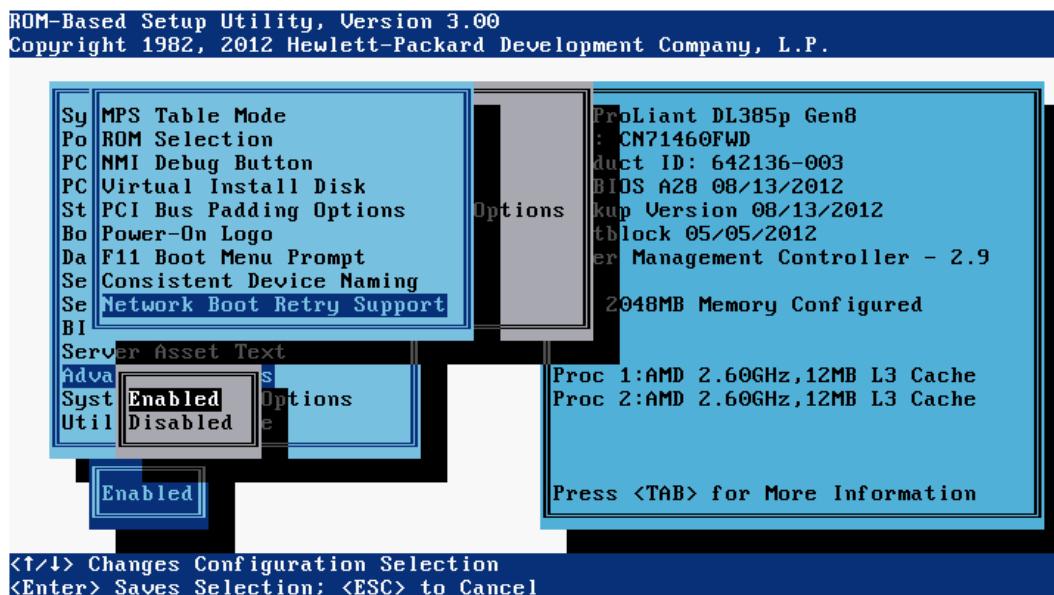
This option controls system logic for retrying a failed network boot when attempting to boot from an installed network adapter. This option affects only the primary network adapter listed in the Standard Boot Order (IPL).

For information about what happens to the booting sequence when none of the devices in the IPL are bootable, see [“Reset on Boot Device Not Found” \(page 118\)](#).

Options include:

- **Enabled** (default)—The system attempts to boot from the primary network adapter up to 20 times before trying to boot from the next IPL device.
- **Disabled**—If the system cannot boot from the primary network adapter, it immediately tries to boot from the next IPL device.

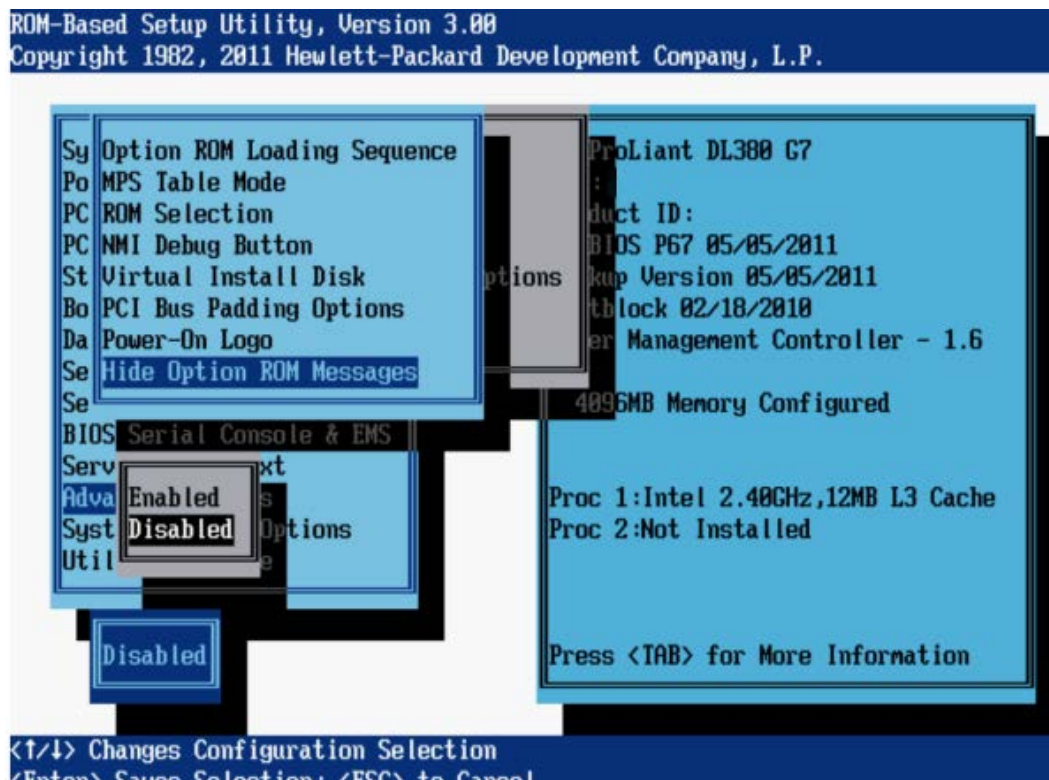
For more information about the IPL, see [“Standard Boot Order \(IPL\) menu” \(page 74\)](#).



NOTE: This option is available on some G7 and Gen8 and servers with Intel processors.

This option controls the display of F-key prompts during POST.

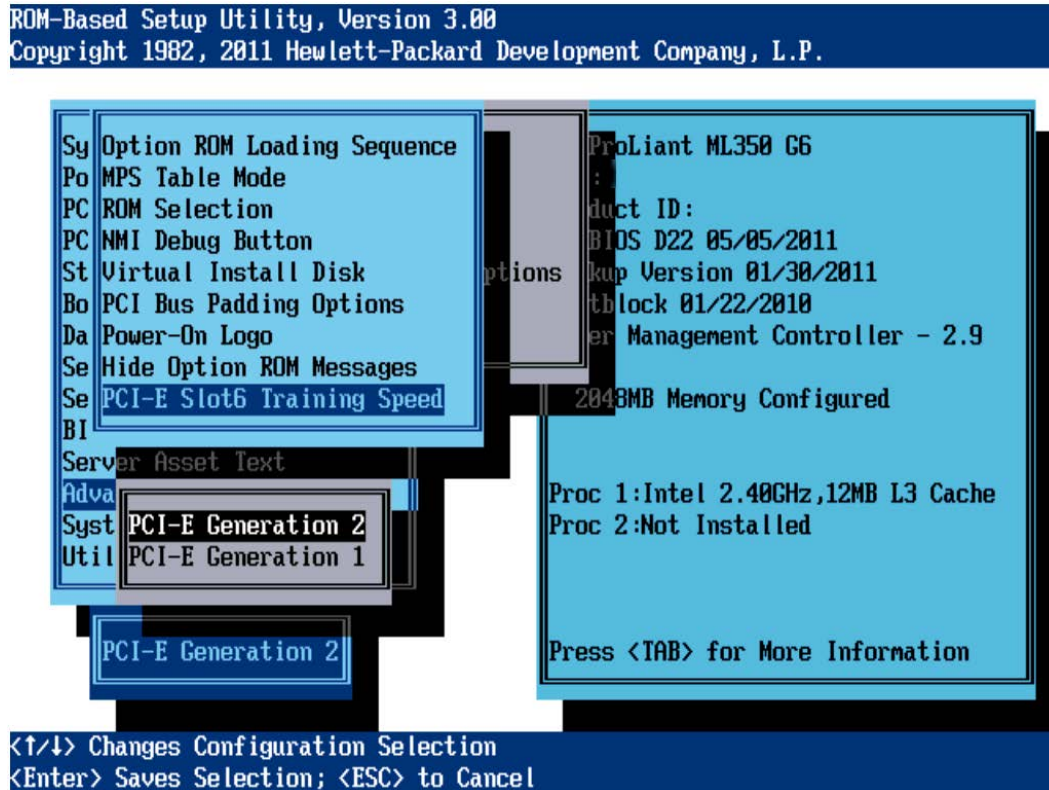
- **Enabled** (default)—Hides all F-key prompts during startup. When enabled, components such as iLO and Smart Array controllers cannot be configured during POST.
- **Disabled**—F-key prompts are displayed during startup.



NOTE: This option is available on some G6 servers with Intel processors.

This option controls PCI express slot 6 only and does not impact the operation of PCIe slots 1-5.

- **PCIe Generation 2** (default)
- **PCIe Generation 1**



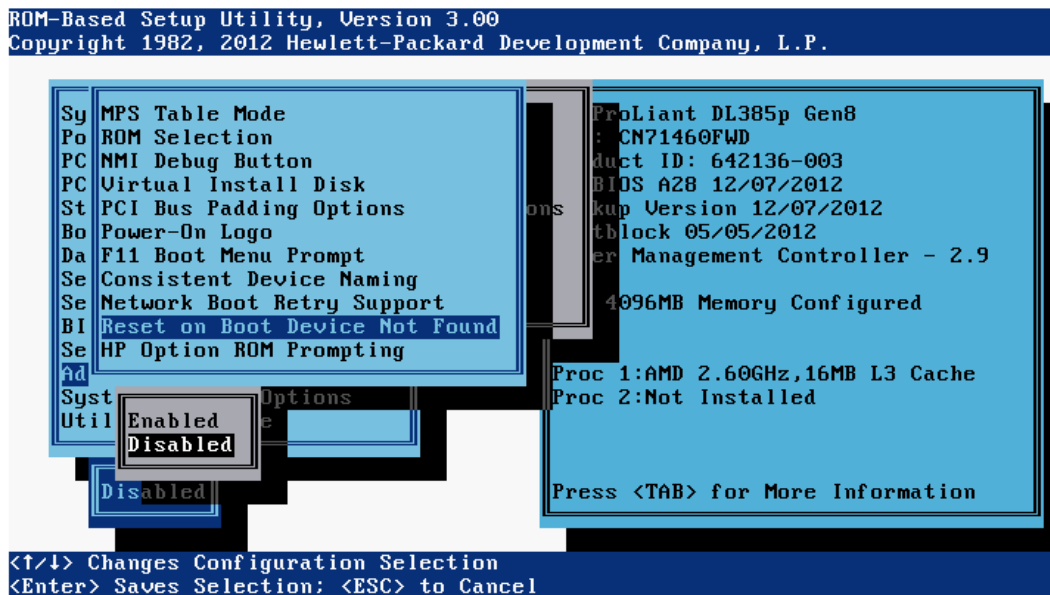
Reset on Boot Device Not Found

NOTE: This option is available on Gen8 servers with Intel processors.

This option controls the System ROM logic of what happens when bootable devices listed in the Standard Boot Order (IPL) are not found.

Options include:

- **Enabled**— System ROM resets the platform after one attempt through the Standard Boot Order (IPL).
- **Disabled** (default)—System ROM continually loops through the Standard Boot Order (IPL).

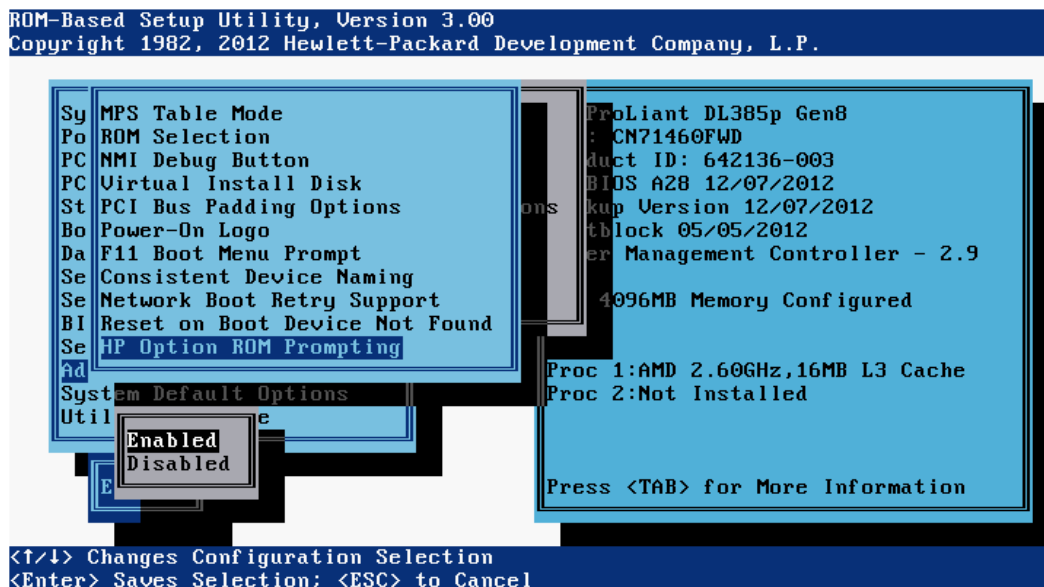


NOTE: This option is available on Gen8 servers with Intel processors.

This option controls whether HP expansion cards discovered during POST will prompt for user input to enter expansion card setup utilities.

Options include:

- **Enabled** (default)—If unconfigured expansion cards are discovered during POST, the system will prompt the user, asking whether to open the expansion card setup utility. POST is halted until you enter a response to the prompt.
- **Disabled**—The POST process will not provide a prompt about configuring expansion cards.



Video Options

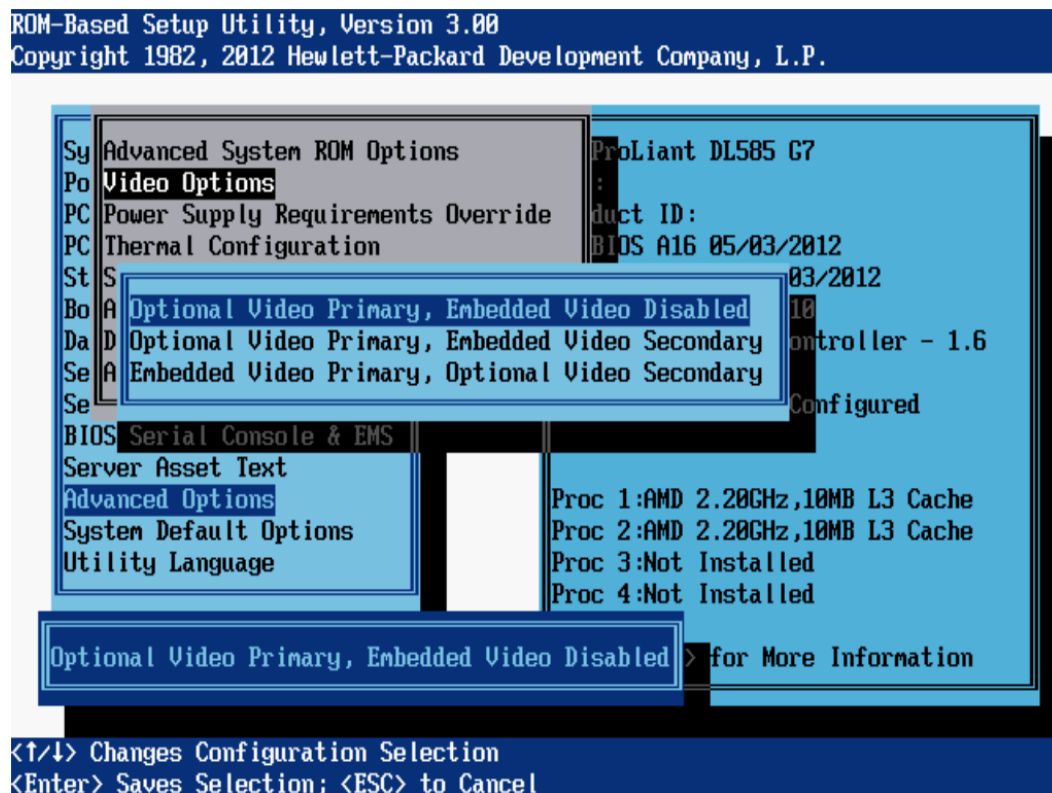
These options control the video display.

Options include:

- **Optional Video Primary, Embedded Video Disabled** (default)—System ROM disables the embedded video controller when an optional video controller is installed in the system.
- **Optional Video Primary, Embedded Video Secondary**—The embedded video controller remains enabled for iLO remote video functionality. The optional video controller is enabled as the primary video controller and is used to show text during POST.
- **Embedded Video Primary, Optional Video Secondary**—The embedded video controller is enabled as the primary controller and shows POST text as well as function for iLO remote video functionality. The secondary controller is enabled for use under an operating system.

NOTE:

- The ability to support dual-head video between the embedded and a stand up device is dependent on support from the operating system. For more information, see your operating system documentation.
- When multiple optional video cards are installed, the card that is selected as primary is based on PCI enumeration, which varies depending on the platform. You may have to remove and reinstall the cards in a different order to control which card is the primary controller.



Power Supply Requirements Override

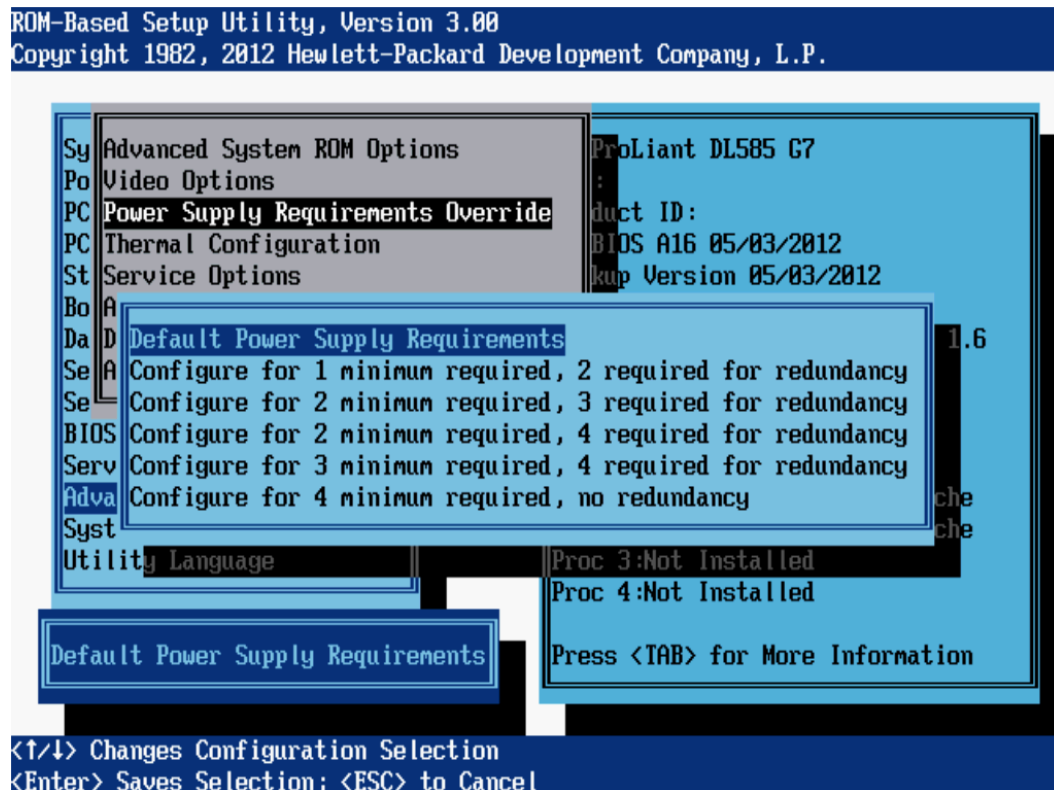
NOTE: This option is available on HP ProLiant DL580 G7 and DL585 G7 servers.

The option enables overriding the system requirement that, when one or more x16 high-powered (225W+) PCI Express graphic cards are installed, the system operate on High Line (200-240 VAC). When this option is enabled, the system is allowed to boot and operate even if the system is operating on Low Line (100-120 VAC).

CAUTION: When Power Supply Requirements Override is enabled, some configurations may not operate properly. Before enabling this option, verify and understand the system power requirements.

After reading the warning message, press any key to display the following settings"

- **Default Power Supply Requirements**
(default)
- Configure for 1 minimum required, 2 required for redundancy
- Configure for 2 minimum required, 3 required for redundancy
- Configure for 2 minimum required, 4 required for redundancy
- Configure for 3 minimum required, 4 required for redundancy
- Configure for 4 minimum required, no redundancy

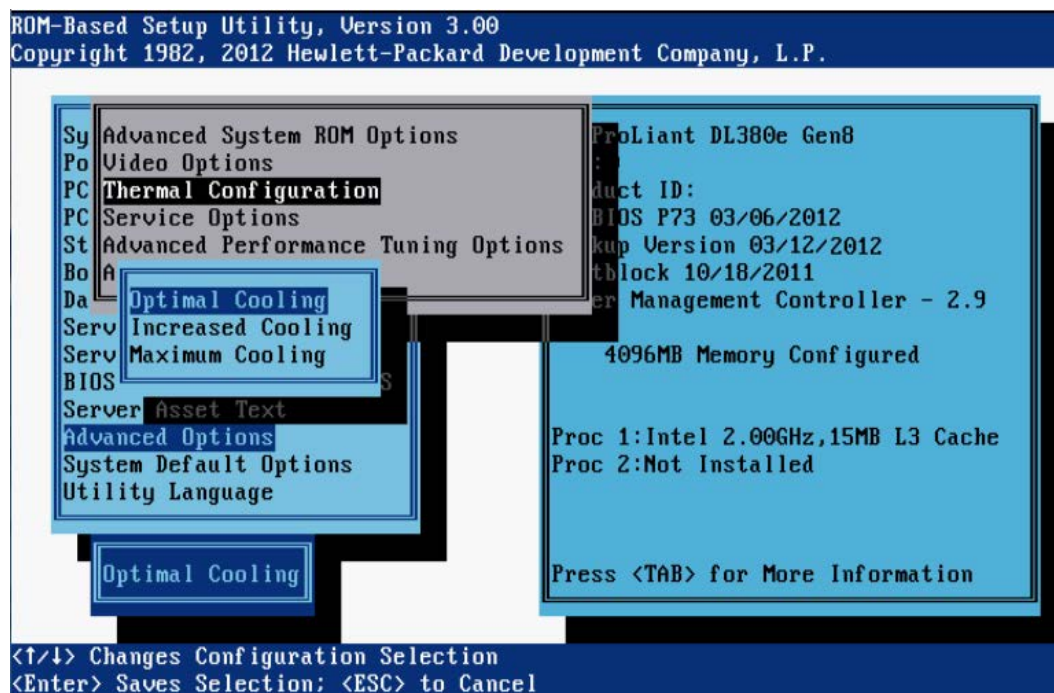


Thermal Configuration

This feature enables the user to select the fan cooling solution for the system.

Depending on the system, options may include:

- **Optimal Cooling** (default)—Provides the most efficient solution by configuring fan speeds to the minimum required to provide adequate cooling.
- **Increased Cooling**—Operates fans at higher speeds to provide additional cooling. HP recommends selecting **Increased Cooling** when a 10GbE NIC Card or I/O Accelerator is installed, or if the system is experiencing thermal issues that cannot be resolved in another manner.
- **Maximum Cooling**—Provides the maximum cooling available for the platform. (Available only on Gen8 servers with Intel processors).



Service Options

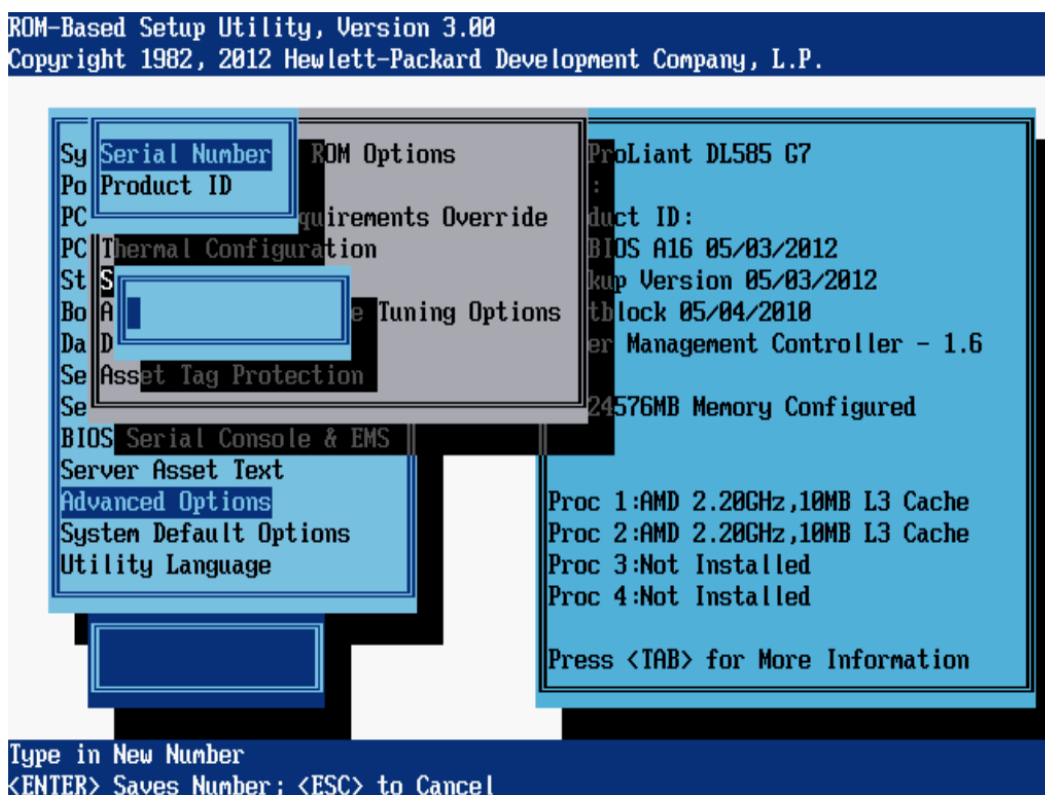
- “Serial Number” (page 123)
- “Product ID” (page 124)

Serial Number

The Serial Number option enables service personnel to change the serial number. HP recommends that you do not change this number unless you are replacing a system board.

- ❗ **IMPORTANT:** The serial number should be modified by qualified service personnel only and must always match the serial number located on the chassis.

After reading the warning message, press any key to display the spaces in which to enter the serial number value.

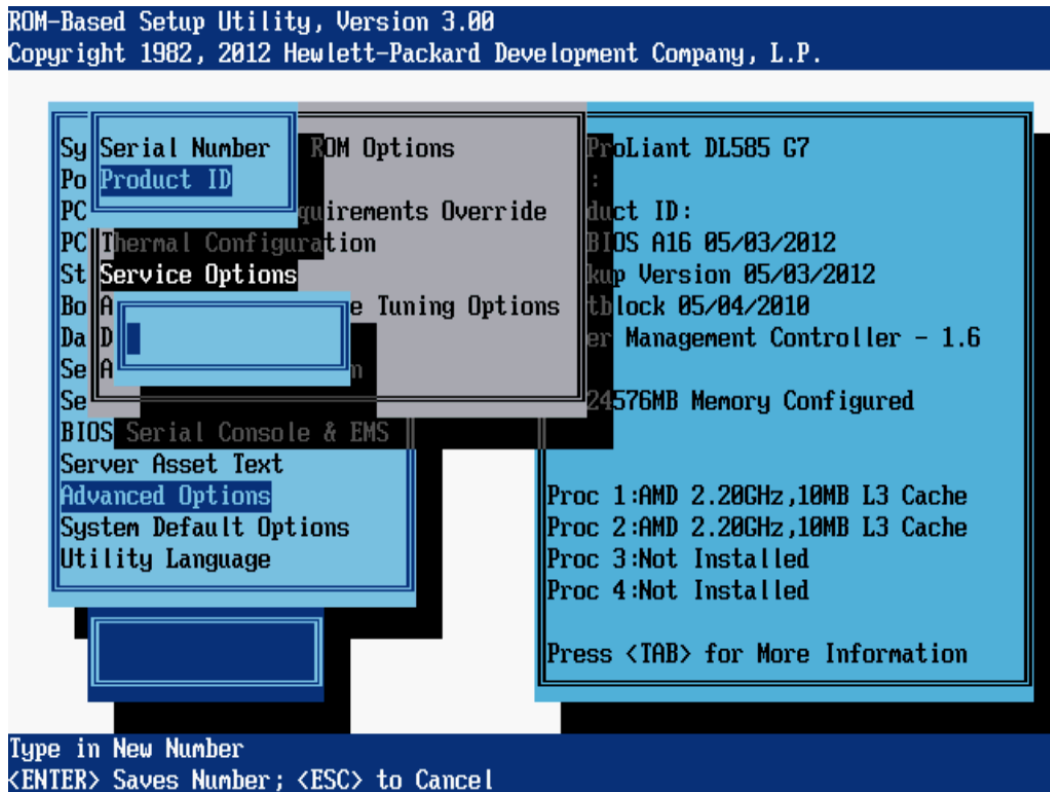


Product ID

The Product ID option sets the system product ID, which is found on the product ID sticker on the chassis.

- ❗ **IMPORTANT:** The Product ID should be modified by qualified service personnel only and must always match the Product ID located on the chassis.

After reading the warning message, press any key to display the spaces for entering the product ID value.



Advanced Performance Tuning Options

Depending on your server model, options may include:

- [“HW Prefetcher” \(page 126\)](#)
- [“Adjacent Sector Prefetch” \(page 127\)](#)
- [“DCU Prefetcher” \(page 128\)](#)
- [“DCU Streamer Prefetcher” \(page 129\)](#)
- [“DCU IP Prefetcher” \(page 130\)](#)
- [“Data Reuse” \(page 131\)](#)
- [“Hardware Prefetch training on Software Prefetch” \(page 132\)](#)
- [“DRAM Prefetch on CPU Request” \(page 133\)](#)
- [“DRAM Prefetch on I/O Request” \(page 134\)](#)
- [“CPU Core Hardware Prefetcher” \(page 135\)](#)
- [“CPU Cache Stride Prefetcher” \(page 136\)](#)
- [“Stack Engine Prediction” \(page 137\)](#)
- [“Node Interleaving” \(page 138\)](#)
- [“1333 MHz Support for 3DPC-10600H HP SmartMemory” \(page 139\)](#)
- [“Data Direct I/O” \(page 140\)](#)
- [“Memory Channel Mode” \(page 141\)](#)
- [“Memory Speed with 2 DIMMs per Channel” \(page 142\)](#)
- [“Hemisphere Mode” \(page 143\)](#)
- [“HPC Optimization Mode” \(page 144\)](#)
- [“ACPI SLIT Preferences” \(page 145\)](#)
- [“Intel Performance Counter Monitor \(PCM\)” \(page 145\)](#)

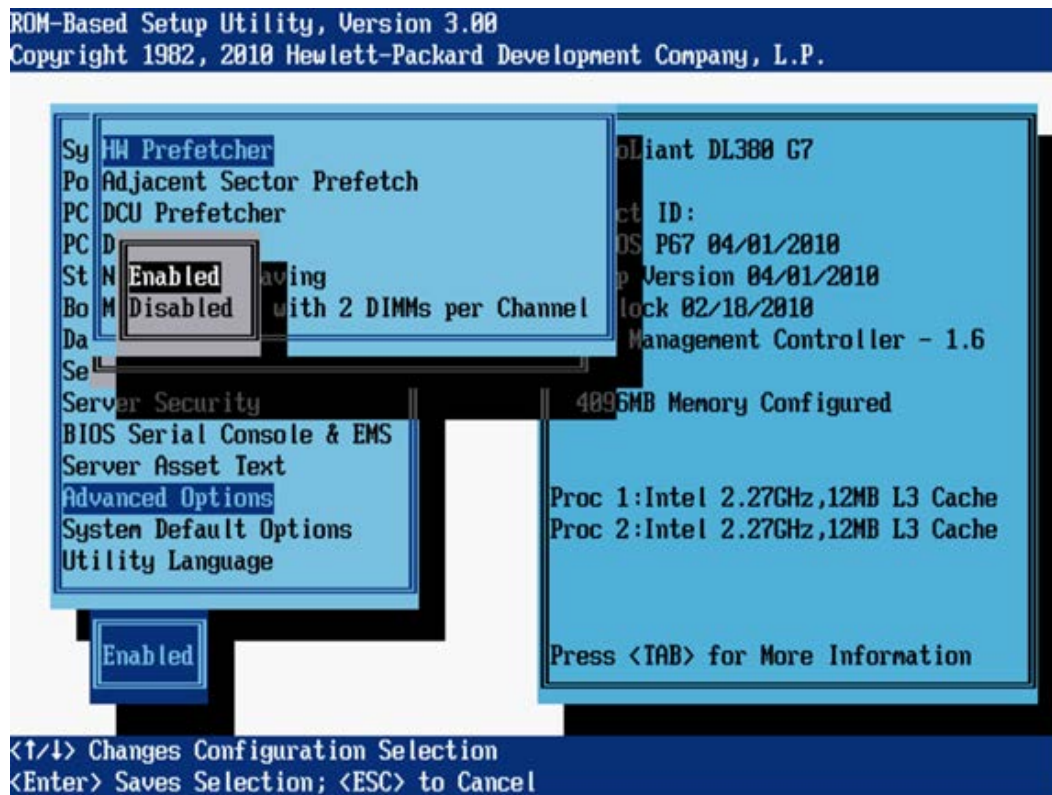
NOTE: This option is available on servers with Intel processors.

This option controls processor prefetch features. In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

❗ **IMPORTANT:** Disabling this option is not recommended because it typically degrades system performance.

Options include:

- **Enabled** (default)
- **Disabled**



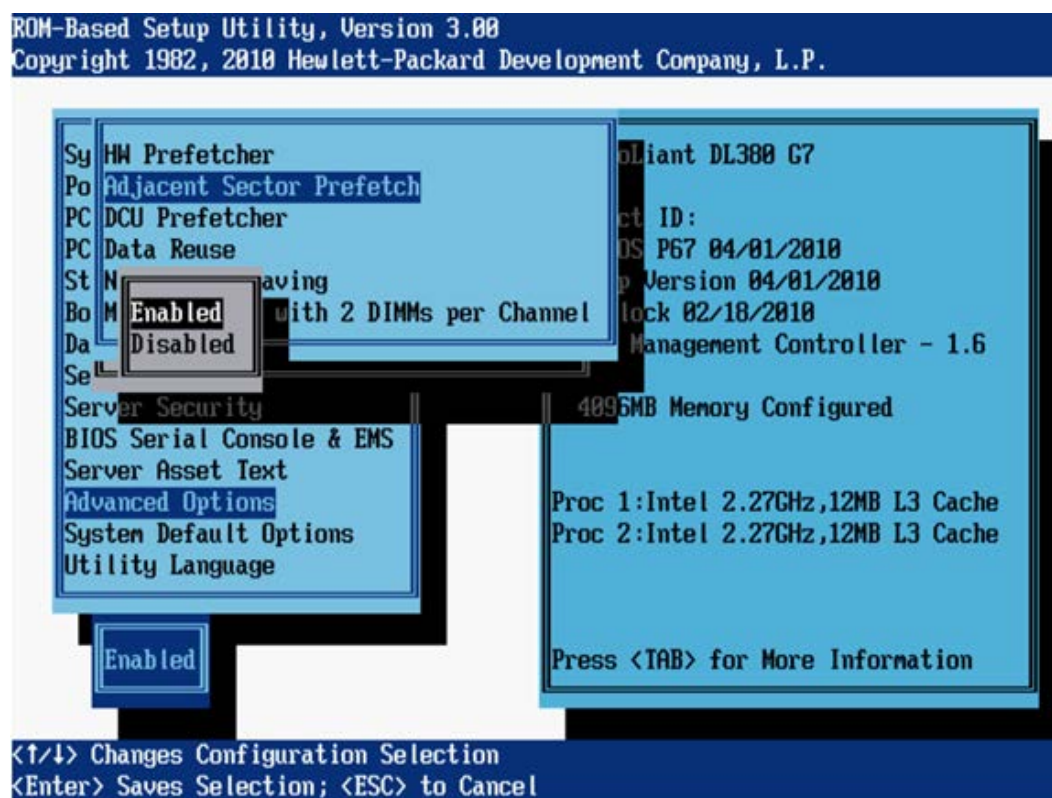
NOTE: This option is available on servers with Intel processors.

This option controls processor prefetch features. In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

- ❗ **IMPORTANT:** Disabling this option is not recommended because it typically degrades system performance.

Options include:

- **Enabled** (default)
- **Disabled**

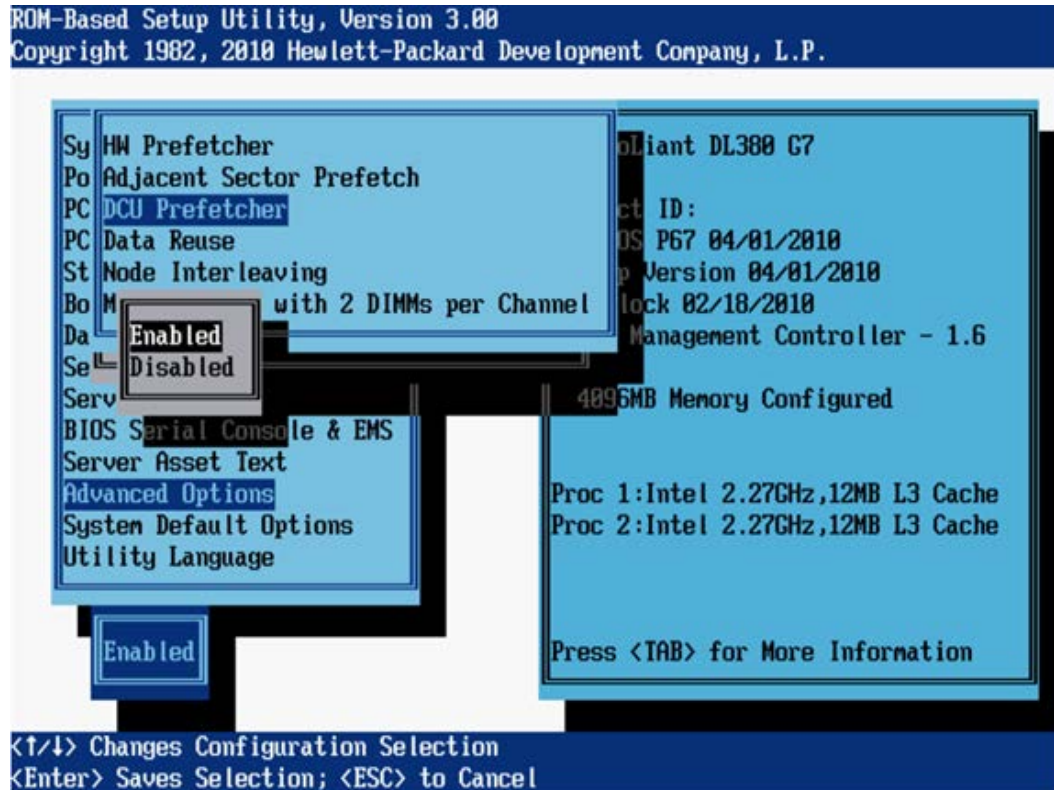


NOTE: This option is available on G7 and earlier servers with Intel processors.

This option controls processor prefetching. In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

Options include:

- **Enabled** (default)
- **Disabled**

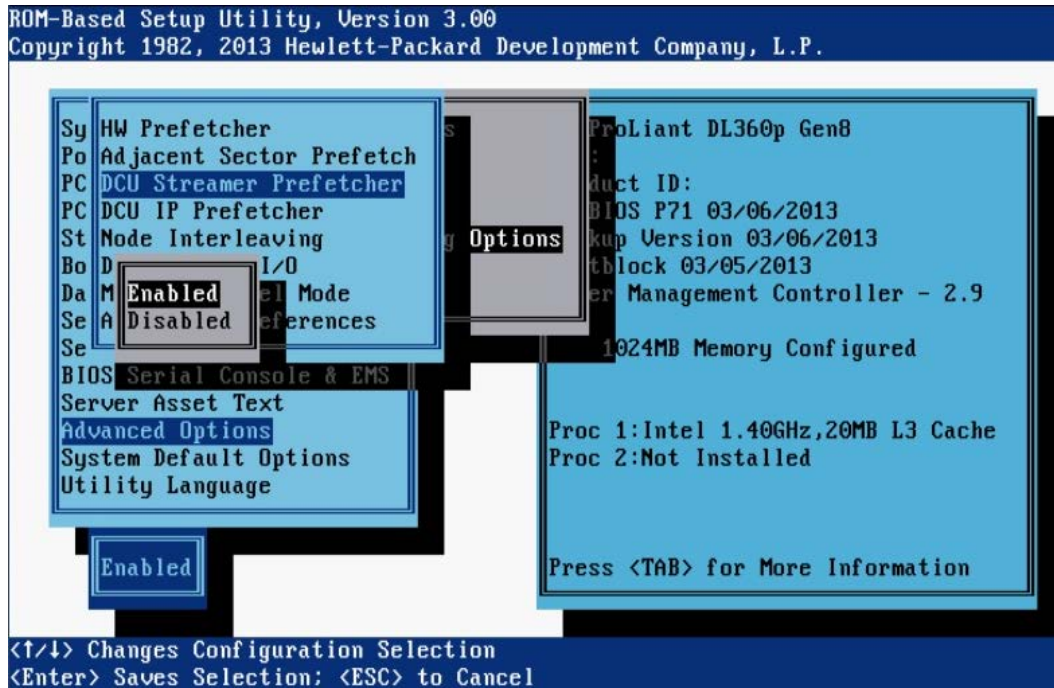


NOTE: This option is available on Gen8 servers with Intel processors.

This option controls processor prefetching. In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

Options include:

- **Enabled** (default)
- **Disabled**

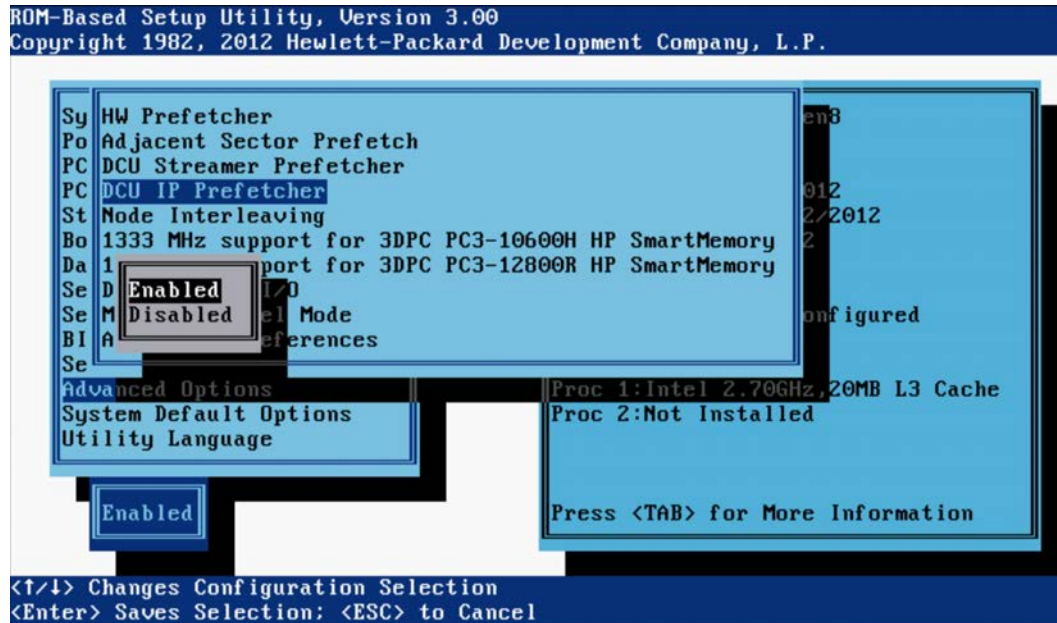


NOTE: This option is available on Gen8 servers with Intel processors.

This option controls processor prefetching. In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

Options include:

- **Enabled** (default)
- **Disabled**

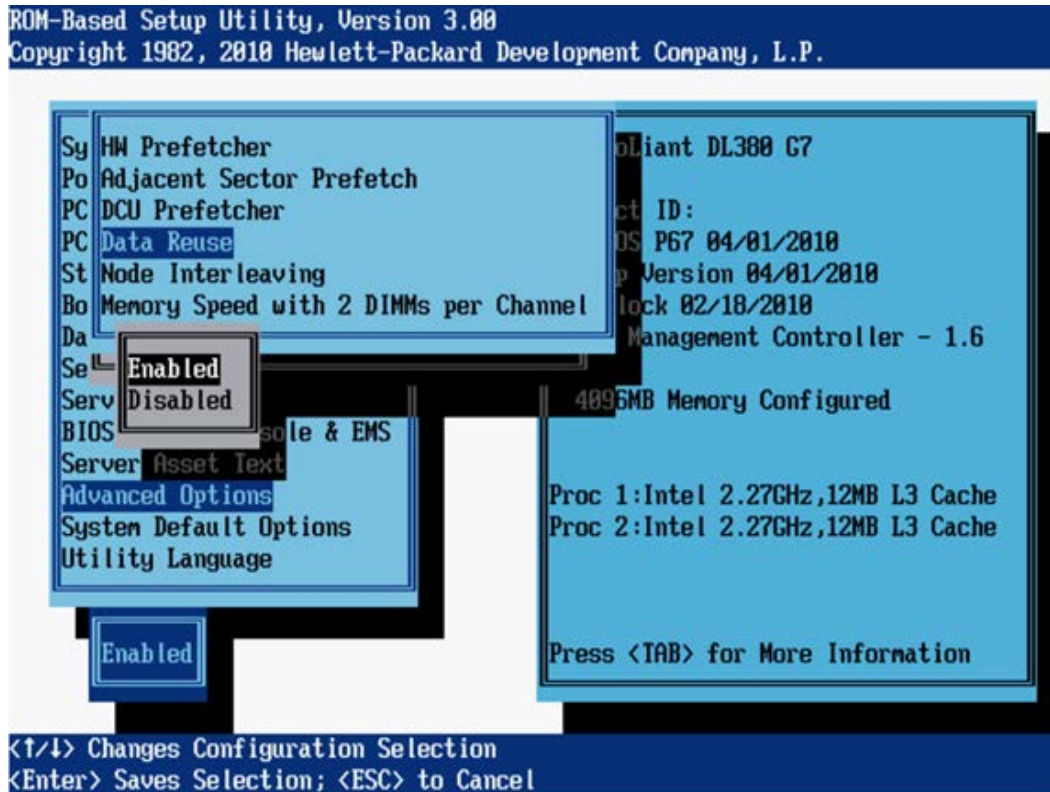


NOTE: This option is available on G7 servers with Intel processors.

This option controls data flow between cache levels. In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

Options include:

- **Enabled** (default)
- **Disabled**



Hardware Prefetch training on Software Prefetch

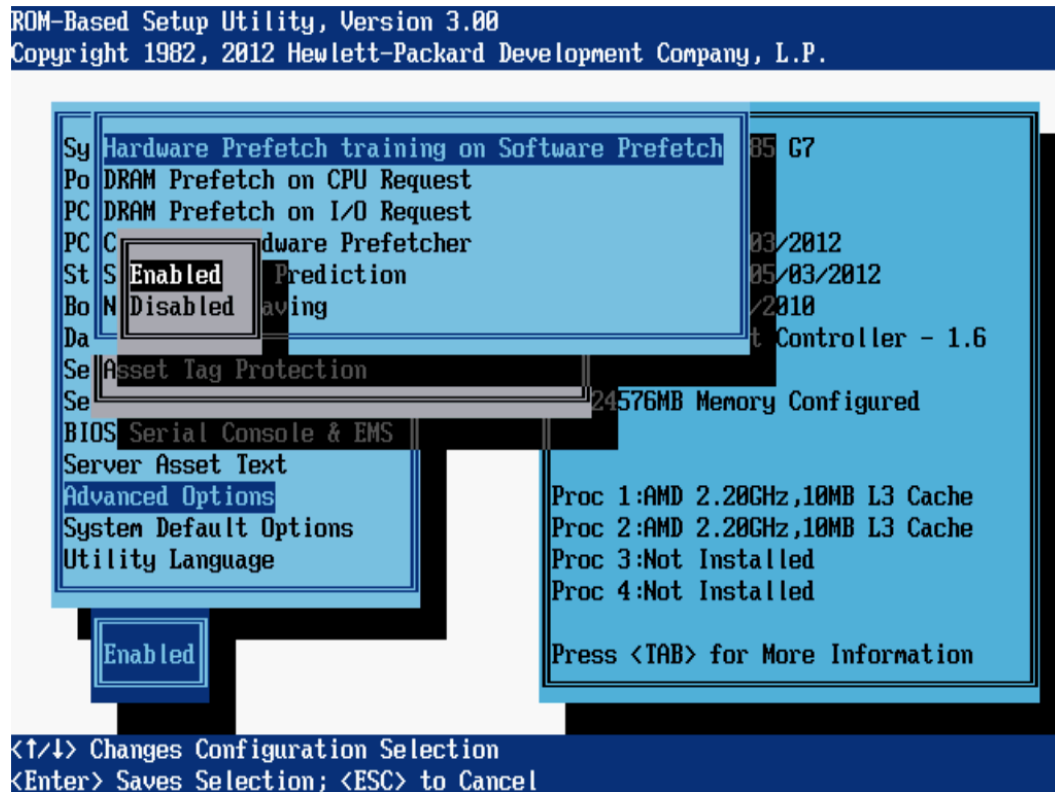
NOTE: This option is available on G7 servers with AMD processors.

The processor assists and calibrates with software prefetching (also known as predicting) technologies for better use of system memory when using applications that manage or request the same kind of information frequently. This option controls those processor prefetch features.

In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

Options include:

- **Enabled** (default)
- **Disabled**



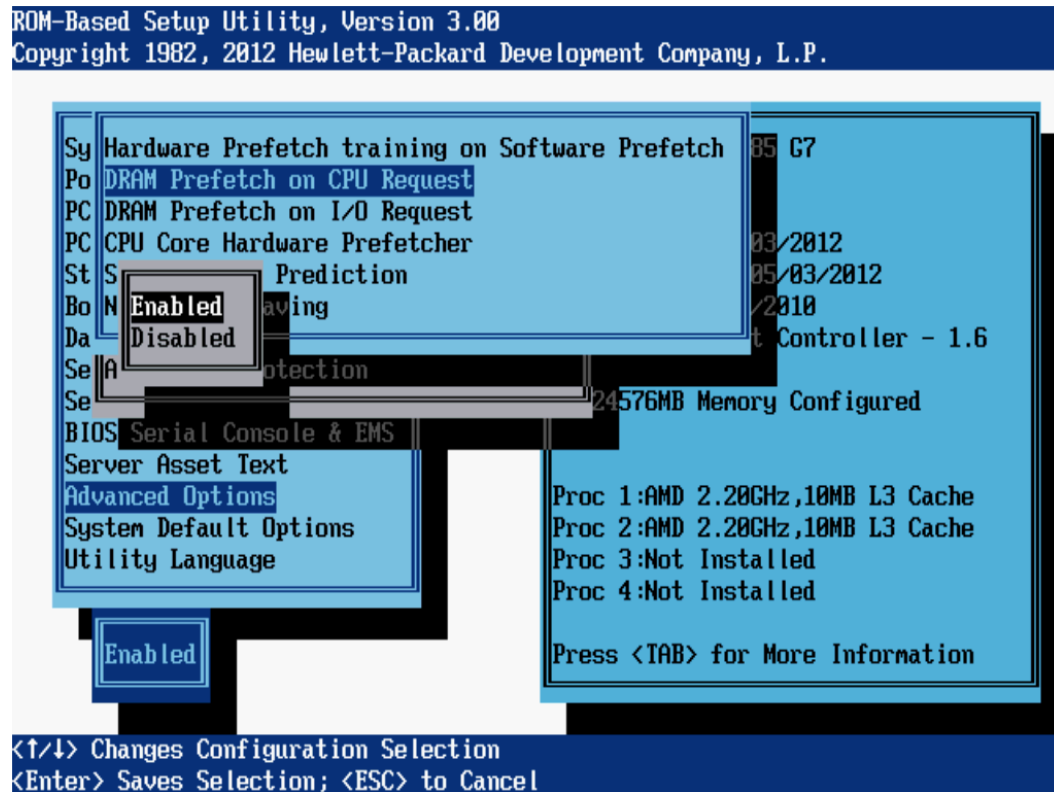
NOTE: This option is available on G7 and Gen8 servers with AMD processors.

Depending on the type of application or software being used, the processor constantly prefetches data from RAM memory to decrease system latency. This option controls those processor prefetches.

In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

Options include:

- **Enabled** (default)
- **Disabled**



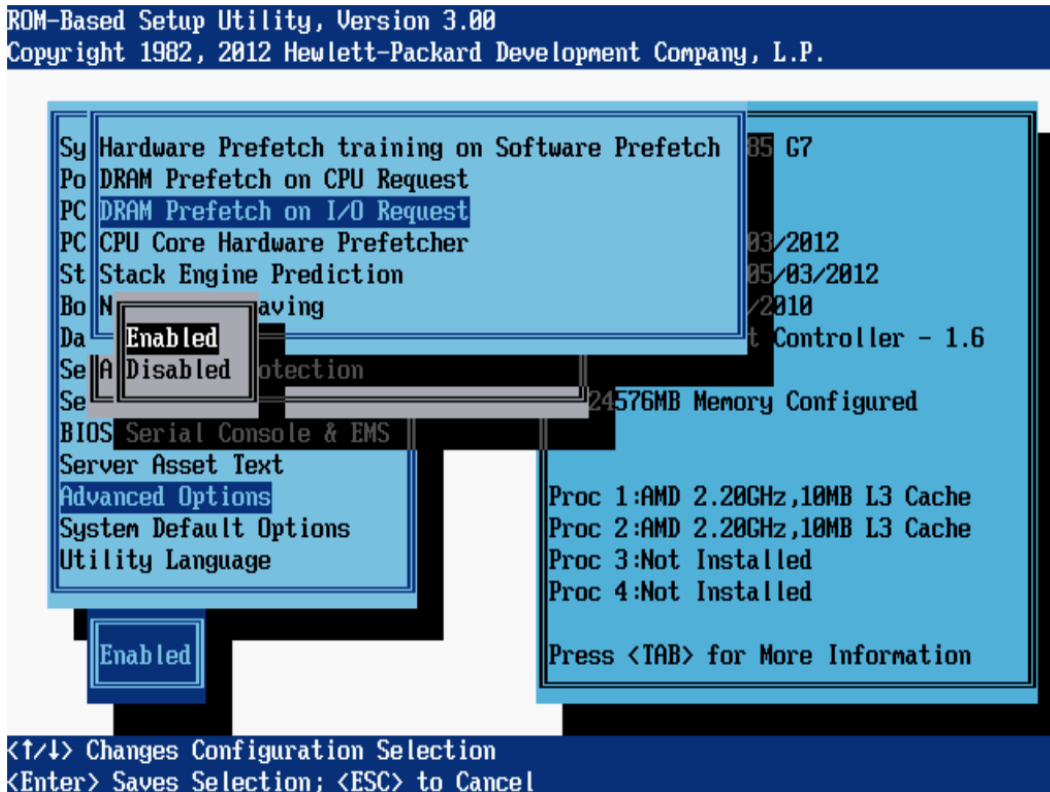
NOTE: This option is available on G7 and Gen8 servers with AMD processors.

Depending on the type of I/O and expansion cards being used, the processor constantly prefetches data from RAM to decrease latency within the I/O subsystems and expansion cards. This option controls those processor prefetch features.

In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

Options include:

- **Enabled** (default)
- **Disabled**

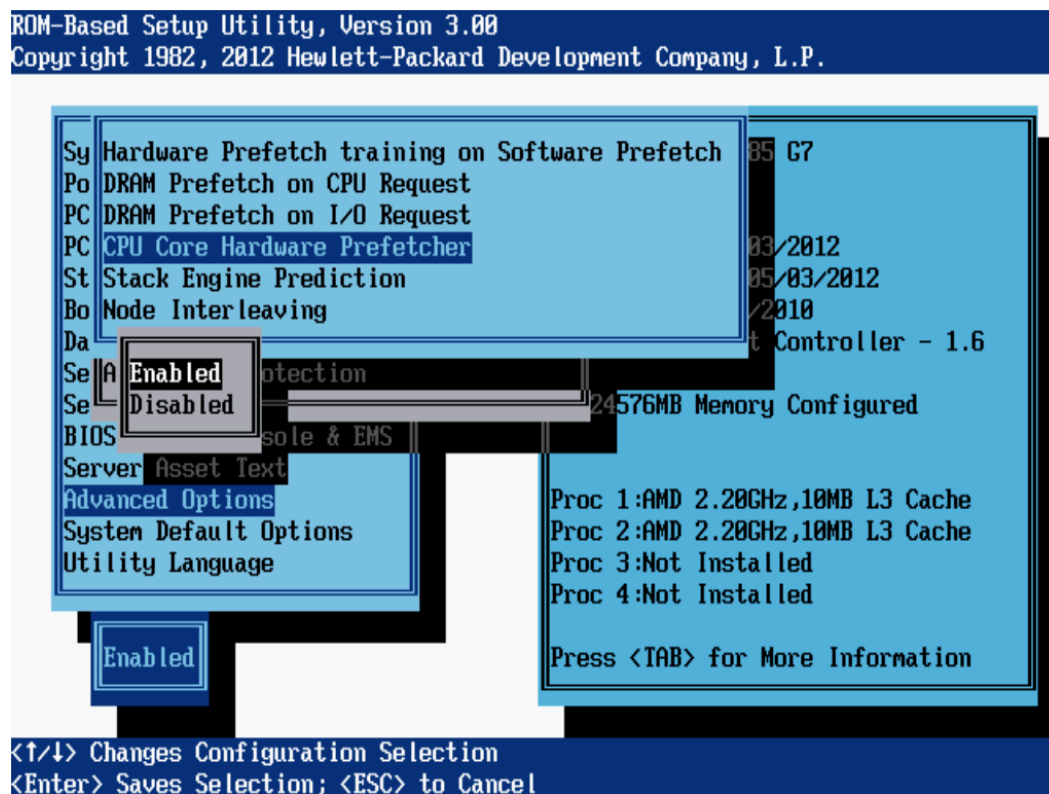


NOTE: This option is available on G7 and Gen8 servers with AMD processors.

This option controls prefetch capability activation between processor cores. In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

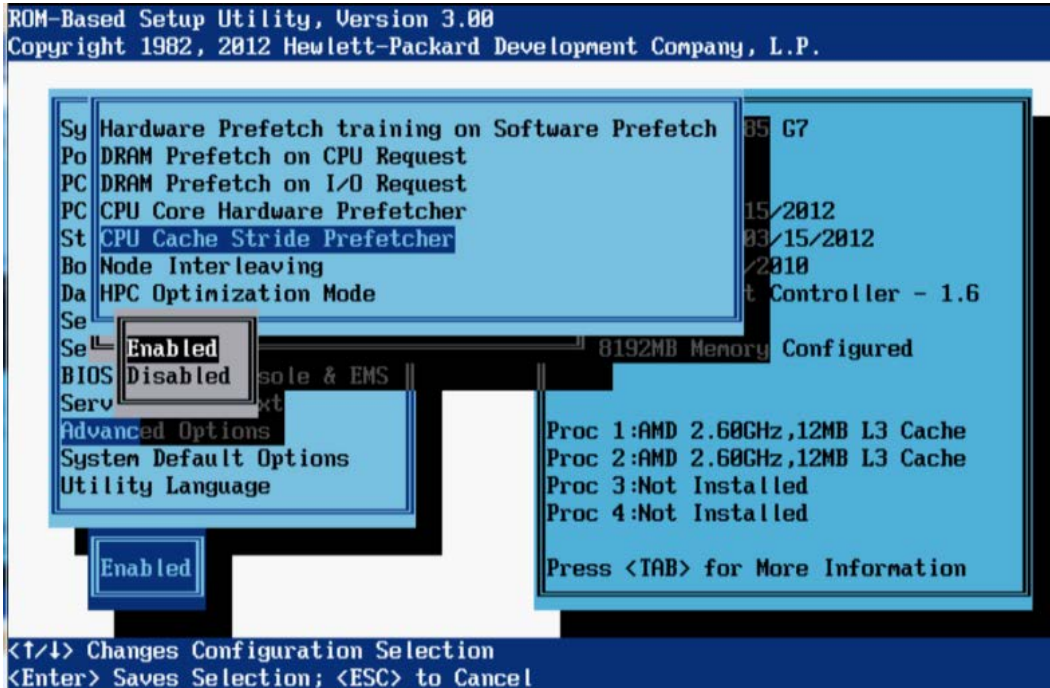
Options include:

- **Enabled** (default)
- **Disabled**



This option controls prefetch capability activation between processor cores. In most cases, this option should remain enabled. With certain workloads, however, disabling this option may provide a performance benefit. Disable this option only after performing application benchmarking to verify improved performance in a particular environment.

- **Enabled** (default)
- **Disabled**



Stack Engine Prediction

NOTE: This option is available on servers with AMD processors.

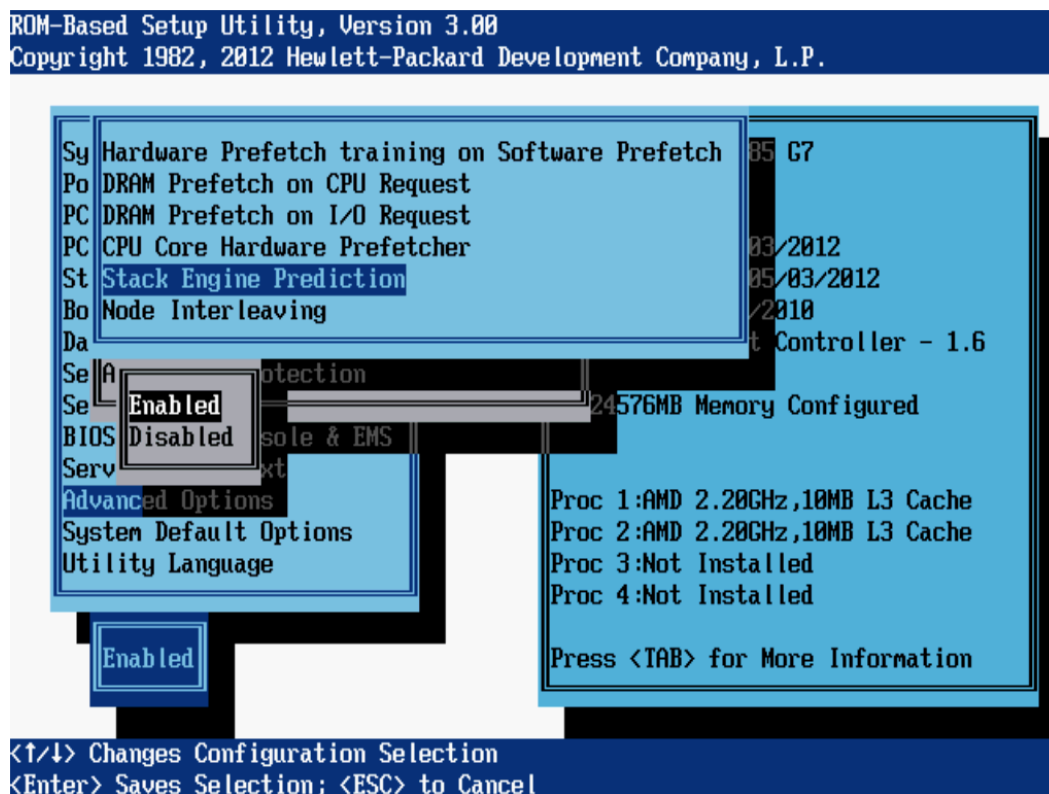
This option controls the processor Stack Engine Prediction logic.



CAUTION: Disabling this option may degrade system performance.

After reading the warning message, press any key to display the following settings:

- **Enabled** (default)
- **Disabled**



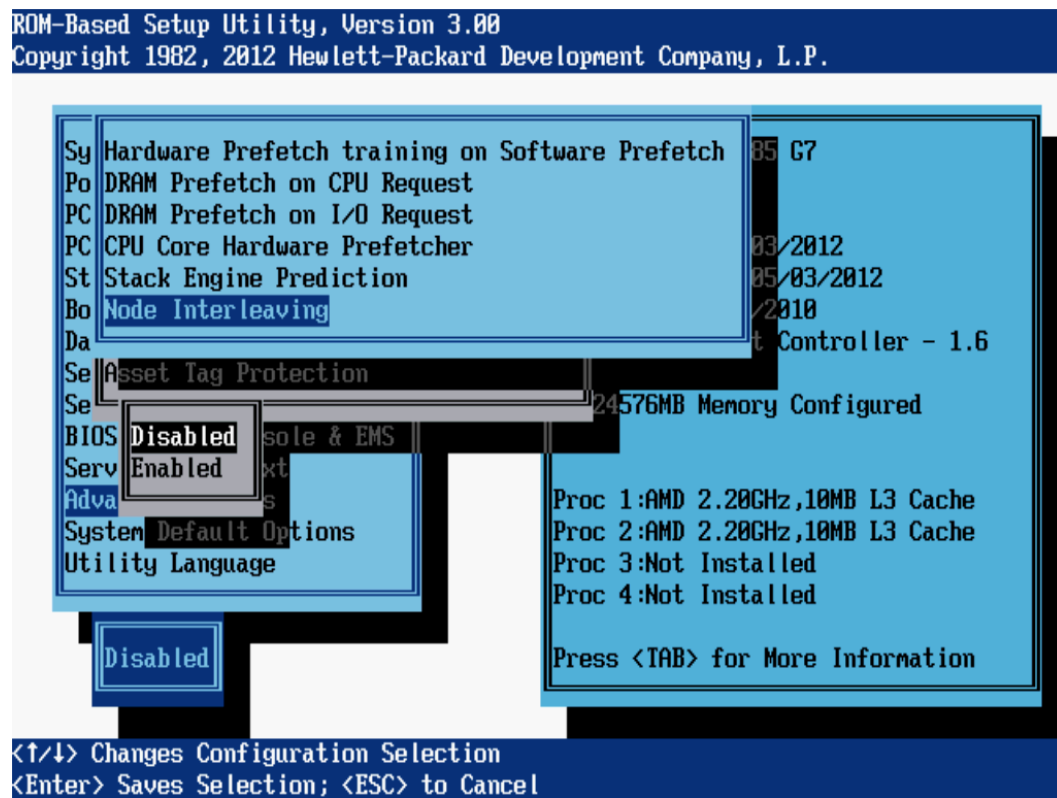
Node Interleaving

Node Interleaving disables the NUMA architecture properties of the system. All operating systems supported by this platform support NUMA architectures. In most cases, you can obtain optimum performance by disabling Node Interleaving. When this option is enabled, memory addresses are interleaved across the memory installed for each processor and some workloads may experience improved performance.

- ❗ **IMPORTANT:** Enabling Node Interleaving may impact operating system performance. Enabling Node Interleaving requires that all nodes have equal memory sizes. This option is not present on DL980 G7.

After reading the warning message, press any key to display the following settings:

- **Enabled**
- **Disabled** (default)



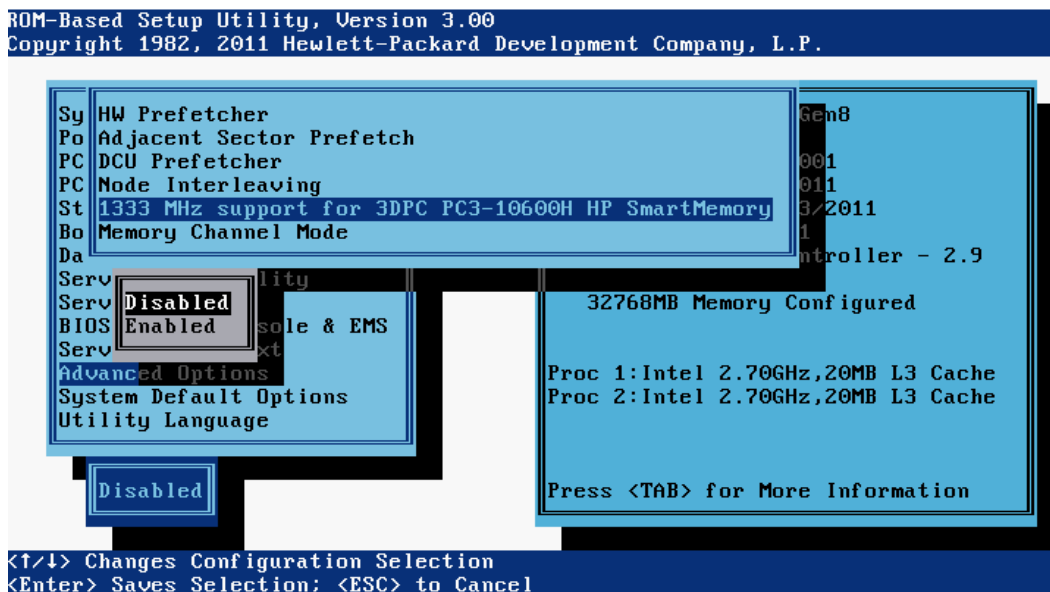
1333 MHz Support for 3DPC-10600H HP SmartMemory

NOTE: This option is available on Gen8 servers with 3DPC-10600H HP SmartMemory.

This option enables memory speed of 1333Mhz for 3-DIMM per channel configurations and should be enabled only when the system contains PC3-10600H HP Smart Memory exclusively.

Options include:

- **Enabled**
- **Disabled** (default)

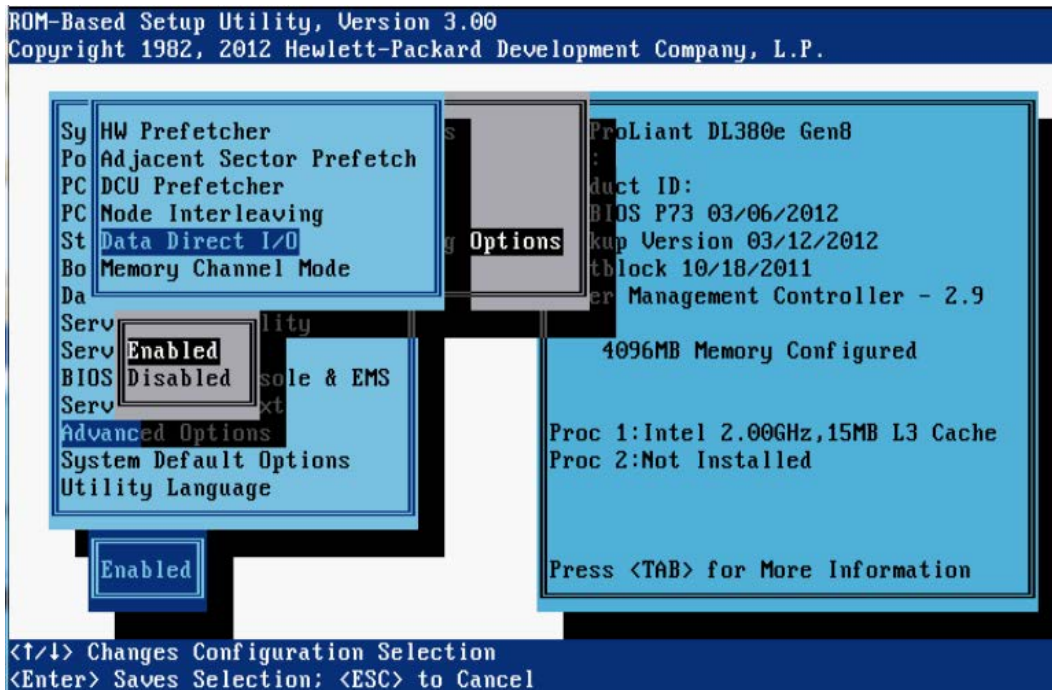


NOTE: This option is available on Gen8 servers with Intel processors.

This option controls the ability for the processor to accelerate I/O operations by reducing the number of I/O related memory accesses. This option increases I/O performance while reducing system power and I/O latency and is highly recommended for low-latency environments.

Options include:

- **Enabled** (default)
- **Disabled**



Memory Channel Mode

NOTE: This option is available on select servers.

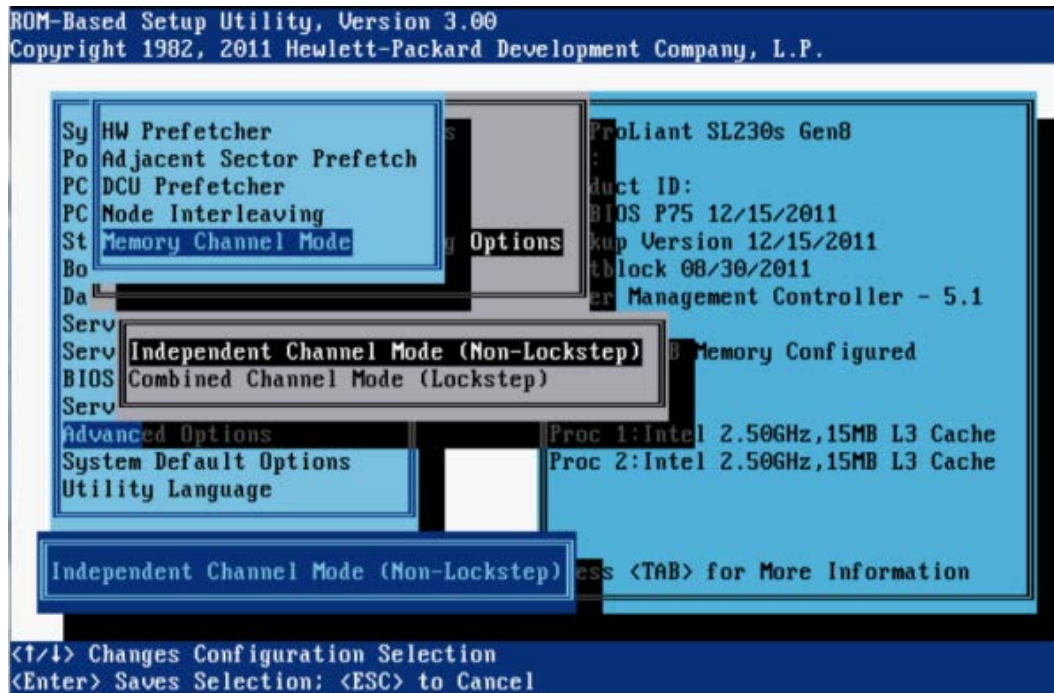
Memory Channel Mode sets the memory to work in Lockstep or Non-Lockstep mode.

Options include:

- **Independent Channel Mode (Non-Lockstep)** (default)—Uses the standard error correction mechanism of Advanced ECC.
- **Combined Channel Mode (Lockstep)**—Provides maximum data protection by allowing multiple-bit memory errors to be corrected in certain instances not possible in Advanced ECC mode.

NOTE: Lockstep Mode (used for Intel servers) and Memory Channel Mode (used for AMD servers) provide the same functionality, allowing the memory controller to correct up to 8 bad bits that are byte aligned.

Activating **Combined Channel Mode** has some memory population rules. For more information, see the user guide or QuickSpecs for the server.

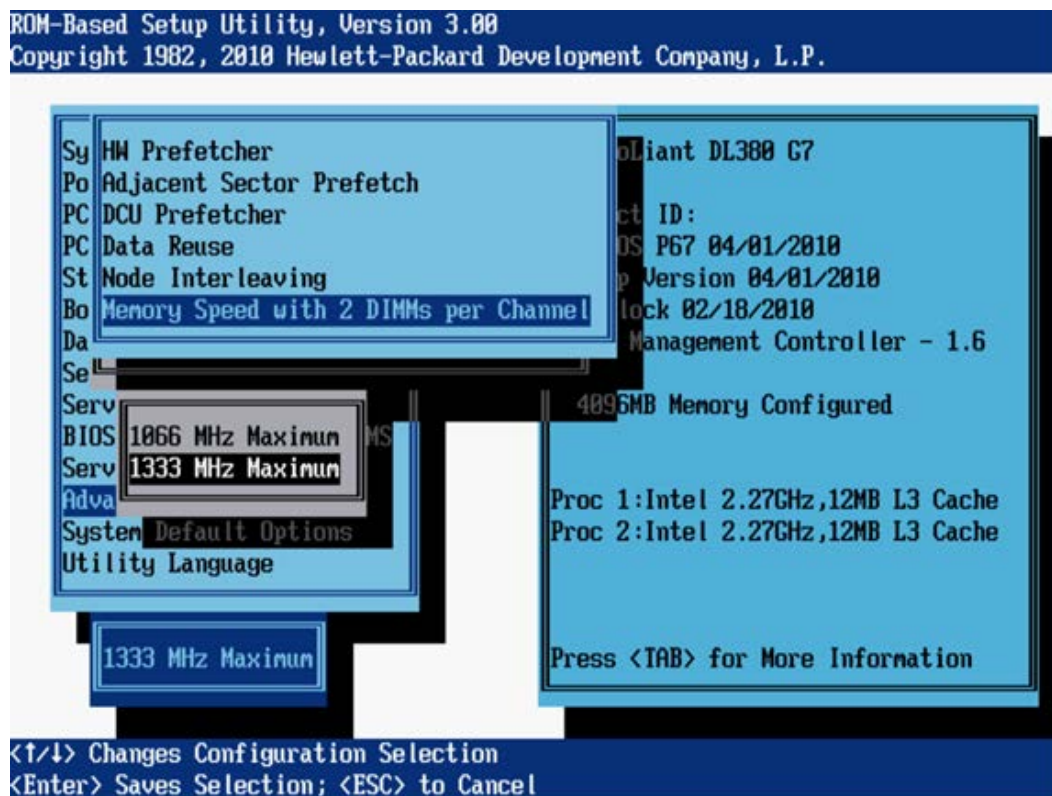


Memory Speed with 2 DIMMs per Channel

NOTE: This option is available on G7 servers with Intel 5500-series processors.

This option configures the system to run DIMMs at 1333 MHz when up to two DIMMs are installed on a memory channel, if all other requirements for 1333 MHz operation are met. This provides a performance increase for most workloads. By default, the system will operate at a maximum 1066 MHz when two DIMMs are installed on any memory channel. HP has validated this functionality with all HP DIMMs.

HP recommends that this setting remain at the default of 1066 MHz maximum when using DIMMs not manufactured by HP.

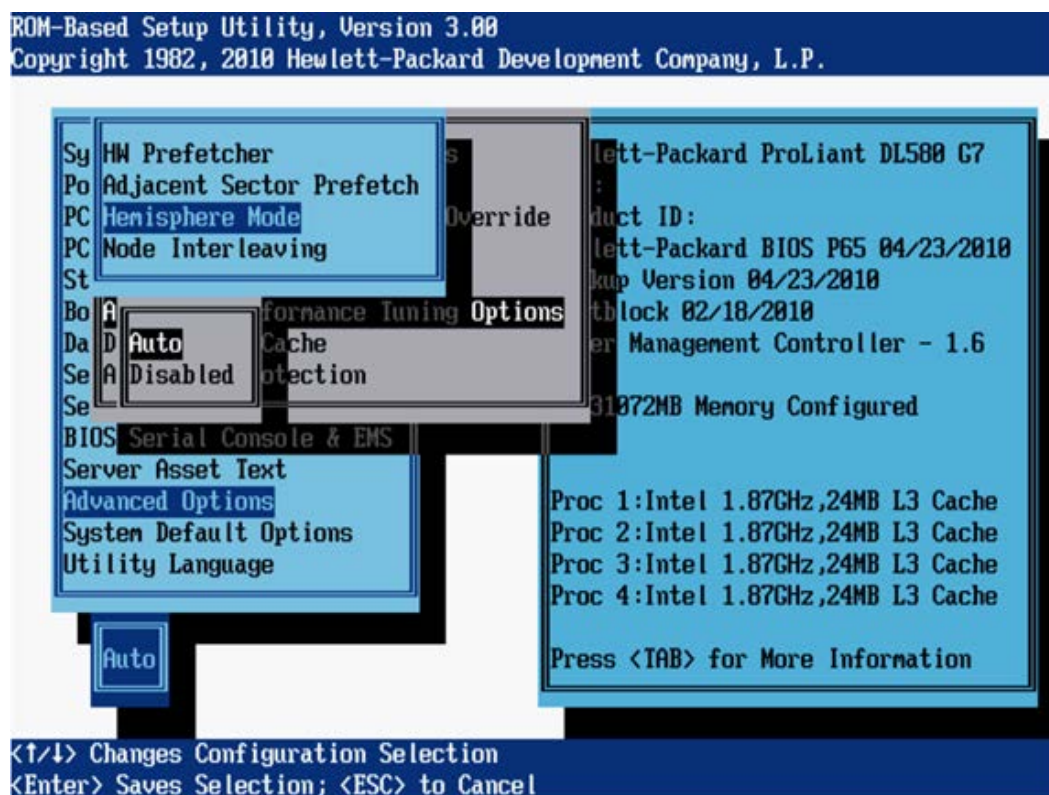


NOTE: This option is available on HP ProLiant DL580 G7, BL620c G7 and BL680c G7 servers.

Hemisphere mode is equivalent to socket level memory interleaving.

Options include:

- **Auto** (default)
- **Disabled**

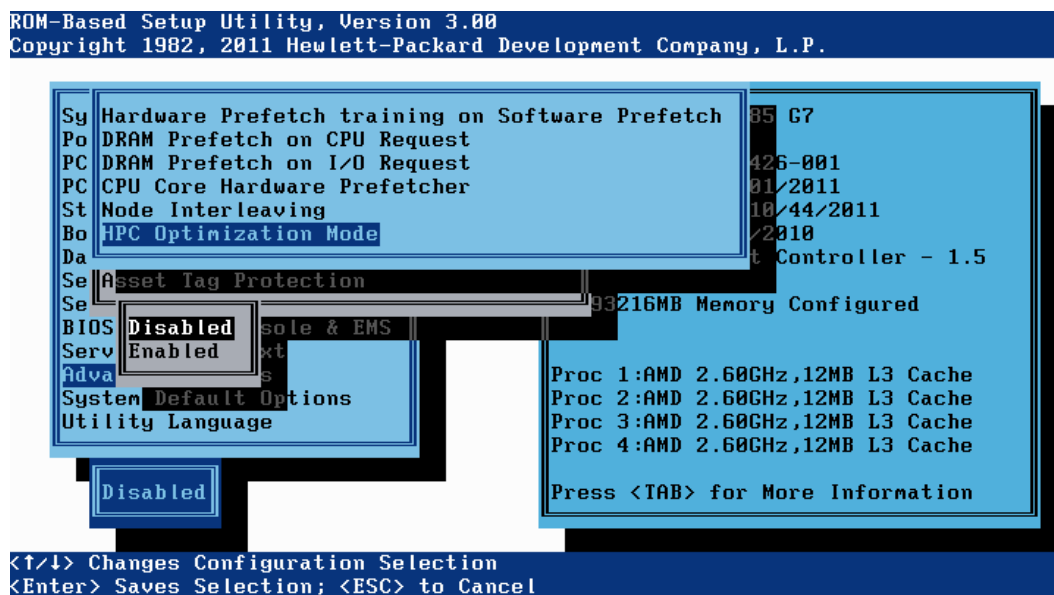


NOTE: This option is available on DL585 G7 and BL685c G7 servers with AMD processors.

This mode is specially designed for customers deploying servers in a High Performance Computing environment. When this mode is enabled, the performance of the processor can be maintained at a high level even if the processor temporarily exceeds the normal power threshold.

Options include:

- **Enabled**
- **Disabled** (default)

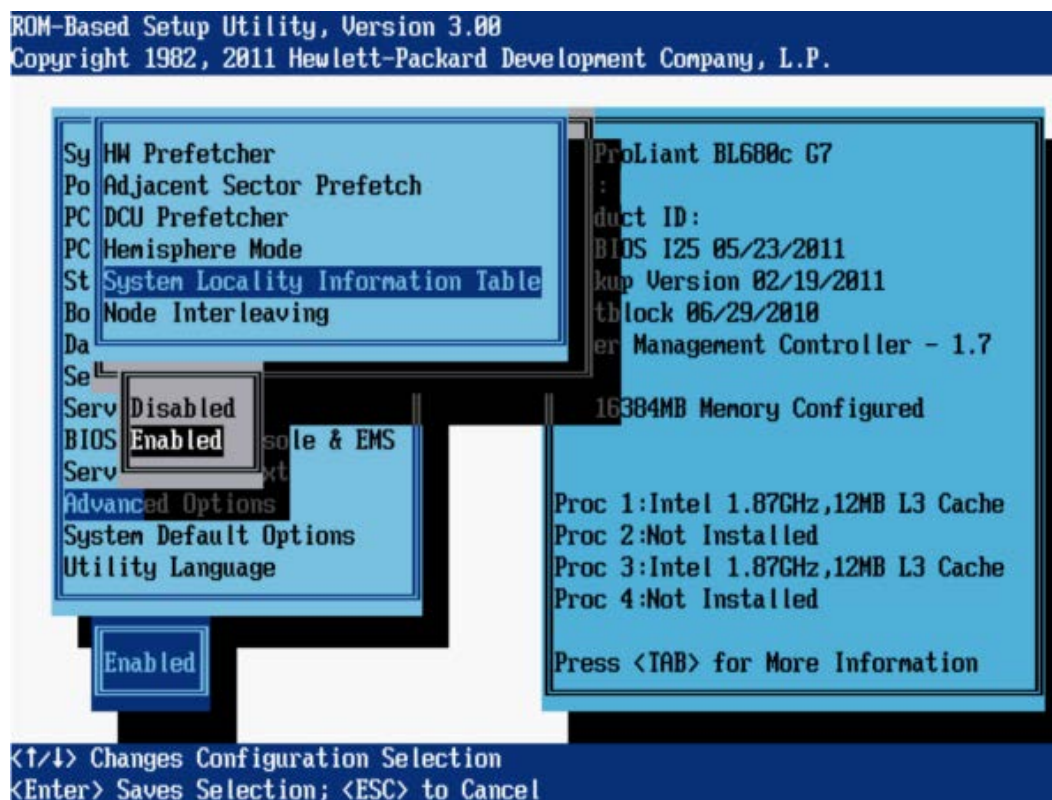


NOTE: This option is available on select Intel and AMD G7 servers and on all Gen8 servers.

The ACPI SLIT (System Locality Information Table) describes the relative access times between processors, memory subsystems, and I/O subsystems. Operating Systems that support the SLIT can use this information to improve performance by allocating resources and workloads more efficiently.

Options include:

- **Enabled** (default)
- **Disabled**



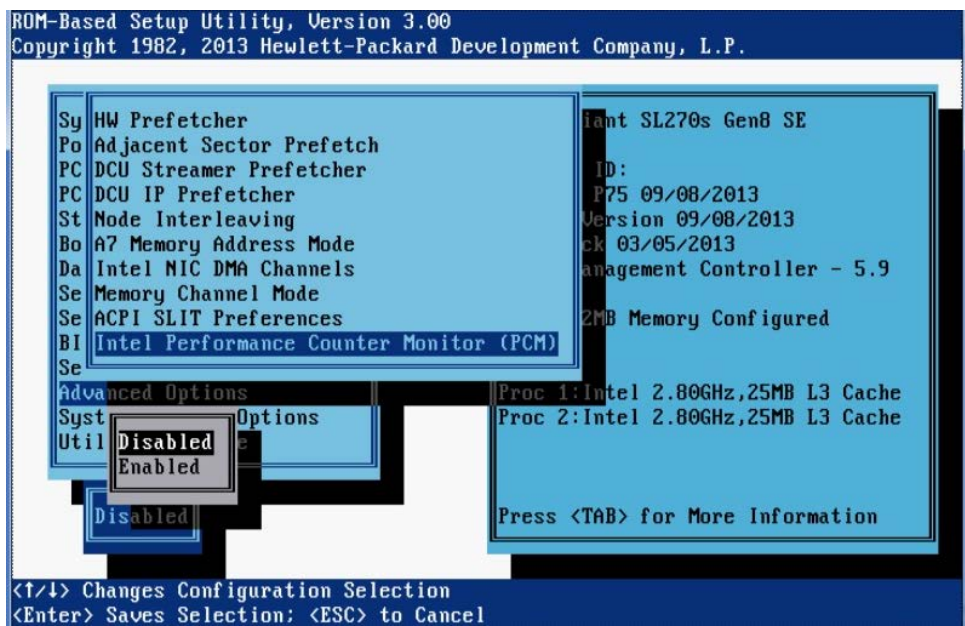
Intel Performance Counter Monitor (PCM)

NOTE: This feature is supported only on Gen8 servers.

When enabled, this option allows you to view and use certain performance counters in the processor, such as the Performance Counter Monitor (PCM).

Options include:

- **Enabled**
- **Disabled** (default)



One Terabyte Memory Limit

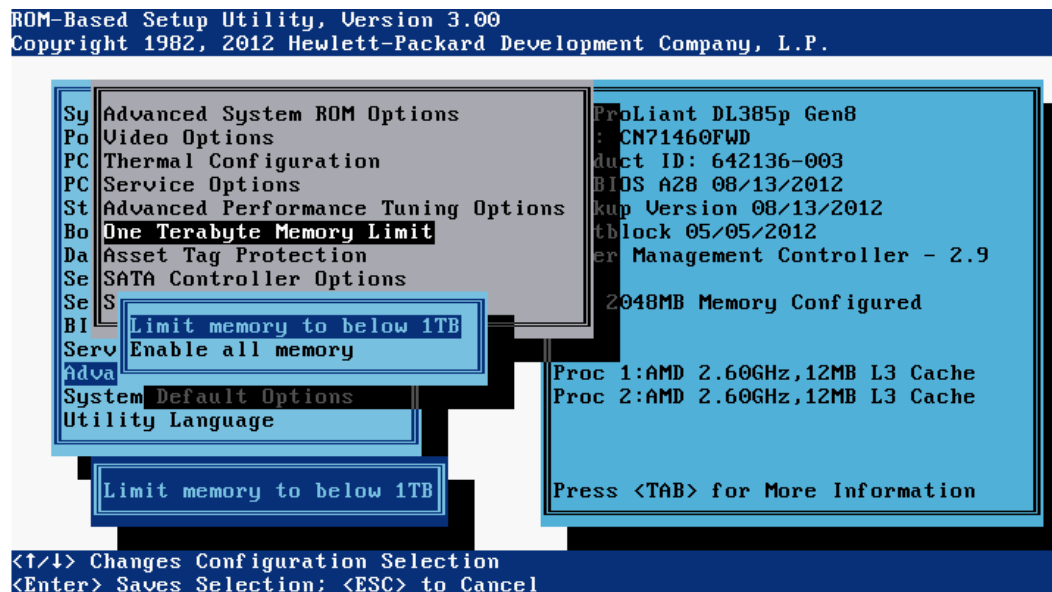
NOTE: This option is available on G7 and Gen8 servers with AMD processors.

This option controls the system addressable memory range.

Options include:

- **Limit memory to below 1TB** (default)
- **Enable all memory**

❗ **IMPORTANT:** Some environments may experience problems when 1 TB or greater memory is made available to the operating system.



Drive Write Cache

NOTE: This option is available on G7 servers. For Gen8 servers, this option is in under **System Options > SATA Controller Options** ("[Drive Write Cache](#)" (page 42))

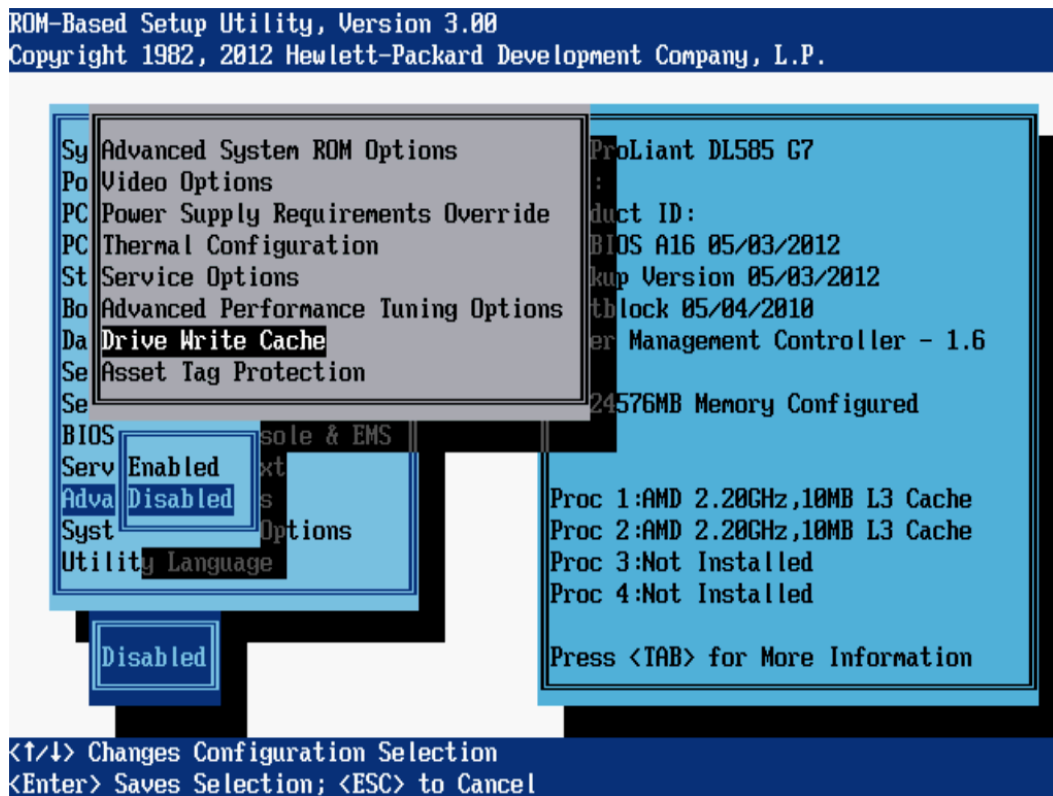
The Drive Write Cache option controls the state of the write cache of the drives attached to the supported controller. This feature provides greater drive performance but could result in data corruption during an unexpected power loss or shutdown.

This option only affects operation for fixed drives attached to the embedded SATA controller when not operating in a software RAID mode. This option has no effect if fixed drives are attached to an embedded or optional Smart Array controller or if the Smart Array B110i Software RAID solution is used.

CAUTION: Enabling Drive Write Cache may result in data loss or data corruption if an unexpected power loss occurs.

After reading the warning message, press any key to display the following settings:

- **Enabled**
- **Disabled** (default)

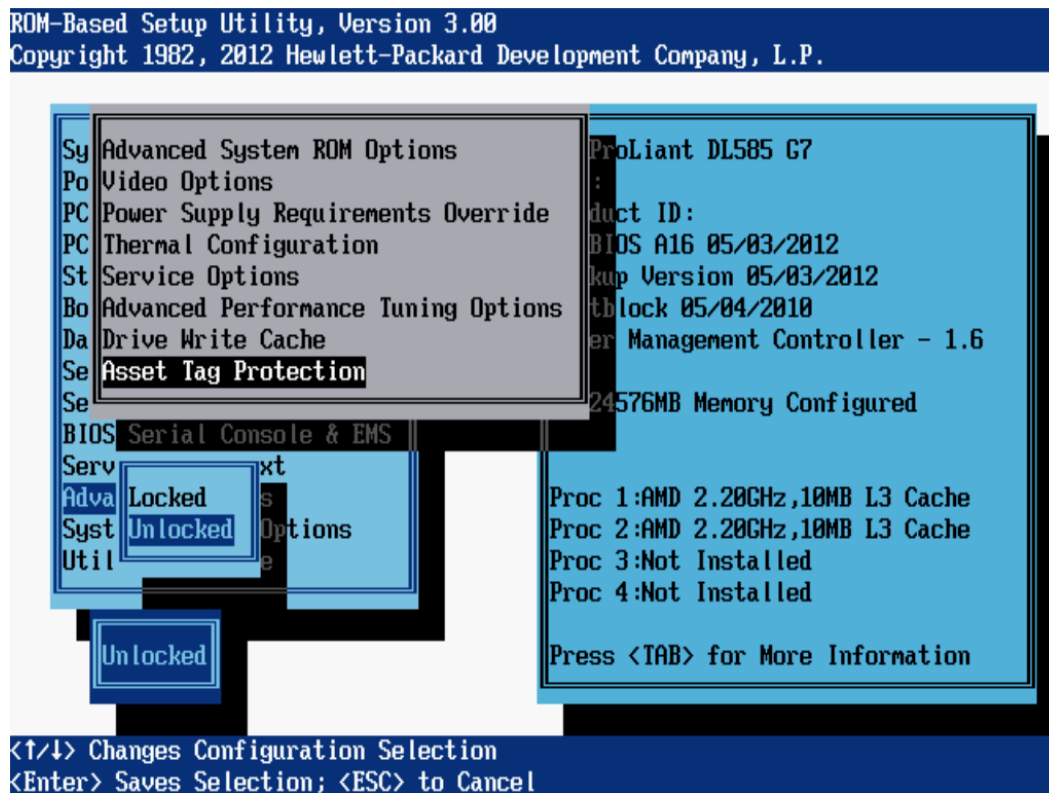


Asset Tag Protection

This option locks or unlocks the Asset Tag information. When the Asset Tag information is locked, the Asset tag is not erased when the default system settings are restored.

After reading the warning message, press any key to display the following settings:

- **Locked**
- **Unlocked** (default)

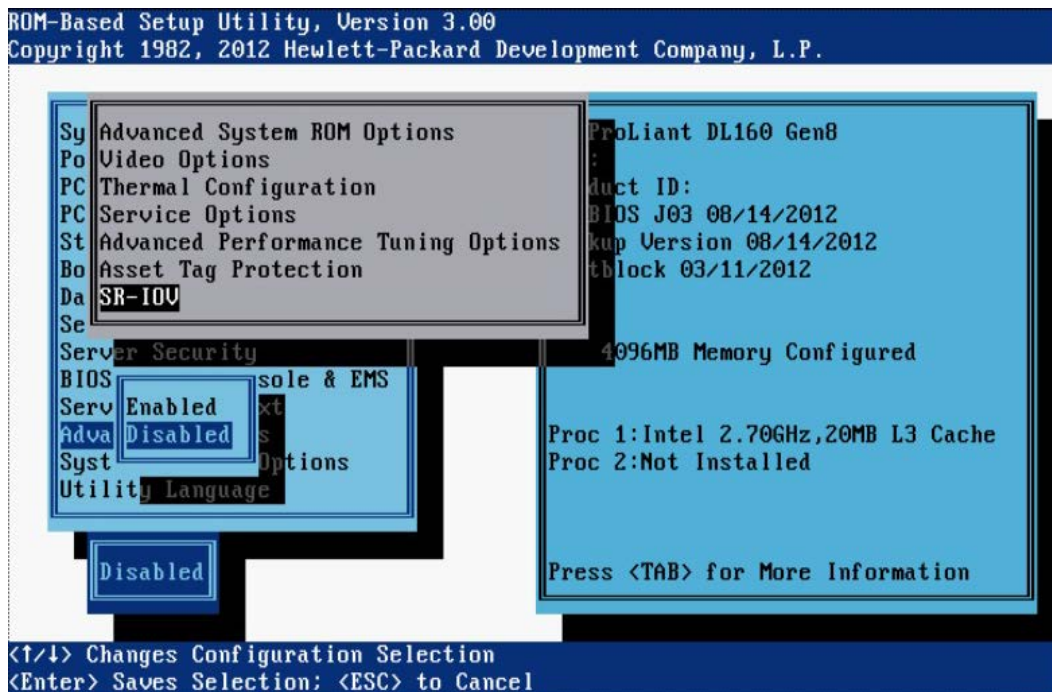


NOTE: This option is available on select G7 servers and all Gen8 servers.

This option controls Single Root I/O Virtualization. SR-IOV is supported on select operating systems and allows, in some cases, the creation of separate virtual instances of a PCIe device. In certain environments, this may increase virtual machines and hypervisor response times.

Options include:

- **Enabled**
- **Disabled** (default)



Embedded SATA RAID

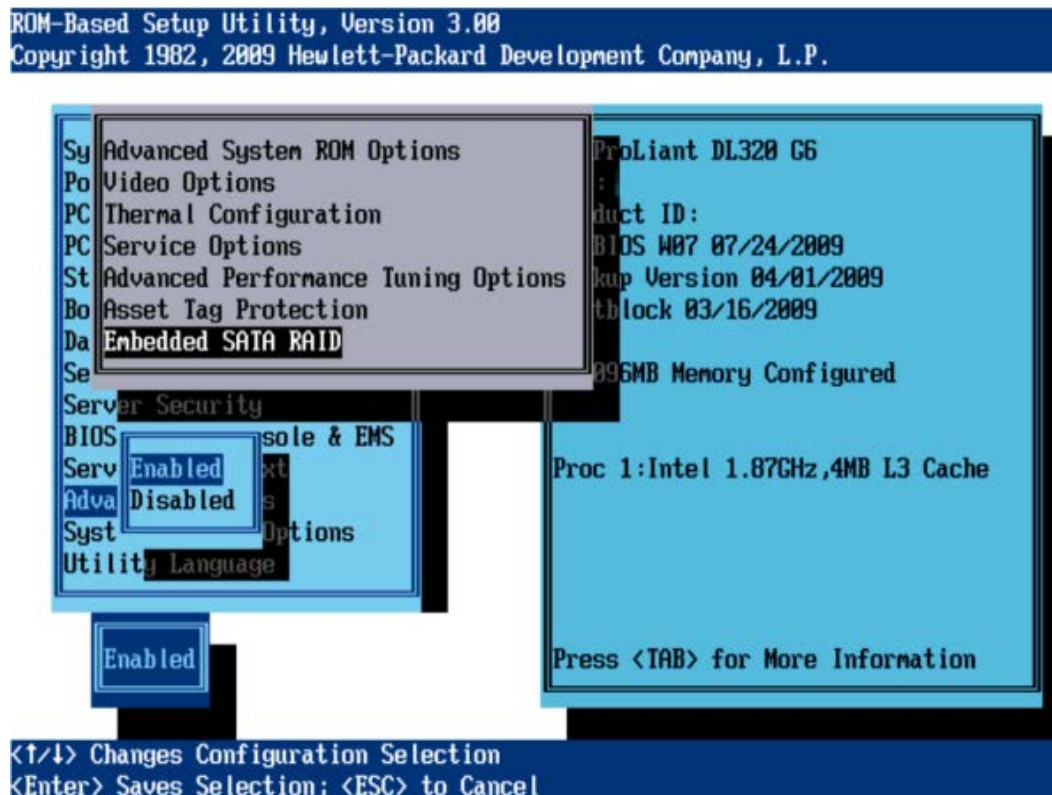
NOTE: This option is available on select G6 and G7 servers.

This option activates RAID functions on the SATA controller, if such functions are available.

Options include:

- **Enabled**
- **Disabled** (default)

CAUTION: Enabling Drive Write Cache may result in data loss or data corruption if an unexpected power loss occurs.



System Default Options menu

- “Restore Default System Settings” (page 152)
- “Restore Settings/Erase Boot Disk” (page 153)
- “User Default Options” (page 154)

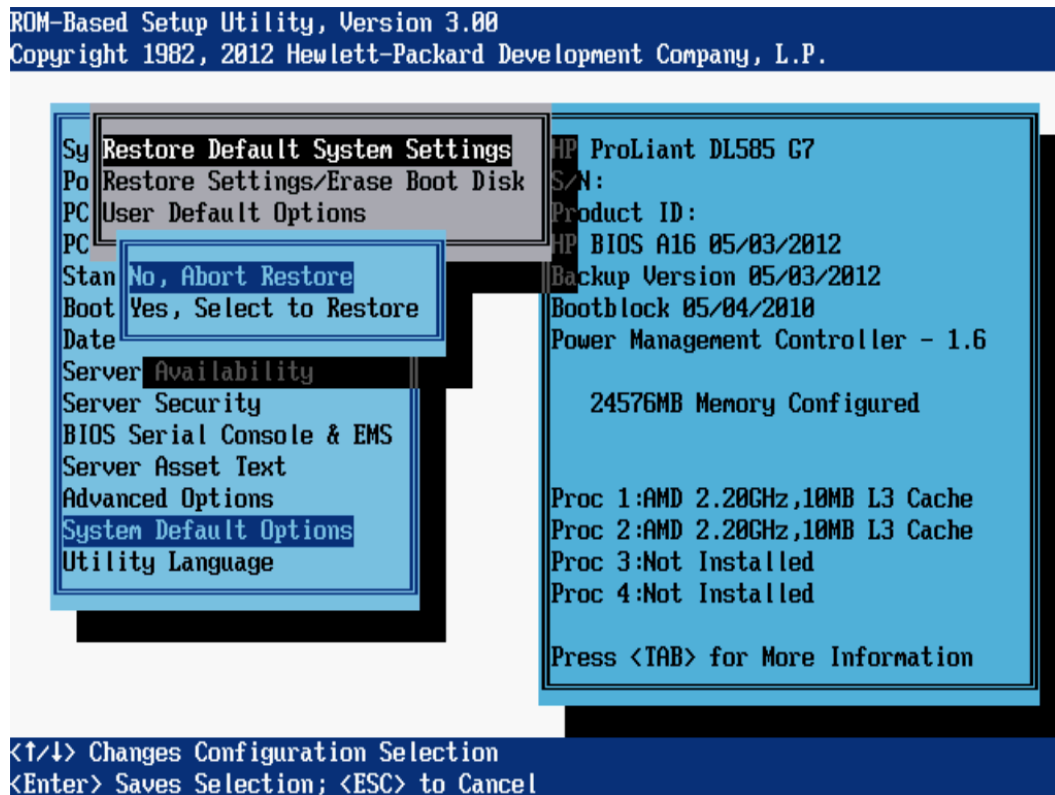
Restore Default System Settings

This option resets all configuration settings to their default values and immediately and automatically restarts the server.

CAUTION: This option resets all configuration settings to their default values. Any modifications will be lost.

After reading the warning message, press any key to display the following confirmation responses:

- **No, Abort Restore** (default)
- **Yes, Select to Restore**



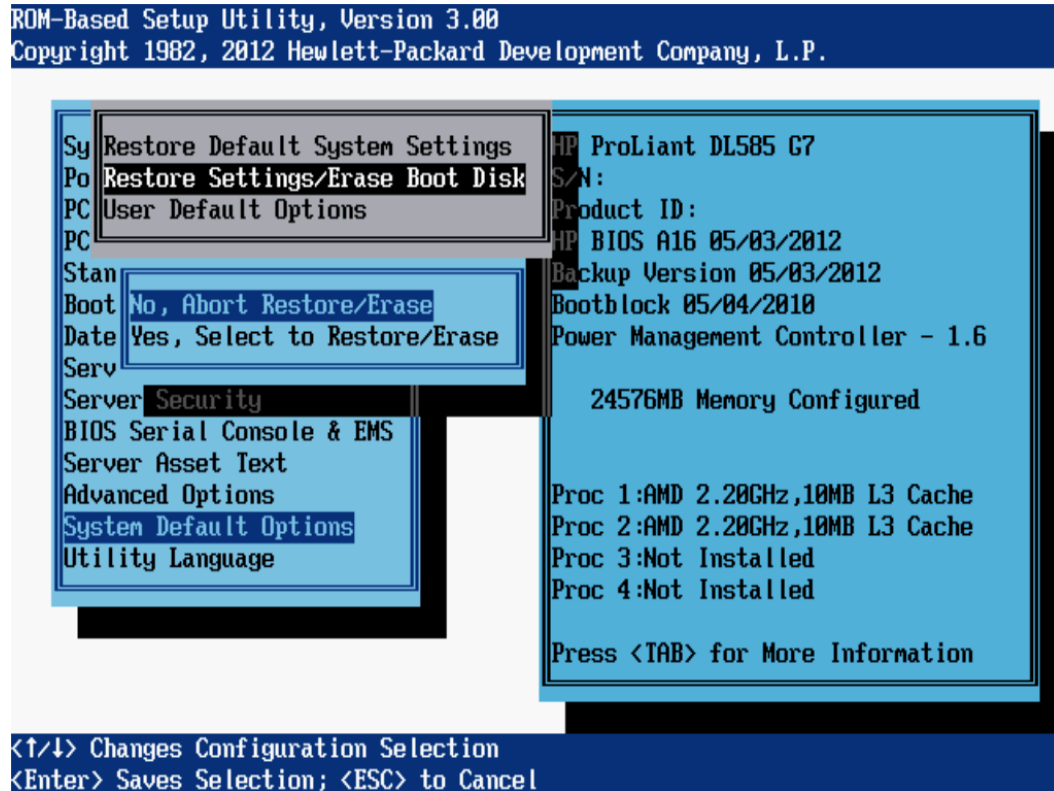
Restore Settings/Erase Boot Disk

The Restore Settings/Erase Boot Disk option resets the date, time, and all configuration settings to default values. Data on the boot disk drive is erased, and changes that have been made are lost.

- △ **CAUTION:** Restoring Default Settings and Erasing Boot Disk resets all configuration settings to their default values and deletes all fixed disk partitions. Any modifications, including all fixed disk partitions, will be lost.

After reading the warning message, press any key to display the following confirmation responses:

- **No, Abort Restore/Erase** (default)
- **Yes, Select to Restore/Erase**

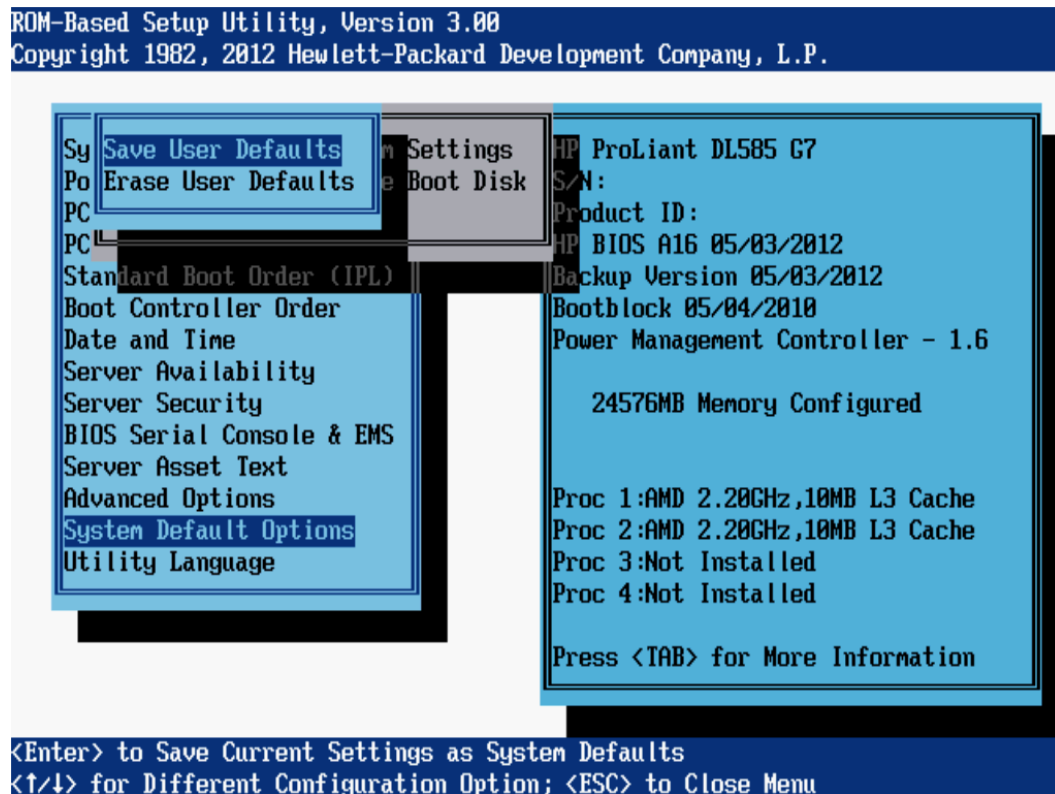


User Default Options

This feature enables the user to define custom default configuration settings. When the default configuration settings are loaded, the user-defined default settings are used instead of the factory defaults. To save the configuration as the default configuration, configure the system and then enable this feature.

Confirmation responses include:

- **Save User Defaults** (default)
- **Erase User Defaults**

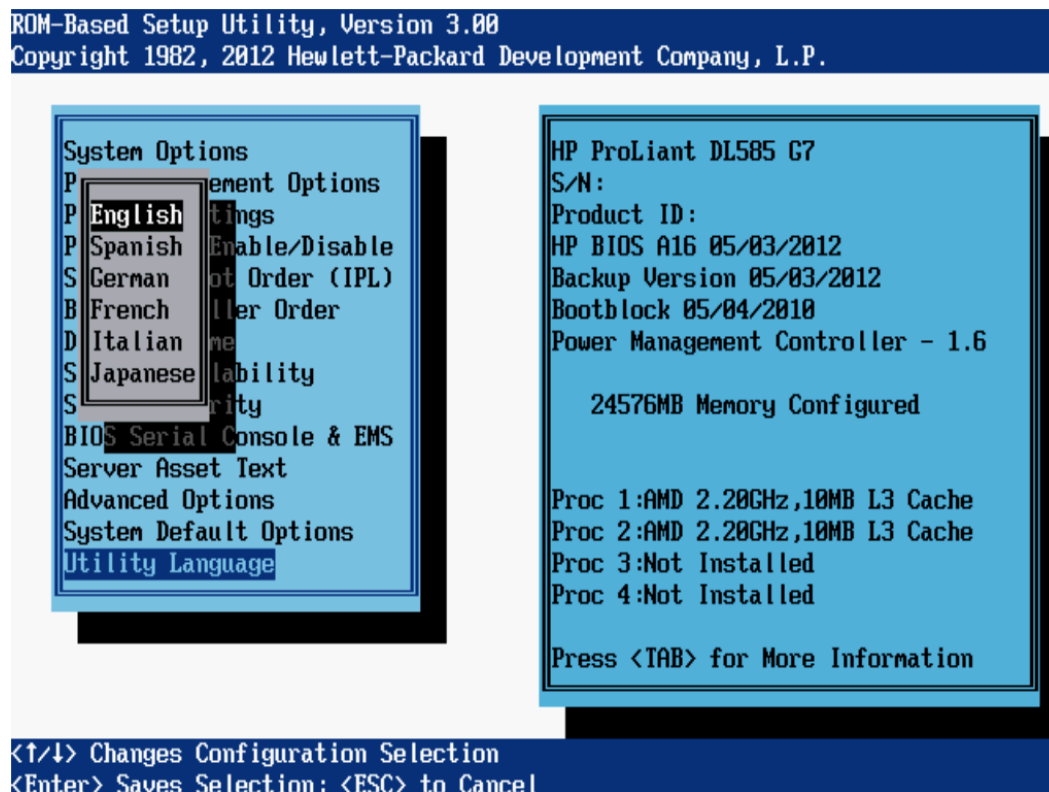


Utility Language menu (G5 through G7 servers)

The Utility Language menu enables you to set the display language for RBSU.

Options include:

- **English** (default)
- **Spanish**
- **German**
- **French**
- **Italian**
- **Japanese**

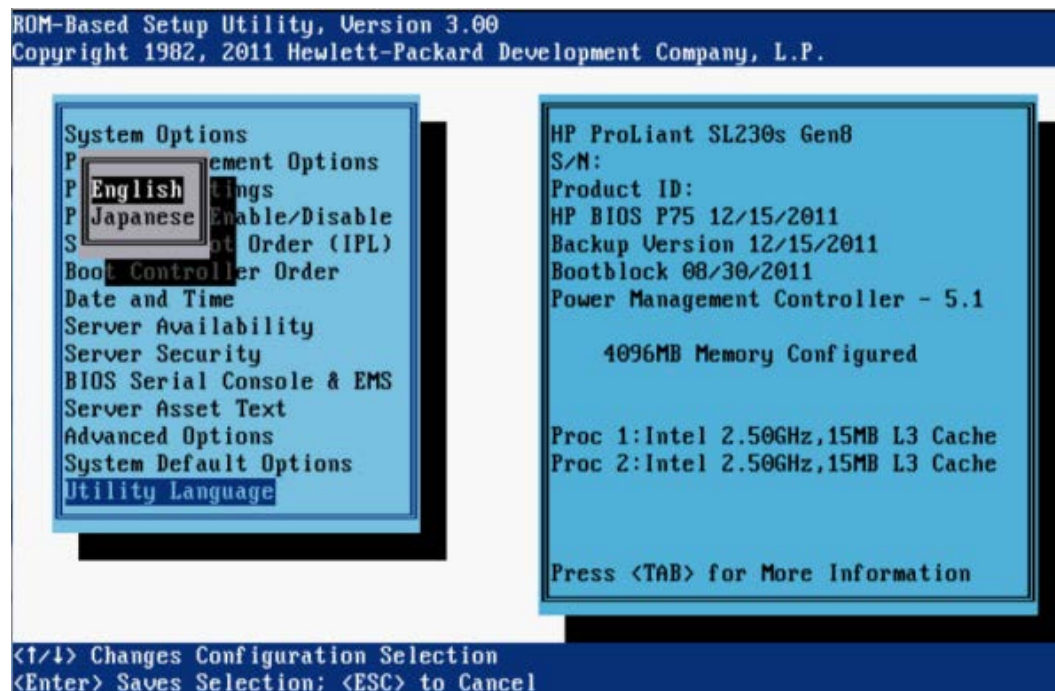


Utility Language menu (Gen8 servers)

The Utility Language menu enables you to set the display language for RBSU.

Options include:

- **English** (default)
- **Japanese**

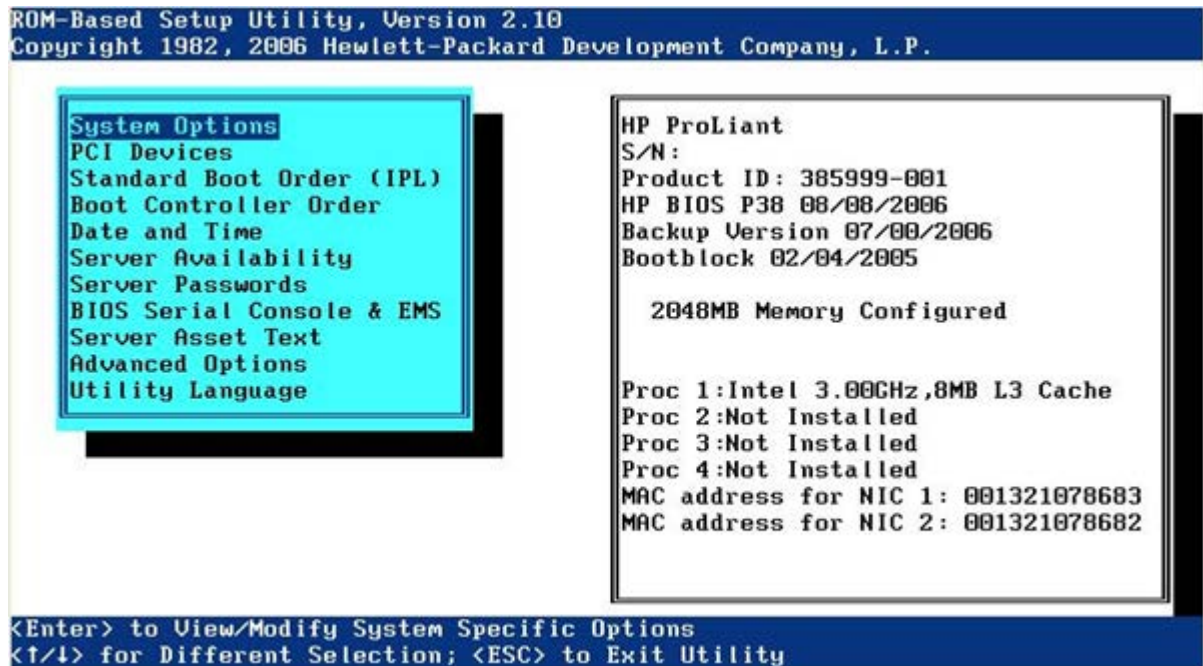


3 RBSU menu-driven interface, version 2.xx (G5 and earlier servers)

RBSU main menu

NOTE: Menu options may differ from those in this document, depending on the server model.

On the left-hand side of the screen, the RBSU menu lists configuration settings to view or modify. On the right-hand side of the screen, a window displays basic server information, including the server model, serial number, BIOS version, backup BIOS version, memory installed, and processors installed.



NOTE: To see online help, highlight the selection and press **F1**. All menus are in English only.

Each RBSU sub-menu and its options are described in this chapter.

System Options menu

The **System Options** menu enables basic I/O server configuration with the following options:

- "Embedded Serial Port A" (page 158)
- "Embedded Serial Port B" (page 159)
- "Virtual Serial Port" (page 160)
- "Optional LPT Mode Support" (page 160)
- "Optional LPT Mode Support" (page 160)
- "Integrated Diskette Controller" (page 160)
- "NUMLOCK Power-On State" (page 160)
- "Embedded NICs" (page 161)
- "Diskette Write Control" (page 161)
- "Diskette Boot Control" (page 161)

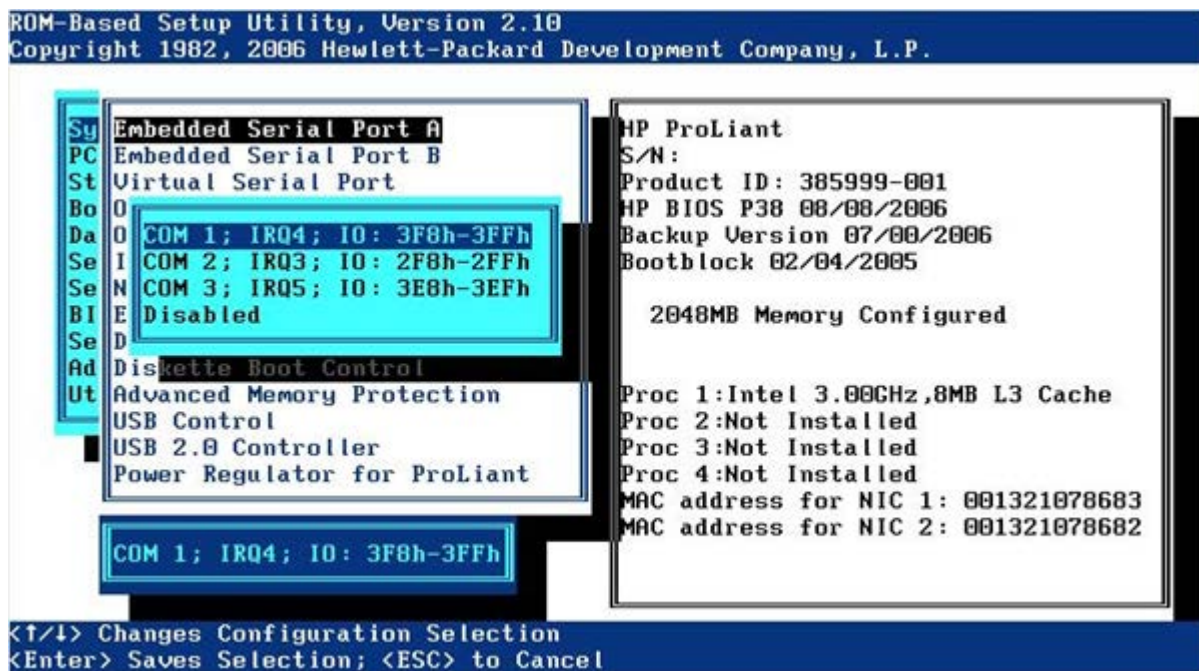
- “Advanced Memory Protection” (page 162)
- “USB Control” (page 163)
- “USB 2.0 EHCI Controller” (page 163)
- “Power Regulator for ProLiant” (page 164)
- “USB External Port Capability” (page 165)
- “Ultra Low Power State” (page 166)

NOTE: Menu options may differ from those in this document, depending on specific server options.

Embedded Serial Port A

The Embedded Serial Port A option sets the configuration for the internal serial port A. The settings include the address and IRQ. This option can also disable the port.

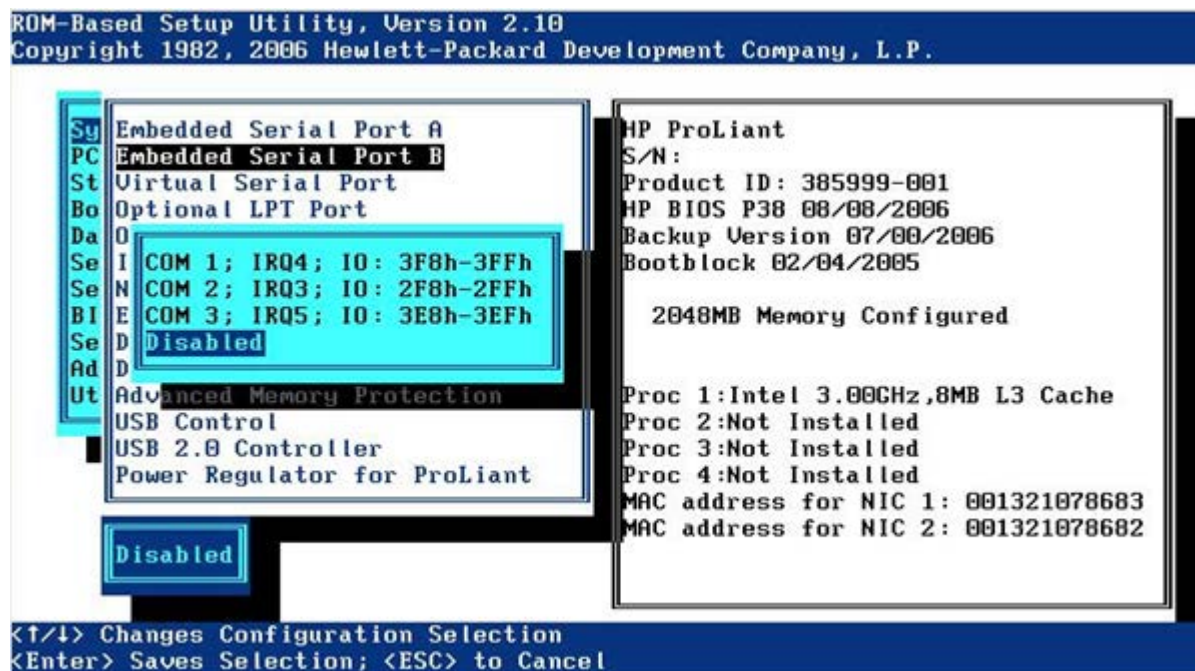
NOTE: Embedded Serial Port options may be named Embedded COM Port options, depending on the server.



Embedded Serial Port B

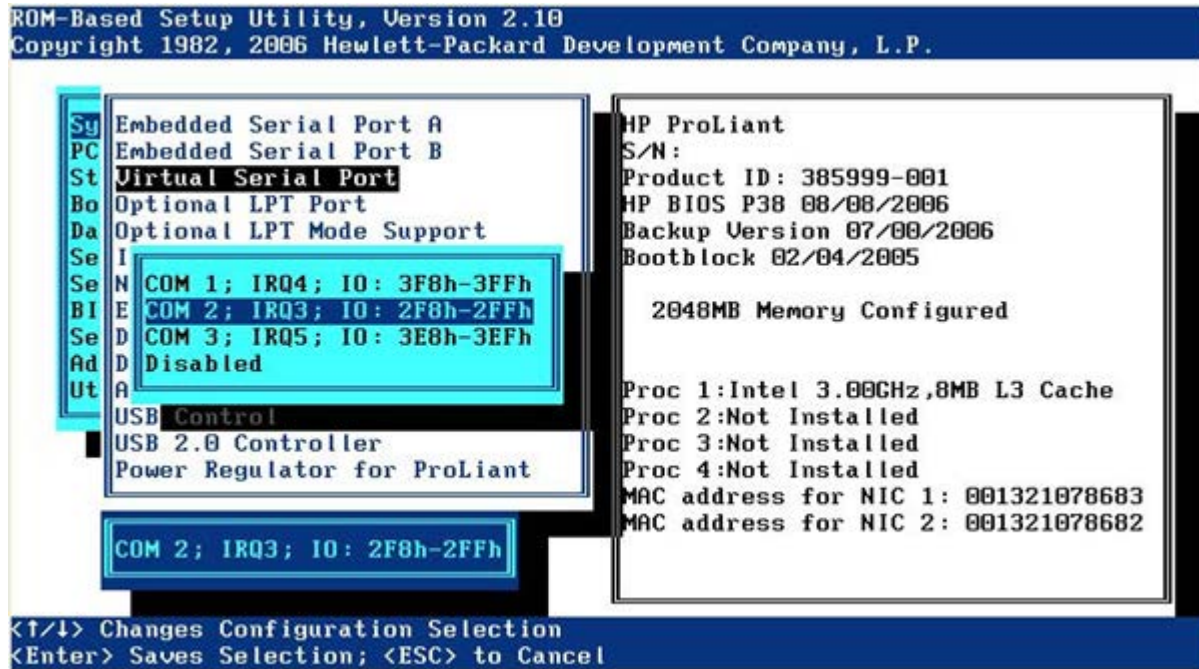
The Embedded Serial Port B option sets the configuration for the internal serial port B. The settings include the address and IRQ. This option can also disable the port.

NOTE: Embedded Serial Port options may be named Embedded COM Port options, depending on the server.



Virtual Serial Port

The Virtual Serial Port option assigns the logical COM Port number and associated default resources used by the Virtual Serial Port. When enabled, the option provides remote access through the iLO management controller to BIOS Serial Console.



For more information about iLO configurations, see the iLO user documents on the Documentation CD or HP website (<http://www.hp.com/go/ilomanagementengine>).

Optional LPT Mode Support

The Optional LPT Mode Support option assigns the local port number and associated default resources to the selected physical LPT. The menu includes the following options:

- SPP Extended
- EPP 1.9
- ECP w/EPP

The OS may overwrite the setting.

Integrated Diskette Controller

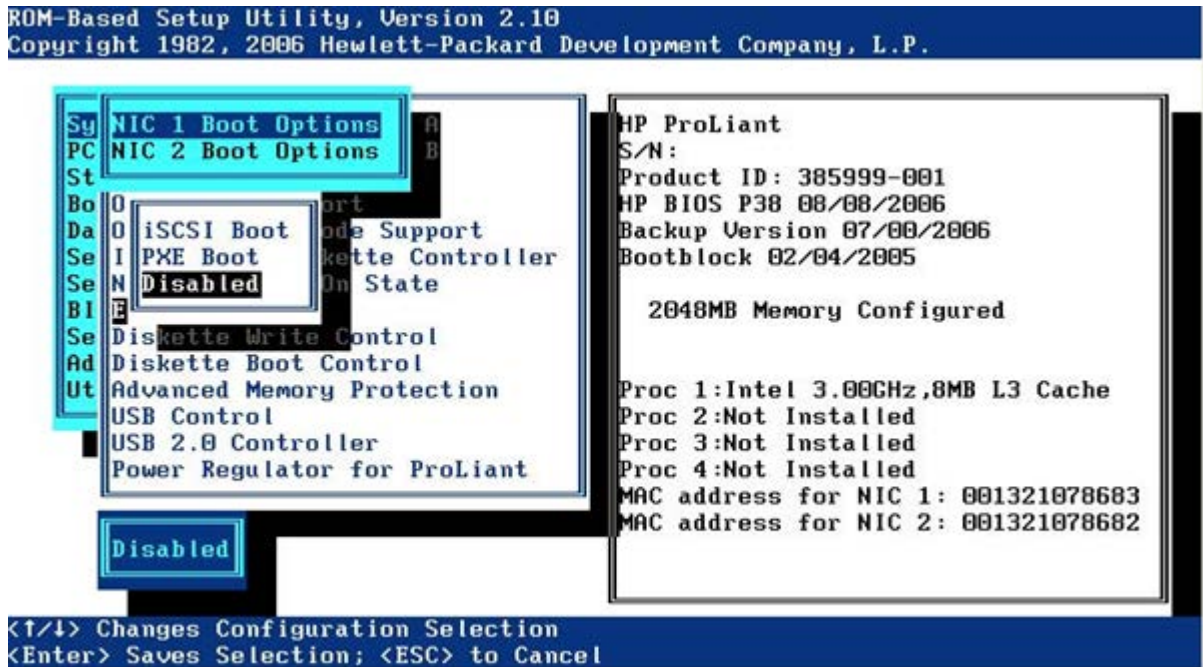
The Integrated Diskette Controller option is a simple toggle setting that enables or disables the diskette drive. When this option is disabled, the server cannot read from or write to the drive. Therefore, Diskette Write Control and Diskette Boot Control are irrelevant when Integrated Diskette Controller is disabled.

NUMLOCK Power-On State

The NUMLOCK Power-On State option is a simple toggle setting that enables or disables the power-up state of the NUMLOCK key. When the NUMLOCK key is enabled, the machine powers up with the NUMLOCK key active.

Embedded NICs

The Embedded NICs option enables iSCSI or PXE Boot support. This option enables the server to boot to the network (embedded NIC only) and attach to a PXE server with boot images. The option also enables the NIC port to display in the Standard Boot Order (IPL) list. For NIC 1, the default setting is PXE Boot, but for subsequent NICs, the default setting is Disabled. For more information on PXE technology, see the *Using PXE Technology on Compaq ProLiant Servers* white paper on the HP website (http://h50146.www5.hp.com/products/software/oe/linux/mainstream/bin/support/doc/pdf/pxe_13sd-1100a-wwen_rev1_us.pdf).



When enabling PXE or iSCSI Boot support, the NIC does not display in the Standard Boot Order (IPL) until the next reboot.

Diskette Write Control

The Diskette Write Control option is a simple toggle setting that sets the write controls for the diskette drive. The available configuration settings are either Read and Write or Read Only. When Read and Write is selected, the server can both read data from and write data to the diskette drive.

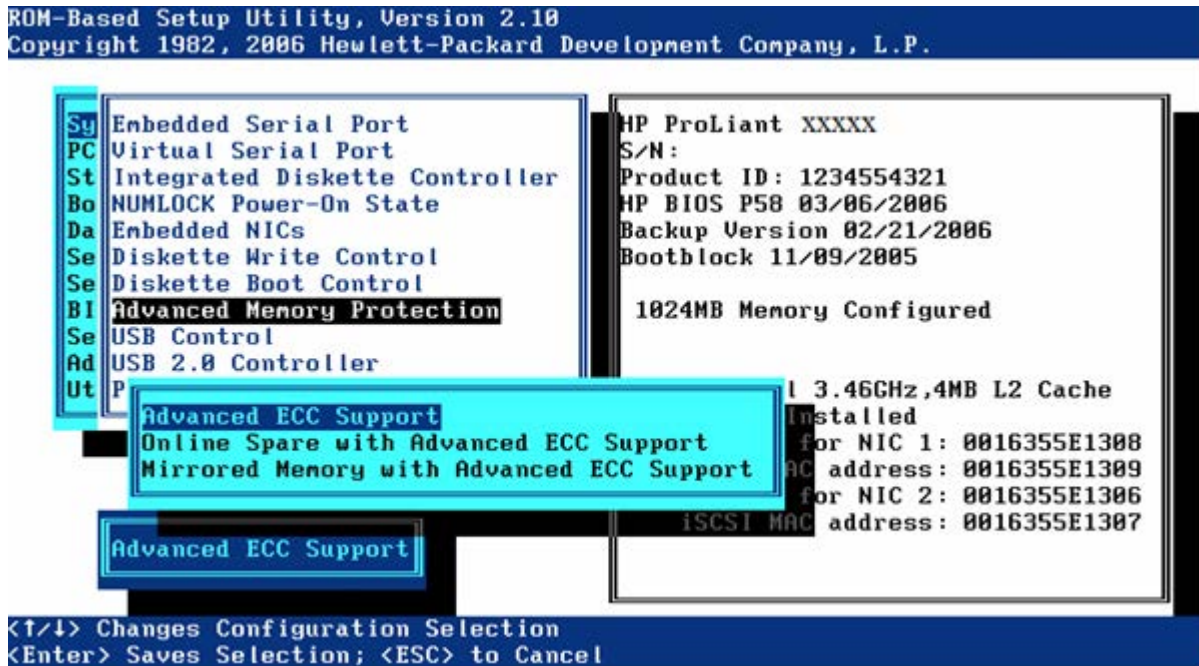
Diskette Boot Control

The Diskette Boot Control option is a simple toggle setting that enables the diskette drive to be used as a boot device. When this option is disabled, the server cannot boot from the diskette drive. This configuration setting is used as a security feature.

Advanced Memory Protection

The Advanced Memory Protection option provides additional memory protection beyond ECC.

For more information about Advanced Memory Protection, see HP ProLiant Advanced Technology on the HP website (<http://h18004.www1.hp.com/products/servers/technology/memoryprotection.html>).



- The Advanced ECC Support (maximum memory) setting disables additional resiliency and provides the largest memory capacity to the OS.
- The Online Spare with Advanced ECC Support setting requires a single group of spare modules and provides automatic failover of degraded modules in the system while it is running.
- The Mirrored Memory with Advanced ECC Support option provides protection against uncorrectable memory errors that would otherwise result in system failure. DIMM banks A and B are mirrored by DIMM banks C and D on the same memory board. The failed memory can be replaced while the system is running.

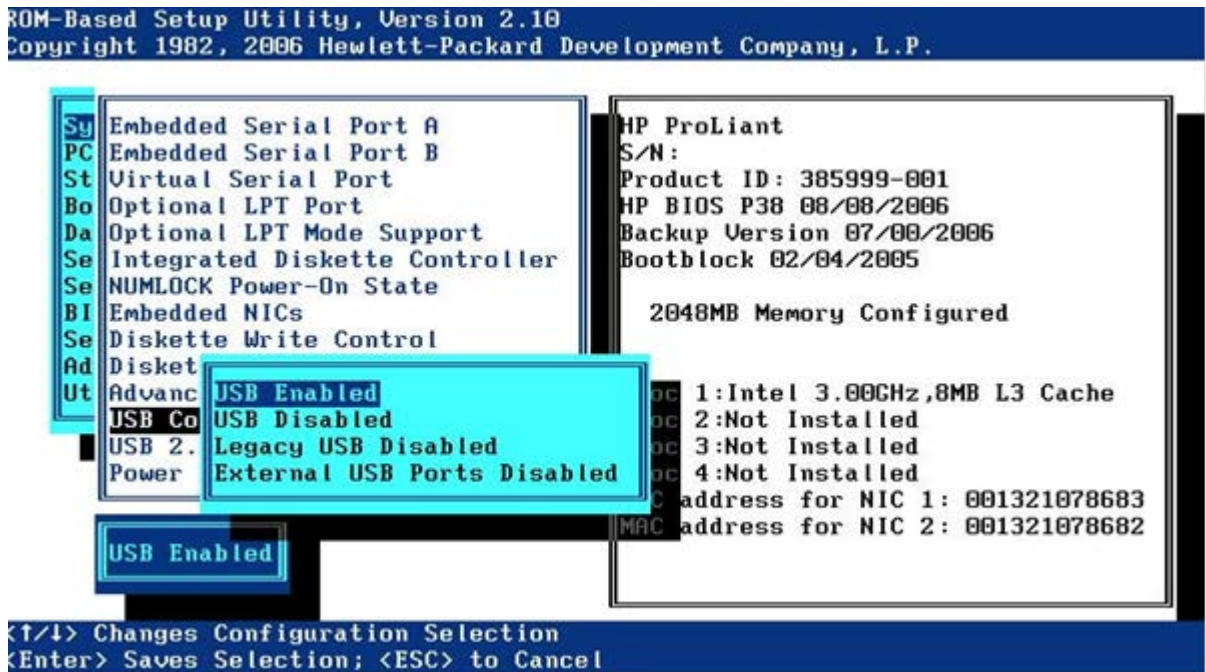
Mirrored DIMM pairs must be the same size to allow selection of single-board mirrored memory or dual-board mirrored memory. Pairing different size DIMMs results in the following caution:

Current memory configuration does not support Online Spare.

USB Control

The USB Control menu determines how USB ports and embedded devices operate at startup:

- When USB Enabled is selected, all USB ports and embedded devices are enabled.
- When USB Disabled is selected, all USB ports and embedded devices are disabled.
- When Legacy USB Disabled is selected, all USB ports are enabled under a USB-aware OS, but USB is not supported during POST or RBSU. Legacy USB Disabled also disables iLO virtual devices.
- When External USB Port Disabled is selected, external USB ports are disabled. Under this option, embedded USB devices still have full support under the ROM and OS.



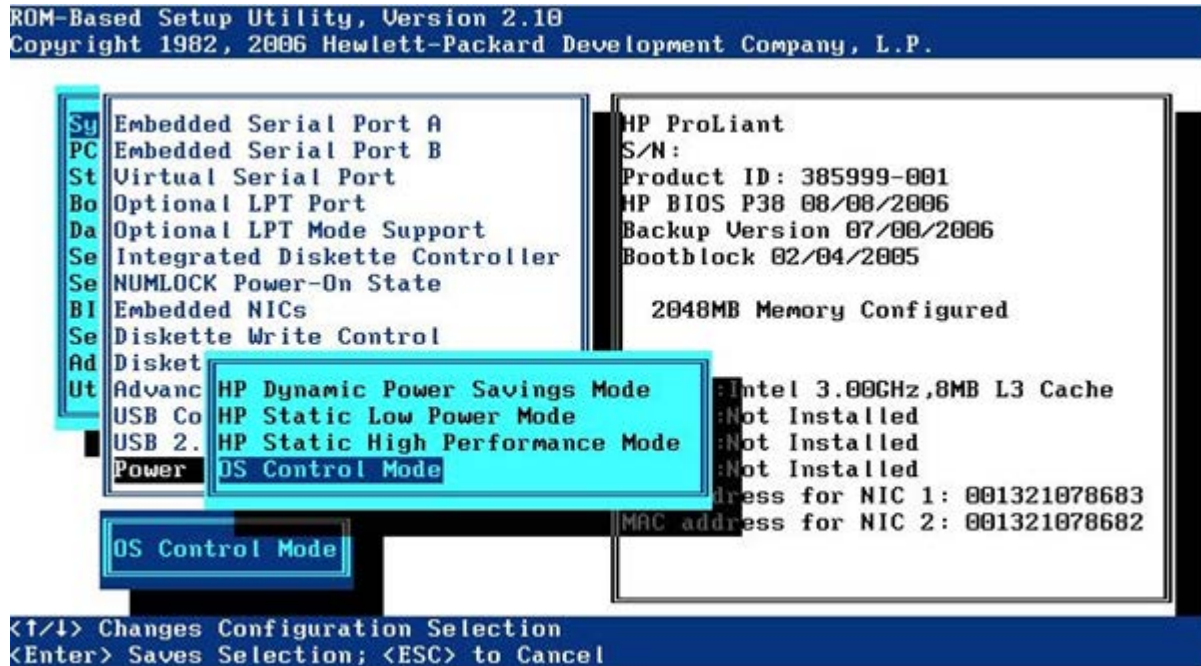
USB 2.0 EHCI Controller

The USB 2.0 EHCI Controller option is a toggle setting that enables or disables the high-speed USB 2.0 controller.

Power Regulator for ProLiant

The Power Regulator for ProLiant option provides multiple options for managing power usage of servers:

- In the HP Dynamic Power Savings Mode, the system adjusts the power and performance of the processor to the workload of the processor.
- In the HP Static Low Power Mode, the system operates in a lower state of performance.
- In the HP Static High Performance Mode, the system operates in its maximum performance state.
- In the OS Control Mode, processors operate at maximum speed unless the OS enables a power management policy.



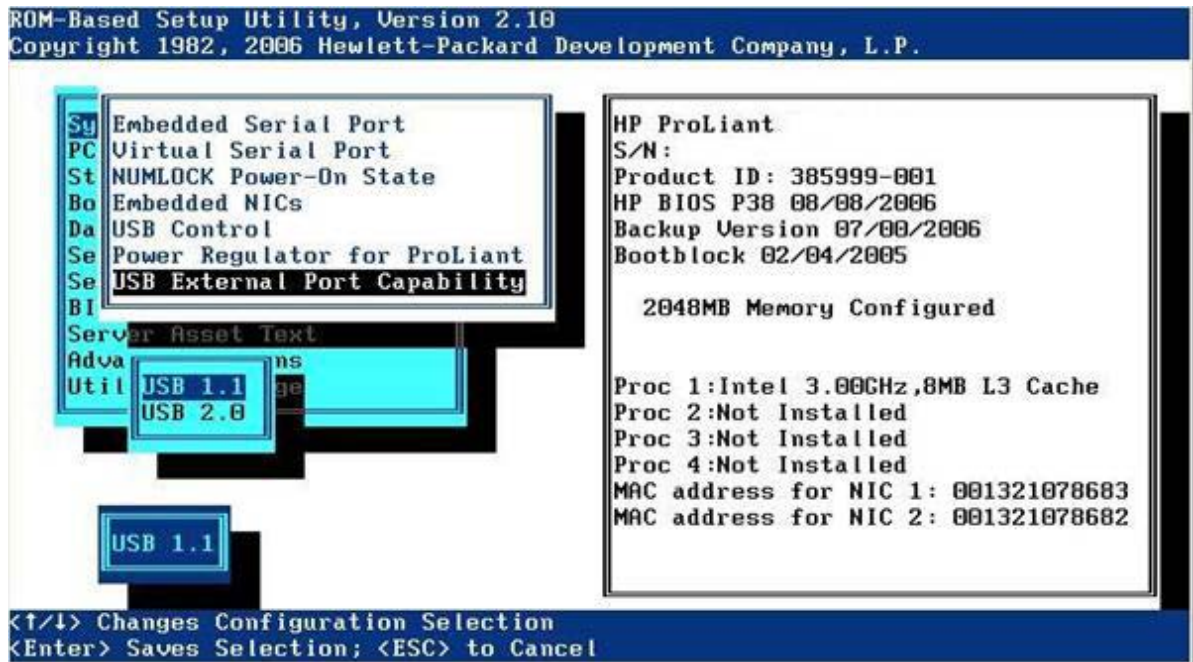
USB External Port Capability

The USB External Port Capability option configures the USB external ports to operate at USB 1.1 or USB 2.0 speeds.

Select USB 2.0 for improved performance if using an operating system other than Microsoft Windows Server 2003 or Microsoft Windows Server 2003 x64.

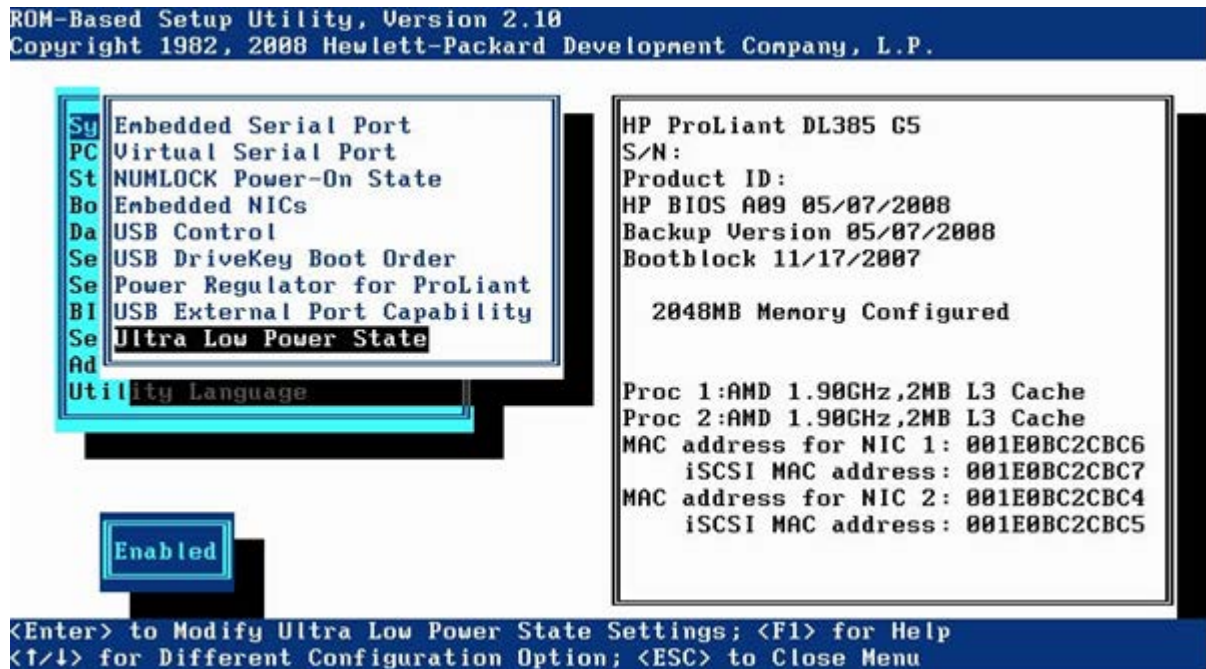
NOTE: Running external USB ports at USB 2.0 with Microsoft Windows Server 2003 or Microsoft Windows Server 2003 x64 causes delays during installations.

This selection does not affect the internal USB port or USB iLO Virtual Media devices.



Ultra Low Power State

Ultra Low Power State enables the system to transition to the lowest processor power state when the Power Regulator Mode is configured for HP Static Low Power Mode or HP Dynamic Power Savings Mode. In HP Static Low Power Mode, power savings increases with a small impact on maximum system performance. HP Dynamic Power Savings Mode increases power savings when processor utilization is low.



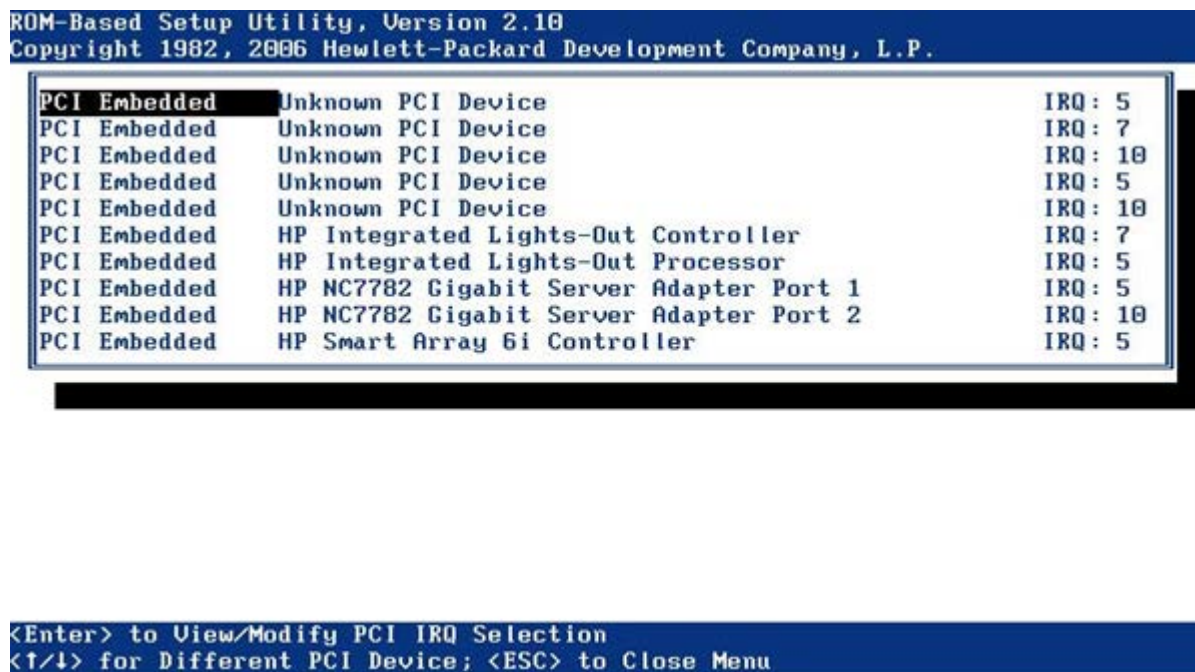
Ultra Low Power State is supported only on HP ProLiant servers with AMD processors.

PCI Devices menu

The PCI Devices menu displays the configuration settings of the PCI devices installed in the server and allows you to modify the IRQ. Multiple PCI devices can share an interrupt.

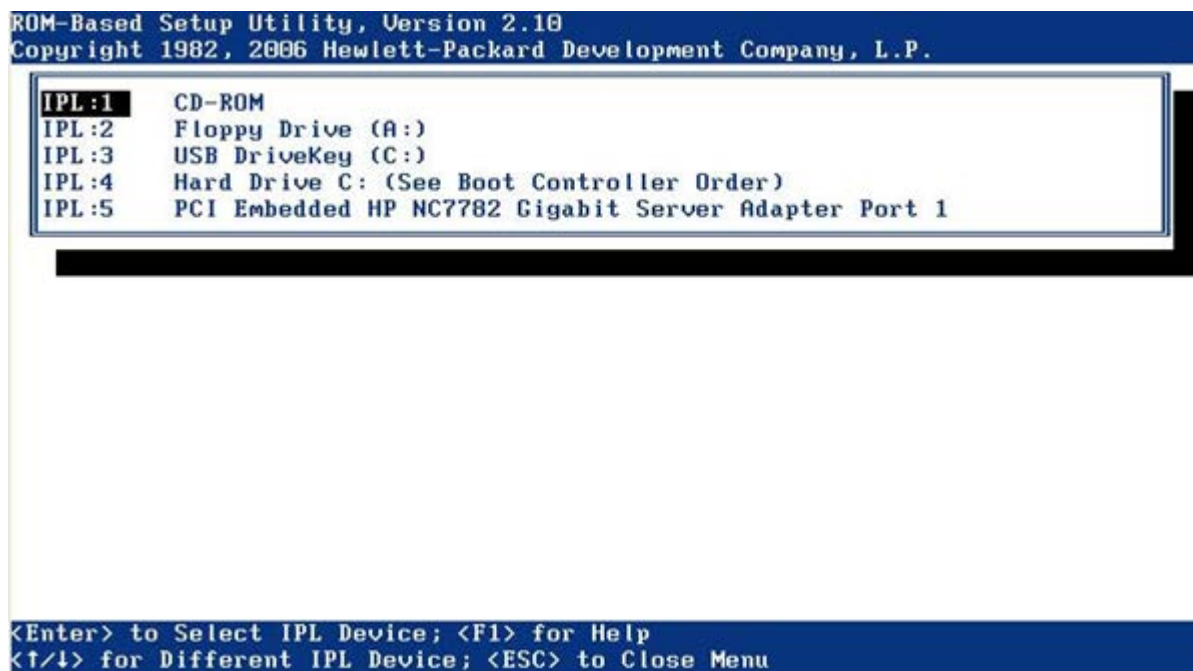
To disable a device, select the device and press the **Enter** key. A menu is displayed with options to change the IRQ and disable the device.

NOTE: Only IRQs that are modified in RBSU retain the change during the next reboot. IRQs on PCI devices that have not been modified are subject to change during reboot.



Standard Boot Order (IPL) menu

The Standard Boot Order (IPL) option configures the Initial IPL device and controls the search order the server uses to look for a bootable device.



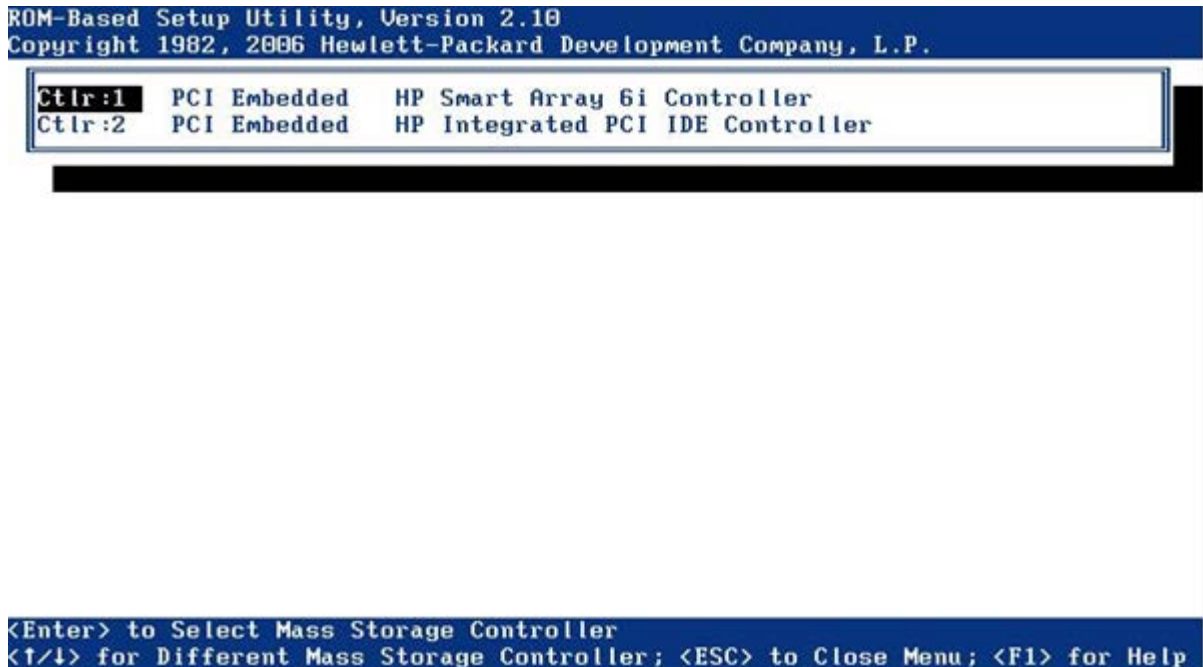
NOTE: If you enable or disable a device, restart the server. Changes do not take effect until after reboot.

Boot Controller Order menu

The Boot Controller Order option selects which of the installed mass storage devices is used as the primary boot controller. The server attempts to power up with the OS on this device.

The primary boot controller is set to controller 1.

NOTE: Changes made to the Boot Controller Order in the ORCA Utility are reflected in this menu.



- ❗ **IMPORTANT:** PCI devices that have been disabled in the PCI Devices menu might still be visible on the Boot Controller Order screen.

Date and Time menu

The Date and Time option sets the system time and date. Enter the date in a month-day-year (mm-dd-yyyy) format. Enter the time in an hour-minute-second (hh:mm:ss) format.

Server Availability menu

The Server Availability menu includes options that configure the ASR features:

- "ASR Status" (page 170)
- "ASR Timeout" (page 170)
- "Thermal Shutdown" (page 170)
- "Wake-On LAN" (page 170)
- "POST Speed Up" (page 170)
- "POST F1 Prompt" (page 171)
- "Power Button" (page 171)
- "Automatic Power-On" (page 171)
- "Power-On Delay" (page 171)

ASR Status

The ASR Status option is a toggle setting that either enables or disables ASR. When set to **Disabled**, no ASR features function.

ASR Timeout

The ASR Timeout option sets a timeout limit for resetting a server that is not responding. When the server has not responded in the selected amount of time, the server automatically resets. The available time increments are:

- 10 minutes
- 15 minutes
- 20 minutes
- 30 minutes
- 5 minutes

Thermal Shutdown

The Thermal Shutdown option is a toggle setting that determines when the server automatically powers down due to dangerous temperatures. When the setting is enabled (default), the Advanced System Management Driver initiates a system shutdown when the temperature reaches within 5 degrees of critical level. When the setting is disabled, the Advanced System Management Driver shuts down the system at critical level.

Wake-On LAN

The Wake-On LAN option is a toggle setting that enables or disables the Wake-On LAN feature. When set to Enabled, the server can be powered up remotely using a network controller. When changing to Enabled, the following caution appears:

When enabling Wake-on LAN, remove all power cords before adding or removing any adapters. Some adapters can cause the system to power on when added or removed.

POST Speed Up

The POST Speed Up option is a toggle setting that enables or disables the extended power-up memory test. When POST Speed Up is set to Enabled, the extended power-up memory test is not executed, and the server powers up more quickly.

POST F1 Prompt

The POST F1 Prompt option is a toggle setting that configures the server so the F1 key must be pressed to proceed when an error is encountered during the power-up sequence. A series of system tests executes during POST before continuing with the following:

- If failures occur that allow the system to continue operating, the system continues to boot but posts a message.
- If critical components fail or are missing, the server attempts to boot. If it can boot, it posts a message and an F1 prompt.
 - If Enabled is selected and an error occurs, the system stops at the F1 prompt until the F1 key is pressed, before continuing to boot.
 - If Delayed is selected and an error occurs, the system pauses for 20 seconds at the F1 prompt, and then continues to boot the OS.
- If the system cannot run with the missing or failed components, it halts until those components are replaced.

NOTE: The POST F1 Prompt setting is enabled by default in ProLiant ML and DL servers and is disabled by default in BL servers.

Power Button

Disabling the Power Button feature causes the momentary power button to stop functioning under any OS. The Power Button feature does not override the 4-second hold-down of the server power button.

Automatic Power-On

The Automatic Power-On feature enables the server to automatically power on when auxiliary power is applied to the server.

Power-On Delay

The Power-On Delay feature delays the server from powering on for a specified time to prevent power usage spikes when multiple servers power up after a power loss. Wake-on LAN, RTC wake-up, and iLO Virtual Power Button events override the delay and immediately power on the server.

The Power-On Delay options are:

- Disabled
- 15-second delay
- 30-second delay
- 45-second delay
- 60-second delay
- Random delay

Server Passwords menu

The Server Passwords menu includes options that configure the password environment of the server:

- “Set Power-On Password” (page 172)
- “Set Admin Password” (page 172)
- “Trusted Platform Module” (page 172)

- [“Network Server Mode” \(page 174\)](#)
- [“QuickLock” \(page 174\)](#)

Set Power-On Password

The Set Power-On Password option sets a password that controls access to the server during power-up. The server cannot be powered up until the correct password is entered. . To disable or clear the password, enter the password followed by a / (slash) when prompted to enter the password.

Password requirements:

- Seven characters maximum.
- Can be any combination of numbers, letters, and special characters.

NOTE: If more than seven characters are entered and accepted as the password, it will not be recognized when next powering on the server. However, if just the first seven characters of that password are entered, it will be recognized, allowing POST to continue.

Set Admin Password

The Set Admin Password option sets a password to control access to the RBSU and the System Maintenance Menu. If set, this password must be entered when F9 or F10 is pressed during POST. To disable or clear the password, enter the password followed by a / (slash) when prompted to enter the password.

Password requirements:

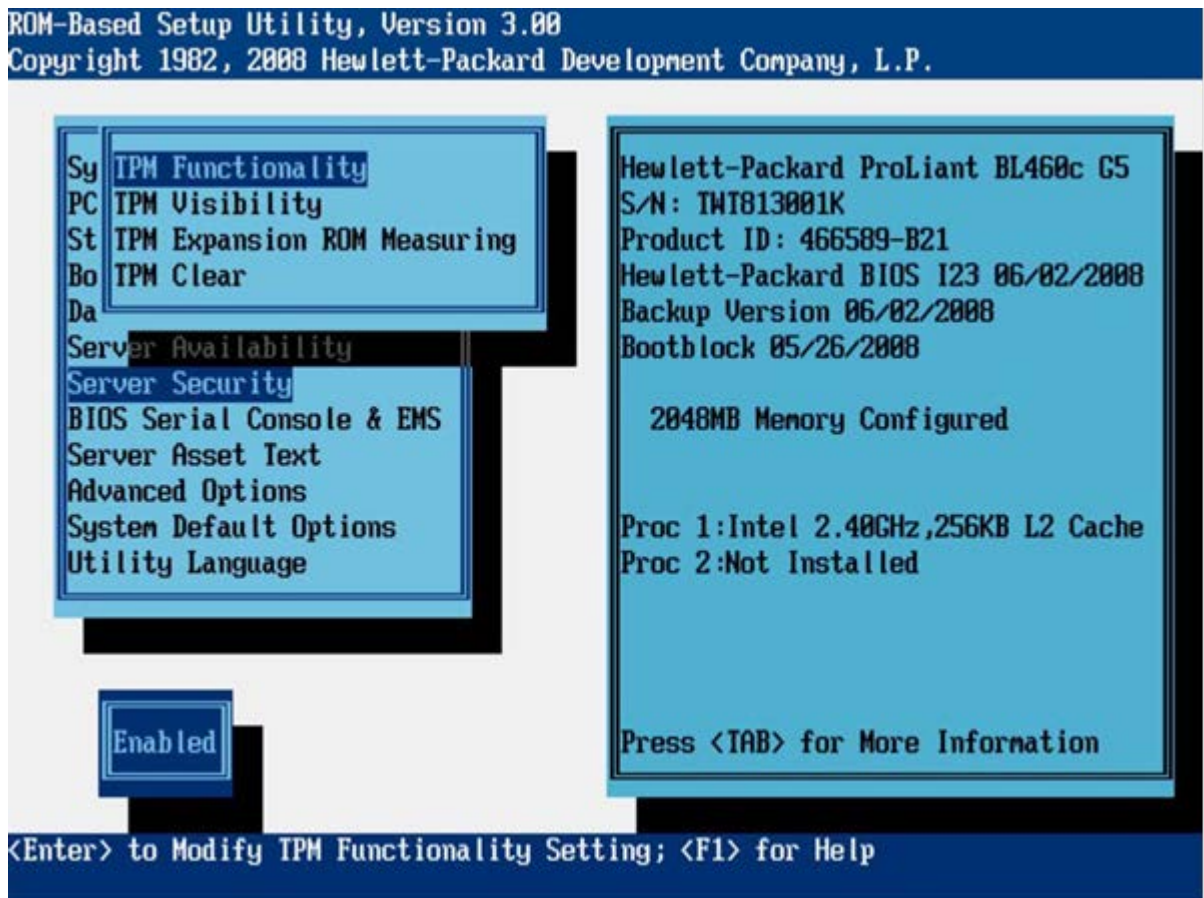
- Seven characters maximum.
- Can be any combination of numbers, letters, and special characters.

NOTE: If more than seven characters are entered and accepted as the password, it will not be recognized when next logging in to the RBSU. However, if just the first seven characters of that password are entered, it will be recognized, allowing access to the RBSU.

Trusted Platform Module

The Trusted Platform Module menu includes options that configure the optional Trusted Platform Module installed on HP ProLiant Generation 5p Servers:

- [“TPM Functionality” \(page 173\)](#)
- [“TPM Visibility” \(page 173\)](#)
- [“TPM Expansion ROM Measuring” \(page 173\)](#)
- [“TPM Clear” \(page 174\)](#)



TPM Functionality

Enabling TPM Functionality enables the TPM and BIOS secure startup. The TPM is fully functional in this mode.

- CAUTION:** When a TPM is installed and enabled on the server, data access is locked if you fail to follow the proper procedures for updating the system or option firmware, replacing the system board, replacing a hard drive, or modifying OS application TPM settings.

For information on installing and enabling the TPM module option, see the *HP Trusted Platform Module Option Installation Instructions* that ships with the option.

Disabling TPM Functionality disables the BIOS secure startup but still allows the TPM to be visible to the operating system. The TPM can respond to most commands in this mode.

Selecting Disabled may prevent the server from booting to a TPM-aware operating system.

TPM Visibility

The TPM Visibility option provides the ability to hide the TPM from the operating system. When the TPM is hidden, BIOS secure startup is disabled, and the TPM does not respond to any commands from any software.

Hiding the TPM may prevent the server from booting to a TPM-aware operating system.

TPM Expansion ROM Measuring

TPM Expansion ROM Measuring enables the BIOS to measure the optional PCI or PCIe expansion ROM code and store that measurement in the TPM. On subsequent reboots, operating systems or validation software that utilize the measurements stored in the TPM can use this data to detect modifications to PCI or PCIe expansion ROM versions.

TPM Clear

The TPM Clear option allows the user to reset the TPM to factory settings, clearing any assigned passwords, keys, or ownership.

Clearing the TPM may prevent the server from booting to a TPM-aware operating system.

Network Server Mode

The Network Server Mode option is a toggle setting that sets the server to operate in network server mode. This feature works in conjunction with the power-on password. When set to Disabled, the server operates normally. When it is set to Enabled, the following actions occur:

- The local keyboard remains locked until the power-on password is entered.
- The power-on password prompt is bypassed.
- When a diskette is in the diskette drive, the server does not start unless the power-on password is entered locally.

❗ **IMPORTANT:** Network server mode cannot be enabled until the power-on password has been established.

NOTE: Generation 8 Servers do not support Network Server Mode.

QuickLock

The QuickLock option is a toggle setting that either enables or disables the QuickLock feature. When set to Enabled, the keyboard is locked by pressing the **Ctrl+Alt+L** keys. The keyboard remains locked until the power-on password is typed.

NOTE: If the power-on password is disabled at the power-on key prompt, the QuickLock feature remains inactive until the password is changed in RBSU.

BIOS Serial Console and EMS menu

❗ **IMPORTANT:** Some languages or characters may require a specific emulation mode.

The BIOS Serial Console and EMS feature configures the serial port to view POST error messages and run RBSU remotely through a serial connection to the server COM port. The remote server does not require a keyboard or mouse. BIOS Serial Console is disabled in the ROM by default. EMS is enabled in the OS by default, but must also be enabled in the ROM.

For more information about the BIOS Serial Console, see [“RBSU BIOS Serial Console \(CLI\)” \(page 188\)](#).

BIOS Serial Console design supports VT100+ protocol, and ANSI and V100 terminal emulation. VT100 is supported by all terminal emulation programs. However, ANSI supports enhanced graphics and is more aesthetically appealing to some users. ANSI is the recommended choice if it meets the system requirements. CLI support is available on some new servers for faster, more compatible display when configuring a server using VT100 emulation. For more information, see [“BIOS Serial Console/CLI overview” \(page 188\)](#).

When viewed in BIOS Serial Console, the RBSU main menu looks slightly different from the local server view.

The following menu options are available:

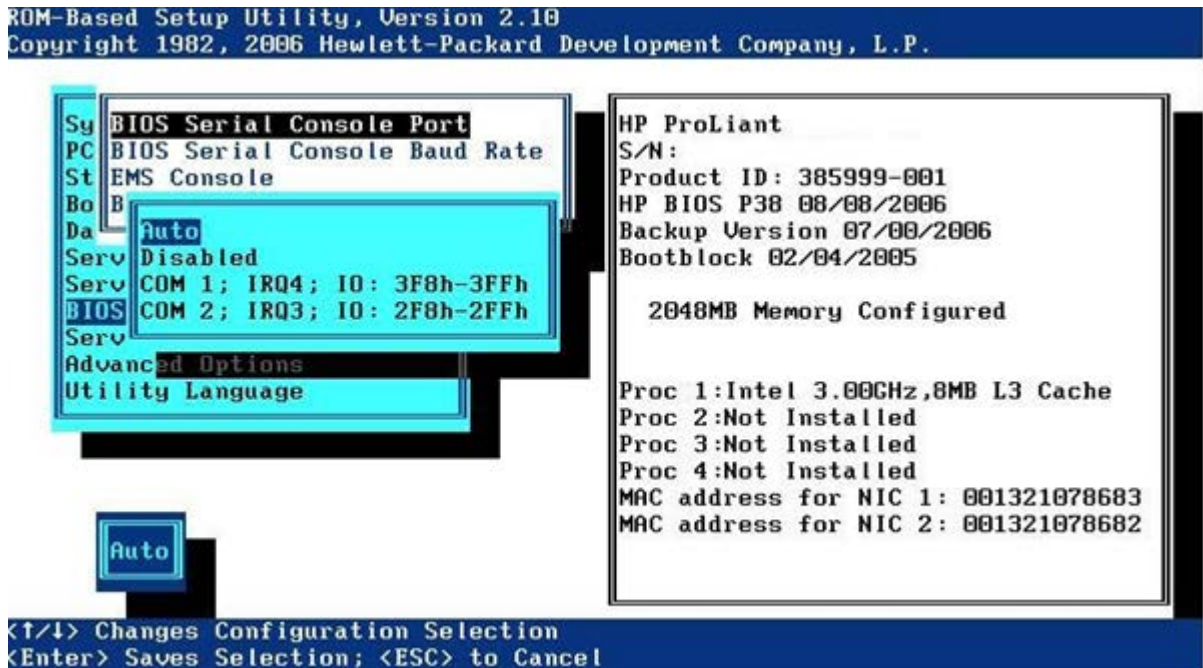
- [“BIOS Serial Console Port” \(page 175\)](#)
- [“BIOS Serial Console Baud Rate” \(page 175\)](#)

- “EMS Console” (page 177)
- “BIOS Interface Mode” (page 178)

BIOS Serial Console Port

The BIOS Serial Console Port option provides additional selections for enabling BIOS Serial Console.

NOTE: A null modem cable should be connected to the serial port/COM port which BIOS Serial Console is enabled.



NOTE: On select newer servers, the BIOS Serial Console Port default is Auto instead of Disabled. During the boot process, the server checks for the presence of a VT100 compatible client running at 9600 Baud connected to the server and automatically enables the BIOS Serial Console for that boot if one is found. This eliminates the need to run RBSU with a local keyboard and monitor attached to enable the BIOS Serial Console feature.

BIOS Serial Console Baud Rate

The BIOS Serial Console Baud Rate option enables baud rate changes.

Sy BIOS Serial Console Port
PC BIOS Serial Console Baud Rate
St EMS Console
Bo BIOS Interface Mode
Da
Serv 9600 bility
Serv 19200 rds
BIOS 57600 onsole & EMS
Serv 115200 Text
Adva ons
Utility Language

9600

HP ProLiant
S/N:
Product ID: 385999-001
HP BIOS P38 08/08/2006
Backup Version 07/00/2006
Bootblock 02/04/2005

2048MB Memory Configured

Proc 1: Intel 3.00GHz, 8MB L3 Cache
Proc 2: Not Installed
Proc 3: Not Installed
Proc 4: Not Installed
MAC address for NIC 1: 001321078683
MAC address for NIC 2: 001321078682

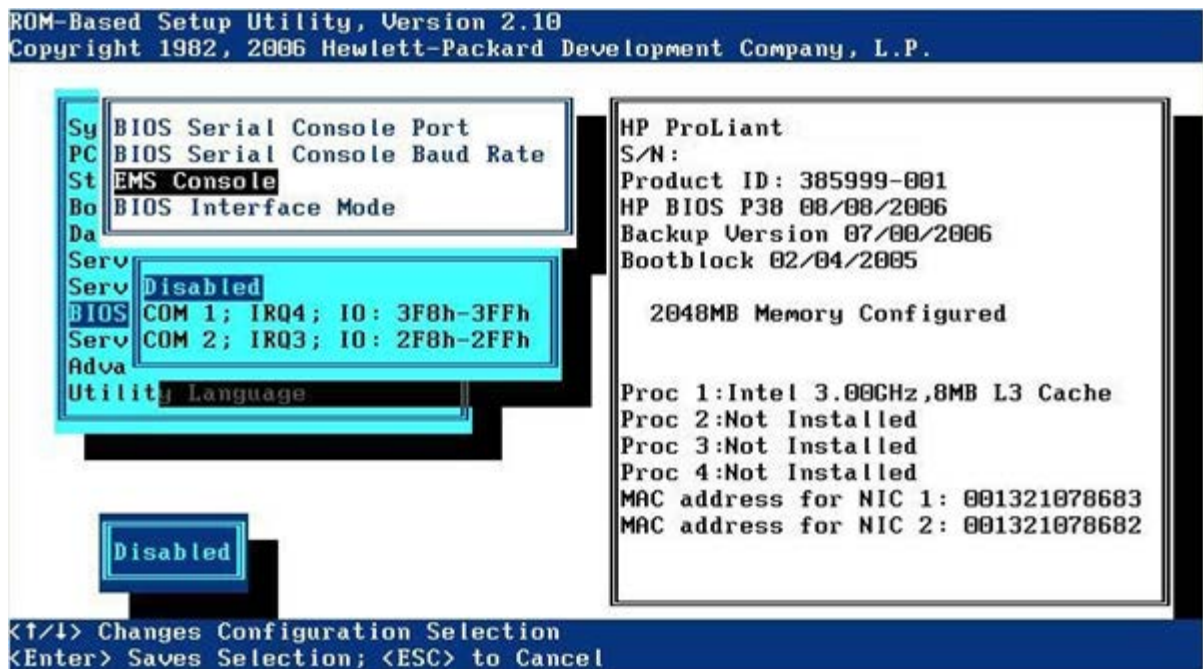
<↑/↓> Changes Configuration Selection
<Enter> Saves Selection; <ESC> to Cancel

EMS Console

The EMS Console option is a Microsoft Windows Server 2003 feature that enables the Emergency Management Console to be redirected through the serial port. The EMS Console feature is disabled by default.

- When using iLO, select the value (COM 1 or COM 2) assigned to the Virtual Serial Port (“Virtual Serial Port” (page 160)).
- When redirecting EMS through a physical serial port, select the value assigned to the Embedded Serial Port (“Embedded Serial Port A” (page 158)).

The EMS Console option is a Microsoft Windows Server 2003 feature that enables the Emergency Management Console to be redirected through the serial port. When using iLO, select the value (COM 1 or COM 2) assigned to the Virtual Serial Port). When redirecting EMS through a physical serial port, select the value assigned to the Embedded Serial Port. The EMS Console feature is disabled by default.



EMS provides input/output support for all Microsoft Windows kernel components: the loader, setup, recovery console, OS kernel, blue screens, and the Special Administration Console. The Special Administration Console is a text mode management console available after Windows Server 2003 OS has initialized. For more information on EMS, go to the Microsoft website (www.microsoft.com).

Microsoft enables EMS in the OS, but EMS must also be enabled in the ROM. EMS, when enabled, assumes the serial port for redirection and may cause interference with other devices attached to the serial port. To avoid interference, EMS is disabled in the system ROM by default on ML and DL servers. If EMS is disabled in Windows Server 2003, perform the following steps to update the boot.ini file:

1. Enable EMS in RBSU.
2. Run bootcfg/ems on/id 1.
3. Reboot.

BIOS Interface Mode

When Auto is selected as the BIOS Interface Mode, CLI mode is automatically selected for this POST only if the keyboard buffer receives characters from the serial port instead of the keyboard. When Command-Line is selected, CLI mode is automatically enabled.

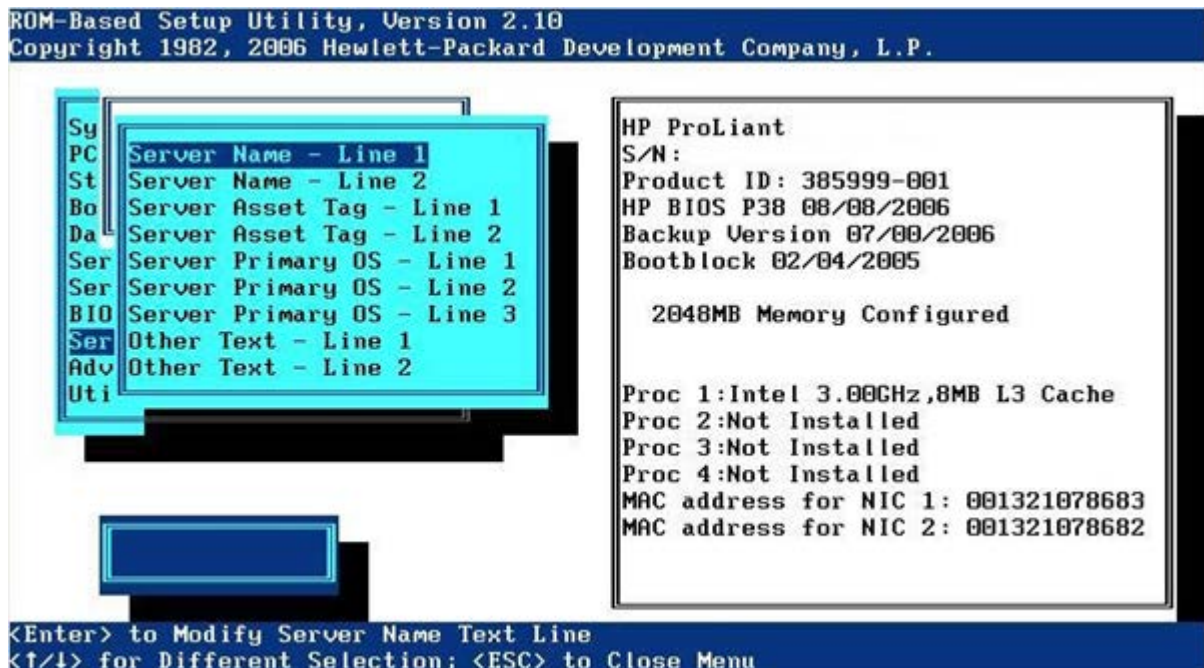
Server Asset Text menu

The Server Asset Text menu includes options that customize the system-specific text for the server. The following menu options are available:

- “Set Server Info Text” (page 178)
- “Set Administrator Info Text” (page 178)
- “Set Service Contact Text” (page 179)
- “Custom POST Message” (page 180)

Set Server Info Text

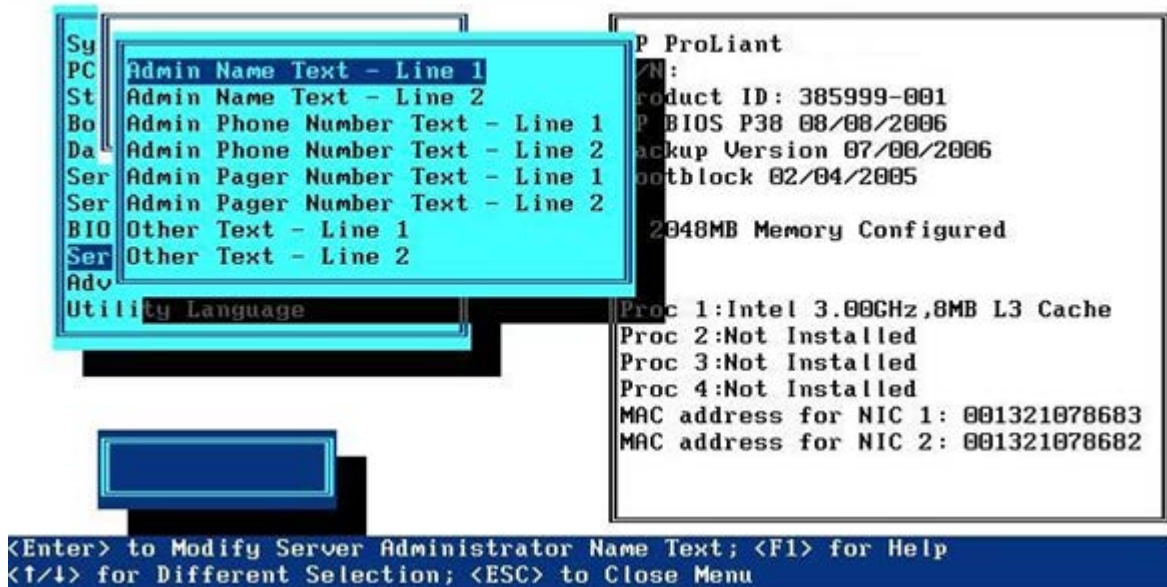
The Set Server Info Text option defines reference information for the server. The setting is blank by default.



- Server Name defines a two-line name identifying the server. A maximum of 14 characters can be entered on each line.
- Server Asset Tag defines a two-line asset tag to identify the server. A maximum of 16 characters can be entered on each line.
- Server Primary OS defines a three-line description of the primary OS of the server. A maximum of 14 characters can be entered on each line.
- Other Text defines two lines of additional text describing the server. A maximum of 14 characters can be entered on each line.

Set Administrator Info Text

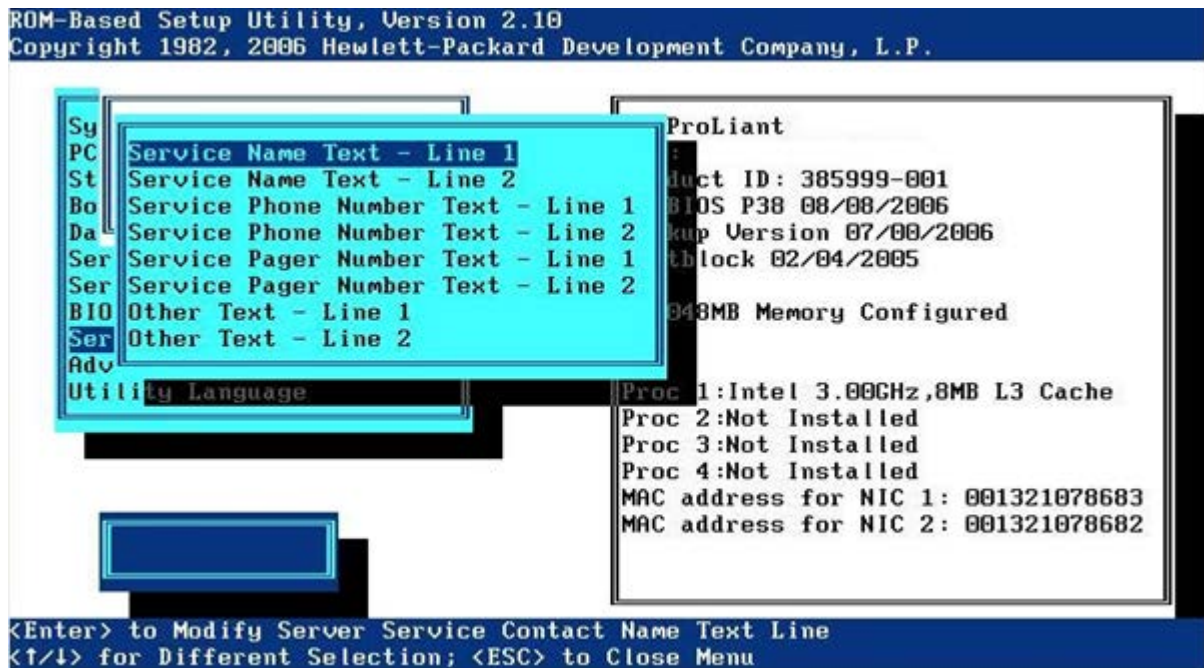
The Set Administrator Info Text option defines reference information for the server administrator.



- Admin Name Text defines a two-line description for the server administrator name. A maximum of 14 characters can be entered on each line.
- Admin Phone Number Text defines two lines of text for the server administrator phone number. A maximum of 14 characters can be entered on each line.
- Admin Pager Number Text defines two lines of text for the server administrator pager number. A maximum of 14 characters can be entered on each line.
- Other Text defines two lines of additional text relating to the server administrator. A maximum of 14 characters can be entered on each line.

Set Service Contact Text

The Set Service Contact Text option defines reference information for the service contact of the server.



- Service Name Text defines a two-line description for the service contact name. A maximum of 14 characters can be entered on each line.
- Service Phone Number Text defines two lines of text for the service contact phone number. A maximum of 14 characters can be entered on each line.
- Service Pager Number Text defines two lines of text for the service contact pager number. A maximum of 14 characters can be entered on each line.
- Other Text defines two lines of additional text relating to the service contact. A maximum of 14 characters can be entered on each line.

Custom POST Message

The Custom POST Message option enables entry of a custom message to display during POST.

Advanced Options menu

The Advanced Options menu includes options that enable you to configure the advanced features of the server:

- "Multi-Processor Specification (MPS) Table Mode" (page 181)
- "ROM Selection" (page 181)
- "Restore Default System Settings" (page 182)
- "Restore Settings/Erase Boot Disk" (page 182)
- "User Default Options" (page 182)
- "NMI Debug Button" (page 183)
- "Virtual Install Disk" (page 183)
- "Secondary IDE Channel Support" (page 183)
- "BIOS Enhanced RAID" (page 183)
- "Node Interleaving" (page 183)
- "Serial Number" (page 184)
- "Product ID" (page 184)

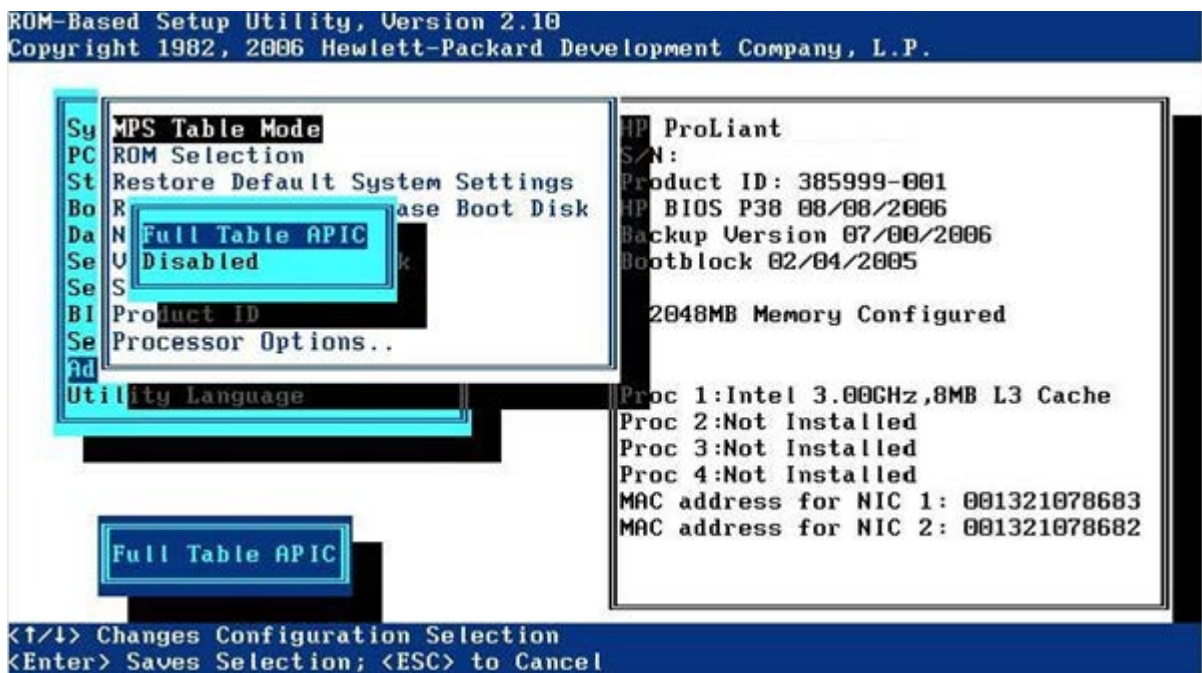
- “Drive Write Cache” (page 184)
- “SATA Software RAID” (page 184)
- “Optional PCI-X Riser Fan Monitoring” (page 184)
- “Processor Options” (page 184)
- “Power Supply Requirements Override” (page 185)
- “Embedded VGA Control” (page 186)

NOTE: Menu options may differ from those in this document, depending on specific server options.

Multi-Processor Specification (MPS) Table Mode

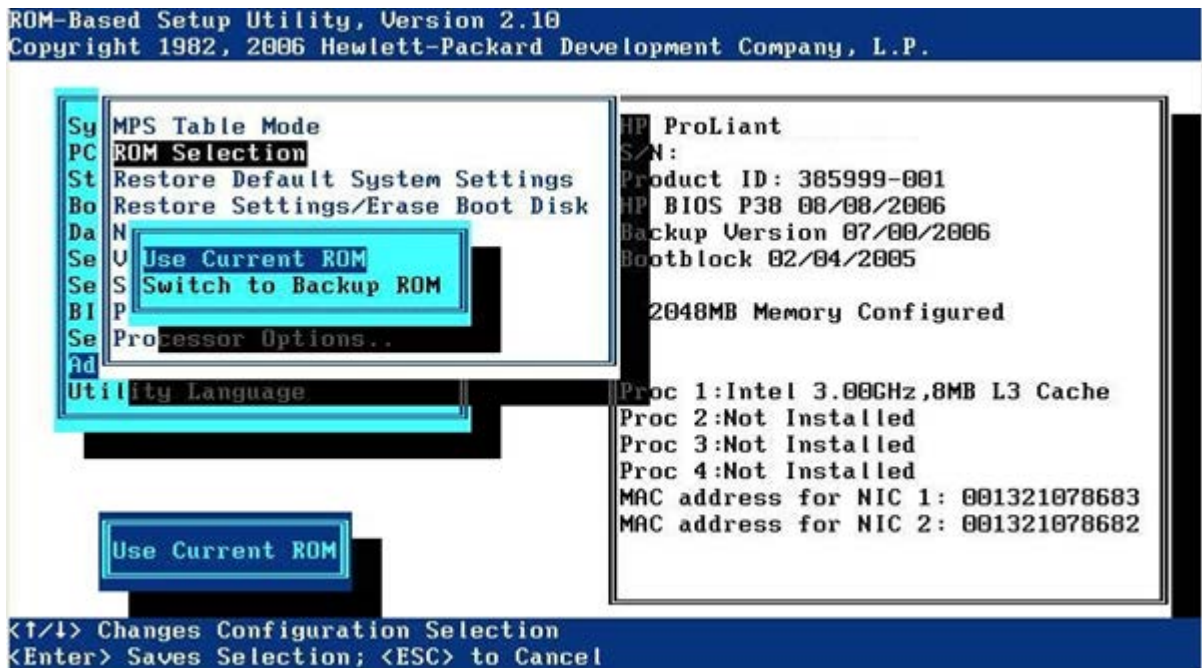
The MPS Table Mode option is automatically set, based on the OS selected, and is used for interrupt routing.

- ❗ **IMPORTANT:** This setting is pre-selected. You can override the default setting at this menu, but successful OS operation is dependent upon the correct (default) setting.



ROM Selection

The ROM Selection option toggles the server ROM between the current ROM and the backup ROM. All servers with redundant ROMs enable you to switch to the backup ROM.



Restore Default System Settings

The Restore Default System Settings option resets the non-volatile memory of the server to an initial, factory state when Yes, Select to Erase is selected. Selecting the Restore Default System Settings option results in the following message:

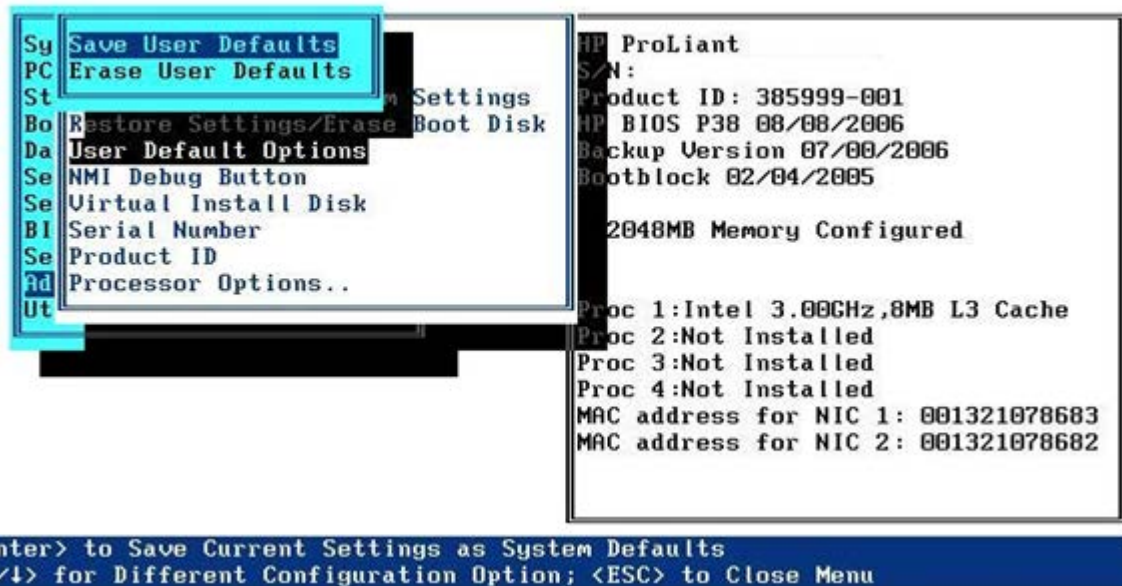
Caution: Clearing NVRAM will reset all configuration settings to their default values. Changes that have been made will be lost.

Restore Settings/Erase Boot Disk

The Restore Settings/Erase Boot Disk option resets the date, time, and all configuration settings to default values. Data on the boot disk drive is erased, and changes that have been made are lost.

User Default Options

User Default Options enable definition of default configuration settings. When the system is configured with default settings and saved, the new default settings override factory defaults.



NMI Debug Button

The NMI Debug Button option is a simple toggle setting that enables you to enable debug functionality when the system has experienced a software lock-up. The NMI Debug Button generates an NMI to allow the use of the OS debugger.

NOTE: When enabled, pressing the NMI Debug Button on the system board during normal OS operation generates a Blue-Screen Trap, ABEND, or Panic, and halts the system.

Virtual Install Disk

The virtual install disk is a holding place within the system ROM that contains embedded boot drivers (such as SCSI or RAID controller drivers) that may be necessary to complete the operating system installation. Typically, boot drivers that are placed in the virtual install disk are either not included as part of the operating system media or are updated for new controllers. Supported operating systems automatically find these drivers, eliminating the need for user intervention. To further optimize the system, HP recommends updating these boot drivers to the latest version after the OS install.

Secondary IDE Channel Support

The Secondary IDE Channel Support option is a toggle setting that enables or disables the secondary IDE channel. When enabled, an additional IDE device can be connected to the secondary IDE channel.

BIOS Enhanced RAID

The BIOS Enhanced RAID feature is a toggle setting that, when enabled, analyzes the Linux data on installed hard drives for failure information. Based on the analysis, the system ROM automatically chooses which hard drive to boot.

Node Interleaving

The Node Interleaving feature requires all nodes to have equal memory sizes when enabled. Enabling Node Interleaving may affect OS performance.

Serial Number

The Serial Number option Enables you to change the serial number. HP recommends that you do not change this number, unless you are replacing a system board. When the Serial Number option is chosen, a warning appears:

The serial number should ONLY be modified by qualified service personnel. This value should always match the serial number located on the chassis.

Product ID

The Product ID option sets the system product ID, which is found on the product ID sticker on the chassis. When the Product ID option is chosen, a warning appears:

The Product ID should ONLY be modified by qualified service personnel. This value should always match the Product ID located on the chassis.

Drive Write Cache

The Drive Write Cache option controls the state of the write cache of the drives attached to the supported controller. When the Drive Write Cache option is chosen, a warning appears:

Enabling Drive Write Cache may result in data loss or data corruption if an unexpected power loss occurs.

SATA Software RAID

The SATA Software RAID feature enables RAID functionality (RAID 0 or RAID 1) for the embedded SATA controller in the system. When the SATA Software RAID option is chosen, a warning appears:

Enabling Software RAID will result in data loss or data corruption on existing SATA drives. Please backup all drives before enabling this feature.

Optional PCI-X Riser Fan Monitoring

The Optional PCI-X Riser Fan Monitoring option, disabled by default, enables fan monitoring when an optional PCI-X expansion cage is installed.

Processor Options

The Processor Options menu includes submenu options for processor settings:

- [“Processor Hyper-Threading” \(page 184\)](#)
- [“HW Prefetcher” \(page 185\)](#)
- [“Adjacent Sector Prefetch” \(page 185\)](#)
- [“No-Execute Memory Protection” \(page 185\)](#)
- [“Intel Virtualization Technology” \(page 185\)](#)
- [“Expansion Card Caching Optimization” \(page 185\)](#)

Processor Hyper-Threading

The Processor Hyper-Threading option is a toggle setting that allows Intel Hyper-Threading Technology to be enabled or disabled, though it is enabled by default. Processor Hyper-Threading delivers two logical processors that can execute multiple tasks simultaneously using shared hardware resources of a single processor. The option is supported through the system BIOS. For more information on processor Hyper-Threading, see the user documents for your server or processor.

HW Prefetcher

The HW Prefetcher option allows processor prefetch features to be disabled. In most cases, the option should remain enabled. The option should be disabled only after performing application benchmarking to verify improved performance in a particular environment.

Adjacent Sector Prefetch

The Adjacent Sector Prefetch option allows processor prefetch features to be disabled. In most cases, the option should remain enabled. The option should be disabled only after performing application benchmarking to verify improved performance in a particular environment.

No-Execute Memory Protection

The No-Execute Memory Protection option, which is a toggle setting that is disabled by default, provides protection against malicious codes and viruses. Unless the location specifically contains executable code, memory is marked as non-executable.

Intel Virtualization Technology

The Intel Virtualization Technology option, when enabled, causes a Virtual Machine Manager to utilize hardware capabilities provided by Intel Virtualization technology. The option is disabled by default.

Expansion Card Caching Optimization

The Expansion Card Caching Optimization option allows some expansion cards to cache their I/O resources for improved performance. If the expansion card and its driver do not support this optimization, this option should remain disabled. When the option is enabled, a warning appears:

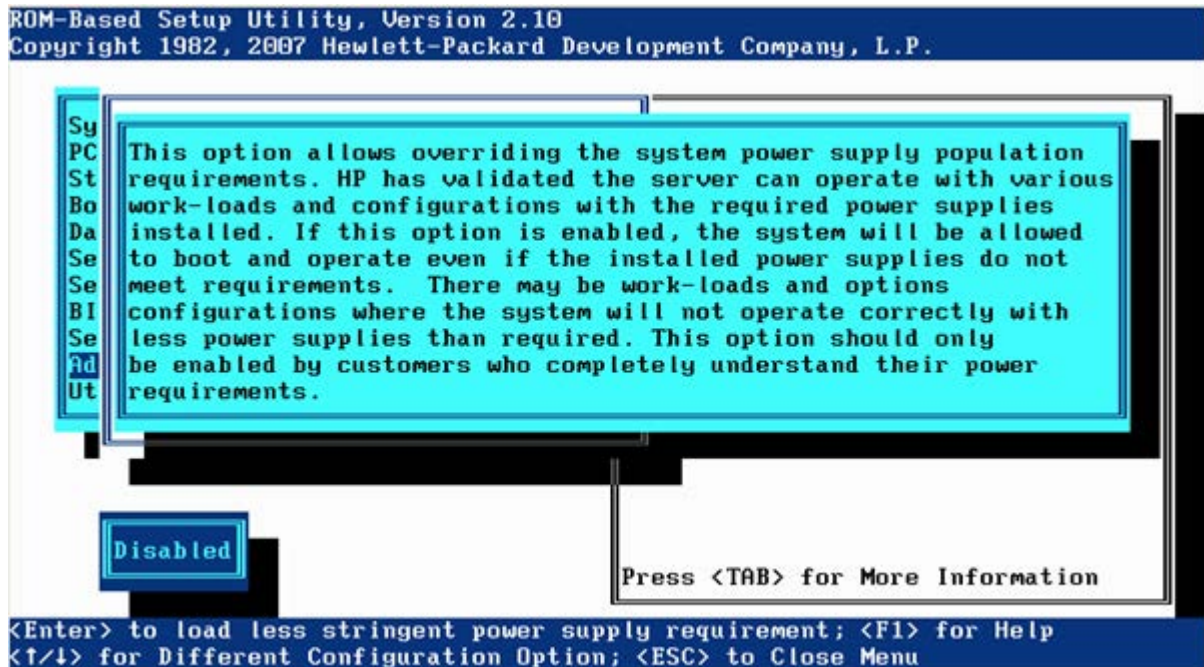
Setting this option to enabled may cause some system RAM to be non-cacheable in certain uncommon memory configurations. See Help.

Power Supply Requirements Override

The Power Supply Requirements Override setting enables the system to boot and operate when installed power supplies do not meet system requirements.



CAUTION: When Power Supply Requirements Override is enabled, some configurations may not operate properly. Before enabling this option, verify and understand the system power requirements.



Embedded VGA Control

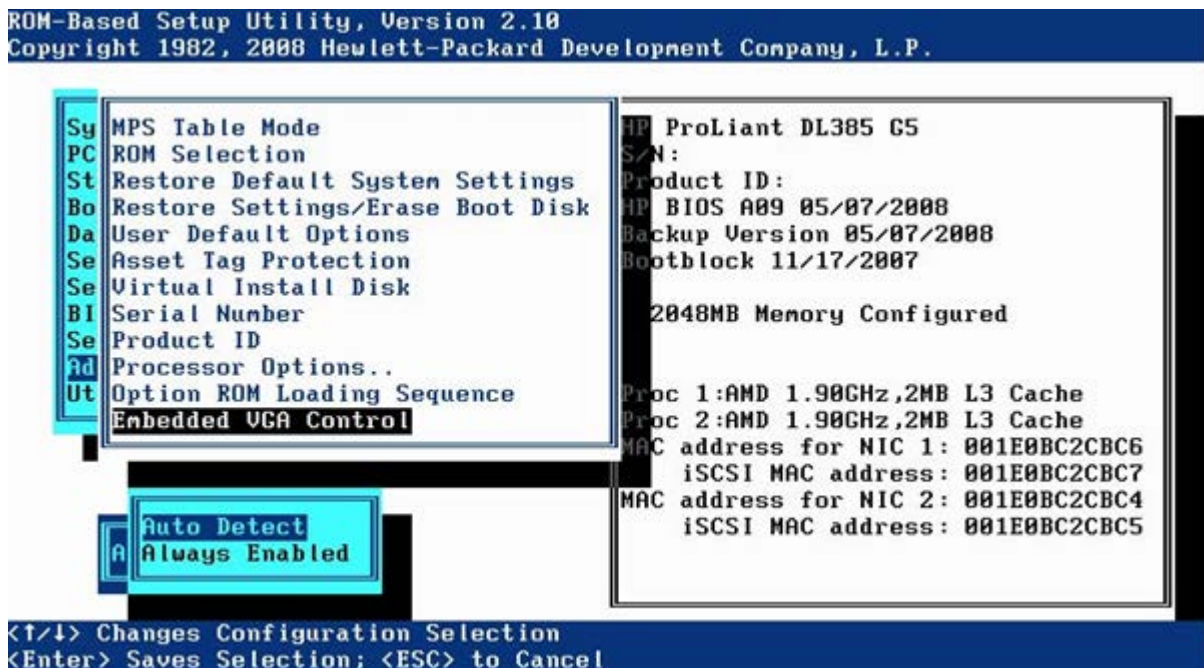
NOTE: The operating system video driver must support dual monitors.

NOTE: The Embedded VGA Control option does not work with all video adapters.

The Embedded VGA Control option, set to Auto Detect by default, disables the embedded video controller when an optional video controller is installed on the server.

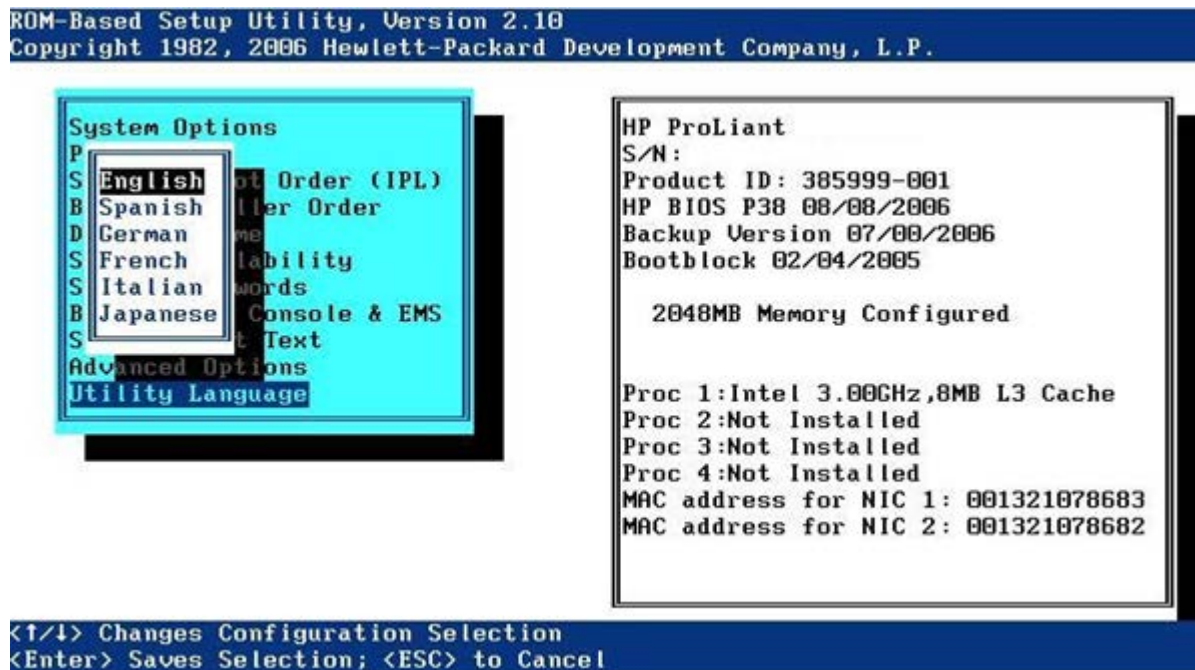
When Always Enabled is selected, the system ROM enables the embedded video controller as the primary video controller. This option provides dual-head support from both the embedded and optional video controllers.

For more information on feature support and how to enable functionality, see the operating system and video driver documentation.



Utility Language menu

The Utility Language menu enables you to set the display language for RBSU.



4 RBSU BIOS Serial Console (CLI)

BIOS Serial Console/CLI overview

A menu-driven user interface and a CLI are required to support both a Windows/PC background and a terminal/VT100 background. (The menu-driven interface does not display correctly on a VT100 interface because menus that get paged in and out require the entire screen to be redrawn.)

By default, if BIOS Serial Console is disabled or not in use, the menu-driven interface is used.

On select newer servers, the BIOS automatically determines whether to run embedded ROM utilities in menu-driven mode or CLI mode. If a VT100-compatible terminal is being used with BIOS Serial Console, CLI mode is selected by default.

BIOS Serial Console setup

To use the BIOS Serial Console, several parameters must be set, including the COM port to use, the baud rate, and default interface mode. Because menu options vary for different server models, for more information, see one of the following sections:

- Gen8 and G7 environments: [“BIOS Serial Console & EMS menu” \(page 94\)](#)
- G6 and earlier environments: [“BIOS Serial Console and EMS menu” \(page 174\)](#)

In addition, a null modem cable should be connected to the serial port/COM port one which BIOS Serial Console is enabled.

Terminal emulation options

BIOS Serial Console supports ANSI and VT100 terminal emulation and is designed to support most terminal emulation programs. No special version of a terminal emulation program is required, although the emulation modes supported may vary by vendors. To avoid compatibility problems, only the core set of VT100 and ANSI terminal emulation is used in BIOS Serial Console. Although this limits some capabilities, this protocol guarantees the maximum compatibility across different platforms and vendors.

NOTE: On some newer servers, emulation will be limited to VT100 compatibility.

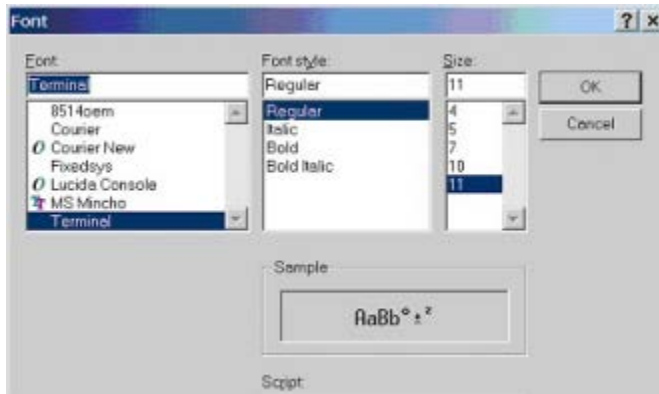
Default settings for terminal emulation and baud rate can be changed through the ProLiant BL e-Class Integrated Administrator for the current session only.

Microsoft HyperTerminal setup

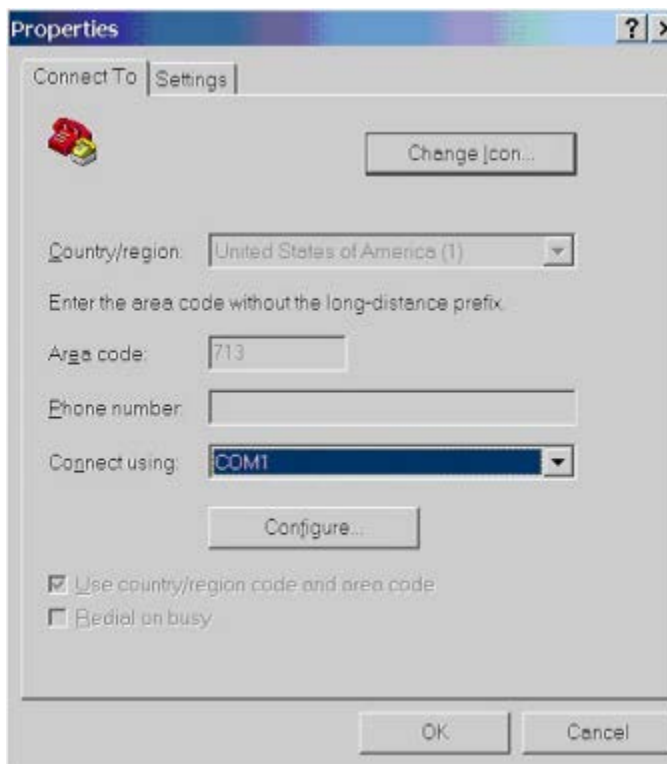
Because Microsoft HyperTerminal is a widely used terminal emulation program, examples of HyperTerminal 6.3 setup screens follow to aid in the initialization process. Be sure that the remote terminal screen settings match the screens in this section. If using an emulation program other than HyperTerminal, see the software reference material for settings information.

NOTE: Microsoft HyperTerminal settings must match BIOS Serial Console settings. Access the OS terminal settings or RBSU to change the default settings.

1. To access the font screen, select the **View** menu from the HyperTerminal main screen, and then click **Font**. Select **Terminal**.

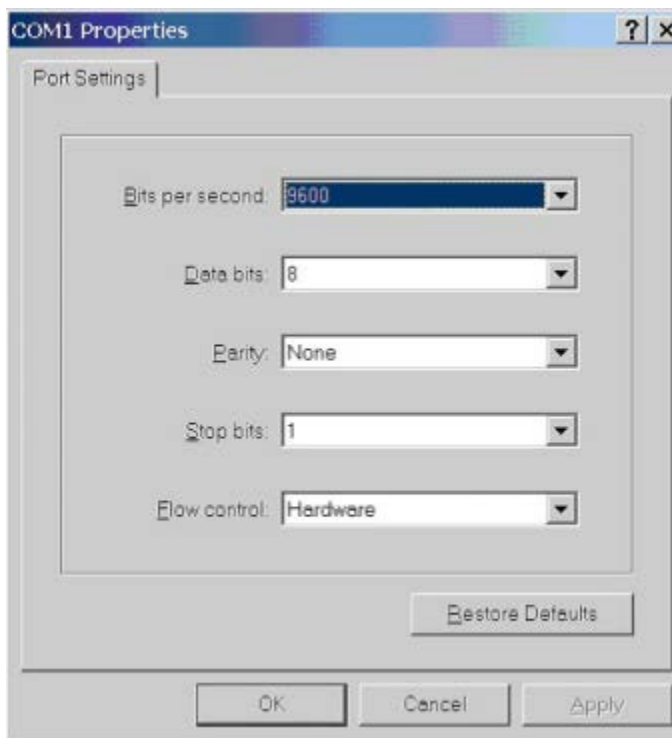


2. Access connection settings from the HyperTerminal main screen by selecting the **File** menu, and then clicking **Properties**.
3. On the Connect To tab, click **Configure** to display the Port Settings tab.

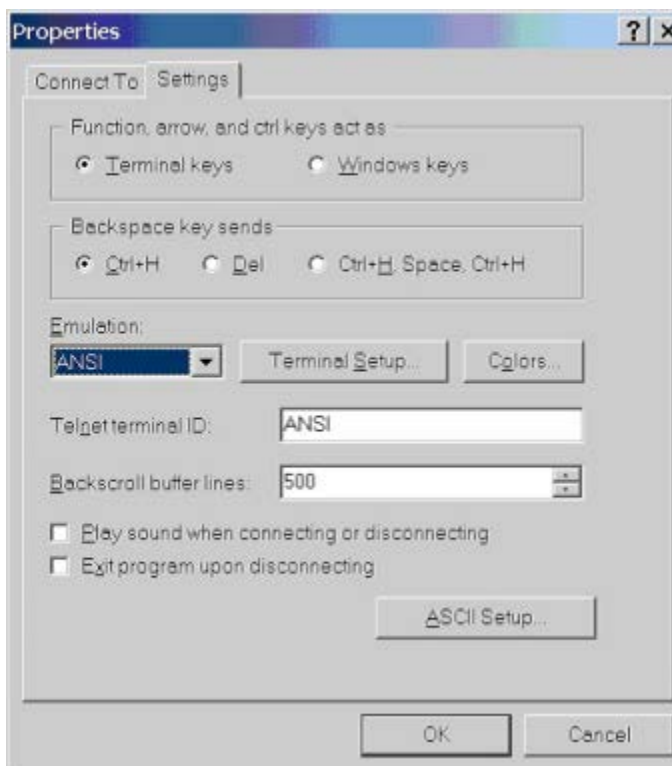


NOTE: If using a notebook computer, the Connect using field should be set to COM1 or COM2, depending on your configuration. COM1 is the HP default setting.

4. Select **Port Settings**. Then click **OK** to return to the Properties screen.

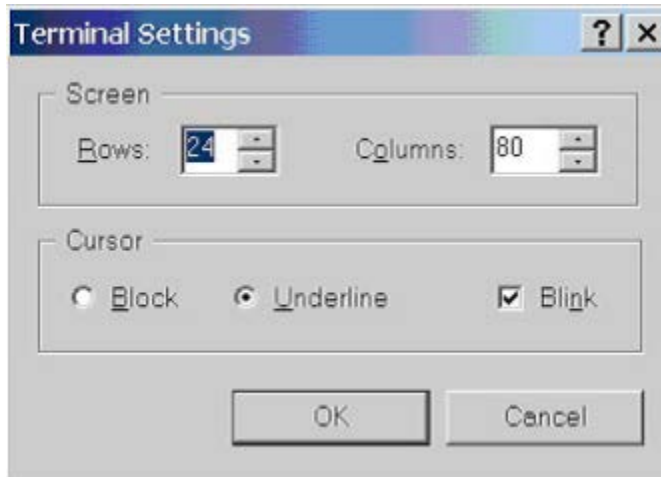


5. On the Properties screen, click the **Settings** tab.
6. If using ANSI emulation, click **Terminal Setup** and select **ANSI** (if using VT100 emulation, see step 9). ANSI is the default setting.

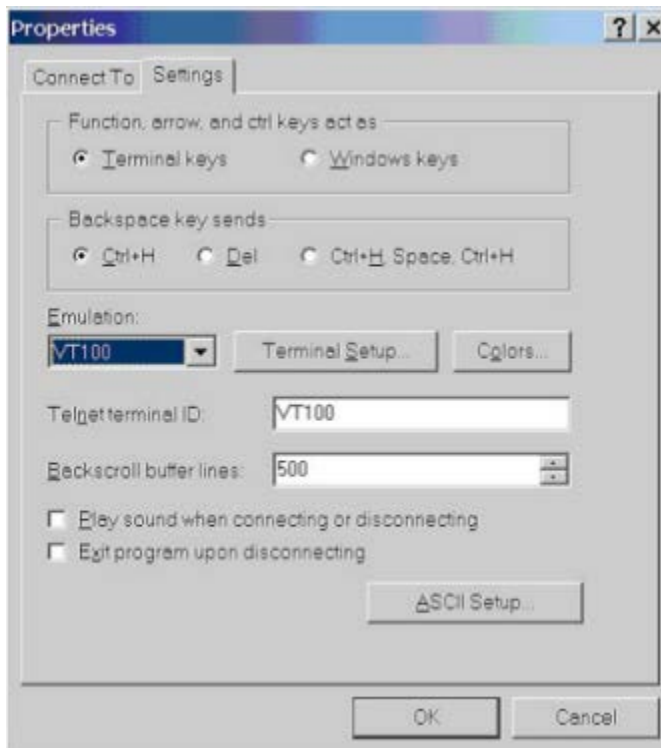


NOTE: Both the remote and local machines must be set to the same emulation.

7. Select **Terminal Settings**.

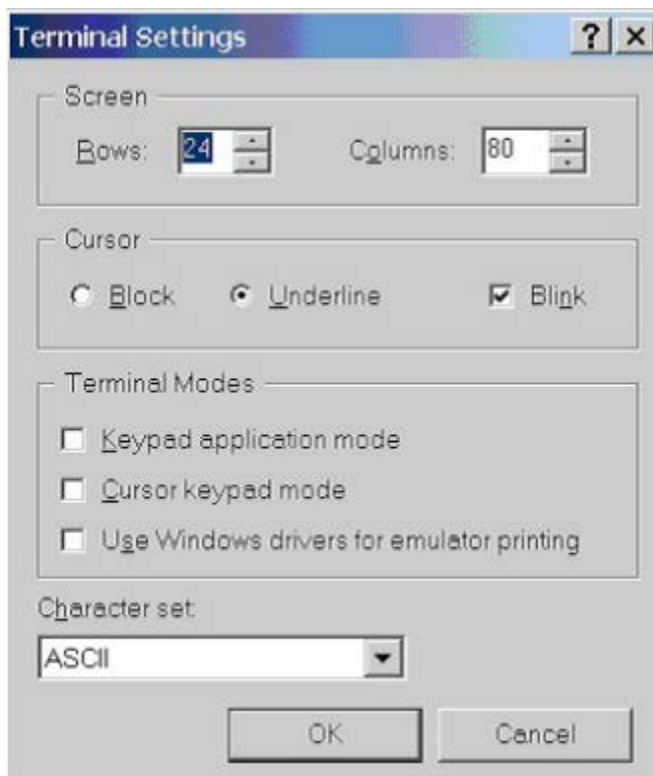


8. Click **OK** to return to the Settings tab, and click **OK** again to complete the HyperTerminal setup process.
9. If using VT100 emulation, click **Terminal Setup** and select **VT100**.

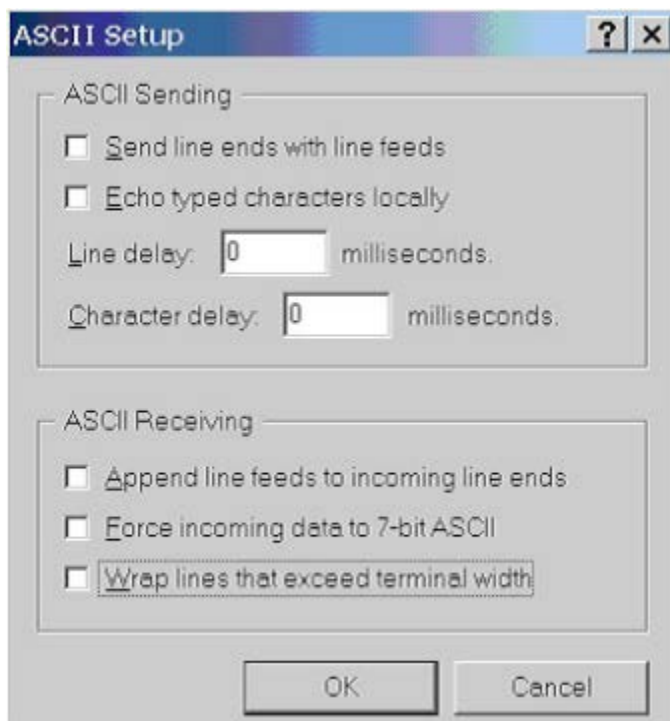


NOTE: If using VT100 emulation, the setting must be changed from the default ANSI setting in RBSU.

10. Select **Terminal Settings**. Click **OK** to return to the Settings tab.



11. On the Settings tab, click **ASCII Setup**.
12. Deselect **Wrap lines that exceed terminal width**. Click **OK** to return to the Settings tab. Then click **OK** to complete the HyperTerminal setup process.



Keystroke emulation

Because not all terminal emulation programs support function keys or special characters, certain keystroke sequences are required for some commands.

Escape sequences

BIOS Serial Console enables you to manually input unsupported keystrokes by entering escape sequences. Each character must be entered within 2 seconds of pressing and holding down the **Esc** key to emulate the escape sequence.

NOTE: You must use escape sequences if the emulation program does not support function keys, but they also work if the emulation program does support function keys. To determine whether you can use function keys, see the terminal emulation guide.

Function keys

Keyboard entry	Defined as
<ESC>1	F1
<ESC>2	F2
<ESC>3	F3
<ESC>4	F4
<ESC>5	F5
<ESC>6	F6
<ESC>7	F7
<ESC>8	F8
<ESC>9	F9
<ESC>0	F10
<ESC>!	F11
<ESC>@	F12

Control keys

Keyboard entry	Defined as
<ESC>h	Home
<ESC>k	End
<ESC>+	Insert
<ESC>-	Delete
<ESC>?	Page Up
<ESC>/	Page Down

Reset key

Keyboard entry	Defined as
<ESC>R<ESC>r<ESC>R	System Reset

Character translations in VT100 mode

The VT100 protocol does not support special characters such as line draw characters. These characters are translated so that they can be displayed on the VT100 screen. Character translation is used for improved VT100 screen display and has no effect on functionality of BIOS Serial Console.

Currently, the special characters in the table are translated into VT100 characters using VT100 protocol.

Special character	Translated into
Line draw character upper left corner	+
Line draw character lower left corner	+
Line draw character upper right corner	+
Line draw character lower right corner	+
Line draw character horizontal line	-
Line draw character vertical line	

Inspect CLI Commands

Command	Usage	Description
HELP	HELP or HELP <command>	Displays all supported commands or usage and descriptions of a specific command.
EXIT	EXIT	Exits Inspect Utility and reboots.
QUIT	QUIT	Exits Inspect Utility and reboots.
EXPORT	EXPORT	Exports ALL information to a text file on floppy drive A.
SHOW CONFIG	SHOW CONFIG	Displays all RBSU options and current settings.
SHOW CMOS	SHOW CMOS	Displays all ISA CMOS.
SHOW IML	SHOW IML	Displays all system event log records.
SHOW SMBIOS	SHOW SMBIOS	Displays all SMBIOS record information.
SHOW PCI	SHOW PCI	Displays all PCI devices and PCI header information.
SHOW EVS	SHOW EVS	Displays all System EVs.
SHOW MEM	SHOW MEM	Displays system memory map.
SHOW SYS	SHOW SYS	Displays overview of System from SMBIOS information.
SHOW BOOT	SHOW BOOT	Displays Primary Boot controller.
SHOW ACC	SHOW ACC	Displays Primary Array Controller Configuration information.

RBSU CLI Commands

The CLI mode of RBSU is a different interface that provides equivalent functionality to the menu-based mode.

Command	Usage	Description
HELP	HELP or HELP <command>	Displays all supported commands or usage and descriptions of a specific command.
EXIT, QUIT	EXIT, QUIT	Exits RBSU and resets or power-cycles system.
SHOW CONFIG	SHOW CONFIG SHOW CONFIG <option>	SHOW CONFIG displays all available <options>. SHOW CONFIG <option> displays current setting and all other setting choices for <option> specified. SHOW CONFIG SCRIPT displays the script required to recreate the settings of the server.
SHOW CONFIG OPTIONS	SHOW CONFIG OPTIONS	Displays list of CONFIG options that are viewable or settable using SHOW or SET CONFIG on this server.
SHOW CONFIG SCRIPT	SHOW CONFIG SCRIPT	Displays the script of SET commands required to recreate all the server system-related configuration settings. Does not display script for Passwords, Date/Time, or Serial Number.
SET CONFIG	SET CONFIG <choice> <option>	Sets CONFIG option setting to choice specified by <choice> that corresponds to the number of the choice listed by SHOW CONFIG for that particular option.
SHOW SN	SHOW SN	Displays current serial number value.
SET SN	SET SN <serial #>	Sets serial number to the value specified.
SHOW BOOT	SHOW BOOT	Displays currently configured boot controller order list.
SET BOOT	SET BOOT <controller #>	Sets new primary boot controller to controller number in list displayed by SHOW BOOT command, and then displays the new list.
SET BOOT (alternate usage for scripting)	SET BOOT <order #> <PCI Vendor/DevID> <PCI Slot #> <PCI Bus #> <PCI Device #> <PCI Fcn #>	Sets controller order # entry to device specified by PCI ID and location. This format is only used by SCRIPT driven commands. Order # is 1-based where 1 is the primary boot controller, and so on.
SHOW IPL	SHOW IPL	Displays current standard boot order device list of IPL devices in priority order.
SET IPL	SET IPL [A: C: CD PXE] <new IPL Priority>	Sets standard boot order priority for the IPL device specified to new priority number specified. The device specified must be represented in the current IPL list displayed by SHOW IPL.

Command	Usage	Description
SHOW PCI	SHOW PCI	Displays a list of all PCI devices and their current IRQ settings or disabled status. Also, displays a list of IRQs available for PCI devices to use.
SET PCI	SET PCI <device #> <IRQ>	Sets an override IRQ value (1-15) for the PCI device selected, where <#> corresponds to the number of the PCI device in the list displayed by the SHOW PCI command. Use 0 for the <IRQ> value to disable a PCI device.
SET PCI (alternate usage for scripting)	SET PCI <device #> <IRQ>	Sets an override IRQ value (1-15) for the PCI device selected, where <#> corresponds to the number of the PCI device in the list displayed by the SHOW PCI command. Use 0 for the <IRQ> value to disable a PCI device.
SHOW SYS	SHOW SYS	Displays overview of System from SMBIOS info.
SET PASSWORD POWERON	SET PASSWORD POWERON	Sets the Power-on password. Password must be entered twice for verification and must be seven characters or fewer.
SET PASSWORD ADMIN	SET PASSWORD ADMIN	Sets the Admin password. Password must be entered twice for verification and must be seven characters or fewer.
SHOW DATE	SHOW DATE	Displays date <mm/dd/yy>
SHOW TIME	SHOW TIME	Displays time <hh:mm>
SET DATE	SET DATE <mm/dd/yy>	Sets date to new value specified. Century value assumed to be 20.
SET TIME	SET TIME <hh:mm>	Sets time to new value specified. Seconds value is set to 0.
SHOW TEXT SERVER	SHOW TEXT SERVER	Displays current server info text strings.
SET TEXT SERVER	SET TEXT SERVER [N A P O] [1 2 3 4] <string>	Sets server info text string specified to <string> where: 'N': Server Name (28) 'A': Server Asset Tag (32) 'P': Server Primary OS (42) 'O': Server Other (28) # is the line number.
SHOW TEXT ADMIN	SHOW TEXT ADMIN	Displays current administrator contact text strings.
SET TEXT ADMIN	SET TEXT ADMIN [N P G O] [1 2 3 4] <string>	Sets administrator contact text string specified by <string> where: 'N': Admin name (28) 'P': Admin Phone number (28) 'G': Admin Pager number (28) 'O': Admin Other (28) # is the line number.
SHOW TEXT SERVICE	SHOW TEXT SERVICE	Displays current service contact text strings.

Command	Usage	Description
SET TEXT SERVICE	SET TEXT SERVICE [N P G O] [1 2 3 4] <string>	Sets service contact text string specified by <X> <#> to <string> where X can be: 'N': Service Name (28) 'P': Service Phone number (28) 'G': Service Pager number (28) 'O': Service Other (28) # is the line number.
SHOW TEXT IMD	SHOW TEXT IMD	Displays current IMD custom text strings.
SET TEXT IMD	SET TEXT IMD [I M S] [1 2 3 4] <string>	Sets IMD Custom text string specified by <X> <#> to <string> where: 'I': Idle Screen (48) 'M': Custom Menu Item (14) 'S': Custom Menu Screen (56) # is the line number.
SHOW TEXT POST	SHOW TEXT POST	Displays current POST custom text strings.
SET TEXT POST	SET TEXT POST <string>	Sets POST Custom text to string specified by <string>.

System Maintenance CLI Commands

Command	Usage	Description
HELP	HELP or HELP <command>	Displays all supported commands or usage and descriptions of a specific command.
EXIT	EXIT	Exits menu and continues booting.
RBSU	RBSU	Executes RBSU (has CLI).
INSPECT	INSPECT	Executes Inspect Utility (has CLI).
PXE	PXE	Attempts PXE Boot.
MEMDIAG	MEMDIAG	Executes Diagnostics Utility specified. (Diagnostics Utility also has CLI output.)
CPUDIAG	CPUDIAG	Executes Diagnostics Utility specified. (Diagnostics Utility also has CLI output.)
DISKDIAG	DISKDIAG	Executes Diagnostics Utility specified. (Diagnostics Utility also has CLI output.)

Command Buffering Support

The CLI mode support buffers the previous five commands entered from the command line, accessible using the up arrow key and the down arrow key.

Additional CLI support

The CLI mode support automatically handles output that scrolls off the screen by implementing a `-More-` prompt at the bottom of the screen. Then, it waits for user input to scroll to the next page of data using key commands.

Key	Function
Space	Scroll to next page
Enter	Scroll to next line
Q	Quit display

5 RBSU configuration flows (manual and scripted)

RBSU configuration flow overview

RBSU can be used in two ways to configure a server:

- “Manual configuration flow” (page 199)
- “Scripted configuration flow” (page 199)

Manual configuration flow

RBSU can be used to configure an HP server manually. When the server is powered up in an unconfigured state, RBSU executes when the F9 key is pressed, allowing the server to be configured.

NOTE:

- Manual flow does not apply for servers with an integrated ATA RAID IDE controller.
 - Manual flow is not necessary for servers with Embedded Server Setup.
-

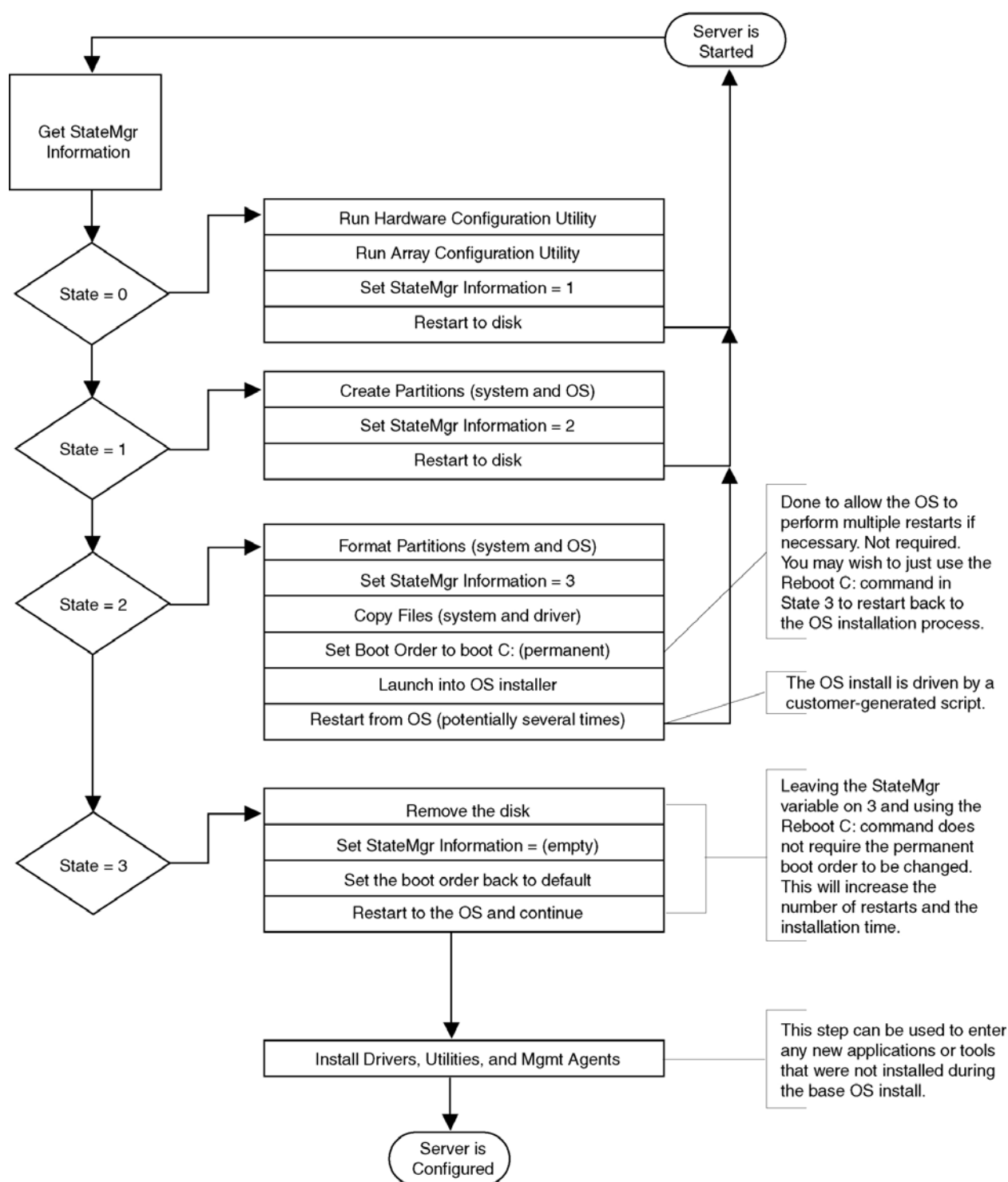
After the server has been configured using RBSU:

1. Restart or power up the server.
2. Press the **F8** key to execute ORCA.
3. After the primary array controller has been configured with ORCA, restart the server.
4. Install the operating system. (“Operating System Installation” (page 210))
5. Install any necessary applications.
6. Use HP SSA to configure any remaining array controllers.

Scripted configuration flow

RBSU can be used with the Scripting Toolkit (STK) to create standard server configuration scripts to automate many of the manual steps in the server configuration process. The Scripting Toolkit can be found on the HP website (<http://h18004.www1.hp.com/products/servers/management/toolkit/stk/index.html>).

Scripted Installation Flow



The following utilities are provided in the toolkit and described in this guide:

- “Configuration Replication Utility (CONREP)” (page 200)
- “HP ROM Configuration Utility (HPRCU)” (page 202)
- “Array Configuration Replication Utility” (page 203)

Configuration Replication Utility (CONREP)

NOTE: This utility is available for G7 and earlier servers.

CONREP is shipped in the Scripting Toolkit (STK) and is a program that works with RBSU to replicate hardware configuration on ProLiant G7 and earlier servers. This utility is run during State 0, Run Hardware Configuration Utility when doing a scripted server deployment. CONREP reads the state of the system environment variables to determine the configuration and then writes the results to an editable script file. This file can then be deployed across multiple servers with similar hardware and software components. For more information, see the *HP Scripting Toolkit User Guide* for your operating system environment on the HP website (<http://h18004.www1.hp.com/products/servers/management/toolkit/stk/index.html>).

The following sections provide information on using CONREP scripts:

- Backing up the existing configuration ("CONREP -s (Store to Data file)" (page 201))
- Restoring a configuration from a backup ("CONREP -l (Load from Data File)" (page 201))

CONREP -s (Store to Data file)

This is an example of usage for HP ProLiant servers not using the Oxx ROM family. To extract the BIOS settings from an SL160z G6 server and save the configuration to an "sl160zconrep.dat" data file:

```
[root@ilo002481b08134 conrep]# ./conrep -s -xconrepSL160zg6_20090728.xml -fsl160zconrep.dat
conrep 3.00 - Scripting Toolkit Configuration Replication Program
Copyright (c) 2007-2012 Hewlett-Packard Development Company, L.P.
System Type: ProLiant SL160z G6
ROM Date : 07/28/2009
ROM Family : 033
Processor Manufacturer : Intel
XML System Configuration : conrep_SL160zg6_20090728.xml
Hardware Configuration : sl160zconrep.dat
Saving configuration data to sl160zconrep.dat.
CONREP Return code: 0
```

NOTE: The file names after the -x and -f options must be specified, otherwise, the default file names conrep.xml and conrep.dat are used, respectively.

NOTE: A platform specific XML file needs to be used for HP ProLiant 100-series servers. If you use the default name this may cause an error while running the CONREP utility.

CONREP -l (Load from Data File)

This is an example of usage for HP ProLiant servers not using the Oxx ROM family. To load the BIOS configuration settings from a previously captured/edited data file (in this case "sl160zconrep.dat") to an SL160z G6 server:

```
[root@ilo002481b08134 conrep]# ./conrep -l -xconrepSL160zg6_20090728.xml -fsl160zconrep.dat
conrep 3.00 - Scripting Toolkit Configuration Replication Program
Copyright (c) 2007-2012 Hewlett-Packard Development Company, L.P.
System Type: ProLiant SL160z G6
ROM Date : 07/28/2009
ROM Family : 033
Processor Manufacturer : Intel
XML System Configuration : conrep_SL160zg6_20090728.xml
Hardware Configuration : sl160zconrep.dat
Loading configuration from sl160zconrep.dat.
ASM values not set! aborting
CONREP Return code: 0
```

HP ROM Configuration Utility (HPRCU)

NOTE: This utility is available for HP ProLiant Gen8 servers.

For more information, see the *HP Scripting Toolkit User Guide* for your operating system environment on the HP website (<http://h18004.www1.hp.com/products/servers/management/toolkit/stk/index.html>).

Using HPRCU

HPRCU is an RBSU configuration utility similar to CONREP. This utility is supported on HP ProLiant Gen8 servers. This utility does not use a definition XML file like the CONREP utility, but directly reads the same table that RBSU uses for feature names and settings. All features and options are now number based. Each feature and option has a unique number.

Using HPRCU over CONREP has the following benefits:

- Simpler user interface— All system ROM settings and the current selections are listed together in one output/input XML file.
- Fewer updates—No updated binary or XML file is needed when BIOS adds or changes features. HPRCU now reads the same tables that RBSU does, which are located in the memory at system boot. When the BIOS changes or adds a new setting, no update to HPRCU is needed.
- Default ROM settings enhancement—The HPRCU XML file now shows users the default settings for each RBSU option.

HPRCU command-line syntax

```
hprcu -s | -l [-f file.xml ] [ -h ]
```

HPRCU command line arguments

Command line argument	Description
-s	This argument saves the system configuration to a file.
-l	This argument loads the system configuration from a file and writes it to the target server.
-f {file.xml}	Name of the input or output file. If not specified, the XML configuration defaults to <code>hprcu.xml</code> .
-h	This argument displays program usage.
-t	Outputs the help and warning text for each feature. Only valid with the <code>-s</code> option.

HPRCU return codes

Command line argument	Description
0	The command was completed successfully.
1	The server is not supported by this utility.
2	The input XML file is missing or is in an invalid format.
3	One of the dependencies is missing. See the error message for details.
4	The system RBSU password is set. The settings cannot be changed until the password is cleared from within RBSU.

Command line argument	Description
5	An error occurred reading the supported features on the server.
6	Invalid command line syntax. Use the <code>-h</code> parameter for complete command line parameters.
7	A general error occurred saving or loading the server settings. See the error message for details.

Array Configuration Replication Utility

ACR is shipped in the Scripting Toolkit and is a replication utility used for RAID arrays. ACR is used during State 0, Run Array Configuration Utility when doing a scripted server deployment. It duplicates the host array controller configuration utilities and writes them onto an editable script file. This file is then loaded onto a startup diskette for deployment to other servers.

6 ROM-based utilities

Some HP ProLiant servers have ROM-based enhancements available, including:

- An auto-configuration process that, in most cases, automatically configures the entire system without intervention.
- The System Maintenance menu, which provides embedded server diagnostics and Inspect Utility information through Embedded Server Setup.
- An erase option for RBSU, which erases the system configuration and boot drive.

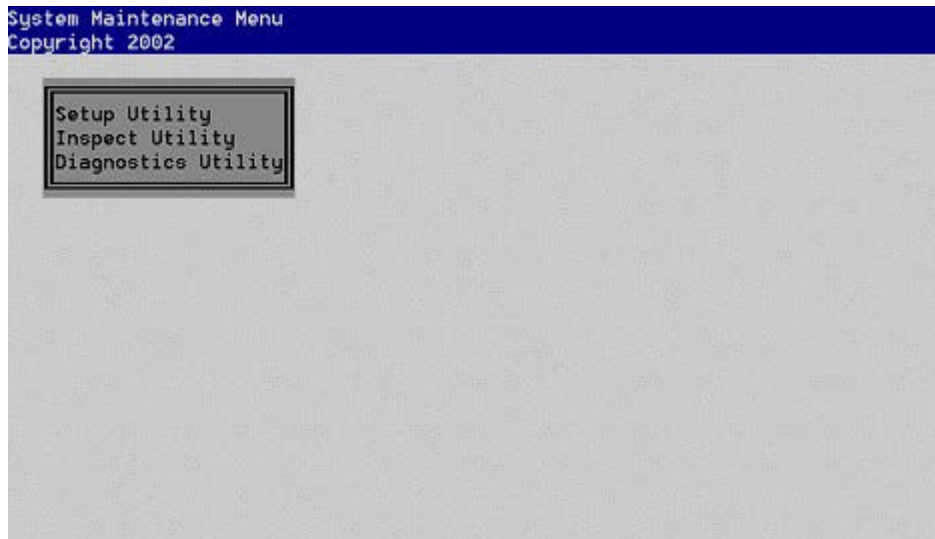
For more information about which features the server supports, see the server-specific documentation.

Embedded server setup

NOTE: Menu options may differ from those in this document, depending on specific server options.

The System Maintenance menu is a utility that replaces the legacy system-partition functionality supported on some ProLiant servers. This utility is embedded in the system ROM and provides access to server diagnostics, RBSU, and the Inspect Utility.

To access the System Maintenance menu, press the **F10** key when prompted from the boot option screen (see [“Boot options” \(page 210\)](#)).



From the System Maintenance menu, you can select from the following utilities that are embedded in the system ROM:

- [“Setup Utility” \(page 205\)](#)
- [“Inspect Utility” \(page 205\)](#)
- [“Diagnostics Utility” \(page 206\)](#)

Setup Utility

Select **Setup Utility** from the System Maintenance menu to run the Setup Utility. Running Setup Utility exits the System Maintenance menu and runs RBSU.

RBSU Erase option

The RBSU Erase option enables you to erase the system configuration and boot drive. On versions of RBSU without this feature, the Erase Non-Volatile Memory option is available in the Advanced Options menu of RBSU, enabling you to erase the system configuration by resetting the NVRAM to an initial, factory state.

The Erase NVRAM/Boot Disk option also erases the system configuration by resetting the NVRAM, but also erases the boot disk. The RBSU Erase option should only be used when you are redeploying a server and are required to erase the NVRAM and boot drive to reinstall the operating system. If available for the server, the Erase NVRAM/Boot Disk option is listed under the Advanced Options menu in RBSU.

Virtual Install Disk option

The virtual install disk is a holding place within the system ROM that contains embedded boot drivers (such as SCSI or RAID controller drivers) that may be necessary to complete the operating system installation. Typically, boot drivers that are placed in the virtual install disk are either not included as part of the operating system media or are updated for new controllers. Supported operating systems automatically find these drivers, eliminating the need for user intervention. HP recommends updating these boot drivers to the latest version after the OS install to further optimize the system.

For more information, see:

- G6 and earlier environments: [“Virtual Install Disk” \(page 183\)](#)
- Gen8 and G7 environments: [“Virtual Install Disk” \(page 108\)](#)

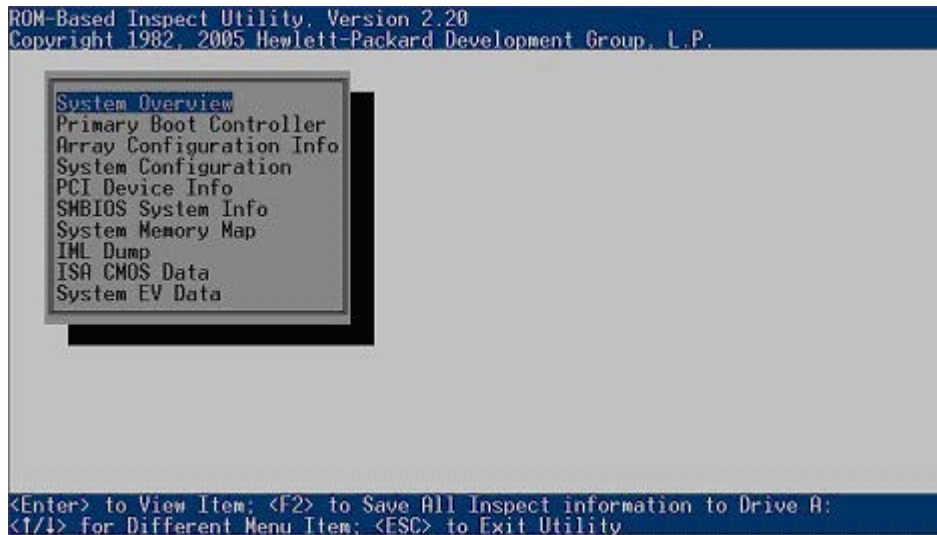
The Virtual Install Disk option is found under the RBSU Advanced Options menu and can be enabled or disabled in RBSU.

Inspect Utility

The Inspect Utility is embedded in the system ROM and enables you to view system configuration information and save the information to a file on a diskette. Press the **F2** key to place all Inspect information onto a diskette.

This utility replaces the version of the Inspect Utility that is a part of the legacy system-partition functionality supported on some HP servers.

If the server has the Inspect Utility feature, select **Inspect Utility** from the System Maintenance menu.

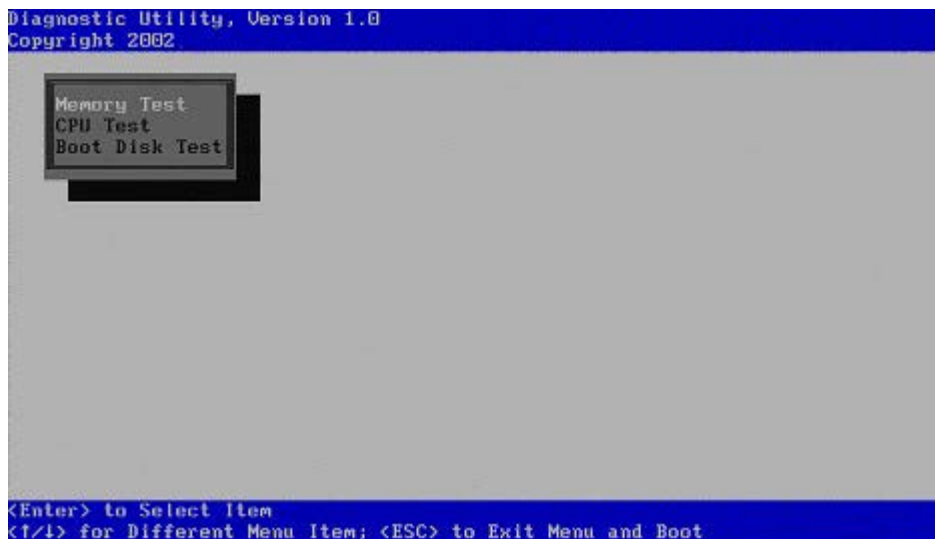


Diagnostics Utility

The Diagnostics Utility is embedded in the system ROM, and provides a pre-boot method for quickly checking the validity of the three major subsystems of the server needed to boot an operating system.

All three of these tests should pass if a bootable operating system is installed on the server.

If any test fails, there may be a problem booting the server. To run the Diagnostics Utility, select **Diagnostics Utility** from the System Maintenance menu.



Memory Test

The memory diagnostic test uses all the processors installed in the server to test all installed memory. The DIMMs that are installed are displayed by the cartridge and socket (or the bank and socket) in which they are located, and errors are reported with a reference to the failed DIMM.

To run the memory diagnostic test, select **Memory Test** from the Diagnostics Utility menu.

For a Generation 5 server with an Intel processor, the following options are available within the **Memory Test** submenu:

- Software Memory Test—Choosing this option automatically runs the test until completion or until you press the **Esc** key to exit.

Boot Disk Test

The boot disk diagnostic test verifies the presence and readiness of a primary boot controller. If a controller is present and ready, the test checks for a valid operating system boot sector.

To run the Boot Disk diagnostic test, select **Boot Disk Test** from the Diagnostics Utility menu.

```
Boot Disk Test
Copyright 2002

Boot Disk Status:    Pass - Disk Present.

Boot Disk Ready:     Pass - Disk Ready.

Verify Boot sector:  Pass - Valid OS Boot Sector Present.

Primary Partition 01
  State : Boot Partition      File system type: Fat16
Primary Partition 02
  State : non active          File system type: Empty
Primary Partition 03
  State : non active          File system type: Empty
Primary Partition 04
  State : non active          File system type: Empty _

<Any Key> to Exit Menu.
```

Auto-Configuration Process

The auto-configuration process automatically runs when you boot the server for the first time. During the power-up sequence, in many cases the system ROM automatically configures the entire system without needing any intervention. During this process, the ORCA Utility, in most cases, automatically configures the array with a default setting based on the number of drives connected to the server.

Drives installed	Drives used	RAID level
1	1	RAID 0
2	2	RAID 1
3, 4, 5, or 6	3, 4, 5, or 6	RAID 5
More than 6	0	None

NOTE: If the boot drive contains logical volumes, or if more than six drives are installed on the system, ORCA does not automatically configure the array. If this occurs, you must run ORCA to configure the array settings.

By default, the auto-configuration process configures the system for a default operating system. To change any default settings in the auto-configuration process, such as the settings for language, operating system, and primary boot controller, open the RBSU by pressing the **F9** key after system POST. After the settings are selected according to your preference, exit RBSU and reboot the server.

Intelligent Provisioning Quick Configs settings and corresponding RBSU settings

Available for HP ProLiant Gen8 servers, Intelligent Provisioning Quick Configs options provide the capability to select a basic policy for performance versus power usage, without having to configure individual settings through RBSU menus.

The following tables show the three Intelligent Provisioning Quick Configs profiles and their corresponding RBSU option settings.

RBSU power management options	Intelligent Provisioning Quick Configs settings		
	Balanced power and performance	Minimum power usage	Maximum performance
"HP Power Profile" (page 44)	Balanced Power and Performance	Minimum Power Usage	Maximum Performance
"HP Power Regulator" (page 45)	HP Dynamic Power Savings Mode	HP Static Low Power Mode	HP Static High Performance Mode
"Minimum Processor Idle Power Core C6 State" (page 52)	Enabled	Enabled	Disabled
"Minimum Processor Idle Power C1e State" (page 53)	Disabled	Enabled	Disabled
"Maximum Memory Bus Frequency" (page 57)	Auto	Auto	Auto
"Memory Interleaving" (page 59)	Channel Interleaving	No Interleaving	Channel Interleaving
"PCI Express Generation 2.0 Support" (page 60)	Auto	Force PCIe Generation 1	Auto
"HyperTransport Frequency" (page 70)	HT Full Performance Mode	HT Power Saving Mode	HT Full Performance Mode
"Dynamic Power Savings Mode Response" (page 63)	Fast	Slow	Fast
"DIMM Voltage Preference" (page 68)	Optimized for Performance	Optimized for Power	Optimized for Performance

RBSU power management options	Intelligent Provisioning Quick Configs settings		
	Balanced power and performance	Minimum power usage	Maximum performance
"HP Power Profile" (page 44)	Balanced Power and Performance	Minimum Power Usage	Maximum Performance
"HP Power Regulator" (page 45)	HP Dynamic Power Savings Mode	HP Static Low Power Mode	HP Static High Performance Mode
"Intel QPI Link Power Management" (page 48)	Enabled	Enabled	Disabled
"Minimum Processor Idle Power Core State" (page 51)	C6 State	C6 State	No C-states

RBSU power management options	Intelligent Provisioning Quick Configs settings		
	Balanced power and performance	Minimum power usage	Maximum performance
"Minimum Processor Idle Power Package State" (page 54)	Package C6 (retention) State	Package C6 (retention) State	No Package State
"Energy/Performance Bias" (page 56)	Balanced Performance	Power Savings Mode	Maximum Performance
"Maximum Memory Bus Frequency" (page 57)	Auto	Auto	Auto
"Channel Interleaving" (page 58)	Enabled	Disabled	Enabled
"Maximum PCI Express Speed" (page 62)	Maximum Supported	PCIe Generation 1	Maximum Supported
"DIMM Voltage Preference" (page 68)	Optimized for Performance	Optimized for Power	Optimized for Performance

Boot options

Near the end of the boot process, the boot options screen is displayed. This screen is visible for several seconds before the system attempts to boot from a supported boot device. During this time, you can press the following keys:

Key	Action
F9	Access RBSU.
F10	In Gen8 systems: Access Intelligent Provisioning. In G7 systems: Access the System Maintenance Menu, which enables you to launch ROM-based Diagnostics or Inspect.
F12	Force a PXE Network boot.

Operating System Installation

For an assisted operating system installation:

- In Gen8 environments, boot the server and press **F10** when prompted to open the Intelligent Provisioning tool.
- In G7 environments, insert the SmartStart CD into the CD-ROM drive to begin the installation process. The operating system and server support software are installed upon completion of this process.

For a manual OS installation, insert the operating system CD into the CD-ROM to begin the installation process.

Acronyms and abbreviations

ACR	Array Configuration Replication utility
ASR	Automatic Server Recovery
CNA	Converged Network Adapter
CONREP	Configuration Replication utility
ECP	Extended Capabilities Port Mode
EMS	Emergency Management Services
EPP	Enhanced Parallel Port Mode
IDE	Integrated Device Electronics
iLO	Integrated Lights-Out
IMD	Integrated Management Display
IOMMU	I/O Memory Management Unit
IPL	Initial Program Load
IRQ	Interrupt Request
LPT	Local Port
MEMBIST	Memory Built-in Self Test
MPS	Multi-Processor Specification
NMI	Non-Maskable Interrupt
NUMA	Non-Uniform Memory Architecture
NVRAM	Non-Volatile Memory
ORCA	Option ROM Configuration for Arrays
PCC	Processor Clocking Control
PCI-X	Peripheral Component Interconnect extended
PCIe	Peripheral Component Interconnect express
POST	Power-On Self Test
PXE	Preboot Execution Environment
RBSU	ROM-Based Setup Utility
RTC	Real-Time Clock
SPP	Standard Parallel Port Mode
TPM	Trusted Platform Module
VSP	Virtual Serial Port

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