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Intel® Server System BIOS Setup Utility Guide

Target Platform:
Intel® Server Systems supporting the Intel® Xeon® processor E5-2600 v3 product family

Revision 1.0

Aug 4, 2014

Intel® Server Boards and Systems – Technical Support and Services

Revision History

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1   Introduction

1.1   Summary

This BIOS Setup Utility Guide describes the functionality of the Basic Input/Output System (BIOS) setup utility for a related family of server products, which have been designed around processors from the Fourth Generation Intel® Core™ Processor Family in combination with the Intel® C610 Series Chipset.

These Intel® Server Boards have been specifically designed to take advantage of the new and improved capabilities of the Fourth Generation Intel® Core™ Processor Family, which for these servers consists of the Intel® Xeon® Processor E5-2600 v3 Product Families.

The BIOS firmware component is a critical element of each server board, since it controls the initialization of the hardware and transition to an Operating System (OS) that provides the intended runtime environment for the server system. The BIOS also provides the interface that allows local and remote configuration of the server hardware and system options.

1.2   Audience

This BIOS Setup Utility Guide is written for those involved in design, development, validation, integration, production, and support of Intel® Server Boards and Systems in which they are installed. It is assumed that the reader is familiar with Intel® processors and the standards that define the server architecture.

1.3   Purpose of Document

This document contains a description of the BIOS implementation for the Intel® Server Boards designed for the Intel® Xeon® Processor E5-2600 v3 Product Families with the C610 Series Chipset. It is intended to specify how the BIOS should behave, and what interfaces and functions it provides to other system components.

This BIOS Setup Utility Guide is <u>not intended</u> to describe other system components beyond what is necessary to understand the BIOS setup implementation and interfaces. For each other system component, there are specification documents, which describe it in detail. Where necessary, references are made in this document to other more detailed specifications.

1.4   Conventions Used in This Document

This document uses typographic and illustrative conventions described below.

1.4.1 Typographical Conventions

1.4.1.1   Function Keys and Special Characters

There are a number of keys on computer keyboards for which there are no normal typographic character representation. For example, there is no typographic character for the shift keys or control keys.

Those characters will be represented by a key name (as usually shown on the keyboard) within angle brackets. For example, **<Shift>** represents pressing either Shift key on the keyboard, **<F2>** represents pressing the F2 function key, and **<Esc>** represents pressing the Escape key.

In cases where there are two keys with the same name and it matters which one is pressed, they will be further distinguished. For example the Control keys on the left and right sides of the keyboard may be represented as **<L.Ctrl>** and **<R.Ctrl>**.

When a "composite character" requires multiple keys to be pressed together, they will be represented as a single hyphenated set of characters like **<Ctrl-Alt-Del>** (for example, to reboot the system) which represents pressing the Control key, Alt key, and Delete key simultaneously.

Multiple keys that must be pressed in sequence, as an "escape sequence", are represented as a series of characters in sequence, including both special key representations and normal keys. For example **<CR><LF>** stands for "Carriage Return" followed by "Line Feed", commonly used at the end of a line of text on the display screen, or **<Esc>[A** means pressing the Escape key followed by the "[" and "A" characters for a PC-ANSI or VT-100+ representation of an "Up Arrow".

1.4.1.2   Hyperlinks

The document text has a number of hyperlinks to other related information within the document. There are also a number of external Uniform Resource Locator (URL) linkages to material available through the Internet.

These linkages are rendered differently in Microsoft* Word* "doc" format versus Abode* Acrobat Portable Document Format (PDF).

- In Microsoft* Word* format, hyperlinks in the text are indicated by a 25% Gray Screen shading plus Blue text color, like Hyperlink Text.
- In Adobe* PDF format, hyperlinks in the text are indicated by Blue text color alone, like Hyperlink Text.
- For both formats, external URLs are indicated by Blue text color, like Internet URL.

1.4.2 Acronyms and Abbreviations

Commonly used acronyms and abbreviations are used in this document where the use contributes to brevity and narrative flow. Any such acronyms and abbreviations will be spelled out in the use, with the shortened version following in parentheses. Succeeding usage may be the acronym or abbreviation alone.

1.4.3 Distinctive Terminology

Within this document, there are some terms that are used to distinguish between closely related meanings. We have tried to use this distinctive terminology as consistently as possible to maintain clarity in descriptions. In particular:

- ▪ "*Platform*" – "*Board*"/"*Server Board*" – "*Family*/*Series*" – "*System*" – "*SKU*"

  - *Platform* is used to indicate a general design concept utilizing a specific combination of processor family and chipset family hardware.

  - *Board* or *Server Board* is used to indicate specific product circuit boards, server motherboards or main boards, which are designed around a given platform concept.

  - *Family* or *Series* is used to indicate a related group of products with a common design factor. For example, the processors used in these boards are from the Fourth Generation Intel® Core™ Processor Family.

  - *System* is used to indicate a combination of a board and chassis and associated hardware, with processor(s) and memory installed.

  - *SKU* (derived from "<u>S</u>tock <u>K</u>eeping <u>U</u>nit) will generally <u>not be</u> used, since it indicates a specific marketing package. While a SKU may be based on a specific board, this document does not generally address that level of product differentiation.

- ▪ "*Socket*" – "*Processor*"/"*Processor Package*" – "*Core*"/"*Processor Core*" – "*Thread*"/"*Processor Thread*"

  - *Socket* is used to indicate socket on a board into which a processor, memory, or other equipment can be inserted. In the context of processors, "sockets" determine how many processors can be installed on a board.

    o *Single Socket (1S)* boards have only one processor socket and support installation of a single processor package.

    o *Dual Socket (2S)* boards have two processor sockets and support installation of two interconnected processor packages.

    o *Quad Socket (4S or MP)* boards have four processor sockets and support installation of four interconnected processor packages. "MP" is an abbreviation for "Multiprocessor", meaning a board with four or more processor sockets.

  - *Processor* or *Processor Package* is used to indicate a single integrated processor hardware unit, which installs into a processor socket on a board. A board may support multiple processors, and a processor may contain multiple cores.

  - *Core* or *Processor Core* is used in the context of a processor package to indicate one independent hardware execution unit contained within the processor package. A processor package may contain multiple cores, which can execute simultaneously, and a single core may support multiple processor threads.

  - *Thread* or *Processor Thread* is used to indicate an independently executing instruction stream within a processor core, which shares certain core resources with any other threads contained within the same core (Intel® Hyper-Theading Technology).

- ▪ "*Bytes*"/"*~B*" – "*Bits*"/"*~b*" and "*Kilo~*"/"*K~*"– "*Mega~*"/"*M~*" – "*Giga~*"/"*G~*"

  - *Bytes* in combination with a quantifier like *K* or *M* or *G* is abbreviated as uppercase *B*. *KB* means *kilobytes*, *MB* means *megabytes*, and *GB* means *gigabytes*.

- *Bits* in combination with a quantifier like *K* or *M* or *G* is abbreviated as lowercase *b*. *Kb* means *kilobits*, *Mb* means *megabits*, and *Gb* means *gigabits*.

- *Kilo~* as a quantifier prefix, abbreviated as *K~*, correctly means 1024. So "*2 kilobytes*" or "*2 KB*" is (2 * 1024) bytes, or 2048 bytes. However, "kilo~" is often used loosely to mean "thousand" (1000, i.e. 1024 rounded off). In this document, "*kilo~*" means 1024 unless otherwise stated.

- *Mega~* as a quantifier prefix, abbreviated as *M~*, correctly means (1024 * 1024), that is, (1024 * kilo~) or 1,048,576. So "*2 megabytes*" or "*2 MB*" is (2 * 1,048,576) bytes, or 2,097,152 bytes. However, "mega~" is often used loosely to mean "million" (1,000,000 –1,048,576 rounded off). In this document, "*mega~*" means 1,048,576 unless otherwise stated.

- *Giga~* as a quantifier prefix, abbreviated as *G~*, correctly means (1024 * 1024 * 1024), that is, (1024 * mega~), or 1,073,741,824. So "*2 gigabytes*" or "*2 GB*" is (2 * 1,073,741,824) bytes, or 2,147,483,648 bytes. However, "giga~" is often used loosely to mean "billion" (1,000,000,000 – 1,073,741,824 rounded off). In this document, "*giga*~" means 1,073,741,824 in the context of *memory size*, or "billion" in the context of *disk drive capacity* (GB) or *processor speed* (GHz), unless otherwise stated.

2   BIOS Setup Utility

The BIOS Setup utility is a text-based utility that allows the user to configure the system and view current settings and environment information for the platform devices. The Setup utility controls the platform's built-in devices, the boot manager, and error manager.

The BIOS Setup interface consists of a number of pages or screens. Each page contains information or links to other pages. The advanced tab in Setup displays a list of general categories as links. These links lead to pages containing a specific category's configuration.

The following sections describe the look and behavior for the platform setup.

2.1   BIOS Setup Operation

The BIOS Setup Utility has the following features:

- Localization – The Intel® Server Board BIOS is only available in English.
- Console Redirection – BIOS Setup is functional via Console Redirection over various terminal emulation standards. When Console Redirection is enabled, the POST display out is in purely Text Mode due to Redirection data transfer in a serial port data terminal emulation mode. This may limit some functionality for compatibility, for example, usage of colors or some keys or key sequences or support of pointing devices.
- Setup screens are designed to be displayable in a 100-character x 31-line format in order to work with Console Redirection, although that screen layout should display correctly on any format with longer lines or more lines on the screen.
- Password protection – BIOS Setup may be protected from unauthorized changes by setting an Administrative Password in the Security screen. When an Administrative Password has been set, all selection and data entry fields in Setup (except System Time and Date) are grayed out and cannot be changed unless the Administrative Password has been entered.

  Note: If an Administrative Password has <u>not</u> been set, anyone who boots the system to Setup has access to all selection and data entry fields in Setup and can change any of them.

2.1.1   Setup Page Layout

The Setup page layout is sectioned into functional areas. Each occupies a specific area of the screen and has dedicated functionality. The following table lists and describes each functional area.

The Setup page is designed to a format of 80 x 24 (24 lines of 80 characters each). The typical display screen in a Legacy mode or in a terminal emulator mode is actually 80 characters by 25 lines but with "line wrap" enabled (which it usually is); the 25th line cannot be used with the Setup page.

Table 1. BIOS Setup Page Layout

Functional Area	Description
Title (Tab) Bar	The Title Bar is located at the top of the screen and displays "Tabs" with the titles of the top-level pages or screens that can be selected. Using the left and right arrow keys moves from page to page through the Tabs.
	When there are more Tabs than can be displayed on the Title (Tab) Bar, they will scroll off to the left or right of the screen and temporarily disappear from the visible Title Bar. Using the arrow keys will scroll them back onto the visible Title Bar. When the arrow keys reach either end of the Title Bar, they will "wrap around" to the other end of the Title Bar.
	For multi-level hierarchies, this shows only the top-level page above the page which the user is currently viewing. The Page Title gives further information.
Page Title	In a multi-level hierarchy of pages beneath one of the top-level Tabs, the Page Title identifying the specific page which the user is viewing is located in the upper left corner of the page. Using the <ESC> (Escape) key will return the user to the higher level in the hierarchy, until the top-level Tab page is reached.
Setup Item List	The Setup Item List is a set of control entries and informational items. The list is displayed in two columns. For each item in the list:
	▪ The left column of the list contains Prompt String (or Label String), a character string which identifies the item. The Prompt String may be up to **34 characters** long in the 80 x 24 page format.
	▪ The right column contains a data field which may be an informational data display, a data input field, or a multiple choice field. Data input or multiple-choice fields are demarcated by square brackets "[....]". This field may be up to **90 characters** long but only the first **22 characters** can be displayed on the 80 x 24 page (**24 characters** for an informational display-only field).
	The operator navigates up and down the right hand column through the available input or choice fields.
	A Setup Item may also represent a selection to open a new screen with a further group of options for specific functionality. In this case, the operator navigates to the desired selection and presses <Enter> to go to the new screen.
Item-Specific Help Area	The Item-specific Help Area is located on the right side of the screen and contains Help Text specific to the highlighted Setup Item. Help information may include the meaning and usage of the item, allowable values, effects of the options, etc.
	The Help Area is a **29 character by 11 line** section of the 80 x 24 page. The Help Text may have explicit line-breaks within it. When the text is longer than 29 characters, it is also broken to a new line, dividing the text at the last space (blank) character before the 29th character. An unbroken string of more than 29 characters will be arbitrarily wrapped to a new line after the 29th character. Text that extends beyond the end of the 11th line will not be displayed.
Keyboard Command Area	The Keyboard Command Area is located at the bottom right of the screen and continuously displays help for keyboard special keys and navigation keys.

2.1.2 Entering BIOS Setup

To enter the BIOS Setup using a keyboard (or emulated keyboard), press the <F2> function key during boot time when the OEM or Intel Logo Screen or the POST Diagnostic Screen is displayed.

The following instructional message is displayed on the Diagnostic Screen or under the Quiet Boot Logo Screen:

```
Press <F2> to enter setup, <F6> Boot Menu, <F12> Network Boot
```

Note: With a USB keyboard, it is important to wait until the BIOS "discovers" the keyboard and beeps – until the USB Controller has been initialized and the USB keyboard activated, key presses will not be read by the system.

When the Setup Utility is entered, the Main screen is displayed initially. However, serious errors cause the system to display the Error Manager screen instead of the Main screen.

It is also possible to cause a boot directly to Setup using an IPMI 2.0 command "Get/Set System Boot Options". For details on that capability, see the explanation in the IPMI description.

2.1.3 Setup Navigation Keyboard Commands

The bottom right portion of the Setup screen provides a list of commands that are used to navigate through the Setup utility. These commands are displayed at all times.

Each Setup menu page contains a number of features. Each feature is associated with a value field, except those used for informative purposes. Each value field contains configurable parameters. Depending on the security option chosen and in effect by the password, a menu feature's value may or may not be changed. If a value cannot be changed, its field is made inaccessible and appears grayed out.

Table 1. BIOS Setup: Keyboard Command Bar

Key	Option	Description
<Enter>	Execute Command	The <Enter> key is used to activate submenus when the selected feature is a submenu, or to display a pick list if a selected option has a value field, or to select a subfield for multi-valued features like time and date. If a pick list is displayed, the <Enter> key selects the currently highlighted item, undoes the pick list, and returns the focus to the parent menu.
<Esc>	Exit	The <Esc> key provides a mechanism for backing out of any field. When the <Esc> key is pressed while editing any field or selecting features of a menu, the parent menu is re-entered.
		When the <Esc> key is pressed in any submenu, the parent menu is re-entered. When the <Esc> key is pressed in any major menu, the exit confirmation window is displayed and the user is asked whether changes can be discarded. If "No" is selected and the <Enter> key is pressed, or if the <Esc> key is pressed, the user is returned to where they were before <Esc> was pressed, without affecting any existing settings. If "Yes" is selected and the <Enter> key is pressed, the setup is exited and the BIOS returns to the main System Options Menu screen.
↑	Select Item	The up arrow is used to select the previous value in a pick list, or the previous option in a menu item's option list. The selected item must then be activated by pressing the <Enter> key.

Key	Option	Description
↓	Select Item	The down arrow is used to select the next value in a menu item's option list, or a value field's pick list. The selected item must then be activated by pressing the <Enter> key.
<Tab>	Select Field	The <Tab> key is used to move between fields. For example, <Tab> can be used to move from hours to minutes in the time item in the main menu.
-	Change Value	The minus key on the keypad is used to change the value of the current item to the previous value. This key scrolls through the values in the associated pick list without displaying the full list.
+	Change Value	The plus key on the keypad is used to change the value of the current menu item to the next value. This key scrolls through the values in the associated pick list without displaying the full list. On 106-key Japanese keyboards, the plus key has a different scan code than the plus key on the other keyboards but will have the same effect.
<F9>	Setup Defaults	Pressing the <F9> key causes the following to display: Load Optimized Defaults? Yes No If "Yes" is highlighted and <Enter> is pressed, all Setup fields are set to their default values. If "No" is highlighted and <Enter> is pressed, or if the <Esc> key is pressed, the user is returned to where they were before <F9> was pressed without affecting any existing field values.
<F10>	Save and Exit	Pressing the <F10> key causes the following message to display: Save configuration and reset? Yes No If "Yes" is highlighted and <Enter> is pressed, all changes are saved and the Setup is exited. If "No" is highlighted and <Enter> is pressed, or the <Esc> key is pressed, the user is returned to where they were before <F10> was pressed without affecting any existing values.

2.1.4 Setup Screen Menu Selection Bar

The Setup Screen Menu selection bar is located at the top of the BIOS Setup Utility screen. It displays tabs showing the major screen selections available to the user. By using the left and right arrow keys, the user can select the listed screens. Some screen selections are out of the visible menu space, and become available by scrolling to the left or right of the current selections displayed.

2.2 BIOS Setup Utility Screens

The following sections describe the screens available in the BIOS Setup utility for the configuration of the server platform.

For each of these screens, there is an image of the screen with a list of Field Descriptions which describe the contents of each item on the screen. Each Field Description is hyperlinked back to the screen image.

These lists follow the following guidelines:

- The text heading for each Field Description is the actual text as displayed on the BIOS Setup screen.

- The text shown in the Option Values and Help Text entries in each Field Description are the actual text and values are displayed on the BIOS Setup screens.

- In the Option Values entries, the text for default values is shown with an underline. These values do not appear underline on the BIOS Setup screen. The underlined text in this document is to serve as a reference to which value is the default value.

- The Help Text entry is the actual text which appears on the screen to accompany the item when the item is the one in focus (active on the screen).

- The Comments entry provides additional information where it may be helpful. This information does not appear on the BIOS Setup screens.

- Information enclosed in angular brackets (< >) in the screen shots identifies text that can vary, depending on the option(s) installed. For example, *<Amount of memory installed>* is replaced by the actual value for "Total Memory".

- Information enclosed in square brackets ([ ]) in the tables identifies areas where the user must type in text instead of selecting from a provided option.

- Whenever information is changed (except Date and Time), the systems requires a save and reboot to take place in order for the changes to take effect. Alternatively, pressing <ESC> discards the changes and resumes POST to continue to boot the system according to the boot order set from the last boot.

2.2.1 BIOS Information Screen (Tab)

BIOS Information Screen is the first screen that appears when the BIOS Setup configuration utility is entered and it contains the entry to BIOS Setup Menu.

```
S2600WT
Genuine Intel(R) CPU @ 2.20GHz                      @2.20 GHz
SE5C610.86B.01.01.0599.080120140224                 8192 MB RAM
Copyright (c) 2010-2014, Intel Corporation


  ▶ Setup Menu                                        This selection will
                                                      take you to the Setup
                                                      Menu



                     F10=Save Changes           F9=Reset to Defaults
    ↑↓=Move Highlight  <Enter>=Select Entry
```
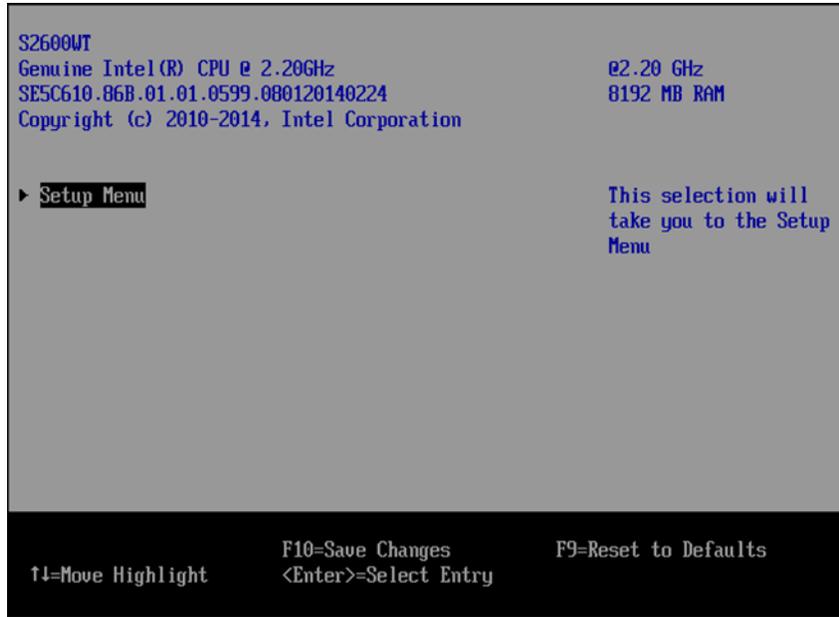
Figure 1. Setup Menu

2.2.2 Setup Menu Screen (Tab)

Setup Menu Screen contains the entire BIOS Setup collection and organizes them into major categories. Each category has a hierarchy with a top-level screen from which lower-level screens may be selected. Each top-level screen appears as an entry, arranged across the top of the Setup screen image of all top-level screens.

The categories and the screens included in each category are listed below, with links to each of the screens named.

Table 2. Screen Map

Categories (Top Level inside the Setup Menu)	2nd Level Screens	3rd Level Screens
Main Screen (Tab)		
Advanced Screen (Tab)		
↳	Processor Configuration	
↳	Power & Performance	
	↳	Uncore Power Management
	↳	CPU P State Control
	↳	CPU C State Control
↳	QPI Configuration	

Categories (Top Level inside the Setup Menu)	2nd Level Screens	3rd Level Screens
↳	Memory Configuration	
	↳	Memory RAS and Performance Configuration
↳	Integrated IO Configuration	
↳	Mass Storage Controller Configuration	
↳	Serial Port Configuration	
↳	USB Configuration	
↳	System Acoustic and Performance Configuration	
Security Screen (Tab)		
↳	BMC LAN Configuration	
	↳	User Configuration
Error Manager Screen (Tab)		
Boot Manager Screen (Tab)		
Boot Maintenance Manager Screen (Tab)		
↳	Advanced Boot Options	
↳	Legacy CDROM Order	
↳	Legacy Hard Disk Order	
↳	Legacy Floppy Order	
↳	Legacy Network Device Order	
↳	Legacy BEV Device Order	
↳	Add EFI Boot Option	
↳	Delete EFI Boot Option	
↳	Change Boot Order Screen	
Save & Exit Screen (Tab)		

2.2.3 Main Screen (Tab)

The Main Screen is the first screen that appears when the BIOS Setup configuration utility is entered, unless an error has occurred. If an error has occurred, the Error Manager Screen appears instead (Figure 31).

```
                              Main

Logged in as:          Administrator          [Enabled] - Display
Platform ID            S2600WT                the logo screen
                                              during POST.
System BIOS
BIOS Boot From         Primary                [Disabled] - Display
Primary BIOS Version   SE5C610.86B.01.01.0599 the diagnostic screen
Primary BIOS Build Date 08/01/2014            during POST.
Backup BIOS Version    SE5C610.86B.01.01.0599
Backup BIOS Build Date 08/01/2014

Memory
Total Memory           8 GB

Quiet Boot             <Enabled>
POST Error Pause       <Disabled>
                                              ↓ Scroll Down

          F10=Save Changes        F9=Reset to Defaults
↑↓=Move Highlight     <Enter>=Select Entry    Esc=Exit
        Copyright (c) 2010-2014, Intel Corporation
```

Figure 2. Main Screen

Screen Field Descriptions:

1. Logged in as:

   Option Values: *<Administrator/User>*

   Help Text: *<None>*

   Comments: *Information only*. Displays password level that setup is running in: Administrator or User. With no passwords set, Administrator is the default mode.

   Back to [*Main Screen*] — [*Screen Map*]

2. Platform ID

   Option Values: *<Platform ID>*

   Help Text: *<None>*

   Comments: *Information only*. Displays the Platform ID (Board ID) for the board on which the BIOS is executing POST.

   The Platform ID is limited to 8 characters, because it is also used in the ACPI Tables which have that limitation. In some cases, this means that the Platform ID is abbreviated from the marketing designation (for example, MFS2600KI is abbreviated to S2600KI).

Back to [*Main Screen*] — [*Screen Map*]

3. BIOS Boot From

Option Values: *<Primary/Backup>*

Help Text: *<None>*

Comments: *Information only.* Displays the exact BIOS portion on the board which is executing POST.

Boot from Backup BIOS means the BIOS is running in Recovery mode and the Primary BIOS may be corrupted.

Back to [*Main Screen*] — [*Screen Map*]

4. Primary BIOS Version

Option Values: *<Primary BIOS version ID>*

Help Text: *<None>*

Comments: *Information only.* The BIOS version displayed uniquely identifies the BIOS that is currently installed and operational on the board. The version information displayed is taken from the BIOS ID String, with the timestamp segment dropped off. The segments displayed are:

Platform:	Identifies that this is the correct platform BIOS
86B:	Identifies this BIOS as being an Intel® Server BIOS
xx:	Major Revision level of the BIOS
yy:	Release Revision level for this BIOS
zzzz:	Release Number for this BIOS

Back to [*Main Screen*] — [*Screen Map*]

5. Primary BIOS Build Date

Option Values: *<Date and time when the currently installed* Primary *BIOS was created (built)>*

Help Text: *<None>*

Comments: *Information only.* The time and date displayed are taken from the timestamp segment of the BIOS ID String.

Back to [*Main Screen*] — [*Screen Map*]

6. Backup BIOS Version

Option Values: *<Primary BIOS version ID>*

Help Text: *<None>*

Comments: *Information only.* The BIOS version displayed uniquely identifies the Backup BIOS that is currently installed and operational on the board. The version information displayed is taken from the BIOS ID String, with the timestamp segment dropped off. The segments displayed are:

Platform:　　　　Identifies that this is the correct platform BIOS
86B:　　　　　　Identifies this BIOS as being an Intel® Server BIOS
xx:　　　　　　　Major Revision level of the BIOS
yy:　　　　　　　Release Revision level for this BIOS
zzzz:　　　　　　Release Number for this BIOS

Back to [*Main Screen***] — [***Screen Map***]**

7. Backup BIOS Build Date

Option Values:　　　　*<Date and time when the currently installed Backup BIOS was created (built)>*

Help Text:　　　　*<None>*

Comments:　　　　*Information only.* The time and date displayed are taken from the timestamp segment of the BIOS ID String.

Back to [*Main Screen***] — [***Screen Map***]**

8. Total Memory

Option Values:　　　　*<Amount of memory installed in the system>*

Help Text:　　　　*<None>*

Comments:　　　　*Information only.* Displays the total physical memory installed in the system, in MB or GB. The term physical memory indicates the total memory discovered in the form of installed DDR4 DIMMs.

Back to [*Main Screen***] — [***Screen Map***]**

9. Quiet Boot

Option Values:　　　　**Enabled**
　　　　　　　　　　　Disabled

Help Text:

　　　　[Enabled] – Display the logo screen during POST.
　　　　[Disabled] – Display the diagnostic screen during POST.

Comments:　　　　This field controls whether the full diagnostic information is displayed on the screen during POST. When Console Redirection is enabled, the Quiet Boot setting is disregarded and the text mode Diagnostic Screen is displayed unconditionally.

Back to [*Main Screen***] — [***Screen Map***]**

10. POST Error Pause

Option Values:　　　　Enabled
　　　　　　　　　　　Disabled

Help Text:
　　　　[Enabled] – Go to the Error Manager for critical POST errors.

[Disabled] – Attempt to boot and do not go to the Error Manager for critical
POST errors.

Comments: If enabled, the POST Error Pause option takes the system to the
error manager to review the errors when major errors occur. Minor and fatal error
displays are not affected by this setting.

Back to [Main Screen**] — [**Screen Map**]**

11. System Date

Option Values: *<System Date initially displays the current system calendar date,
including the day of the week>*

Help Text:

System Date has configurable fields for the current Month, Day, and Year.
The year must be between 2013 and 2099.
Use [Enter] to select the next field.
Use [+] or [-] key to modify the selected field.

Comments: This field initially displays the current system day of week and
date. It may be edited to change the system date. When the System Date is reset by the
"BIOS Defaults" jumper, BIOS Recovery Flash Update, or other method, the date will be
the earliest date in the allowed range – **Saturday 01/01/2013**.

Back to [Main Screen**] — [**Screen Map**]**

12. System Time

Option Values: *<System Time initially displays the current system time of day, in
24-hour format>*

Help Text:

System Time has configurable fields for Hours, Minutes, and Seconds.
Hours are in 24-hour format.
Use the [Enter] key to select the next field.
Use the [+] or [-] key to modify the selected field.

Comments: This field initially displays the current system time (24-hour time).
It may be edited to change the system time. When the System Time is reset by the
"BIOS Defaults" jumper, BIOS Recovery Flash Update, or other method, the time will be
the earliest time of day in the allowed range – **00:00:00** (although the time will be
updated beginning from when it is reset early in POST).

Back to [Main Screen**] — [**Screen Map**]**

2.2.4 Advanced Screen (Tab)

The Advanced screen provides an access point to configure several groups of options. On this screen, the user can select the option group to be configured. Configuration actions are performed on the selected screen, and not directly on the Advanced screen.

This screen is the same for all board series, selecting between the same groups of options, although the options for different boards are not necessarily identical.

To access this screen from the **Main** screen or other top-level "Tab" screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the **Advanced** screen is selected.
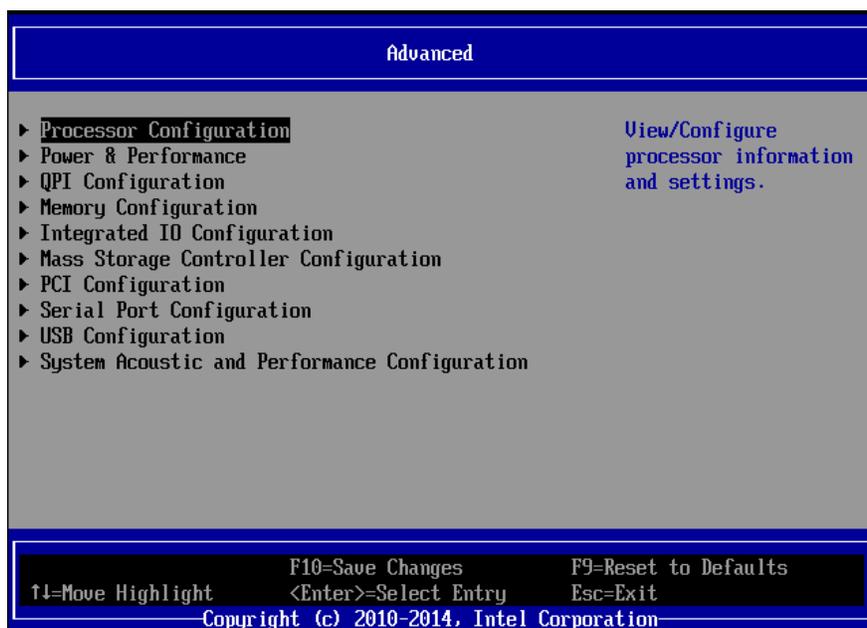
Figure 3. Advanced Screen

Screen Field Descriptions:

1. Processor Configuration

    Option Values: *<None>*

    Help Text: *View/Configure processor information and settings.*

    Comments: *Selection only.* Select this line and press the <Enter> key to go to the **Processor Configuration** group of configuration settings.

    Back to [Advanced Screen**] — [**Screen Map**]**

2. Power & Performance

    Option Values: *<None>*

    Help Text: *View/Configure power & performance information and settings.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the ***Power & Performance*** group of configuration settings.

Back to [Advanced Screen***] — [***Screen Map***]***

3. QPI Configuration

Option Values: *<None>*

Help Text: *View/Configure QPI information and settings.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the ***QPI Configuration*** group of configuration settings.

Back to [Advanced Screen***] — [***Screen Map***]***

4. Memory Configuration

Option Values: *<None>*

Help Text: *View/Configure memory information and settings.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the ***Memory Configuration*** group of configuration settings.

Back to [Advanced Screen***] — [***Screen Map***]***

5. Integrated IO Configuration

Option Values: *<None>*

Help Text: *View/Configure Integrated IO information and settings.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the ***Integrated IO Configuration*** group of configuration settings.

Back to [Advanced Screen***] — [***Screen Map***]***

6. Mass Storage Controller Configuration

Option Values: *<None>*

Help Text: *View/Configure mass storage controller information and settings.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the ***Mass Storage Controller Configuration*** group of configuration settings.

Back to [Advanced Screen***] — [***Screen Map***]***

7. PCI Configuration

Option Values: *<None>*

Help Text: *View/Configure PCI information and settings.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the group of configuration settings.

Back to [Advanced Screen***] — [***Screen Map***]***

8. Serial Port Configuration

Option Values: *<None>*

Help Text: *View/Configure serial port information and settings.*

Comments: *Selection only*. Select this line and press the <Enter> key to go to the **Serial Port Configuration** group of configuration settings.
Back to [Advanced Screen***] — [***Screen Map***]***

9. USB Configuration

Option Values: *<None>*

Help Text: *View/Configure USB information and settings.*

Comments: *Selection only*. Select this line and press the <Enter> key to go to the **USB Configuration** group of configuration settings.

Back to [Advanced Screen***] — [***Screen Map***]***

10. System Acoustic and Performance Configuration

Option Values: *<None>*

Help Text: *View/Configure system acoustic and performance information and settings.*

Comments: *Selection only*. Select this line and press the <Enter> key to go to the **System Acoustic and Performance Configuration** group of configuration settings.

Back to [Advanced Screen***] — [***Screen Map***]***

2.2.5 Processor Configuration

The Processor Configuration screen displays the processor identification and microcode level, core frequency, cache sizes, Intel® QuickPath Interconnect (QPI) information for all processors currently installed. It also allows the user to enable or disable a number of processor options.

To access this screen from the *Main* screen, select *Advanced > Processor Configuration*. To move to another screen, press the <Esc> key to return to the *Advanced* screen, then select the desired screen.
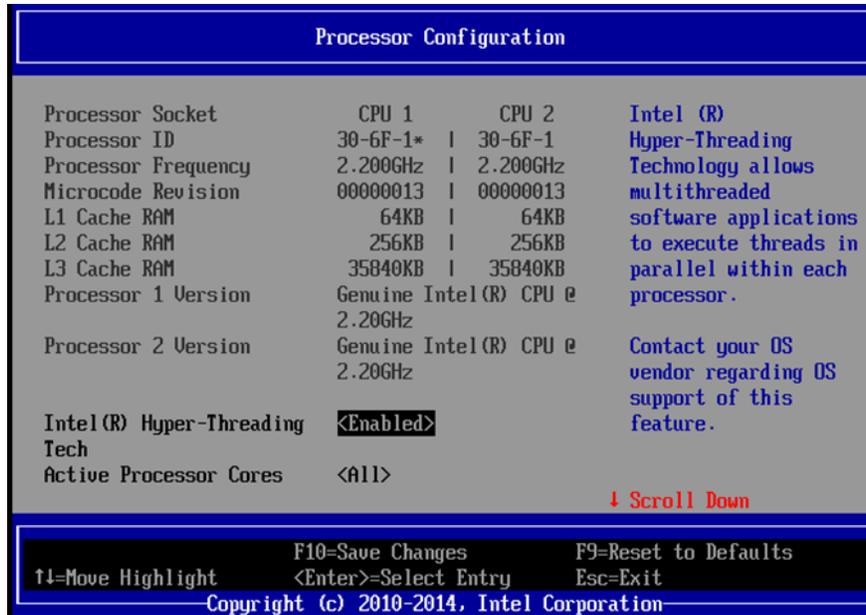
Figure 4. Processor Configuration Screen

Screen Field Descriptions:

1. Processor ID

   Option Values: *<CPUID>*

   Help Text: *<None>*

   Comments: *Information only*. Displays the Processor Signature value (from the CPUID instruction) identifying the type of processor and the stepping.

   For multi-socket boards, the processor selected as the Bootstrap Processor (BSP) has an asterisk ("*****") displayed beside the Processor ID. "N/A" will be displayed for a processor if not installed.

   S2600 series boards have 2 Processor ID displays, regardless of whether the second CPU socket has a processor installed. If the socket does not have a processor installed, "N/A" will be displayed for the processor data.

   ***Back to [**Processor Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]*

2. **Processor Frequency**

   Option Values: *<Current Processor Operating Frequency>*

   Help Text: *<None>*

   Comments: *Information only.* Displays current operating frequency of the
   processor.

   Single-socket boards have a single processor display; 2-socket or 4-socket boards
   have a display column for each socket, showing "N/A" for empty sockets where
   processors are not installed.

   Back to [*Processor Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

3. **Microcode Revision**

   Option Values: *<Microcode Revision Number>*

   Help Text: *<None>*

   Comments: *Information only.* Displays Revision Level of the currently loaded
   processor microcode.

   Single-socket boards have a single processor display; 2-socket or 4-socket boards
   have a display column for each socket, showing "N/A" for empty sockets where
   processors are not installed.

   Back to [*Processor Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

4. **L1 Cache RAM**

   Option Values: *<L1 cache size>*

   Help Text: *<None>*

   Comments: *Information only.* Displays size in KB of the processor L1 Cache.
   Since L1 cache is not shared between cores, this is shown as the amount of L1 cache
   per core. There are two types of L1 cache, so this amount is the total of L1 Instruction
   Cache plus L1 Data Cache for each core.

   Single-socket boards have a single processor display; 2-socket or 4-socket boards
   have a display column for each socket, showing "N/A" for empty sockets where
   processors are not installed.

   Back to [*Processor Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

5. **L2 Cache RAM**

   Option Values: *<L2 cache size>*

   Help Text: *<None>*

   Comments: *Information only.* Displays size in KB of the processor L2 Cache.
   Since L2 cache is not shared between cores, this is shown as the amount of L2 cache
   per core.

Single-socket boards have a single processor display; 2-socket or 4-socket boards have a display column for each socket, showing "N/A" for empty sockets where processors are not installed.

Back to [*Processor Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

6. L3 Cache RAM

Option Values: *<L3 cache size>*

Help Text: *<None>*

Comments: *Information only*. Displays size in MB of the processor L3 Cache. Since L3 cache is shared between all cores in a processor package, this is shown as the total amount of L3 cache per processor package.

Single-socket boards have a single processor display; 2-socket or 4-socket boards have a display column for each socket, showing "N/A" for empty sockets where processors are not installed.

Back to [*Processor Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

7. Processor 1 Version

8. Processor 2 Version

Option Values: *<ID string from processor>*

Help Text: *<None>*

Comments: *Information only*. Displays Brand ID string read from processor with CPUID instruction.

Single-socket boards have a single processor display; 2-socket or 4-socket boards have a display line for each socket, showing "N/A" for empty sockets where processors are not installed.

Back to [*Processor Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

9. Intel(R) Hyper-Threading Tech

Option Values: **Enabled**
Disabled

Help Text:
Intel(R) Hyper-Threading Technology allows multithreaded software applications to execute threads in parallel within each processor.

Contact your OS vendor regarding OS support of this feature.

Comments: This option is only visible if all processors installed in the system support Intel® Hyper-Threading Technology.

Back to [*Processor Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

10. Active Processor Cores

Option Values: **All**
                        1
                        2
                        3
                        4
                        N minus 1 (N is the number of cores in the processor package)

Help Text: *Number of cores to enable in each processor package.*

Comments: The number of cores that appear as selections depends on the number of cores available in the processors installed. Boards may have as many as 8 cores in each of 1, 2, or 4 processors. The same number of cores must be active in each processor package.

This Setup screen should begin with the number of currently active cores as the number displayed. See note below – this may be different from the number previously set by the user.

Note: The ME can control the number of active cores independently of the BIOS Setup setting. If the ME disables or enables processor cores, that will override the BIOS setting, and the number selected by the BIOS will be disregarded.

***Back to [**Processor Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]*

11. Execute Disable Bit

Option Values: **Enabled**
                        Disabled

Help Text:
            Execute Disable Bit can help prevent certain classes of malicious buffer overflow attacks.

            Contact your OS vendor regarding OS support of this feature.

Comments: This option is only visible if all processors installed in the system support the Execute Disable Bit. The OS and applications installed must support this feature in order for it to be enabled.

***Back to [**Processor Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]*

12. Intel(R) Virtualization Technology

Option Values: Enabled
                        Disabled

Help Text:
            Intel(R) Virtualization Technology allows a platform to run multiple operating systems and applications in independent partitions.

            Note: A change to this option requires the system to be powered off and then back on before the setting takes effect.

Comments: This option is only visible if all processors installed in the system support Intel® VT. The software configuration installed on the system must support this feature in order for it to be enabled.

Back to [Processor Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

13. Intel(R) TXT

Option Values: Enabled
Disabled

Help Text: *Enable/Disable Intel(R) Trusted Execution Technology. Takes effect after reboot.*

Comments: Intel® TXT only appears with products and processors which have TXT support capability. This option is only available when both Intel® Virtualization Technology and Intel® VT for Directed IO are enabled and on models equipped with a TPM. The TPM must be active in order to support Intel® TXT.

Note: Changing the setting for Intel® TXT requires the system to perform a Hard Reset in order for the new setting to become effective.

Back to [Processor Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

14. DPR Memory Size

Option Values: 1M DPR
3M DPR
64M DPR
128M DPR
255M DPR

Help Text: *Allows selection of the TXT DPR Memory size in the system.*

Comments: This option is only visible when Intel® TXT is enabled.

Back to [Processor Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

15. Enhanced Error Containment Mode

Option Values: Enabled
Disabled

Help Text:
Enable Enhanced Error Containment Mode (Data Poisoning) – Erroneous data coming from memory will be poisoned. If disabled (default), will be in Legacy Mode – No data poisoning support available.

Comments: Enhanced Error Containment (Data Poisoning) is not supported by all models of processors, and this option will not appear unless all installed processors support Enhanced Error Containment. This option globally enables or disables both Core and Uncore Data Poisoning, for processors which support them.

Back to [Processor Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

16. MLC Streamer

    Option Values: **<u>Enabled</u>**
                                     Disabled

    Help Text:

        MLC Streamer is a speculative prefetch unit within the processor(s).

        Note: Modifying this setting may affect performance.

    Comments: MLC Streamer is normally **Enabled**, for best efficiency in L2 Cache and Memory Channel use but disabling it may improve performance for some processing loads and on certain benchmarks.

Back to [*Processor Configuration Screen***] — [***Advanced Screen***] — [***Screen Map***]**

17. MLC Spatial Prefetcher

    Option Values: **<u>Enabled</u>**
                                     Disabled

    Help Text:

        [Enabled] – Fetches adjacent cache line (128 bytes) when required data is not currently in cache.

        [Disabled] – Only fetches cache line with data required by the processor (64 bytes).

    Comments: MLC Spatial Prefetcher is normally **Enabled**, for best efficiency in L2 Cache and Memory Channel use but disabling it may improve performance for some processing loads and on certain benchmarks.

Back to [*Processor Configuration Screen***] — [***Advanced Screen***] — [***Screen Map***]**

18. DCU Data Prefetcher

    Option Values: **<u>Enabled</u>**
                                     Disabled

    Help Text:

        The next cache line will be prefetched into L1 data cache from L2 or system memory during unused cycles if it sees that the processor core has accessed several bytes sequentially in a cache line as data.

        [Disabled] – Only fetches cache line with data required by the processor (64 bytes).

    Comments: DCU Data Prefetcher is normally **Enabled**, for best efficiency in L1 Data Cache and Memory Channel use but disabling it may improve performance for some processing loads and on certain benchmarks.

Back to [*Processor Configuration Screen***] — [***Advanced Screen***] — [***Screen Map***]**

19. DCU Instruction Prefetcher

Option Values: **<u>Enabled</u>**
Disabled

Help Text:
The next cache line will be prefetched into L1 instruction cache from L2 or system memory during unused cycles if it sees that the processor core has accessed several bytes sequentially in a cache line as data.

Comments: DCU Instruction Prefetcher is normally **Enabled**, for best efficiency in L1 Instruction Cache and Memory Channel use but disabling it may improve performance for some processing loads and on certain benchmarks.

Back to [*Processor Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

20. Direct Cache Access (DCA)

Option Values: **<u>Enabled</u>**
Disabled

Help Text:
Allows processors to increase the I/O performance by placing data from I/O devices directly into the processor cache.

Comments: System performance is usually best with Direct Cache Access Enabled. In certain unusual cases, disabling this may give improved results.

Back to [*Processor Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

21. Extended ATR

Option Values: **0x03**

0x01

Help Text: *Extended Timeout value for PCIe tuning.*

Comments: Adjust ATR value to PCIe performance improvement.

Back to [*Processor Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

22. PFloor Tuning

Option Values: *[Entry Field maximum Non-Turbo Frequency minus 3 of installed Processors – 12, **12** is default]*

Help Text: *Adjustment of CPU idle frequency for PCIe Bus tuning.*

Comments: Adjustment of CPU idle frequency for PCIe performance tuning.

Back to [*Processor Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

2.2.6 Power & Performance

The Power & Performance screen allows the user to specify a profile which is optimized in the direction of either reduced power consumption or increased performance.

To access this screen from the **Main** screen, select **Advanced > Power & Performance**. To move to another screen, press the <Esc> key to return to the **Advanced** screen, then select the desired screen.

There are four possible profiles from which to choose. When a Power and Performance Profile is chosen, that in turn will cause the system to implement a defined list of Setup option settings and internal (non-visible) settings.

There is an explanation displayed on the screen, because of the fact that other settings may be adjusted without specifically notifying the user.
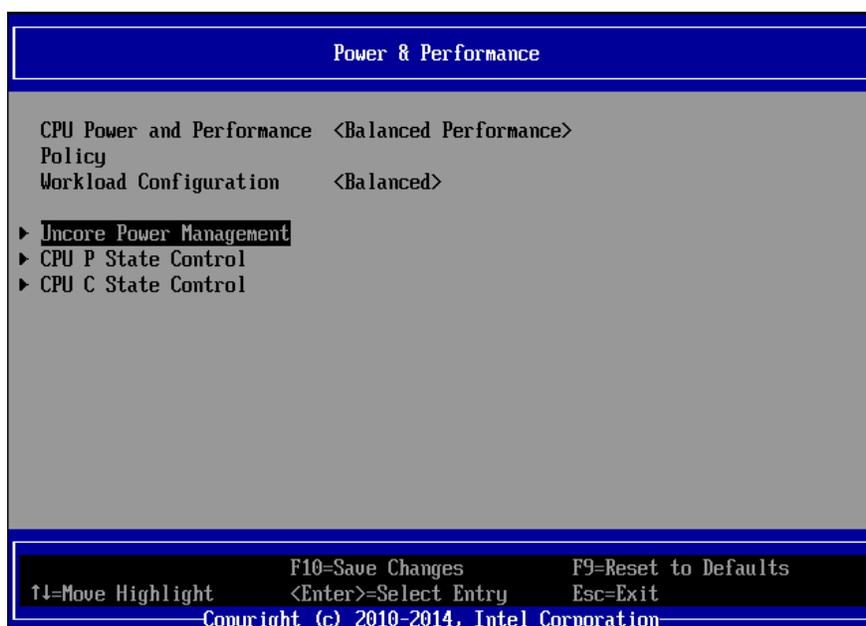
Figure 5. Power & Performance Screen

Screen Field Descriptions:

1. CPU Power and Performance Policy

   Option Values: *Performance*
                      Balanced Performance
                      Balanced Power
                      Power

   Help Text:
   Allows the user to set an overall power and performance policy for the system, and when changed will modify a selected list of options to achieve the policy.

These options are still changeable outside of the policy but do reflect the changes that the policy makes when a new policy is selected.

[Performance] Optimization is strongly toward performance, even at the expense of energy efficiency.

[Balanced Performance] Weights optimization toward performance, while conserving energy.

[Balanced Power] Weights optimization toward energy conservation, with good performance.

[Power] Optimization is strongly toward energy efficiency, even at the expense of performance.

Comments: Choosing one of these four Power and Performance Profiles implements a number of changes in BIOS settings, both visible settings in the Setup screens and non-visible internal settings.

Back to [Power & Performance Screen**] — [**Advanced Screen**] — [**Screen Map**]**

2. Workload Configuration

Option Values: **Balanced**
                       I/O Sensitive

Help Text:
Controls the aggressiveness of the energy performance BIOS settings. This bit field allows the BIOS to choose a configuration that may improve performance on certain workloads.

Comments: IVR enables fine granularity voltage regulation and allows the voltage and frequency of Uncore to be programmed independently. The Uncore activity is monitored to optimize the frequency in real-time. This option is only visible when Enhanced Intel SpeedStep® is enabled by the BIOS.

Back to [Power & Performance Screen**] — [**Advanced Screen**] — [**Screen Map**]**

3. Uncore Power Management

Option Values: *<None>*

Help Text: *View/Configure Uncore Power Management information and settings.*

Comments: <u>Selection only</u>. Select this line and press the <Enter> key to go to the **Uncore Power Management** group of configuration settings.

Back to [Power & Performance Screen**] — [**Advanced Screen**] — [**Screen Map**]**

4. CPU P State Control

Option Values: *<None>*

Help Text: *View/Configure CPU P State Control information and settings.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the **CPU P State Control** group of configuration settings.

Back to [*Power & Performance Screen***] — [***Advanced Screen***] — [***Screen Map***]**

5. CPU C State Control

Option Values: *<None>*

Help Text: *View/Configure CPU C State Control information and settings.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the **CPU C State Control** group of configuration settings.

Back to [*Power & Performance Screen***] — [***Advanced Screen***] — [***Screen Map***]**

2.2.6.1   Uncore Power Management

The CPU P State Control screen allows the user to specify a policy which is optimized for the Processors with the direction of either reduced power consumption or increased performance.

To access this screen from the *Main* screen, select *Advanced > Power & Performance > Uncore Power Management*. To move to another screen, press the <Esc> key to return to the *Power & Performance* screen, if necessary press the <Esc> key again to return to the *Advanced* screen, then select the desired screen.

Figure 6. Uncore Power Management Screen

Screen Field Descriptions:

1. Uncore Frequency Scaling

   Option Values: *Enabled*
                         Disabled

   Help Text:
           Allows the voltage and frequency of Uncore to be programmed independently.
           The Uncore activity is monitored to optimize the frequency in real-time.

   Comments: IVR enables fine granularity voltage regulation and allows the voltage and frequency of Uncore to be programmed independently. The Uncore activity is monitored to optimize the frequency in real-time. This option is only visible when Enhanced Intel SpeedStep® is enabled by the BIOS.

   Back to [*Uncore Power Management Screen****] — [****Power & Performance Screen****] — [****Advanced Screen****] — [****Screen Map****]***

2. Performance P-limit

Option Values: ***Enabled***
Disabled

Help Text:
Allows the Uncore frequency coordination of two processors when enabled.

Comments: This option is only visible if two processors are installed in the system. In a two-socket system, it may be desirable to have the two processors running at similar Uncore frequencies. The Performance P-limit feature does this by coordinating frequency between the two sockets. This avoids latency increases caused by an "idle" socket running at a low CLR frequency, slowing down accesses from a "busy" socket.

Back to [*Uncore Power Management Screen****] — [****Power & Performance Screen****] — [****Advanced Screen****] — [****Screen Map****]***

2.2.6.2   CPU P State Control

The CPU P State Control screen allows the user to specify a policy which is optimized for the Processors with the direction of either reduced power consumption or increased performance.

To access this screen from the **Main** screen, select **Advanced > Power & Performance > CPU P State Control**. To move to another screen, press the <Esc> key to return to the **Power & Performance** screen, if necessary press the <Esc> key again to return to the **Advanced** screen, then select the desired screen.
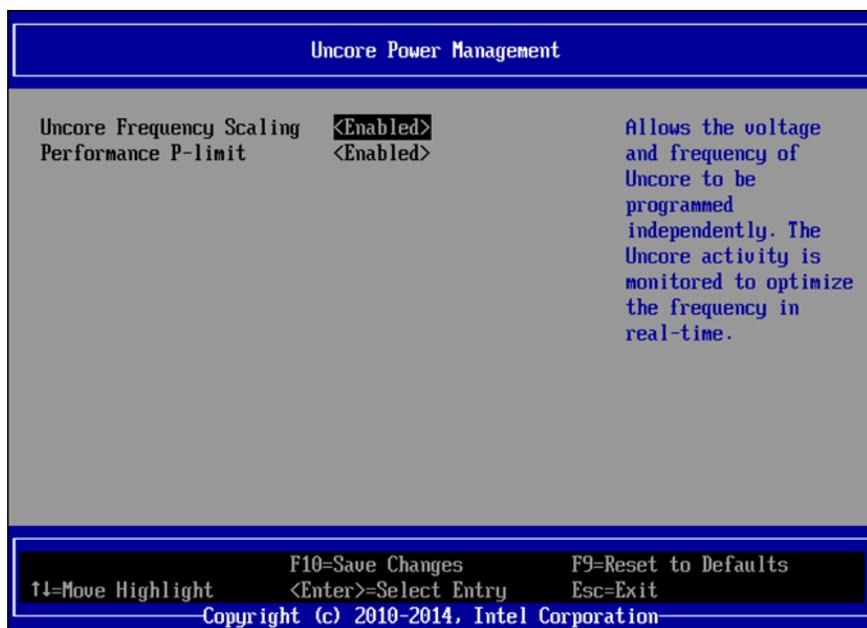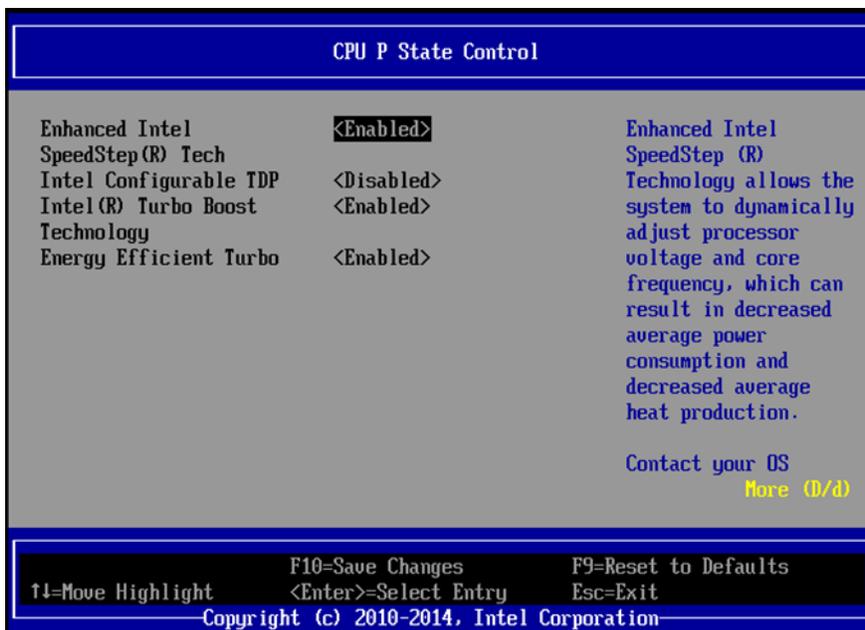

Figure 7. CPU P State Control Screen

Screen Field Descriptions:

1. Enhanced Intel SpeedStep(R) Tech

    Option Values: **Enabled**
                          Disabled

    Help Text:
        Enhanced Intel SpeedStep(R) Technology allows the system to dynamically adjust processor voltage and core frequency, which can result in decreased average power consumption and decreased average heat production.

        Contact your OS vendor regarding OS support of this feature.

    Comments: When Disabled, the processor setting reverts to running at Max TDP Core Frequency (rated frequency).

    This option is only visible if all processors installed in the system support Enhanced Intel SpeedStep® Technology. In order for the Intel® Turbo Boost option to be available, Enhanced Intel SpeedStep® Technology must be **Enabled**.

2. Intel Configurable TDP

    Option Values: *Enabled*
                                 Disabled

    Help Text: *Allows the user to disable/enable Intel Config TDP.*

    Comments: This option is only visible if all processors installed in the system support Intel® Configurable TDP Technology. In order for this option to be available, Enhanced Intel SpeedStep® Technology must be **Enabled**.

3. Configurable TDP Level

    Option Values: ***Nominal***
                                 Level 1
                                 Level 2

    Help Text:
        Allows the user to select Intel Config TDP level – Nominal is the default TDP.

    Comments: This option is only visible if all processors installed in the system support Intel® Configurable TDP Technology. In order for the Intel® Turbo Boost option to be available, Enhanced Intel SpeedStep® Technology and Intel Configurable TDP must be **Enabled**.

4. Intel(R) Turbo Boost Technology

    Option Values: **Enabled**
                                   Disabled

    Help Text:
        Intel(R) Turbo Boost Technology allows the processor to automatically increase its frequency if it is running below power, temperature, and current specifications.

    Comments: This option is only visible if all processors installed in the system support Intel® Turbo Boost Technology. In order for this option to be available, Enhanced Intel SpeedStep® Technology must be **Enabled**.

5. Energy Efficient Turbo

Option Values: **<u>Enabled</u>**
Disabled

Help Text:
When Energy Efficient Turbo is enabled, the CPU cores only enter the turbo frequency when the PCU detects high utilization.

Comments: This option is only visible if all processors installed in the system support Intel® Turbo Boost Technology. In order for this option to be available, Intel® Turbo Boost Technology must be **Enabled**.

***Back to [**CPU P State Control Screen**] — [**Power & Performance Screen**] — [**Advanced Screen**] — [**Screen Map**]*

2.2.6.3   CPU C State Control

The CPU C State Control screen allows the user to specify a policy which is optimized for the Processors' sleep state.

To access this screen from the **Main** screen, select **Advanced > Power & Performance > CPU C State Control**. To move to another screen, press the <Esc> key to return to the **Power & Performance** screen, if necessary press the <Esc> key again to return to the **Advanced** screen, then select the desired screen.


```
┌─────────────────────────────────────────────────────────────────┐
│                       CPU C State Control                         │
├─────────────────────────────────────────────────────────────────┤
│                                                                   │
│  CPU C-State          <Enabled>           When CPU C-State is      │
│  C1E Autopromote      <Enabled>           enabled, the CPU         │
│  Processor C3         <Disabled>          cores enters the         │
│  Processor C6         <Disabled>          sleep state when         │
│                                           there is no loading      │
│                                           on it.                   │
│                                                                   │
│                                                                   │
│                                                                   │
│          F10=Save Changes           F9=Reset to Defaults          │
│  ↑↓=Move Highlight    <Enter>=Select Entry    Esc=Exit            │
│         Copyright (c) 2010-2014, Intel Corporation                │
└─────────────────────────────────────────────────────────────────┘
```
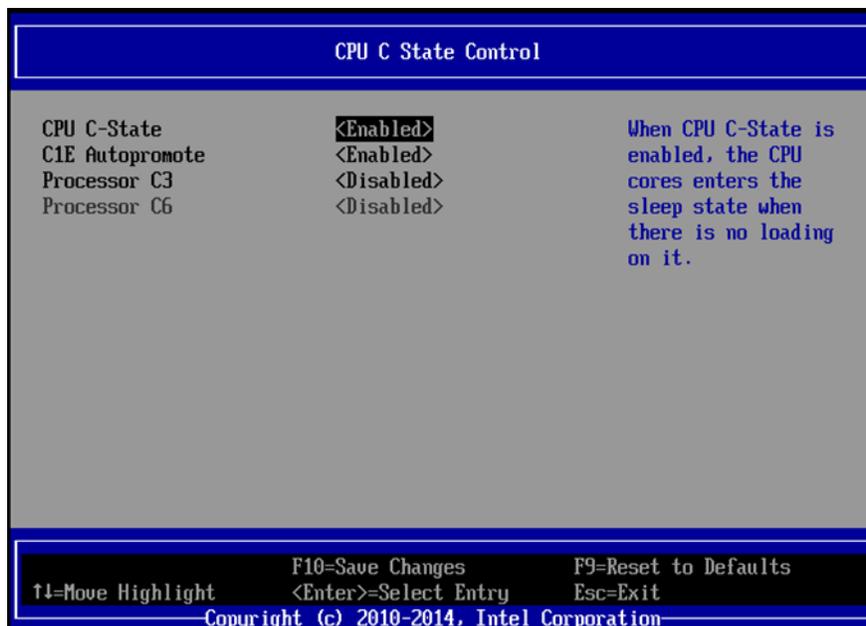
Figure 8. CPU C State Control Screen

Screen Field Descriptions:

1. CPU C-State

   Option Values: **Enabled**
                            Disabled

   Help Text:
           When CPU C-State is enabled, the CPU cores enter the sleep state when there is no loading on it.

   Comments: This option is the main switch for all CPU C-states.

   Back to [CPU C State Control Screen**] — [**Power & Performance Screen**] — [**Advanced Screen**] — [**Screen Map**]**

2. C1E Autopromote

   Option Values: **Enabled**
                           <u>Disabled</u>

Help Text:

*When Enabled, the CPU will switch to the Minimum Enhanced Intel SpeedStep®
Technology operating point when all execution cores enter C1. Frequency will
switch immediately, followed by gradual Voltage switching.*

*When Disabled, the CPU will not transition to the minimum Enhanced Intel
SpeedStep® Technology operating point when all cores enter C1.*

Comments: This is normally Disabled but can be Enabled for improved
performance on certain benchmarks and in certain situations.

Back to [*CPU C State Control Screen***] — [***Power & Performance Screen***] — [***Advanced
Screen***] — [***Screen Map***]**

3. Processor C3

Option Values: Enabled
<u>Disabled</u>

Help Text: *Enable/Disable Processor C3 (ACPI C2/C3) report to OS.*

Comments: This is normally **Disabled** but can be **Enabled** for improved
performance on certain benchmarks and in certain situations.

Back to [*CPU C State Control Screen***] — [***Power & Performance Screen***] — [***Advanced
Screen***] — [***Screen Map***]**

4. Processor C6

Option Values: **<u>Enabled</u>**
Disabled

Help Text: *Enable/Disable Processor C6 (ACPI C3) report to OS.*

Comments: This is normally **Enabled** but can be **Disabled** for improved
performance on certain benchmarks and in certain situations.

Back to [*CPU C State Control Screen***] — [***Power & Performance Screen***] — [***Advanced
Screen***] — [***Screen Map***]**

2.2.7 QPI Configuration

The QPI Configuration screen allows the user to view details about the QPI link status and alter QPI link speed settings.

To access this screen from the **Main** screen, select **Advanced > QPI Configuration**. To move to another screen, press the <Esc> key to return to the **Advanced** screen, then select the desired screen.

```
                         QPI Configuration

    Current Intel(R) QPI Link    Fast                 Allows for selecting
    Speed                                             the Intel (R)
    Intel(R) QPI Link            9.6 GT/s             QuickPath
    Frequency                                         Interconnect
    Intel(R) QPI Frequency      <Auto Max>            Frequency.
    Select                                            Recommended to leave
                                                      in [Auto Max] so that
                                                      BIOS can select the
                                                      highest common Intel
                                                      (R) QuickPath
                                                      Interconnect
                                                      frequency.




                   F10=Save Changes         F9=Reset to Defaults
    ↑↓=Move Highlight      <Enter>=Select Entry       Esc=Exit
              Copyright (c) 2010-2014, Intel Corporation
```
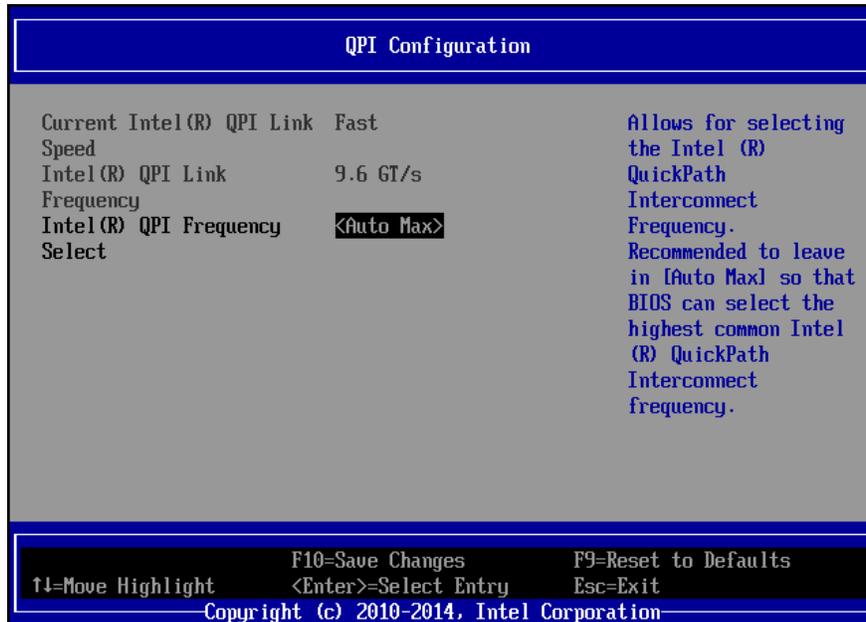
Figure 9. QPI Configuration Screen

Screen Field Descriptions:

1. Current Intel(R) QPI Link Speed

Option Values: *Slow*
                   Fast

Help Text: *<None>*

Comments: *Information only*. Displays current Link Speed setting for the QPI Links. *Appears only on multi-socket boards*.

QPI Link Speed should display as "Slow" only when running at the "Boot Speed" of 50 MT/s, or when a multi-socket board has only one processor installed, so QPI is not functional. It should always be "Fast" when the QPI Link Frequency is in the normal functional range of 6.4 GT/s or above.

***Back to [**QPI Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

---

2. Intel(R) QPI Link Frequency

Option Values: *N/A*
6.4 GT/s
8.0GT/s
9.6 GT/s
Unknown GT/s

Help Text: *<None>*

Comments: *Information only*. Displays current frequency at which the QPI Links are operating. *Appears only on multi-socket boards*.

When a multi-socket board has only one processor installed, QPI Link Frequency will be shown as "N/A".

Back to [*QPI Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

3. Intel(R) QPI Frequency Select

Option Values: **Auto Max**
6.4 GT/s
8.0 GT/s
9.6 GT/s

Help Text:

Allows for selecting the Intel(R) QuickPath Interconnect Frequency. Recommended to leave in [Auto Max] so that the BIOS can select the highest common Intel(R) QuickPath Interconnect frequency.

Comments: Lowering the QPI frequency may improve performance per watt for some processing loads and on certain benchmarks. [Auto Max] will give the maximum QPI performance available. *Appears only on multi-socket boards*.

When a multi-socket board has only one processor installed, this will be grayed out, with the previous value remaining displayed.

Changes in QPI Link Frequency will not take effect until the system reboots, so this will not immediately change the QPI Link Frequency display. Changing QPI Link Frequency does not affect the QPI Link Speed.

Back to [*QPI Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

2.2.8   Memory Configuration

The Memory Configuration screen allows the user to view details about the DDR4 DIMMs that are installed as system memory, and alter BIOS Memory Configuration settings where appropriate.

For S2600 series boards this screen shows memory system information, has options to select, and allows the user to select the "Configure Memory RAS and Performance" screen for further system memory information and configuration.

This screen differs somewhat between different boards which have different memory configurations. Some boards have one processor socket and fewer DIMMs, while other boards have two sockets or four sockets, more DIMMs, and the boards may have RAS and Performance options if configured for them.

To access this screen from the *Main* screen, select *Advanced > Memory Configuration*. To move to another screen, press the <Esc> key to return to the *Advanced* screen, then select the desired screen.
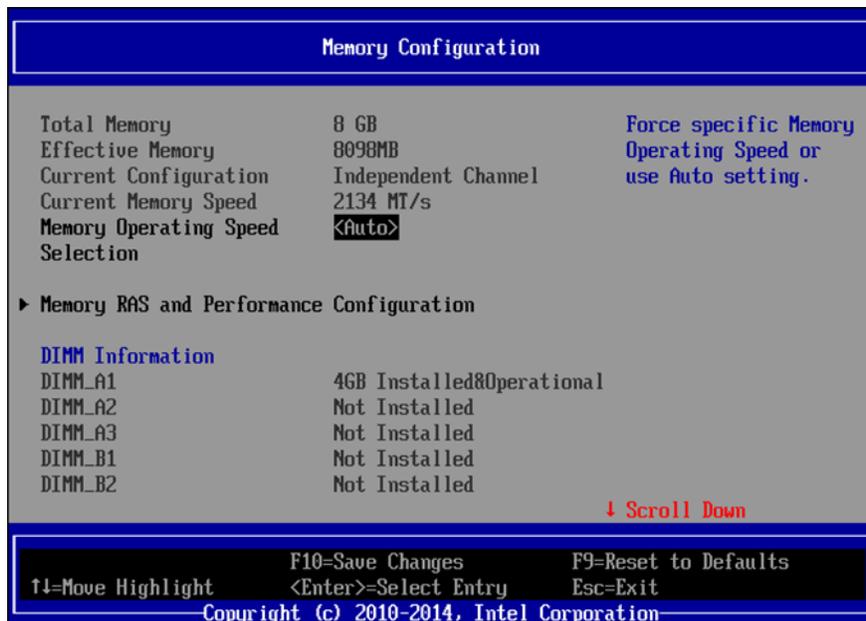
```
                        Memory Configuration

 Total Memory               8 GB                    Force specific Memory
 Effective Memory           8098MB                  Operating Speed or
 Current Configuration      Independent Channel     use Auto setting.
 Current Memory Speed       2134 MT/s
 Memory Operating Speed     <Auto>
 Selection

 ▶ Memory RAS and Performance Configuration

 DIMM Information
 DIMM_A1                    4GB Installed&Operational
 DIMM_A2                    Not Installed
 DIMM_A3                    Not Installed
 DIMM_B1                    Not Installed
 DIMM_B2                    Not Installed
                                              ↓ Scroll Down

                  F10=Save Changes          F9=Reset to Defaults
   ↑↓=Move Highlight    <Enter>=Select Entry      Esc=Exit
                 Copyright (c) 2010-2014, Intel Corporation
```

Figure 10. Memory Configuration Screen

Screen Field Descriptions:

1. **Total Memory**

   Option Values: *<Total Physical Memory Installed in System>*

   Help Text: *<None>*

   Comments: *Information only.* Displays the amount of memory available in the system in the form of installed DDR4 DIMMs, in units of GB.

2. Effective Memory

Option Values: *<Total Effective Memory>*

Help Text: *<None>*

Comments: *Information only.* Displays the amount of memory available to the OS in MB or GB.

The Effective Memory is the Total Physical Memory minus the sum of all memory reserved for internal usage, RAS redundancy, and SMRAM.

Note: Some server operating systems do not display the total physical memory installed.

3. Current Configuration

Option Values: *Independent Channel*
Mirror
Rank Sparing
Lockstep

Help Text: *<None>*

Comments: *Information only.* Displays one of the following:

- ***Independent Channel*** – DIMMs are operating in Independent Channel Mode, the default configuration when there is no RAS Mode configured.

- ***Mirror*** – Mirroring RAS Mode has been configured and is operational.

- ***Rank Sparing*** – Rank Sparing RAS Mode has been configured and is operational.

- ***Lockstep*** – Lockstep RAS Mode has been configured and is operational.

4. Current Memory Speed

Option Values: *<Operational Memory Speed in MT/s>*

Help Text: *<None>*

Comments: *Information only.* Displays the speed in MT/s at which the memory is currently running.

The supported memory speeds are 1333 MT/s, 1600 MT/s, 1866 MT/s, and 2133 MT/s. The actual memory speed capability depends on the memory configuration.

5. Memory Operating Speed Selection

Option Values: ***Auto***
                1333
                1600
                1866
                2133

Help Text: *Force specific Memory Operating Speed or use Auto setting.*

Comments: Allows the user to select a specific speed at which memory will operate. Only speeds that are legitimate are available, that is, the user can only specify speeds less than or equal to the auto-selected Memory Operating Speed. The default **Auto** setting will select the highest achievable Memory Operating Speed consistent with the DIMMs and processors installed.

Back to [*Memory Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

6. Memory RAS and Performance Configuration

Option Values: *<None>*

Help Text:
    Configure memory RAS (Reliability, Availability, and Serviceability) and view current memory performance information and settings.

Comments: *Selection only.* Select this line and press the <Enter> key to go to the **Memory RAS and Performance Configuration** group of configuration settings.

Back to [*Memory Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

7. DIMM_A1
8. DIMM_A2
9. DIMM_A3
10. DIMM_B1

(DIMM_B2 through DIMM_H2 omitted)

11. DIMM_H3

(DIMM_J1 through DIMM_T2 omitted)

12. DIMM_T3
Option Values: <DIMM Size> <DIMM Status>
                Where DIMM Size is:
                    Size of DIMM in GB
                Where DIMM Status is:
                    Installed&Operational
                    Not Installed
                    Failed/Disabled

Help Text: *<None>*

Comments: *Information only.* Displays the status of each DIMM socket present on the board. There is one line for each DIMM socket present on the board.

For each DIMM socket, the DIMM Status reflects one of the following three possible states:

- **Installed&Operational** – There is a DDR4 DIMM installed and operational in this slot.
- **Not Installed** – There is no DDR4 DIMM installed in this slot.
- **Failed/Disabled** – The DIMM installed in this slot has failed during initialization and/or was disabled during initialization.

For each DIMM that is in the **Installed & Operational** state, the DIMM Size in GB of that DIMM is displayed. This is the physical size of the DIMM, regardless of how it is counted in the Effective Memory size.

Note: In "**DIMM_XY**", **X** denotes the Channel Identifier A-P, and **Y** denotes the DIMM Slot identifier 1-3 within the Channel. DIMM_A2 is the DIMM socket on Channel A, Slot 2. Not all boards have the same number of channels and slots – this is dependent on the board features.

S2600 boards can have DIMMs A1, A2, A3 to H1, H2, H3 (max 2 CPU/4 chan/3 DPC).

Back to [Memory Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]

2.2.8.1   Memory RAS and Performance Configuration

The Memory RAS and Performance Configuration screen allows the user to customize several memory configuration options, such as whether to use Memory Mirroring or Memory Sparing.

To access this screen from the *Main* screen, select *Advanced > Memory Configuration > Memory RAS and Performance Configuration*. To move to another screen, press the <Esc> key to return to the *Memory Configuration* screen, if necessary press the <Esc> key again to return to the *Advanced* screen, then select the desired screen.

Screen Field Descriptions:

1. Memory Mirroring Possible

    Option Values: *Yes*
                            No

    Help Text: *<None>*

    Comments: *Information only.* Displays whether the current DIMM configuration is capable of Memory Mirroring. For Memory Mirroring to be possible, DIMM configurations on all paired channels must be identical between the channel pair (Mirroring Domain).

    [*Memory Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

2. Memory Rank Sparing Possible

    Option Values: *Yes*
                            No

    Help Text: *<None>*

    Comments: *Information only.* Displays whether the current DIMM configuration is capable of Rank Sparing. For Rank Sparing to be possible, DIMM configurations on all channels must be capable of supporting Rank Sparing.

    Note: The Correctable Error Threshold value is also the Sparing Fail Over threshold value. Threshold values of "All" or "None" are not valid for Rank Sparing. If the Correctable Error Threshold is set to either of those values, Rank Spring will not be possible.

    [*Memory Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

3. Memory Lockstep Possible

    Option Values: *Yes*
                            No

    Help Text: *<None>*

    Comments: *Information only.* Displays whether the current DIMM configuration is capable of Memory Lockstep. For Memory Lockstep to be possible,

DIMM configurations on all paired channels must be identical between the channel pair.

[*Memory Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

4. Select Memory RAS Configuration

Option Values: **Maximum Performance**
                        Mirroring
                        Rank Sparing
                        Lockstep

Help Text:

Allows the user to select the memory RAS Configuration to be applied for the next boot.

Comments: Available modes depend on the current memory population. Modes which are not listed as "possible" should not be available as choices. If the only valid choice is "Maximum Performance", then this option should be grayed out and unavailable.

Maximum Performance – (default) No RAS but best memory utilization since full amount of memory is available, operating in Independent Channel Mode.

Mirroring – Most reliability by using half of memory as a mirror image, can survive an Uncorrectable ECC Error.

Rank Sparing – Offers reliability by reserving spare ranks to replace failing ranks which are generating excessive Correctable ECC Errors.

Lockstep – Allows SDDC capability with x8 DIMMs installed. No memory size impact but does have a performance and power penalty.

Note: Since only RAS Modes which are listed as "possible" are available for selection, it is not possible to select a RAS Mode without first installing an appropriate DIMM configuration.

[*Memory Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

5. Multi-Rank Sparing

Option Values: **1 Rank**
                        2 Rank
                        3Rank
                        Auto

Help Text:

The Rank number used when Rank Sparing is enabled.

Comments: This option is only present when Select Memory RAS Configuration is Rank Sparing.

[*Memory Configuration Screen***] — [***Advanced Screen***] — [***Screen Map***]**

6. NUMA Optimized

Option Values: **_Enabled_**
                    Disabled

Help Text:

> _If enabled, the BIOS includes ACPI tables that are required for NUMA-aware Operating Systems._

Comments: This option is only present for boards which have two or more processor sockets. When a multi-socket board has only a single processor without Cluster-on-Die support installed, this option is grayed out and set as Disabled; when a multi-socket board has only a single processor with Cluster-on-Die support installed, this option is grayed out and set the same as Cluster-on-Die option below.

When enabled, the SRAT and SLIT ACPI tables are provided that show the locality of systems resources, especially memory, which allows a "NUMA Aware" OS to optimize which processor threads are used by processes which can benefit by having the best access to those resources.

[*Memory Configuration Screen***] — [***Advanced Screen***] — [***Screen Map***]**

7. Cluster-on-Die

Option Values: Enabled
                    Disabled

Help Text:

> _When NUMA and COD are both enabled, the BIOS will publish one NUMA domain per cluster i.e., two NUMA domains per socket in the ACPI SLIT/SRAT tables._

Comments: This option is only available for processors with Cluster-on-Die capability. When NUMA option is disabled, this option will be disabled and hidden.

[*Memory Configuration Screen***] — [***Advanced Screen***] — [***Screen Map***]**

8. Patrol Scrub

Option Values: **_Enabled_**
                    Disabled

Help Text:
> _When enabled, performs periodic checks on memory cells and proactively walks through populated memory space, to seek and correct soft ECC errors._

Comments: When enabled, Patrol Scrub is initialized to read through all of memory in a 24-hour period, correcting any Correctable ECC Errors it encounters by writing back the corrected data to memory.

[Memory Configuration Screen] — [Advanced Screen] — [Screen Map]

9. Demand Scrub

Option Values: **Enabled**
Disabled

Help Text:
When enabled, executes when an ECC error is encountered during a normal read/write of data and corrects that data.

Comments: When enabled, Demand Scrub automatically corrects a Correctable ECC Error encountered during a fetch from memory by writing back the corrected data to memory.

[Memory Configuration Screen] — [Advanced Screen] — [Screen Map]

10. Correctable Error Threshold

Option Values: *20*
__10__
5
All
None

Help Text:

Threshold value for logging Correctable Errors (CE) – Threshold of 10 (default) logs 10th CE, "All" logs every CE, and "None"' means no CE logging. All and None are not valid with Rank Sparing.

Comments: Specifies how many Correctable Errors must occur before triggering the logging of a SEL Correctable Error Event. Only the first threshold crossing is logged, unless "All" is selected. "All" causes every CE that occurs to be logged. "None" suppresses CE logging completely.

When Rank Sparing RAS Mode is configured, "All" and "None" are not valid, so they will not be present as choices.

This threshold is applied on a per-rank basis. The Correctable Error occurrences are counted for each memory rank. When any one rank accumulates a CE count equal to the CE Threshold, then a single CE SEL Event is logged, and all further CE logging is suppressed.

Note that the CE counts are subject to a "leaky bucket" mechanism that reduces the count as a function of time, to keep from accumulating counts unnecessarily over the term of a long operational run.

This is also the Correctable Error threshold used when Rank Sparing RAS Mode is configured. When a CE threshold crossing occurs in Rank Sparing Mode on a channel which is in Redundant state, it causes a Sparing Fail Over (SFO) event to occur. That threshold crossing will also be logged as a Correctable Error event if it is the first to occur in the system.

2.2.9 Integrated IO Configuration

The Integrated IO Configuration screen allows the user to configure the Integrated IO used for onboard devices inside Intel processors.

To access this screen from the **Main** screen, select **Advanced > Integrated IO Configuration**. To move to another screen, press the <Esc> key to return to the **Advanced** screen, then select the desired screen.
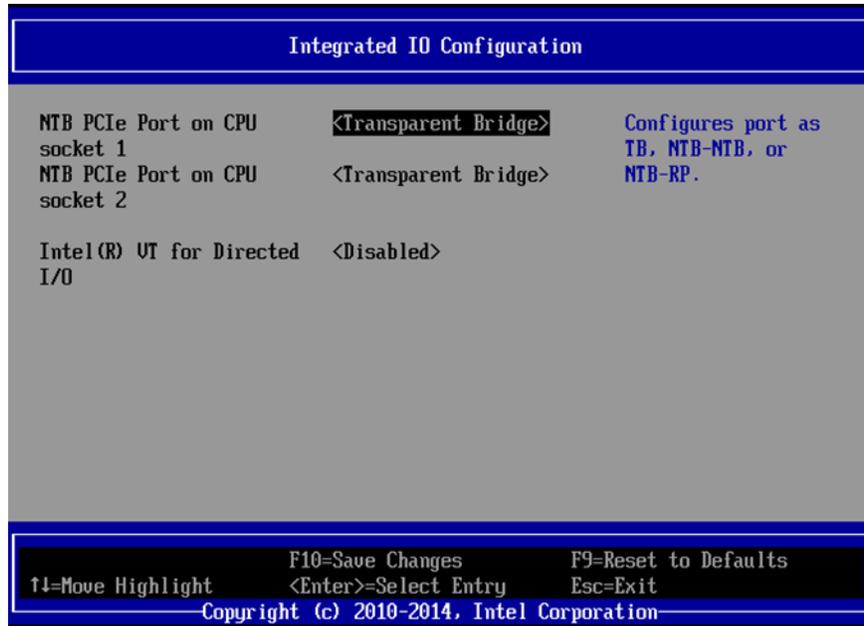
```
                    Integrated IO Configuration

 NTB PCIe Port on CPU      <Transparent Bridge>    Configures port as
 socket 1                                          TB, NTB-NTB, or
 NTB PCIe Port on CPU      <Transparent Bridge>    NTB-RP.
 socket 2

 Intel(R) VT for Directed  <Disabled>
 I/O




        F10=Save Changes            F9=Reset to Defaults
 ↑↓=Move Highlight    <Enter>=Select Entry     Esc=Exit
        Copyright (c) 2010-2014, Intel Corporation
```

Figure 11. Integrated IO Configuration Screen

Screen Field Descriptions:

1. NTB PCIe Port on CPU socket 1

2. NTB PCIe Port on CPU socket 2

    Option Values: **Transparent Bridge**
                          NTB to NTB
                          NTB to RP

    Help Text:

        Configures port as TB, NTB-NTB, or NTB-RP.

    Comments: This option selects the configuration mode of PCI Express Port 3A to support NTB configuration.

    Note: When NTB is enabled, Spread Spectrum Clocking (SSC) is required to be disabled at each NTB link.

*Back to [*Integrated IO Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]*

3. Enable NTB Bars

Option Values: **Disabled**
Enabled

Help Text:

If disabled, the BIOS will not program NTB BAR size registers.

Comments: This option allows the BIOS to program NTB BAR registers with default values when Enabled. If disabled, the BIOS will not program NTB BAR registers and the task is left to drivers.

This option only appears when NTB PCIe Port on CPU socket1/2 is not configured as "Transparent Bridge".

*Back to [*Integrated IO Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]*

4. Crosslink control override

Option Values: **DSD/USP**
USD/DSP

Help Text:

Configure NTB port as DSP/USP, USD/DSP, or use external pins.

Comments: This option configures the Crosslink configuration of the NTB port.

This option only appears when NTB PCIe Port on CPU socket1/2 is not configured as "Transparent Bridge".

*Back to [*Integrated IO Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]*

5. Intel(R) VT for Directed I/O

Option Values: Enabled
Disabled

Help Text:
Enable/Disable Intel(R) Virtualization Technology for Directed I/O (Intel(R) VT-d).

Report the I/O device assignment to VMM through DMAR ACPI Tables.

Comments: This option is only visible if all processors installed in the system support Intel® VT-d. The software configuration installed on the system must support this feature in order for it to be enabled.

*Back to [*Integrated IO Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]*

6. Interrupt Remapping

Option Values: **Enabled**
Disabled

Help Text:
> *Enable/Disable Intel(R) VT-d Interrupt Remapping support. For some processors, this option may be "always enabled".*

Comments: This option only appears when Intel® Virtualization Technology for Directed I/O is **Enabled.** For some processors this will be enabled unconditionally whenever Intel® VT-d is enabled. In that case, this option will be shown as "Enabled", and grayed out and not changeable.

Back to [*Integrated IO Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

7. Coherency Support

Option Values: Enabled
                      Disabled

Help Text:
> *Enable/Disable Intel(R) VT-d Coherency support.*

Comments: This option only appears when Intel® Virtualization Technology for Directed I/O is **Enabled**.

Back to [*Integrated IO Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

2.2.10 Mass Storage Controller Configuration

The Mass Storage Configuration screen allows the user to configure the Mass Storage controllers that are integrated into the server board on which the BIOS is executing. This includes only onboard Mass Storage controllers. Mass Storage controllers on add-in cards are not included in this screen, nor are other storage mechanisms such as USB-attached storage devices or Network Attached Storage.

There are two SATA Port configured in this screen, representing the SATA controller and the sSATA controller 2 with SATA drive support and RAID support. There are also informational displays of two AHCI controller's configuration, and SATA Drive Information when applicable. If the presence of an Intel® Storage Module is detected, the type of Storage Module is displayed as information-only.

To access this screen from the **Main** screen, select **Advanced > Mass Storage Controller Configuration**. To move to another screen, press the <Esc> key to return to the **Advanced** screen, then select the desired screen.
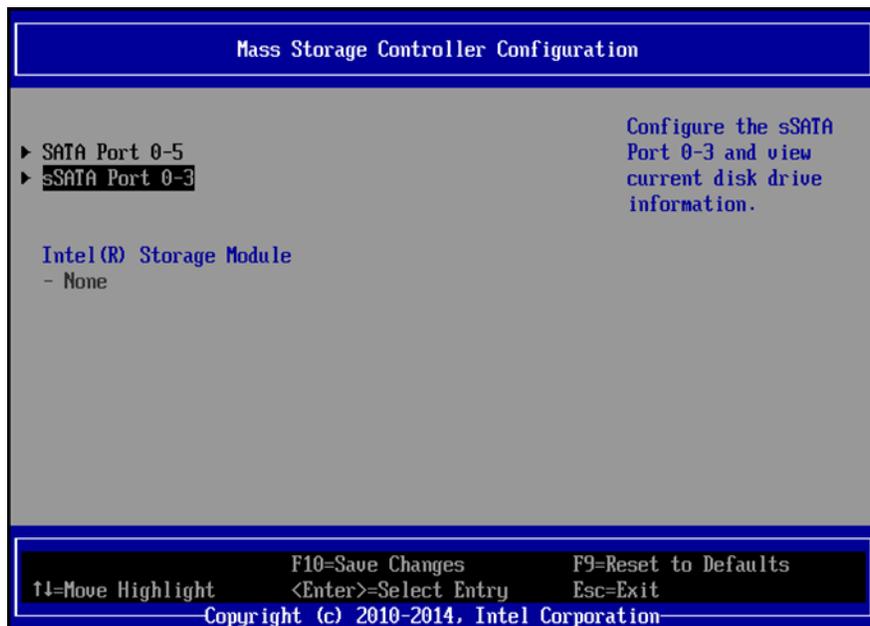

Figure 12. Mass Storage Controller Configuration Screen

Screen Field Descriptions:

1. SATA Port 0-5

2. sSATA Port 0-3

   Option Values: *<None>*

   Help Text: *Configure the* SATA Port 0-5 (sSATA Port 0-3) *and view current disk drive information.*

Comments: Selection only. Select this line and press the <Enter> key to go to the **SATA Port Configuration** group of configuration settings.

Back to [Mass Storage Controller Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

3. SAS Controller

Option Values: **Enabled**
Disabled

Help Text: *Enable or Disable the LSI SAS controller.*

Comments: This Option is for Cotton Wood Pass Server Board to enable/disable onboard LSI SAS controller.

Back to [Mass Storage Controller Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

4. Intel(R) Storage Module

Option Values: **None**
<Name of Storage Module detected>

Names of Storage Modules supported at this time are:

Intel(R) Integrated RAID Module
Intel(R) Integrated RAID Module RMS25PB040
Intel(R) Integrated RAID Module RMT3PB080
Intel(R) Integrated RAID Module RMS25CB080
Intel(R) Integrated RAID Module RMS25CB040
Intel(R) Integrated RAID Module RMT3CB080
Intel(R) Integrated RAID Module RMS25JB080
Intel(R) Integrated RAID Module RMS25JB040
Intel(R) Integrated RAID Module RMS25KB080
Intel(R) Integrated RAID Module RMS25KB040
Intel(R) Integrated RAID Module RMS3CC080
Intel(R) Integrated RAID Module RMS3CC040
Intel(R) Integrated RAID Module RMS3HC080
Intel(R) Integrated RAID Module RMS3JC080

Help Text: *<None>*

Comments: *Information only*. If no Intel® Storage Module is detected, then **None** is displayed. This shows the customer the product name of the module installed, which helps in identifying drivers, support, documentation, etc.

Back to [Mass Storage Controller Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

2.2.10.1   SATA Port Configuration

The SATA Port Configuration screen allows the user to configure the AHCI Capable controllers that are integrated into the server board on which the BIOS is executing. There are two onboard controllers, the AHCI SATA controller and the AHCI sSATA controller with SATA drive support and RAID support. There are also informational displays of AHCI controller configuration, and SATA Drive Information when applicable.

To access this screen from the *Main* screen, select *Advanced > Mass Storage Controller Configuration > SATA Port*. To move to another screen, press the <Esc> key to return to the *Mass Storage Controller Configuration* screen, if necessary press the <Esc> key again to return to the *Advanced* screen, then select the desired screen.
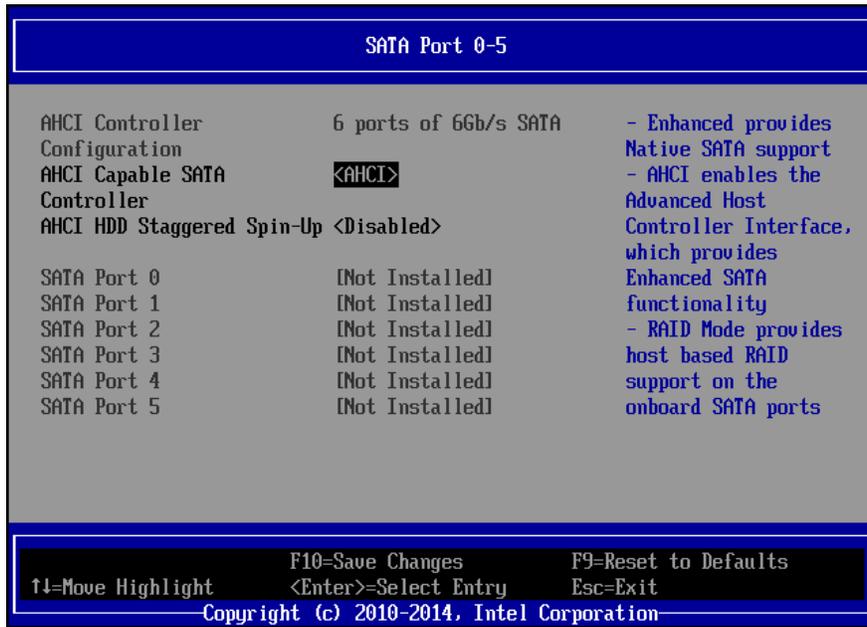
Figure 13. SATA Port Configuration Screen

Screen Field Descriptions:

    1. AHCI Controller Configuration

        Option Values: *<AHCI Port Configuration>*

                                   One of these strings:

                                   Controller is disabled
                                   6 ports of 6Gb/s SATA (for SATA Port 0-5)
                                   4 ports of 6Gb/s SATA (for sSATA Port 0-3)

        Help Text: *<None>*

        Comments: *Information only*. This is a display showing which ports are available through the onboard AHCI capable SATA controller, if the controller is enabled.

This information is also displayed during POST in the POST Diagnostic Screen.

The number of SATA ports available from the integrated AHCI-capable SATA Controller is dependent on the specific server board installed in the system. Different server board designs expose different SATA port configurations. The Platform ID (Board ID) is displayed in the Main Screen.

Back to [SATA Port Configuration Screen**] — [**Mass Storage Controller Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

2. AHCI Capable SATA Controller

Option Values: Disabled
                      Enhanced
                      AHCI
                      RAID Mode

Help Text:

> *- Enhanced provides Native SATA support.*
> *- AHCI enables the Advanced Host Controller Interface, which provides Enhanced SATA functionality.*
> *- RAID Mode provides host based RAID support on the onboard SATA ports.*

Comments: This option configures the onboard AHCI-capable SATA controller, which is distinct from the SCU. The number and type of ports it controls differ between board series.

If the SATA Controller is *Disabled*, the SATA Ports will not operate and any installed SATA devices will be unavailable.

Enhanced provides Native SATA support using native SATA drivers included with the vast majority of current OSes. *AHCI* enables the Advanced Host Controller Interface, which provides Enhanced SATA functionality plus possible additional functionality (Native Command Queuing, Hot Plug, and Staggered Spin Up). It uses AHCI drivers available for the majority of current OSes.

RAID Mode provides host based RAID support on the onboard SATA ports. RAID levels supported and required drivers depend on the RAID stack selected.

Back to [SATA Port Configuration Screen**] — [**Mass Storage Controller Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

3. AHCI Capable RAID Options

Option Values: **Intel(R) ESRT2 (LSI*)**
                      Intel(R) RSTe

Help Text:

> *- Intel(R) ESRT2 (Powered By LSI*): Supports RAID 0/1/10 and optional RAID 5 with Intel® RAID5 Upgrade Keys. Uses Intel® ESRT2 drivers (based on LSI* MegaSR).*

- Intel(R) RSTe: Provides pass-through drive support. Also provides host based RAID 0/1/10/5 support. Uses Intel(R) RSTe iastor drivers.

Comments: This option only appears when the SATA Controller is enabled, and *RAID Mode* has been selected as the operational SATA Mode. This setting selects the RAID stack to be used for SATA RAID with the onboard AHCI SATA controller.

If a RAID Volume has not previously been created that is compatible with the RAID stack selected, it will be necessary to Save and Exit and reboot in order to create a RAID Volume.

Note: This option does not appear on all boards.

Back to [*SATA Port Configuration Screen] — [***Mass Storage Controller Configuration Screen***] — [***Advanced Screen***] — [***Screen Map***]**

4. AHCI HDD Staggered Spin-Up

    Option Values: Enabled
    Disabled

    Help Text:

    If enabled for the AHCI Capable SATA controller, Staggered Spin-Up will be performed on drives attached to it. Otherwise these drives will all spin up at boot.

    Comments: This option enables or disables Staggered Spin-up only for disk drives attached to ports on the AHCI Capable SATA Controller. Disk drives attached to SATA/SAS ports on the Storage Control Unit are controlled by a different method for Staggered Spin-Up and this option does not affect them.

    This option is only visible when the SATA Controller is enabled and *AHCI* or *RAID* has been selected as the operational SATA Mode.

    Staggered Spin-Up is needed when there are enough HDDs attached to the system to cause a marked startup power demand surge when all drives start spin-up together. Since the power demand is greatest just as the drive spinning is started, the overall startup power demand can be leveled off by starting up each drive at a slightly different time, so the power demand surges for multiple drives do not coincide and cause too great a power draw.

    When Staggered Spin-Up is enabled, it does have a possibility of increasing boot time if there are many HDDs attached, because of the interval between starting drives spinning. However, that is exactly the scenario in which Staggered Spin-Up is most needed, because the more disk drives attached, the greater the startup demand surge.

    Setting the external eSATA connector *Enabled* (when available) does not invalidate the Staggered Spin-Up option, although there may be less need for Staggered Spin-Up in a system configured for eSATA use.

Back to [SATA Port Configuration Screen**] — [**Mass Storage Controller Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

5. SATA Port

(For Port numbers 0-5 on AHCI SATA controller and Port number 0-3 on the AHCI sSATA controller)

Option Values: **<u>Not Installed</u>**
                             <Drive Information>

Help Text: *<None>*

Comments: <u>*Information only*</u>. The Drive Information, when present, typically consists of the drive model identification and size for the disk drive installed on a particular port.

This Drive Information line is repeated for the SATA Ports for the two onboard AHCI capable SATA Controllers. However, for any given board, only the ports which are physically populated on the board are shown. That is, a board which only implements the two 6 GB/s ports 0 and 1 only shows those two ports in this Drive Information list.

This section for Drive Information does not appear at all when the SATA operational mode is *RAID Mode*.

Back to [SATA Port Configuration Screen**] — [**Mass Storage Controller Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

2.2.11 Serial Port Configuration

The Serial Port Configuration screen allows the user to configure the Serial A and Serial B ports. In Legacy ISA nomenclature, these are ports COM1 and COM2 respectively.

To access this screen from the **Main** screen, select **Advanced > Serial Port Configuration**. To move to another screen, press the <Esc> key to return to the **Advanced** screen, then select the desired screen.

The primary usage for these serial ports is to enable Serial Console Redirection and Serial Over LAN (SOL) capabilities. Either port can be used for Serial Console Redirection but SOL is only supported on Serial A.

Figure 14. Serial Port Configuration Screen
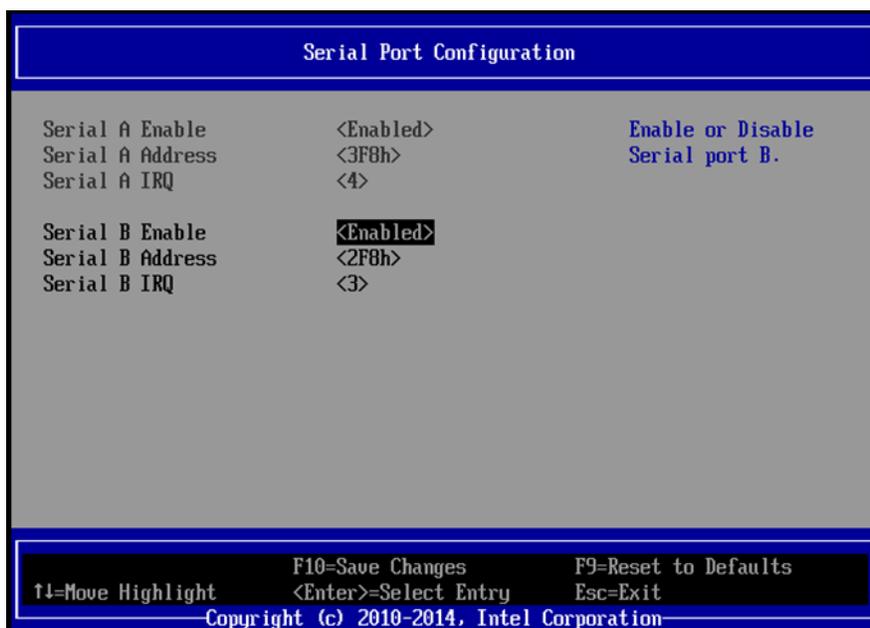
Screen Field Descriptions:

1. Serial A Enable

   Option Values: **Enabled**
                      Disabled

   Help Text: *Enable or Disable Serial port A.*

   Comments: Serial Port A can be used for either Serial Over LAN or Serial Console Redirection.

   Back to [Serial Port Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

2. Address

Option Values: **3F8h**
2F8h
3E8h
2E8h

Help Text: *Select Serial port A base I/O address.*

Comments: Legacy I/O port address. This field will not appear when Serial A port enable/disable does not appear.

Back to [*Serial Port Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

3. IRQ

Option Values: 3
4

Help Text: *Select Serial port A interrupt request (IRQ) line.*

Comments: Legacy IRQ. This field will not appear when Serial A port enable/disable does not appear.

Back to [*Serial Port Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

4. Serial B Enable

Option Values: **Enabled**
Disabled

Help Text: *Enable or Disable Serial port B.*

Comments: Serial Port B can be used for Serial Console Redirection.

Back to [*Serial Port Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

5. Address

Option Values: 3F8h
2F8h
3E8h
2E8h

Help Text: *Select Serial port B base I/O address.*

Comments: Legacy I/O port address.

Back to [*Serial Port Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

6. IRQ

Option Values: **3**
4

Help Text: *Select Serial port B interrupt request (IRQ) line.*

Comments: Legacy IRQ.

Back to [*Serial Port Configuration Screen***] — [***Advanced Screen***] — [***Screen Map***]**

2.2.12 USB Configuration

The USB Configuration screen allows the user to configure the available USB controller options.

To access this screen from the **Main** screen, select **Advanced > USB Configuration**. To move to another screen, press the <Esc> key to return to the **Advanced** screen, then select the desired screen.

This screen displays all USB Mass Storage devices which have been detected in the system. These include USB-attached Hard Disk Drives (HDDs), Floppy Disk Drives (FDDs), CDROM and DVDROM drives, and USB Flash Memory devices (USB Key, Keyfob, etc.).

Each USB Mass Storage device may be set to allow the media emulation for which it is formatted, or an emulation may be specified. For USB Flash Memory devices in particular, there are some restrictions:

- A USB Key formatted as a CDROM drive will be recognized as an HDD.
- A USB Key formatted without a Partition Table will be forced to FDD emulation.
- A USB Key formatted with one Partition Table, and less than 528 MB in size, will be forced to FDD emulation – otherwise if it is 528 MB or greater in size, it will be forced to HDD emulation.

Note: USB devices can be "hot plugged" during POST, and will be detected, enumerated, and work under OS environment. They will NOT be displayed on this screen and enumerated as bootable devices.
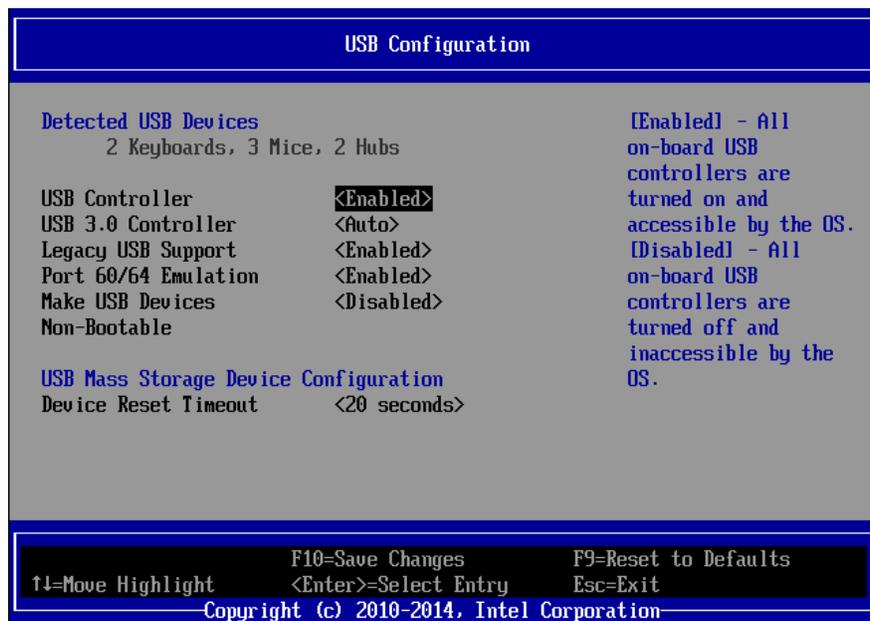

Figure 15. USB Configuration Screen

<u>Screen Field Descriptions</u>:

1. Detected USB Devices

   Option Values: *<Number of USB devices detected in system>*

   Help Text: *<None>*

   Comments: *Information only.* Displays the total number of USB devices of all types which have been detected in POST.

   Note: There is one USB keyboard and one USB mouse detected from the BMC KVM function under this item even if no USB devices are connected to the system.

   Back to [*USB Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

2. USB Controller

   Option Values: **<u>Enabled</u>**
   Disabled

   Help Text:

   [Enabled] – All on-board USB controllers are turned on and accessible by the OS. [Disabled] – All on-board USB controllers are turned off and inaccessible by the OS.

   Comments: When the USB controllers are *Disabled*, there is no USB IO available for either POST or the OS. In that case, all following fields on this screen are grayed out and inactive.

   Back to [*USB Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

3. USB 3.0 Controller

   Option Values: **Auto**

   Enabled
   Disabled

   Help Text:

   Auto – USB 3.0 port always boots with USB 2.0 controller in BIOS POST and only switches to USB 3.0 after OS USB 3.0 driver is loaded.

   Disabled – Hide XHCI.

   Enabled – During the first boot, USB 3.0 port starts with USB 2.0 controller in BIOS POST; if OS driver USB 3.0 is loaded, it switches to XHCI and continues using as USB 3.0 speed during BIOS POST when next boot.

   Back to [*USB Configuration Screen****] — [****Advanced Screen****] — [****Screen Map****]***

4. Legacy USB Support

Option Values: **Enabled**
                   Disabled
                   Auto

Help Text:

Enables Legacy USB support. AUTO option disables legacy support if no USB devices are connected. Disable option will only keep USB Keyboard devices available for EFI applications.

Comments: When *Legacy USB Support* is *Disabled*, USB devices are available only through OS drivers.

If the *USB controller* setting is *Disabled*, this field is grayed out and inactive.

Back to [*USB Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

5. Port 60/64 Emulation

Option Values: **Enabled**
                   Disabled

Help Text:

Enables I/O port 60h/64h emulation support.
This may be needed for legacy USB keyboard support when using an OS that is USB unaware.

Comments: If the *USB controller* setting is *Disabled*, this field is grayed out and inactive.

Back to [*USB Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

6. Make USB Devices Non-Bootable

Option Values: Enabled
                   Disabled

Help Text:

Exclude USB in Boot Table.
[Enabled] – This will remove all USB Mass Storage devices as Boot options.
[Disabled] – This will allow all USB Mass Storage devices as Boot options.

Comments: This is a security option. When *Disabled*, the system cannot be booted directly to a USB device of any kind. USB Mass Storage devices may still be used for data storage.

If the *USB controller* setting is *Disabled*, this field is grayed out and inactive.

Back to [*USB Configuration Screen*] — [*Advanced Screen*] — [*Screen Map*]

7. Device Reset Timeout

Option Values: 10 seconds
                        20 seconds
                        30 seconds
                        40 seconds

Help Text:

> *USB Mass Storage device Start Unit command timeout.*
> *Setting to a larger value provides more time for a mass storage device to be ready, if needed.*

Comments: If the <u>USB controller</u> setting is <u>Disabled</u>, this field is grayed out and inactive.

Back to [USB Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

8. Mass Storage Devices:

Option Values: **Auto**
                        Floppy
                        Forced FDD
                        Hard Disk
                        CD-ROM

Help Text:

> *[Auto] – USB devices less than 530 MB are emulated as floppies.*
> *[Forced FDD] – HDD formatted drive is emulated as an FDD (e.g., ZIP drive).*

Comments: This field is hidden if no USB Mass Storage devices are detected.

This setup screen can show a maximum of eight USB Mass Storage devices on the screen. If more than eight devices are installed in the system, the "USB Devices Enabled" displays the correct count but only the first eight devices discovered are displayed in this list.

If the <u>USB controller</u> setting is <u>Disabled</u>, this field is grayed out and inactive.

Back to [USB Configuration Screen**] — [**Advanced Screen**] — [**Screen Map**]**

2.2.13 System Acoustic and Performance Configuration

The System Acoustic and Performance Configuration screen allows the user to configure the thermal control behavior of the system with respect to what parameters are used in the system's Fan Speed Control algorithms.

To access this screen from the **Main** screen, select **Advanced > System Acoustic and Performance Configuration**. To move to another screen, press the <Esc> key to return to the **Advanced** screen, then select the desired screen.
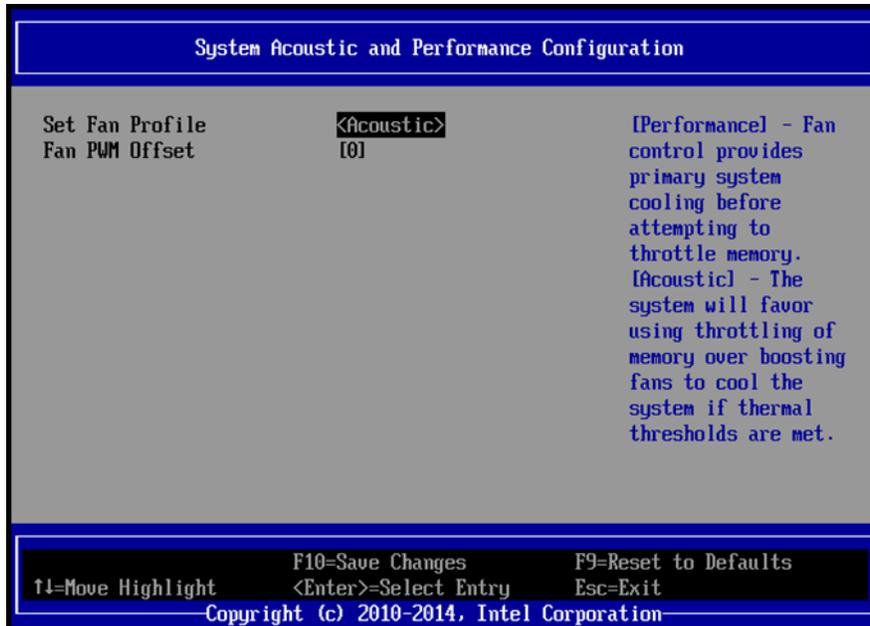
Figure 16. System Acoustic and Performance Configuration

<u>**Screen Field Descriptions**</u>:

1. Set Fan Profile

   Option Values: Performance
   <u>Acoustic</u>

   Help Text:

   [Performance] – Fan control provides primary system cooling before attempting to throttle memory.
   [Acoustic] – The system will favor using throttling of memory over boosting fans to cool the system if thermal thresholds are met.

   Comments: This option allows the user to choose a Fan Profile that is optimized for maximizing performance or for minimizing acoustic noise.

   When *Performance* is selected, the thermal conditions in the system are controlled by raising fan speed when necessary to raise cooling performance. This provides cooling

without impacting system performance but may impact system acoustic performance – fans running faster are typically louder.

When *Acoustic* is selected, then rather than increasing fan speed for additional cooling, the system will attempt first to control thermal conditions by throttling memory to reduce heat production. This regulates the system's thermal condition without changing the acoustic performance but throttling memory may impact system performance.

Back to [System Acoustic and Performance Configuration**] — [**Advanced Screen**] — [**Screen Map**]**

2. Fan PWM Offset

   Option Values: *[Entry Field 0-100, **0** is default]*

   Help Text:

   Valid Offset 0-100. This number is added to the calculated PWM value to increase Fan Speed.

   Comments: This is a percentage by which the calculated fan speed will be increased. The user can apply positive offsets that result in increasing the minimum fan speeds.

   Back to [System Acoustic and Performance Configuration**] — [**Advanced Screen**] — [**Screen Map**]**

2.2.14 Security Screen (Tab)

The Security screen allows the user to enable and set the Administrator and User passwords and to lock out the front panel buttons so they cannot be used. This screen also allows the user to enable and activate the Trusted Platform Module (TPM) security settings on those boards that support TPM.

Note that it is necessary to activate the TPM in order to enable Intel® Trusted Execution Technology (TXT) on boards that support it. Changing the TPM state in Setup will require a Hard Reset for the new state to become effective.

This BIOS supports (but does not require) "Strong Passwords" for security. The "Strong Password" criteria for both Administrator and User passwords require that passwords be between 8 and 14 characters in length, and a password must contain at least one case-sensitive alphabetic character, one numeric character, and one special character. A warning is given when a password is set which does not meet the Strong Password criteria but the password is accepted.

For further security, the BIOS optionally may require a Power on Password to be entered in early POST in order to boot the system. When Power On Password is enabled, POST is halted soon after power-on while the BIOS queries for a Power On Password. Either the Administrator or the User password may be entered for a Power on Password.

To access this screen from the **Main** screen or other top-level "Tab" screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the **Security** screen is selected.
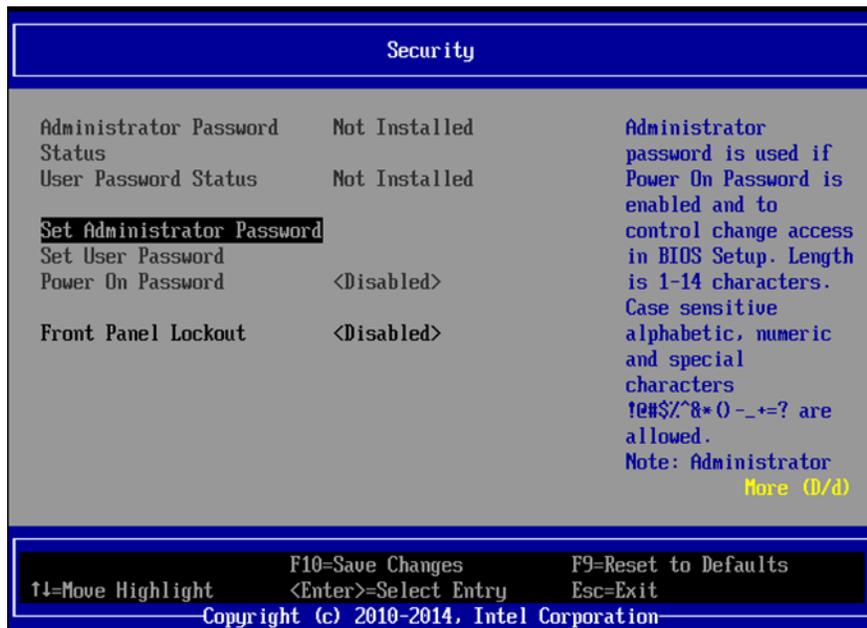

Figure 17. Security Screen

Screen Field Descriptions:

1. **Administrator Password Status**

   Option Values: *Installed*
   Not Installed

   Help Text: *<None>*

   Comments: *Information only.* Indicates the status of the Administrator
   Password.

   Back to [*Security Screen*] — [*Screen Map*]

2. **User Password Status**

   Option Values: *Installed*
   Not Installed

   Help Text: *<None>*

   Comments: *Information only.* Indicates the status of the User Password.

   Back to [*Security Screen*] — [*Screen Map*]

3. **Set Administrator Password**

   Option Values: *[Entry Field – 0-14 characters]*

   Help Text:

   *Administrator password is used if Power On Password is enabled and to control
   change access in BIOS Setup. Length is 1-14 characters. Case sensitive
   alphabetic, numeric, and special characters !@#$%^&*()-_+=? are allowed.
   Note: Administrator password must be set in order to use the User account.*

   Comments: This password controls "change" access to Setup. The
   Administrator has full access to change settings for any Setup options, including
   setting the Administrator and User passwords.

   When Power On Password protection is enabled, the Administrator password may be
   used to allow the BIOS to complete POST and boot the system.

   Deleting all characters in the password entry field removes a password previously set.
   Clearing the Administrator Password also clears the User Password.

   If invalid characters are present in the password entered, it will not be accepted, and
   there will be popup error message:

   *Password entered is not valid. Only case sensitive alphabetic, numeric and
   special characters !@#$%^&*()-_+=? are allowed.*

   The Administrator and User passwords must be different. If the password entered is
   the same as the User password, it will not be accepted, and there will be popup error
   message:

Password entered is not valid. Administrator and User passwords must be different.

Strong passwords are encouraged, although not mandatory. If a password is entered which does not meet the "Strong Password" criteria, there will be a popup warning message:

Warning – a Strong Password should include at least one each case sensitive alphabetic, numeric, and special character. Length should be 8 to 14 characters.

Back to [Security Screen**] — [**Screen Map**]**

4. Set User Password

Option Values: *[Entry Field – 0-14 characters]*

Help Text:

User password is used if Power On Password is enabled and to allow restricted access to BIOS Setup. Length is 1-14 characters. Case sensitive alphabetic, numeric, and special characters !@#$%^&()-_+=? are allowed.*
Note: Removing the administrator password also removes the user password.

Comments: The User password is available only if the Administrator Password has been installed. This option protects Setup settings as well as boot choices. The User Password only allows limited access to the Setup options, and no choice of boot devices.

When Power On Password protection is enabled, the User password may be used to allow the BIOS to complete POST and boot the system.

The password format and entry rules and popup error and warning message are the same for the User password as for the Administrator password (see above).

Back to [Security Screen**] — [**Screen Map**]**

5. Power On Password

Option Values: Enabled
                        Disabled

Help Text:

Enable Power On Password support. If enabled, password entry is required in order to boot the system.

Comments: When Power On Password security is enabled, the system will halt soon after power-on and the BIOS will ask for a password before continuing POST and booting. Either the Administrator or User password may be used.

If an Administrator password has not been set, this option will be grayed out and unavailable. If this option is enabled and the Administrator password is removed, that will also disable this option.

Back to [Security Screen**] — [**Screen Map**]**

6. Front Panel Lockout

Option Values: Enabled
                          <u>Disabled</u>

Help Text:

If enabled, locks the power button OFF function and the reset and NMI Diagnostic Interrupt buttons on the system's front panel. If [Enabled] is selected, power-off and reset must be controlled via a system management interface, and the NMI Diagnostic Interrupt is not available.

Back to [*Security Screen****] — [****Screen Map****]***

7. TPM State

Option Values: *<Displays current TPM Device State>*
                          May be:
                                    Enabled & Activated
                                    Enabled & Deactivated
                                    Disabled & Activated
                                    Disabled & Deactivated

Help Text: *<None>*

Comments: *<u>Information only</u>*. Shows the current TPM device state.

A **<u>Disabled</u>** TPM device does not execute commands that use the TPM functions and TPM security operations are not available.

An **<u>Enabled & Deactivated</u>** TPM is in the same state as a disabled TPM, except that setting of the TPM ownership is allowed if it is not present already.

An **<u>Enabled & Activated</u>** TPM executes all commands that use the TPM functions and TPM security operations are also available.

Note: This option appears only on boards equipped with a TPM.

Back to [*Security Screen****] — [****Screen Map****]***

8. TPM Administrative Control

Option Values: **<u>No Operation</u>**
                          Turn On
                          Turn Off
                          Clear Ownership

Help Text:

[No Operation] – No changes to current state.
[Turn On] – Enables and activates TPM.
[Turn Off] – Disables and deactivates TPM.
[Clear Ownership] – Removes TPM ownership & returns TPM to factory default

state.
Note: Setting returns to [No Operation] on every boot.

Comments: Any Administrative Control operation selected will require the system to perform a Hard Reset in order to become effective.

Note: This option appears only on boards equipped with a TPM.

Back to [Security Screen***] — [***Screen Map***]***

2.2.15 BMC LAN Configuration

To access this screen from the *Main* screen, select **Server Management > BMC LAN Configuration.** To move to another screen, press the <Esc> key to return to the **Server Management** screen, then select the desired screen.

The BMC configuration screen allows the user to configure the BMC Baseboard LAN channel and an Dedicated Management LAN channel, and to manage BMC User settings for up to five BMC Users.

An Dedicated Management NIC Module (DMN) may be installed in the server system.

In that case, the LAN settings for the DMN NIC may be configured.

This screen has a choice of IPv4 or IPv6 addressing. IPv6 and IPv4 addressing options appear and are configured simultaneously. This is true for both the Baseboard LAN configuration and the Dedicated Server Management NIC Module.

IP addresses for either IPv4 or IPv6 addressing can be assigned by static IP addresses manually typed in, or by dynamic IP addresses supplied by a Dynamic Host Configuration Protocol (DHCP) server. IPv6 addressing can also be provided by "stateless auto configuration" which does not require a DHCP server.

The BMC LAN Configuration screen is unusual in that the LAN Configuration parameters are maintained by the BMC itself, so this screen is just a User Interface to the BMC configuration. As such, the initial values of the LAN options shown on the screen are acquired from the BMC when this screen is initially accessed by a user. Any values changed by the user are communicated back to the BMC when a "Save Changes" or "Save Changes and Exit" action is performed. If a "Discard Changes" or "Discard Changes and Exit" action is performed instead, any accumulated changes from this screen will be disregarded and lost.

BMC LAN Configuration

► **User Configuration**

Baseboard LAN configuration
IP Source	Static/**Dynamic**
IP Address	[0.0.0.0]
Subnet Mask	[0.0.0.0]
Gateway IP	[0.0.0.0]

Baseboard LAN IPv6 configuration
IPv6	Enabled/**Disabled**
IPv6 Source	Static/**Dynamic**/Auto
IPv6 Address	[0000.0000.0000.0000.0000.0000.0000.0000]
Gateway IPv6	[0000.0000.0000.0000.0000.0000.0000.0000]
IPv6 Prefix Length	[0 – 128, **64** is default]

Dedicated Management LAN Configuration
Remote Management Module	<Not Present/ Present >
IP Source	Static/**Dynamic**
IP Address	[0.0.0.0]
Subnet Mask	[0.0.0.0]
Gateway IP	[0.0.0.0]

Dedicated Management LAN IPv6 Configuration
IPv6 Source	Static/**Dynamic**/Auto
IPv6 Address	[0000.0000.0000.0000.0000.0000.0000.0000]
Gateway IPv6	[0000.0000.0000.0000.0000.0000.0000.0000]
IPv6 Prefix Length	[0 – 128, **64** is default]
BMC DHCP Host Name	[DHCP Host Name display/edit]

Server Management

Figure 18. BMC LAN Configuration Screen

Screen Field Descriptions:

1. User Configuration

   Option Values: *<None>*

   Help Text: *View/Configure User information and settings of the BMC.*

Comments: _Selection only_. Select this line and press the <Enter> key to go to the **User Configuration** group of configuration settings.

Back to [**_BMC LAN Configuration Screen_] — [**_Screen Map_***]**

2. IP Source

  Option Values: Static
           <u>Dynamic</u>

  Help Text:

     Select BMC IP Source. If [Static], IP parameters may be edited. If [Dynamic], these fields are display-only and IP address is acquired automatically (DHCP).

  Comments: This specifies the IP Source for IPv4 addressing for the Baseboard LAN. There is a separate IP Source field for the Dedicated Management LAN configuration.

  When IPv4 addressing is used, the initial value for this field is acquired from the BMC, and its setting determines whether the other Baseboard LAN IPv4 addressing fields are display-only (when **_Dynamic_**) or can be edited (when **_Static_**).

  Back to [**_BMC LAN Configuration Screen_] — [**_Screen Map_***]**

3. IP Address

  Option Values: _[Entry Field 0.0.0.0, **<u>0.0.0.0</u>** is default]_

  Help Text: _View/Edit IP Address. Press <Enter> to edit._

  Comments: This specifies the IPv4 Address for the Baseboard LAN. There is a separate IPv4 Address field for the Dedicated Management LAN configuration.

  When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **_IP Source_** determines whether this field is display-only (when **_Dynamic_**) or can be edited (when **_Static_**).

  Back to [**_BMC LAN Configuration Screen_]— [**_Screen Map_***]**

4. Subnet Mask

  Option Values: _[Entry Field 0.0.0.0, **<u>0.0.0.0</u>** is default]_

  Help Text: _View/Edit Subnet Mask. Press <Enter> to edit._

  Comments: This specifies the IPv4 addressing Subnet Mask for the Baseboard LAN. There is a separate IPv4 Subnet Mask field for the Dedicated Management LAN configuration.

  When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **_IP Source_** determines whether this field is display-only (when **_Dynamic_**) or can be edited (when **_Static_**).

  Back to [**_BMC LAN Configuration Screen_] — [**_Screen Map_***]**

5. Gateway IP

Option Values: *[Entry Field 0.0.0.0, **0.0.0.0** is default]*

Help Text: *View/Edit Gateway IP. Press <Enter> to edit.*

Comments: This specifies the IPv4 addressing Gateway IP for the Baseboard LAN. There is a separate IPv4 Gateway IP field for the Dedicated Management LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IP Source** determines whether this field is display-only (when **Dynamic**) or can be edited (when **Static**).

Back to [BMC LAN Configuration Screen**] — [**Screen Map**]**

6. IPv6

Option Values: Enabled
Disabled

Help Text:

Option to Enable/Disable IPv6 addressing and any IPv6 network traffic on these channels.

Comments: The initial value for this field is acquired from the BMC. It may be changed in order to switch between IPv4 and IPv6 addressing technologies.

When this option is set to **Disabled**, all other IPv6 fields will not be visible for the Baseboard LAN and Dedicated Management DMN (if installed). When IPv6 addressing is **Enabled**, all IPv6 fields for the Baseboard LAN and Dedicated Management DMN will become visible.

Back to [BMC LAN Configuration Screen**]— [**Screen Map**]**

7. IPv6 Source

Option Values: Static
Dynamic
Auto

Help Text:

Select BMC IPv6 source. If [Static], IPv6 parameters may be edited. If [Dynamic], these fields are display-only and IPv6 address is acquired automatically (DHCP). If [Auto], these fields are display-only and IPv6 address is acquired using ICMPv6 router / neighbor discovery.

Comments: This specifies the IP Source for IPv6 addressing for the Baseboard LAN configuration. There is a separate IPv6 Source field for the Dedicated Management LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is **Enabled**, the initial value for this field is acquired from the BMC, and its setting determines whether the other Baseboard LAN IPv6 addressing fields are display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

Back to [BMC LAN Configuration Screen**]— [**Screen Map**]**

8. IPv6 Address

Option Values: *[Entry Field 0000:0000:0000:0000:0000:0000:0000:0000, **0000:0000:0000:0000:0000:0000:0000:0000** is default]*

Help Text:

View/Edit IPv6 address. Press <Enter> to edit. IPv6 addresses consist of 8 hexadecimal 4-digit numbers separated by colons.

Comments: This specifies the IPv6 Address for the Baseboard LAN. There is a separate IPv6 Address field for the Dedicated Management LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IPv6 Source** determines whether this field is display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

Back to [BMC LAN Configuration Screen**]— [**Screen Map**]**

9. Gateway IPv6

Option Values: *[Entry Field 0000:0000:0000:0000:0000:0000:0000:0000, **0000:0000:0000:0000:0000:0000:0000:0000** is default]*

Help Text:

View/Edit Gateway IPv6 address. Press <Enter> to edit. Gateway IPv6 addresses consist of 8 hexadecimal 4-digit numbers separated by colons.

Comments: This specifies the Gateway IPv6 Address for the Baseboard LAN. There is a separate Gateway IPv6 Address field for the Dedicated Management LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IPv6 Source** determines whether this field is display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

Back to [BMC LAN Configuration Screen**]— [**Screen Map**]**

10. IPv6 Prefix Length

Option Values: *[Entry Field 0-128, **64** is default]*

Help Text:

View/Edit IPv6 Prefix Length from 0 to 128 (default 64). Press <Enter> to edit.

Comments: This specifies the IPv6 Prefix Length for the Baseboard LAN. There is a separate IPv6 Prefix Length field for the Dedicated Management LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IPv6 Source** determines whether this field is display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

Back to [BMC LAN Configuration Screen**]— [**Screen Map**]**

11. Remote Management Module

Option Values: *Not Present*
Present

Help Text: *<None>*

Comments: *Information only*. Displays whether a Dedicated Management Lan component is currently installed. This information may come from querying the BMC.

Back to [BMC LAN Configuration Screen**]— [**Screen Map**]**

12. IP Source

Option Values: Static
Dynamic

Help Text:

Select Dedicated Management LAN IP source. If [Static], IP parameters may be edited. If [Dynamic], these fields are display-only and IP address is acquired automatically (DHCP).

Comments: This specifies the IP Source for IPv4 addressing for the DMN LAN connection. There is a separate IP Source field for the Baseboard LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC, and its setting determines whether the other DMN LAN IPv4 addressing fields are display-only (when **Dynamic**) or can be edited (when **Static**).

Back to [BMC LAN Configuration Screen**]— [**Screen Map**]**

13. IP Address

Option Values: *[Entry Field 0.0.0.0, **0.0.0.0** is default]*

Help Text: *View/Edit IP Address. Press <Enter> to edit.*

Comments: This specifies the IPv4 Address for the DMN LAN. There is a separate IPv4 Address field for the Baseboard LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IP Source** determines whether this field is display-only (when **Dynamic**) or can be edited (when **Static**).

Back to [*BMC LAN Configuration Screen****]— [****Screen Map****]***

14. Subnet Mask

Option Values: *[Entry Field 0.0.0.0, **0.0.0.0** is default]*

Help Text: *View/Edit Subnet Mask. Press <Enter> to edit.*

Comments: This specifies the IPv4 addressing Subnet Mask for the DMN LAN. There is a separate IPv4 Subnet Mask field for the Baseboard LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IP Source** determines whether this field is display-only (when **Dynamic**) or can be edited (when **Static**).

Back to [*BMC LAN Configuration Screen****]— [****Screen Map****]***

15. Gateway IP

Option Values: *[Entry Field 0.0.0.0, **0.0.0.0** is default]*

Help Text: *View/Edit Gateway IP. Press <Enter> to edit.*

Comments: This specifies the IPv4 addressing Gateway IP for the DMN LAN. There is a separate IPv4 Gateway IP field for the Baseboard LAN configuration.

When IPv4 addressing is used, the initial value for this field is acquired from the BMC. The setting of **IP Source** determines whether this field is display-only (when **Dynamic**) or can be edited (when **Static**).

Back to [*BMC LAN Configuration Screen****]— [****Screen Map****]***

16. IPv6 Source

Option Values: Static
Dynamic
Auto

Help Text:

Select DMN LAN IPv6 source. If [Static], IPv6 parameters may be edited. If [Dynamic], these fields are display-only and IPv6 address is acquired automatically (DHCP). If [Auto], these fields are display-only and IPv6 address is acquired using ICMPv6 router / neighbor discovery.

Comments: This specifies the IP Source for IPv6 addressing for the DMN LAN configuration. There is a separate IPv6 Source field for the Baseboard LAN configuration.

This option is only visible when the **IPv6** option is set to **Enabled**.

When IPv6 addressing is **Enabled**, the initial value for this field is acquired from the BMC, and its setting determines whether the other DMN LAN IPv6 addressing fields are display-only (when **Dynamic** or **Auto**) or can be edited (when **Static**).

Back to [*BMC LAN Configuration Screen****]— [****Screen Map****]***

17. IPv6 Address

Option Values: *[Entry Field 0000:0000:0000:0000:0000:0000:0000:0000,*
0000:0000:0000:0000:0000:0000:0000:0000 *is default]*

Help Text:

*View/Edit IPv6 address. Press <Enter> to edit. IPv6 addresses consist of 8
hexadecimal 4-digit numbers separated by colons.*

Comments: This specifies the IPv6 Address for the DMN LAN. There is a
separate IPv6 Address field for the Baseboard LAN configuration.

This option is only visible when the ***IPv6*** option is set to ***Enabled***.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC.
The setting of ***IPv6 Source*** determines whether this field is display-only (when
Dynamic or ***Auto***) or can be edited (when ***Static***).

Back to [*BMC LAN Configuration Screen****]— [****Screen Map****]***

18. Gateway IPv6

Option Values: *[Entry Field 0000:0000:0000:0000:0000:0000:0000:0000,*
0000:0000:0000:0000:0000:0000:0000:0000 *is default]*

Help Text:

*View/Edit Gateway IPv6 address. Press <Enter> to edit. Gateway IPv6 addresses
consist of 8 hexadecimal 4-digit numbers separated by colons.*

Comments: This specifies the Gateway IPv6 Address for the DMN LAN. There
is a separate Gateway IPv6 Address field for the Baseboard LAN configuration.

This option is only visible when the ***IPv6*** option is set to ***Enabled***.

When IPv6 addressing is used, the initial value for this field is acquired from the BMC.
The setting of ***IPv6 Source*** determines whether this field is display-only (when
Dynamic or ***Auto***) or can be edited (when ***Static***).

Back to [*BMC LAN Configuration Screen****]— [****Screen Map****]***

19. IPv6 Prefix Length

Option Values: *[Entry Field 0-128,* ***64*** *is default]*

Help Text:

View/Edit IPv6 Prefix Length from 0 to 128 (default 64). Press <Enter> to edit.

Comments: This specifies the IPv6 Prefix Length for the DMN LAN. There is a
separate IPv6 Prefix Length field for the Baseboard LAN configuration.

This option is only visible when the ***IPv6*** option is set to ***Enabled***.

2.2.15.1   User Configuration

The User Configuration screen allows the user to manage BMC User settings for up to five BMC Users.

Server Management

User Configuration

User ID	anonymous
Privilege	Callback/ User/Operator/**Administrator**
User Status	**Disable**/Enable
User Password	
User ID	root
Privilege	**Administrator**
User Status	**Disable**/Enable
User Password	
User ID	User3
Privilege	Callback/ **User**/Operator/Administrator
User Status	**Disable**/Enable
User Name	[User Name display/edit]
User Password	
User ID	User4
Privilege	Callback/ User/Operator/**Administrator**
User Status	**Disable**/Enable
User Name	[User Name display/edit]
User Password	
User ID	User5
Privilege	Callback/ User/Operator/**Administrator**
User Status	**Disable**/Enable
User Name	[User Name display/edit]
User Password	

Figure 19. User Configuration Screen

Screen Field Descriptions:

1. User ID

    Option Values: anonymous
    root
    User3
    User4
    User5

    Help Text: *<None>*

    Comments: *Information only.* These 5 User IDs are fixed choices and cannot be changed. The BMC supports 15 User IDs natively but only the first 5 are supported through this interface.

    Back to [*User Configuration Screen****] — [****BMC LAN Configuration Screen****]— [****Screen Map****]***

2. Privilege

    Option Values: Callback
    User
    Operator
    Administrator

    Help Text:

    View/Select user privilege. User2 (root) privilege is "Administrator" and cannot be changed. The default privilege of User3 is User.

    Comments: The level of privilege that is assigned for a User ID affects which functions that user may perform.

    Back to [*User Configuration Screen****] — [****BMC LAN Configuration Screen****]— [****Screen Map****]***

3. User Status

    Option Values: Enabled
    Disabled

    Help Text:

    Enable/Disable LAN access for selected user. Also enables/disables SOL, KVM, and media redirection.

    Comments: Note that status setting is ***Disabled*** by default until set to ***Enabled***.

    Back to [*User Configuration Screen****] — [****BMC LAN Configuration Screen****] —[****Screen Map****]***

4. User Name

    Option Values: *[Entry Field, 4-16 characters]*

Help Text:

> *Press <Enter> to edit User Name. User Name is a string of 4 to 16 alphanumeric characters, and must begin with an alphabetic character. User Name cannot be changed for User1 (anonymous) and User2 (root).*

Comments:　　　　　User Name can only be edited for users other than "anonymous" and "root". Those two User Names may not be changed.

Back to [User Configuration Screen**] — [**BMC LAN Configuration Screen**] — [**Screen Map**]**

5. User Password

Option Values:　　　*[Popup Entry Field, 0-20 characters]*

Help Text:

> *Press <Enter> key to enter password. Maximum length is 20 characters. Any ASCII printable characters can be used: case-sensitive alphabetic, numeric, and special characters.*
>
> *Note: Password entered will override any previously set password.*

Comments:　　　　　This field will not indicate whether there is a password set already. There is no display – just press <Enter> for a popup with an entry field to enter a new password. Any new password entered will override the previous password, if there was one.

Back to [User Configuration Screen**] — [**BMC LAN Configuration Screen**] — [**Screen Map**]**

2.2.16 Boot Maintenance Manager Screen (Tab)

The Boot Maintenance Manager screen contains all bootable media encountered during POST, and allows the user to configure the desired order in which boot devices are to be tried.

To access this screen from the **Main** screen or other top-level "Tab" screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the **Boot Maintenance Manager** screen is selected.

The first boot device in the specified Boot Order which is present and is bootable during POST will be used to boot the system, and will continue to be used to reboot the system until the boot device configuration has changed (that is, which boot devices are present), or until the system has been powered down and booted in a "cold" power-on boot.

Note: USB devices can be "hot plugged" during POST, and will be detected and "beeped". They will be enumerated and displayed on the USB Configuration Setup screen. However, they may not be enumerated as bootable devices, depending on when in POST they were hot plugged. If they were recognized <u>before</u> the enumeration of bootable devices, they will appear as Boot Devices if appropriate. If they were recognized after Boot Device enumeration, they will not appear as a bootable device for the Boot Maintenance Manager screen, the Boot Manager screen, or the F6 Boot Menu.

There are two main types of boot order control, Legacy Boot and UEFI boot. These are mutually exclusive – when UEFI Boot is enabled, Legacy Boot (the default) is disabled. Within Legacy Boot operation, there are two further methods of ordering boot devices, Dynamic Boot Order and Static Boot Order.

The default for Boot Order control is Legacy Boot, with Dynamic Boot Order. If all types of bootable devices are installed in the system, then the default Boot Order is as follows:

- Legacy CD/DVD-ROM
- Legacy Floppy Disk Drive
- Legacy Hard Disk Drive
- Legacy PXE Network Device
- Legacy BEV (Boot Entry Vector) Device
- EFI Shell and EFI Boot paths

In this default Boot Order, a USB device may appear in any of several Device Classes, due to the flexibility of USB connections and USB emulation of various types of devices.

Note: A USB Key (USB Flash Drive) can be formatted to emulate either a Floppy Drive or a Hard Drive and will appear in that Boot Device Class. However, although it can be formatted as a CDROM Drive, it will not be detected as such. It will be treated as a Hard Disk and will appear in the list of available Hard Drives.
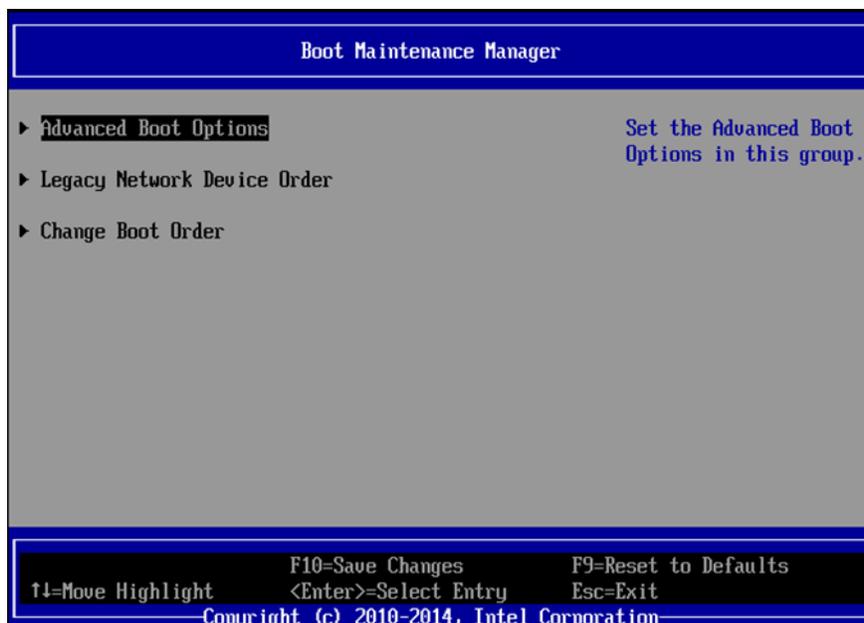
Figure 20. Boot Maintenance Manager Screen

Screen Field Descriptions:

1. Advanced Boot Options

   Option Values: *<None>*

   Help Text: *Set the Advanced Boot Options in this group.*

   Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to go to the **Advanced Boot Options Screen**.

   Back to [*Boot Maintenance Manager Screen****] — [****Screen Map****]***

2. Add EFI Boot Option

   Option Values: *<None>*

   Help Text: *Add a new EFI boot option to the boot order.*

   Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to go to the **Add EFI Boot Option Screen**.

   This option is only displayed if an EFI bootable device is available to the system.

   Back to [*Boot Maintenance Manager Screen****] — [****Screen Map****]***

3. Delete EFI Boot Option

   Option Values: *<None>*

   Help Text: *Remove an EFI boot option from the boot order.*

   Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to go to the **Delete EFI Boot Option Screen**.

This option is only displayed if an EFI boot path is included in the Boot Order.

Back to [*Boot Maintenance Manager Screen****] — [****Screen Map****]***

4. Legacy CDROM Order

Option Values: *<None>*

Help Text: *Set the order of the legacy devices in this group.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the **Legacy CDROM Order Screen**.

This option appears when one or more bootable CDROM drives are available in the system and the Boot Mode options is chosen as Legacy. This includes USB CDROM devices but <u>not</u> USB Keys formatted for CRDOM emulation, which are seen as Hard Disk drives.

Back to [*Boot Maintenance Manager Screen****] — [****Screen Map****]***

5. Legacy Hard Disk Order

Option Values: *<None>*

Help Text: *Set the order of the legacy devices in this group.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the **Legacy Hard Disk Order Screen**.

This option appears when one or more bootable Hard Disk drives are available in the system and the Boot Mode options is chosen as Legacy. This includes USB Hard Disk devices and USB Keys formatted for Hard Disk or CRDOM emulation.

Back to [*Boot Maintenance Manager Screen****] — [****Screen Map****]***

6. Legacy Floppy Order

Option Values: *<None>*

Help Text: *Set the order of the legacy devices in this group.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the **Legacy Floppy Order Screen**.

This option appears when one or more bootable Floppy Disk drives are available in the system and the Boot Mode options is chosen as Legacy. This includes USB Floppy Disk devices and USB Keys formatted for Floppy Disk emulation.

Back to [*Boot Maintenance Manager Screen****] — [****Screen Map****]***

7. Legacy Network Device Order

Option Values: *<None>*

Help Text: *Set the order of the legacy devices in this group.*

Comments: *Selection only.* Select this line and press the <Enter> key to go to the **Legacy Network Device Order Screen**.

This option appears when one or more bootable Network Devices are available in the system and the Boot Mode options is chosen as Legacy.

Back to [Boot Maintenance Manager Screen**] — [**Screen Map**]**

8. Legacy BEV Device Order

    Option Values: *<None>*

    Help Text: *Set the order of the legacy devices in this group.*

    Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to go to the **Legacy BEV Device Order Screen**.

    This option appears when one or more bootable BEV Devices are available in the system and the Boot Mode options is chosen as Legacy.

    Back to [Boot Maintenance Manager Screen**] — [**Screen Map**]**

9. Change Boot Order

    Option Values: *<None>*

    Help Text: *Set the Boot Order in this group.*

    Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to go to the **Change Boot Order Screen.**

    Back to [Boot Maintenance Manager Screen**] — [**Screen Map**]**

2.2.16.1 **Advanced Boot Options**

The Advanced Boot Options screen allows the user to control the advanced boot options features like Boot Mode and Static Boot order.

To access this screen from the *Main* screen, select *Boot Maintenance Manager > Advanced Boot Options*. To move to another screen, press the <Esc> key to return to the *Boot Maintenance Manager* screen, then select the desired screen.

System Boot Timeout	[0 – 65535, **0** is default]
Boot Mode	UEFI/**Legacy**
Video BIOS	**UEFI**/Legacy
Boot Option Retry	Enabled/**Disabled**
USB Boot Priority	**Enabled**/Disabled
Static Boot Order	Enabled/**Disabled**
Reset Static Boot Order	Yes/**No Action**
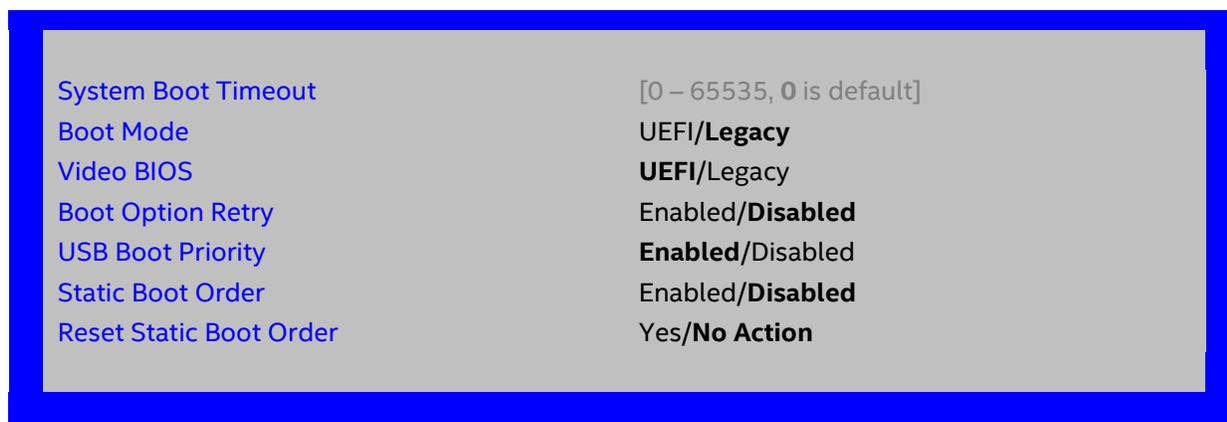
Figure 21. Advanced Boot Options Screen

Screen Field Descriptions:

1. System Boot Timeout

   Option Values: *[Entry Field 0-65535, <u>**0**</u> is default]*

   Help Text:

   > *The number of seconds the BIOS will pause at the end of POST to allow the user to press the [F2] key for entering the BIOS Setup utility.*
   > *Valid values are 0-65535. Zero is the default. A value of 65535 causes the system to go to the Boot Manager menu and wait for user input for every system boot.*

   Comments: After entering the desired timeout, press the <Enter> key to register that timeout value to the system. These settings are in seconds. The timeout value entered will take effect on the next boot.

   This timeout value is independent of the FRB2 setting for BIOS boot failure protection. The FBR2 countdown will be suspended during the time that the Boot Timeout countdown is active.

   Also, if the <Pause> key is pressed during the time that the Boot Timeout is active, the Boot Timeout countdown will be suspended until the Pause state has been dismissed and normal POST processing has resumed.

   Back to [*Advanced Boot Options Screen****] — [****Boot Maintenance Manager Screen****] — [****Screen Map****]***

2. Boot Mode

Option Values: UEFI
<u>Legacy</u>

Help Text:

When Boot Mode is Legacy, the BIOS only loads modules required for booting Legacy Operating Systems.

When Boot Mode is UEFI, the BIOS only loads modules required for booting UEFI-aware Operating Systems.

Comments: When Boot Mode is Legacy, only Legacy Option ROMs and Legacy OS Boot are supported; UEFI OPROMs and UEFI OS Boot are not supported.

When Boot Mode is UEFI, Only UEFI OPROMs and UEFI OS boot are supported; Legacy OPROMs and Legacy OS Boot are NOT supported.

Back to [*Advanced Boot Options Screen****] — [****Boot Maintenance Manager Screen****] — [****Screen Map****]***

3. Video BIOS

Option Values: **<u>UEFI</u>**
Legacy

Help Text:

If Video BIOS is Legacy, the BIOS uses the legacy video ROM instead of the EFI video ROM when Boot Mode is UEFI.

Comments: This option appears only when Boot Mode option is chosen as UEFI. The default – UEFI – is to use UEFI Graphic Output Protocol (GOP); if it is Legacy, legacy video ROM is used.

If Boot Mode changes to Legacy, Video BIOS will change to Legacy and be hidden automatically.

Back to [*Advanced Boot Options Screen****] — [****Boot Maintenance Manager Screen****] — [****Screen Map****]***

4. Boot Option Retry

Option Values: Enabled
<u>Disabled</u>

Help Text:

If enabled, this continually retries non-EFI-based boot options without waiting for user input.

Comments: This option is intended to keep retrying for cases where the boot devices could possibly be slow to initially respond, e.g., if the devices were "asleep" and did not wake quickly enough. However, if none of the devices in the Boot Order <u>ever</u> responds, the BIOS will continue to reboot indefinitely.

Back to [*Advanced Boot Options Screen****] — [****Boot Maintenance Manager Screen****] — [****Screen Map****]***

5. USB Boot Priority

Option Values: **Enabled**
                   Disabled

Help Text:

> *If enabled, newly discovered USB devices are moved to the top of their boot device category.*
> *If disabled, newly discovered USB devices are moved to the bottom of their boot device category.*

Comments: This option enables or disables the "USB Reorder" functionality. USB Boot Priority, if enabled, is intended for the case where a user wants to be able to plug in a USB device and immediately boot to it, for example in case of a maintenance or System Administration operation. If a User Password is installed, USB Boot Priority action is suspended when a User Password is installed.

Back to [*Advanced Boot Options Screen****] — [****Boot Maintenance Manager Screen****] — [****Screen Map****]***

6. Static Boot Order

Option Values: Enabled
                   Disabled

Help Text:

> *[Disabled] – Devices removed from the system are deleted from Boot Order Tables.*
> *[Enabled] – Devices removed have positions in Boot Order Tables retained for later reinsertion.*

Comments: This option appears only when Boot Mode option is chosen as Legacy. When the option changes to "Enabled" from "Disabled", it will enable Static Boot Order (SBO) from the next boot onward, and also the current Boot Order will be stored as the SBO template.

When the option changes from "Enabled" to "Disabled", this will disable SBO and the SBO template will be cleared.

Otherwise it will retain the current Enabled/Disabled state.

Back to [*Advanced Boot Options Screen****] — [****Boot Maintenance Manager Screen****] — [****Screen Map****]***

7. Reset Static Boot Order

Option Values: Yes
                   No Action

Help Text:

> *[Yes] Take snapshot of current boot order to save as Static Boot Order Template.*

Comments: This option appears only when Boot Mode option is chosen as Legacy. This option allows you to save the Boot Order list as the Static Boot Order template without disabling and re-enabling the Static Boot Order option.

Select <u>Yes</u> to snapshot the current Boot Options list into the Static Boot Options list on the next boot. After saving Static Boot Options list, this option will change back to <u>No Action</u> automatically.

This option is available only when the Static Boot Order option is <u>Enabled</u>. Otherwise it will grayed out and unavailable.

Back to [*Advanced Boot Options Screen****] — [****Boot Maintenance Manager Screen****] — [****Screen Map****]***

2.2.16.2 Legacy CDROM Order

The Legacy CDROM Order screen allows the user to control the order in which the BIOS attempts to boot from the Legacy CDROM drives installed in the system. This screen is only available when there is at least one CDROM device available in the system configuration and the Boot Mode options is chosen as Legacy.

Note: A USB attached CDROM device will appear in this section. However, a USB Key formatted as a CRDOM device will not – it will be detected as a Hard Disk device and will be included in the Hard Disk Order Screen.

To access this screen from the *Main* screen, select **Boot Maintenance Manager > Legacy CDROM Order**. To move to another screen, press the <Esc> key to return to the **Boot Maintenance Manager** screen, then select the desired screen.

	Boot Maintenance Manager
Legacy CDROM Order	
CDROM #1	<Available CDROM devices>
CDROM #2	<Available CDROM devices>
Save Changes and Exit this sub-menu	
Discard Changes and Exit this sub-menu	
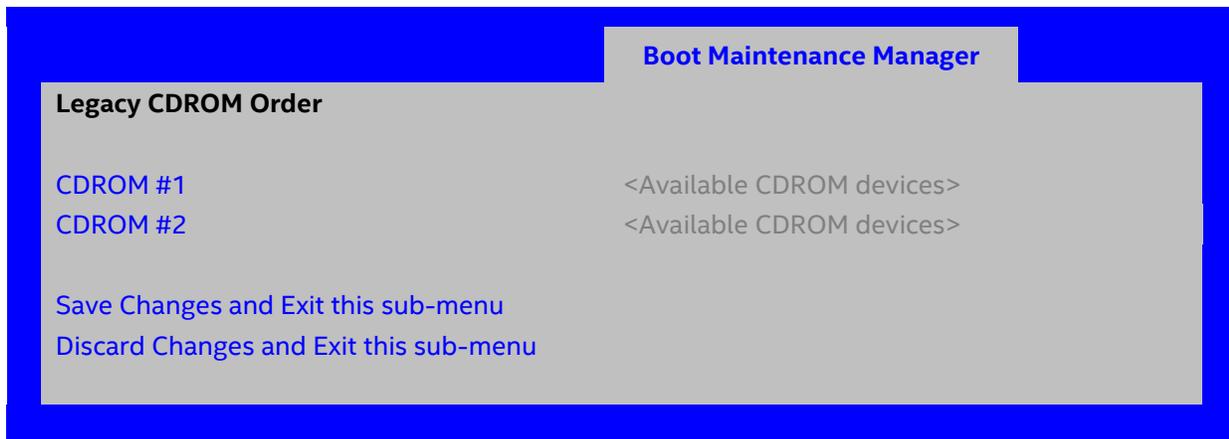
Figure 22. Legacy CDROM Order Screen

Screen Field Descriptions:

1. CDROM #1
2. CDROM #2

Option Values: *<Available CDROM devices>*

Help Text:

Set system boot order by selecting the boot option for this position.

Warning: Pressing F10 or select 'Save Changes and Exit this sub-menu' is required to save the changes in this screen before you exit it. This behavior only applies in the Boot Order pages, other pages are not affected.

Comments: Choose the order of booting among CDROM devices by choosing which available CDROM device should be in each position in the order.

Back to [*Legacy CDROM Order Screen****] — [****Boot Maintenance Manager Screen****] — [****Screen Map****]***

3. Save Changes and Exit this sub-menu

Option Values: *<None>*

Help Text: *<None>*

Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to exit current Setup Screen with any changes in Legacy CDROM Boot Order settings saved.

The <F10 > function key may also be used in current Setup screen to initiate a "Save Changes" action.

Back to [*Save & Exit Screen***] — [***Screen Map***]**

4. Discard Changes and Exit this sub-menu

Option Values: *<None>*

Help Text: *<None>*

Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to exit current Setup Screen without saving any changes in Legacy CDROM Boot Order settings.

Back to [*Save & Exit Screen***] — [***Screen Map***]**

2.2.16.3   Legacy Hard Disk Order

The Legacy Hard Disk Order screen allows the user to control the order in which the BIOS attempts to boot from the hard disk drives installed in the system. This screen is only available when there is at least one hard disk device available in the system configuration and the Boot Mode options is chosen as Legacy. Note that a USB attached Hard Disk drive or a USB Key device formatted as a hard disk will appear in this section.

To access this screen from the *Main* screen, select *Boot Maintenance Manager > Legacy Hard Disk Order.* To move to another screen, press the <Esc> key to return to the *Boot Maintenance Manager* screen, then select the desired screen.

Note: The BCV devices which are storage devices are also grouped in Legacy Hard Disk Order Screen.

Boot Maintenance Manager

Legacy Hard Disk Order

Hard Disk #1   <Available Hard Disk devices>
Hard Disk #2   <Available Hard Disk devices>

Save Changes and Exit this sub-menu
Discard Changes and Exit this sub-menu

Figure 23. Legacy Hard Disk Order Screen

Screen Field Descriptions:

1. Hard Disk #1
2. Hard Disk #2

    Option Values: *<Available Hard Disk devices>*

    Help Text:

        Set system boot order by selecting the boot option for this position.

        Warning: Pressing F10 or select 'Save Changes and Exit this sub-menu' is required to save the changes in this screen before you exit it. This behavior only applies in the Boot Order pages, other pages are not affected.

    Comments: Choose the order of booting among Hard Disk devices by choosing which available Hard Disk device should be in each position in the order.

    Back to [*Legacy Hard Disk Order Screen****] — [****Boot Maintenance Manager Screen****] — [****Screen Map****]***

3. Save Changes and Exit this sub-menu

Option Values: *<None>*

Help Text: *<None>*

Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to exit current Setup Screen with any changes in Legacy Hard Disk Boot Order settings saved.

The <F10 > function key may also be used in current Setup screen to initiate a "Save Changes" action.

Back to [*Save & Exit Screen****] — [****Screen Map****]***

4. Discard Changes and Exit this sub-menu

Option Values: *<None>*

Help Text: *<None>*

Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to exit current Setup Screen without saving any changes in Legacy Hard Disk Boot Order settings.

Back to [*Save & Exit Screen****] — [****Screen Map****]***

2.2.16.4   Legacy Floppy Order

The Legacy Floppy Order screen allows the user to control the order in which the BIOS attempts to boot from the Legacy Floppy Disk drives installed in the system. This screen is only available when there is at least one Floppy Disk (diskette) device available in the system configuration and the Boot Mode options is chosen as Legacy. Note that a USB attached diskette drive or a USB Key device formatted as a diskette drive will appear in this section.

To access this screen from the *Main* screen, select *Boot Maintenance Manager > Legacy Floppy Order*. To move to another screen, press the <Esc> key to return to the *Boot Maintenance Manager* screen, then select the desired screen.
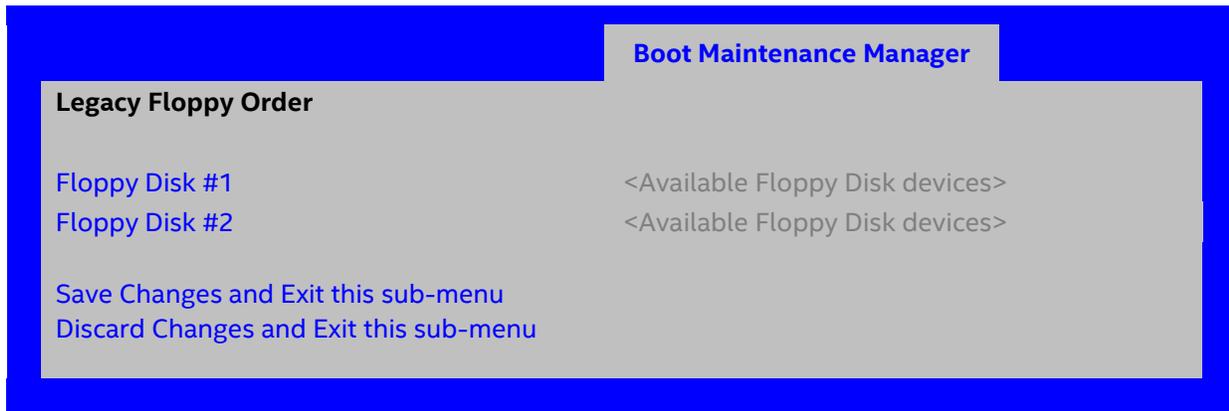

	Boot Maintenance Manager
Legacy Floppy Order	
Floppy Disk #1	<Available Floppy Disk devices>
Floppy Disk #2	<Available Floppy Disk devices>
Save Changes and Exit this sub-menu	
Discard Changes and Exit this sub-menu	

Figure 24. Legacy Floppy Order Screen

Screen Field Descriptions:

1. Floppy Disk #1
2. Floppy Disk #2

   Option Values: *<Available Floppy Disk devices>*

   Help Text:

   > *Set system boot order by selecting the boot option for this position.*
   >
   > *Warning: Pressing F10 or select 'Save Changes and Exit this sub-menu' is required to save the changes in this screen before you exit it. This behavior only applies in the Boot Order pages, other pages are not affected.*

   Comments: Choose the order of booting among Floppy Disk devices by choosing which available Floppy Disk device should be in each position in the order.

   Back to [Legacy Floppy Order Screen**] — [**Boot Maintenance Manager Screen**] — [**Screen Map**]**

3. Save Changes and Exit this sub-menu

   Option Values: *<None>*

   Help Text: *<None>*

Comments: *Selection only.* Select this line and press the <Enter> key to exit current Setup Screen with any changes in Legacy Floppy Boot Order settings saved.

The <F10 > function key may also be used in current Setup screen to initiate a "Save Changes" action.

Back to [*Save & Exit Screen***] — [***Screen Map***]**

4. Discard Changes and Exit this sub-menu

Option Values: *<None>*

Help Text: *<None>*

Comments: *Selection only.* Select this line and press the <Enter> key to exit current Setup Screen without saving any changes in Legacy Floppy Boot Order settings.

Back to [*Save & Exit Screen***] — [***Screen Map***]**

2.2.16.5   Legacy Network Device Order

The Legacy Network Device Order screen allows the user to control the order in which the BIOS attempts to boot from the network bootable devices installed in the system. This screen is only available when there is at least one network bootable device available in the system configuration and the Boot Mode options is chosen as Legacy.

To access this screen from the **Main** screen, select **Boot Maintenance Manager > Legacy Network Device Order**. To move to another screen, press the <Esc> key to return to the **Boot Maintenance Manager** screen, then select the desired screen.
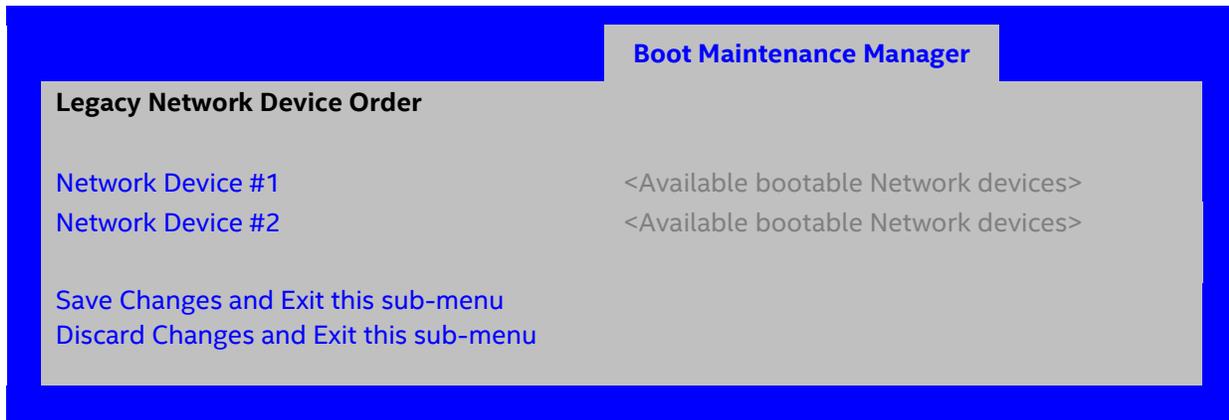
	Boot Maintenance Manager
Legacy Network Device Order	
Network Device #1	<Available bootable Network devices>
Network Device #2	<Available bootable Network devices>
Save Changes and Exit this sub-menu	
Discard Changes and Exit this sub-menu	

Figure 25. Legacy Network Device Order Screen

Screen Field Descriptions:

1. Network Device #1
2. Network Device #2

    Option Values: *<Available Network Devices>*

    Help Text:

      Set system boot order by selecting the boot option for this position.

      Warning: Pressing F10 or select 'Save Changes and Exit this sub-menu' is required to save the changes in this screen before you exit it. This behavior only applies in the Boot Order pages, other pages are not affected.

    Comments: Choose the order of booting among Network Devices by choosing which available Network Device should be in each position in the order.

    Back to [Legacy Network Device Order Screen**] — [**Boot Maintenance Manager Screen**] — [**Screen Map**]**

3. Save Changes and Exit this sub-menu

    Option Values: *<None>*

    Help Text: *<None>*

Comments: *Selection only*. Select this line and press the <Enter> key to exit current Setup Screen with any changes in Legacy Network Device Boot Order settings saved.

The <F10 > function key may also be used in current Setup screen to initiate a "Save Changes" action.

Back to [Save & Exit Screen**] — [**Screen Map**]**

4. Discard Changes and Exit this sub-menu

Option Values: *<None>*

Help Text: *<None>*

Comments: *Selection only*. Select this line and press the <Enter> key to exit current Setup Screen without saving any changes in Legacy Network Device Boot Order settings.

Back to [Save & Exit Screen**] — [**Screen Map**]**

2.2.16.6   Legacy BEV Device Order

The Legacy BEV Device Order screen allows the user to control the order in which the BIOS attempts to boot from the BEV Devices installed in the system. This screen is only available when there is at least one BEV device available in the system configuration and the Boot Mode options is chosen as Legacy.

To access this screen from the *Main* screen, select *Boot Maintenance Manager > Legacy BEV Device Order*. To move to another screen, press the <Esc> key to return to the *Boot Maintenance Manager* screen, then select the desired screen.
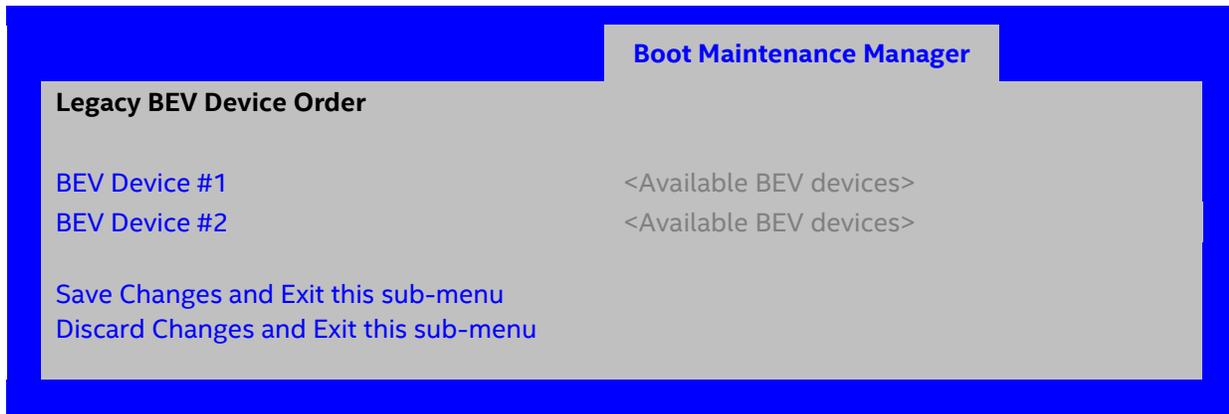
	Boot Maintenance Manager
Legacy BEV Device Order	
BEV Device #1	<Available BEV devices>
BEV Device #2	<Available BEV devices>
Save Changes and Exit this sub-menu	
Discard Changes and Exit this sub-menu	

Figure 26. Legacy BEV Device Order Screen

Screen Field Descriptions:

1. BEV Device #1
2. BEV Device #2

      Option Values: *<Available BEV Devices>*

      Help Text:

            Set system boot order by selecting the boot option for this position.

            Warning: Pressing F10 or select 'Save Changes and Exit this sub-menu' is required to save the changes in this screen before you exit it. This behavior only applies in the Boot Order pages, other pages are not affected.

      Comments: Choose the order of booting among BEV Devices by choosing which available BEV Device should be in each position in the order.

      Back to [*Legacy BEV Device Order Screen****] — [****Boot Maintenance Manager Screen****] — [****Screen Map****]***

3. Save Changes and Exit this sub-menu

      Option Values: *<None>*

      Help Text: *<None>*

Comments: *Selection only*. Select this line and press the <Enter> key to exit current Setup Screen with any changes in Legacy BEV Device Boot Order settings saved.

The <F10 > function key may also be used in current Setup screen to initiate a "Save Changes" action.

Back to [Save & Exit Screen**] — [**Screen Map**]**

4. Discard Changes and Exit this sub-menu

Option Values: *<None>*

Help Text: *<None>*

Comments: *Selection only*. Select this line and press the <Enter> key to exit current Setup Screen without saving any changes in Legacy BEV Device Boot Order settings.

Back to [Save & Exit Screen**] — [**Screen Map**]**

2.2.16.7   Add EFI Boot Option

The Add EFI Boot Option screen allows the user to add an EFI boot option to the boot order. The "Internal EFI Shell" Boot Option is permanent and cannot be added or deleted.

To access this screen from the **Main** screen, select **Boot Maintenance Manager > Add EFI Boot Option**. To move to another screen, press the <Esc> key to return to the **Boot Maintenance Manager** screen, then select the desired screen.
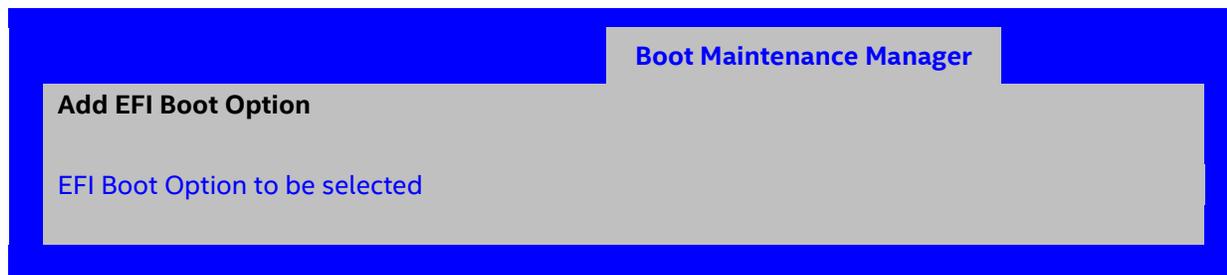
Boot Maintenance Manager

Add EFI Boot Option

EFI Boot Option to be selected

Figure 27. Add EFI Boot Option Screen

Screen Field Descriptions:

1. EFI Boot Option to be selected

    Option Values: *<None>*

    Help Text: *<None>.*

    Comments: *Selection only.* This will list current EFI devices paths enumerated by the BIOS during the POST to select the EFI Boot Option.

    Back to [*Add EFI Boot Option Screen***] — [***Boot Maintenance Manager Screen***] — [***Screen Map***]**

2.2.16.8 Delete EFI Boot Option

The Delete EFI Boot Option screen allows the user to remove an EFI boot option from the boot order. The "Internal EFI Shell" Boot Option will not be listed, since it is permanent and cannot be added or deleted.

To access this screen from the **Main** screen, select **Boot Maintenance Manager > Delete EFI Boot Option**. To move to another screen, press the <Esc> key to return to the **Boot Maintenance Manager** screen, then select the desired screen.
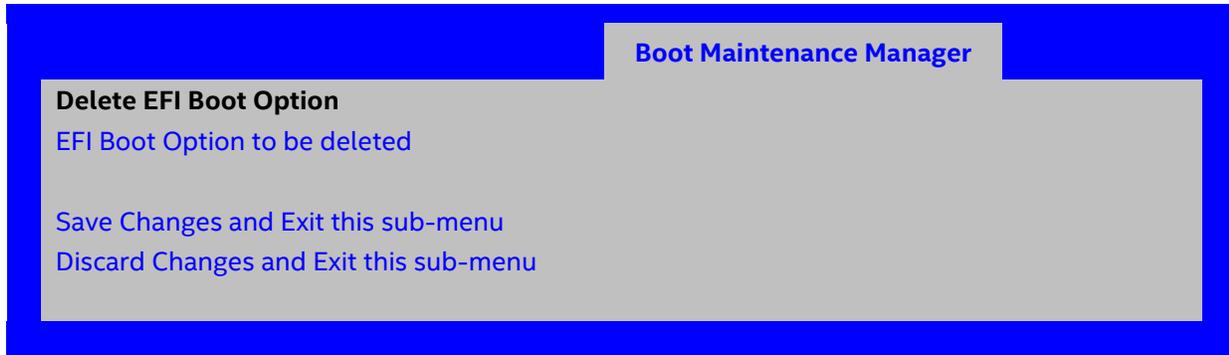

Figure 28. Delete EFI Boot Option Screen

Screen Field Descriptions:

1. EFI Boot Option to be deleted

    Option Values: *[CheckBox]*

    Help Text: *Select one to delete.*

    Comments: Use the checkbox to select the EFI Boot Option to be deleted. This will not allow a user to delete the EFI Shell.

    Back to [Delete EFI Boot Option Screen**] — [**Boot Maintenance Manager Screen**] — [**Screen Map**]**

2. Save Changes and Exit this sub-menu

    Option Values: *<None>*

    Help Text: *<None>*

    Comments: *Selection only*. Select this line and press the <Enter> key to exit current Setup Screen with any changes in this menu.

    The <F10 > function key may also be used in current Setup screen to initiate a "Save Changes" action.

    Back to [Save & Exit Screen**] — [**Screen Map**]**

3. Discard Changes and Exit this sub-menu

    Option Values: *<None>*

Help Text: *<None>*

Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to exit
current Setup Screen without saving any changes in this menu.

Back to [*Save & Exit Screen****] — [****Screen Map****]***

2.2.16.9   Change Boot Order Screen

The Change Boot Order screen allows the user to configure the desired order of legacy or UEFI boot devices in which the boot device is to be tried sequentially.

To access this screen from the **Main** screen, select **Boot Maintenance Manager > Change Boot Order.** To move to another screen, press the <Esc> key to return to the **Boot Maintenance Manager** screen, then select the desired screen.
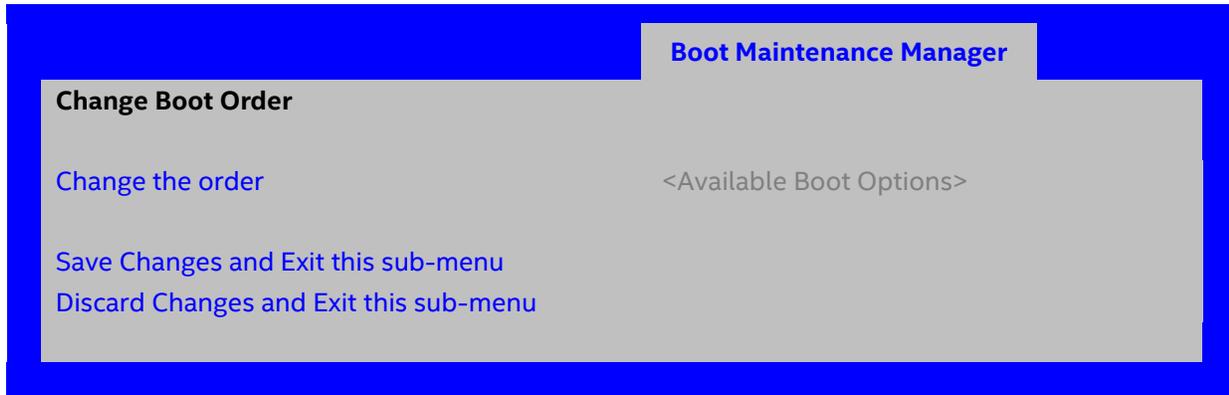
Boot Maintenance Manager

Change Boot Order

Change the order   <Available Boot Options>

Save Changes and Exit this sub-menu
Discard Changes and Exit this sub-menu

Figure 29. Change Boot Order Screen

Screen Field Descriptions:

1. Change the order
   Option Values: *<Available Boot options>*

   Help Text: *Change the order.*

   Comments: Choose the boot order of booting Devices. *Use [+] or [-] key to move up/down the selected field.*

   Back to [*Change Boot Order Screen***] — [***Boot Maintenance Manager Screen***] — [***Screen Map***]**

2. Save Changes and Exit this sub-menu

   Option Values: *<None>*

   Help Text: *<None>*

   Comments: *Selection only*. Select this line and press the <Enter> key to exit current Setup Screen with any changes in this menu.

   The <F10 > function key may also be used in current Setup screen to initiate a "Save Changes" action.

   Back to [*Save & Exit Screen***] — [***Screen Map***]**

3. Discard Changes and Exit this sub-menu

   Option Values: *<None>*

Help Text: *<None>*

Comments: <u>*Selection only*</u>. Select this line and press the <Enter> key to exit current Setup Screen without saving any changes in this menu.

Back to [Save & Exit Screen**] — [**Screen Map**]**

2.2.17 Boot Manager Screen (Tab)

The Boot Manager screen allows the user to view a list of devices available for booting, and to select a boot device for immediately booting the system. There is no predetermined order for listing bootable devices. They are simply listed in order of discovery.

Regardless of whether any other bootable devices are available, the "Internal EFI Shell" will always be available.

Note: This list is **_not_** in order according to the system Boot Option order. Reordering Boot Devices or even removing them from the Boot Order completely has no effect on the Boot Manager.

To access this screen from the **Main** screen or other top-level "Tab" screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the **Boot Manager** screen is selected.

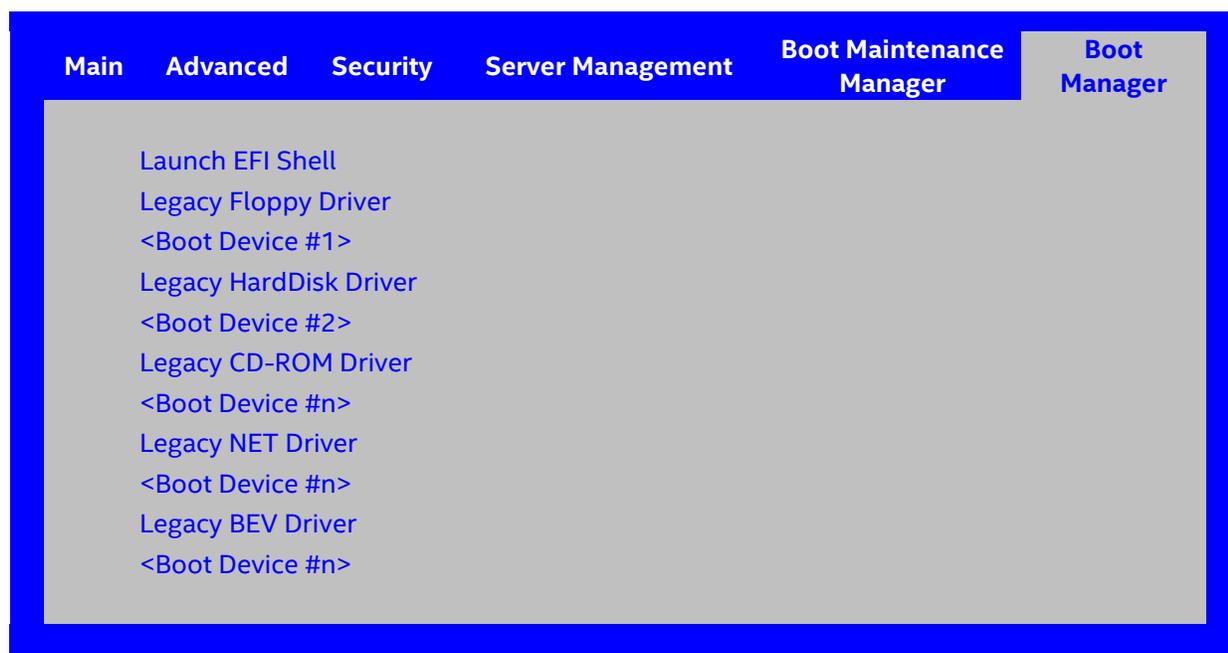| Main	Advanced	Security	Server Management	Boot Maintenance Manager	Boot Manager

Launch EFI Shell
Legacy Floppy Driver
<Boot Device #1>
Legacy HardDisk Driver
<Boot Device #2>
Legacy CD-ROM Driver
<Boot Device #n>
Legacy NET Driver
<Boot Device #n>
Legacy BEV Driver
<Boot Device #n>

Figure 30. Boot Manager Screen

Screen Field Descriptions:

1. Launch EFI Shell

   Option Values: *<None>*

   Help Text:

   > *Select this option to boot now.*
   > *Note: This list is not the system boot option order. Use the Boot Options menu to view and configure the system boot option order.*

Comments: The EFI Shell will always be present in the list of bootable devices.

Back to [*Boot Manager Screen****] — [****Screen Map****]***

2. <Boot Device #1>
3. <Boot Device #2>
4. <Boot Device #n>

Option Values: *<None>*

Help Text:

Select this option to boot now.
Note: This list is not the system boot option order. Use the Boot Options menu to view and configure the system boot option order.

Comments: These are names of bootable devices discovered in the system. The system user can choose any of them from which to initiate a one-time boot – that is, booting from any device in this list will not permanently affect the defined system Boot Order.

These bootable devices are not displayed in any specified order, particularly not in the system Boot Order established by the Boot Maintenance Manager screen. This is just a list of bootable devices in the order in which they were enumerated.

Back to [*Boot Manager Screen****] — [****Screen Map****]***

2.2.18 Error Manager Screen (Tab)

The Error Manager screen displays any POST Error Codes encountered during BIOS POST, along with an explanation of the meaning of the Error Code in the form of a Help Text. This is an _Information Only_ screen.

To access this screen from the **Main** screen or other top-level "Tab" screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the **Error Manager** screen is selected.
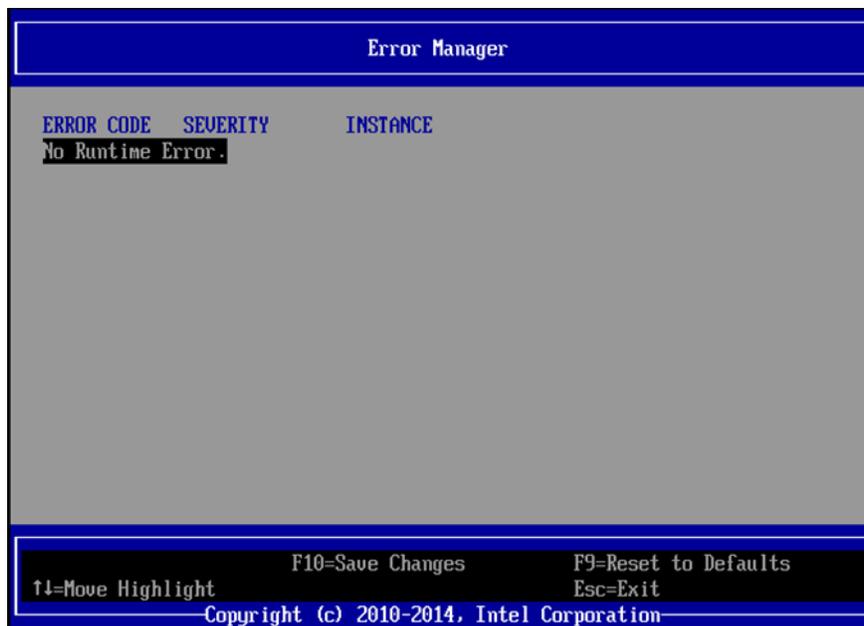

Figure 31. Error Manager Screen

Screen Field Descriptions:

1. ERROR CODE

   Option Values: _<POST Error Code>_

   Help Text: _<N/A>_

   Comments: This is a POST Error Code – a BIOS-originated error that occurred during POST initialization.

   Back to [_Error Manager Screen_**] — [**_Screen Map_**]**

2. SEVERITY

   Option Values: Minor
                                    Major
                                    Fatal

   Help Text: _<N/A>_

Comments: Each POST Error Code has a Severity associated with it.

Back to [*Error Manager Screen****] — [****Screen Map****]***

3. INSTANCE

Option Values: *<Depends on error code>*

Help Text: *<N/A>*

Comments: Where applicable, this field shows a value indicating which one of a group of components was responsible for generating the POST Error Code that is being reported.

Back to [*Error Manager Screen****] — [****Screen Map****]***

4. DESCRIPTION

Option Values: *<N/A>*

Help Text: *<Description of POST Error Code>*

Comments: This is a description of the meaning of the POST Error Code that is being reported. This text actually appears in the screen space that is usually reserved for "Help" messages.

Back to [*Error Manager Screen****] — [****Screen Map****]***

2.2.19 Save & Exit Screen (Tab)

The Save & Exit screen allows the user to choose whether to save or discard the configuration changes made on other Setup screens. It also allows the user to restore the BIOS settings to the factory defaults or to save or restore them to a set of user-defined default values. If Load Default Values is selected, the factory default settings (noted in bold in the Setup screen images) are applied. If Load User Default Values is selected, the system is restored to previously saved User Default Values.

To access this screen from the **Main** screen or other top-level "Tab" screen, press the right or left arrow keys to traverse the tabs at the top of the Setup screen until the **Save & Exit** screen is selected.

Note: There is a Legal Disclaimer footnote at the bottom of the Save & Exit screen:

Certain brands and names may be claimed as the property of others.

This is reference to any instance in the Setup screens where names belonging to other companies may appear. For example "LSI*" appears in Setup in the context of Mass Storage RAID options.
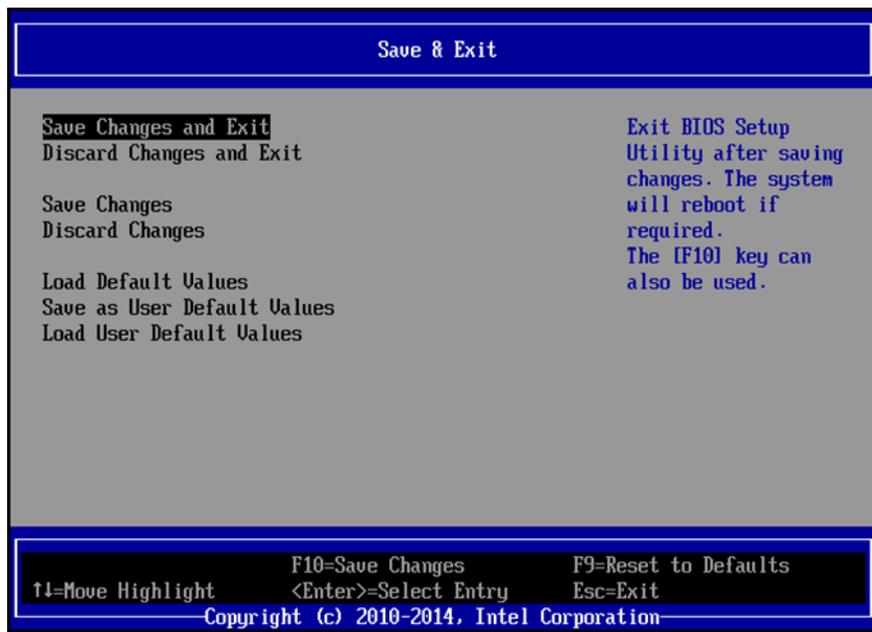

Figure 32. Save & Exit Screen

Screen Field Descriptions:

1. Save Changes and Exit

    Option Values: *<None>*

    Help Text:

> *Exit BIOS Setup Utility after saving changes. The system will reboot if required. The [F10] key can also be used.*

Comments: *Selection only.* Select this line and press the <Enter> key to exit Setup with any changes in BIOS settings saved. If there have been no changes made in the settings, the BIOS will resume executing POST.

If changes have been made in BIOS settings, a confirmation pop-up will appear. If the "Save Changes & Exit" action is positively confirmed, any persistent changes will be applied and saved to the BIOS settings in NVRAM storage, then the system will reboot if necessary (which is normally the case). If the "Save Changes & Exit" action is not confirmed, the BIOS will resume executing Setup.

The <F10 > function key may also be used from anyplace in Setup to initiate a "Save Changes & Exit" action.

Back to [Save & Exit Screen**] — [**Screen Map**]**

2. Discard Changes and Exit

Option Values: *<None>*

Help Text:

> *Exit BIOS Setup Utility without saving changes.*
> *The [Esc] key can also be used.*

Comments: *Selection only.* Select this line and press the <Enter> key to exit Setup without saving any changes in BIOS settings. If there have been no changes made in the settings, the BIOS will resume executing POST.

If changes have been made in BIOS settings, a confirmation pop-up will appear. If the "Discard Changes & Exit" action is positively confirmed,, all pending changes will be discarded and the BIOS will resume executing POST. If the "Discard Changes & Exit" action is not confirmed, the BIOS will resume executing Setup without discarding any changes.

The <Esc > key may also be used in Setup to initiate a "Discard Changes & Exit" action.

Back to [Save & Exit Screen**] — [**Screen Map**]**

3. Save Changes

Option Values: *<None>*

Help Text: *Save Changes made so far to any of the setup options.*

Comments: *Selection only.* Select this line and press the <Enter> key to save any pending changes in BIOS settings. If there have been no changes made in the settings, the BIOS will resume executing POST.

Also, the user should be aware that most changes require a reboot to become active. If changes have been made and saved, without exiting Setup, the system should be rebooted later even if no additional changes are made.

Back to [_Save & Exit Screen_**] — [**_Screen Map_**]**

4. Discard Changes

> Option Values: _<None>_
>
> Help Text: _Discard Changes made so far to any of the setup options._
>
> Comments: _Selection only._ Select this line and press the <Enter> key to discard any pending unsaved changes in BIOS settings. If there have been no changes made in the settings, the BIOS will resume executing POST.
>
> If changes have been made in BIOS settings and not yet saved, a confirmation pop-up will appear. If the "Discard Changes" action is positively confirmed, all pending changes will be discarded and the BIOS will resume executing POST. If the "Discard Changes" action is not confirmed, the BIOS will resume executing Setup without discarding pending changes.

Back to [_Save & Exit Screen_**] — [**_Screen Map_**]**

5. Load Default Values

> Option Values: _<None>_
>
> Help Text: _Load Defaults Values for all the setup options._
>
> Comments: _Selection only._ Select this line and press the <Enter> key to load default values for all BIOS settings. These are the initial factory settings ("failsafe" settings) for all BIOS parameters.
>
> There will be a confirmation popup to verify that the user really meant to take this action.
>
> After initializing all BIOS settings to default values, the BIOS will resume executing Setup, so the user may make additional changes in the BIOS settings if necessary (for example, Boot Order) before doing a "Save Changes and Exit" with a reboot to make the default settings take effect, including any changes made after loading the defaults.
>
> The <F9> function key may also be used from anyplace in Setup to initiate a "Load Default Values" action.

Back to [_Save & Exit Screen_**] — [**_Screen Map_**]**

6. Save as User Default Values

> Option Values: _<None>_
>
> Help Text: _Save the changes made so far as User Default Values._
>
> Comments: _Selection only._ Select this line and press the <Enter> key to save the current state of the settings for all BIOS parameters as a customized set of "User Default Values".
>
> These are a user-determined set of BIOS default settings that can be used as an alternative instead of the initial factory settings ("failsafe" settings) for all BIOS parameters.

By changing the BIOS settings to values that the user prefers to have for defaults, and then using this operation to save them as "User Default Values", that version of BIOS settings can be restored at any time by using the following "Load User Default Values" operation.

There will be a confirmation popup to verify that the user really intended to take this action.

Loading the "factory default" values with F9 or the "Load Default Values" – or by any other means – does not affect the User Default Values. They remain set to whatever values they were saved as.

Back to [Save & Exit Screen**] — [**Screen Map**]**

7. Load User Default Values

   Option Values: *<None>*

   Help Text: *Load the User Default Values to all the setup options.*

   Comments: *Selection only.* Select this line and press the <Enter> key to load User Default Values for all BIOS settings. These are user-customized BIOS default settings for all BIOS parameters, previously established by doing a "Save User Defaults" action (see above).

   There will be a confirmation popup to verify that the user really intended to take this action.

   Back to [Save & Exit Screen**] — [**Screen Map**]**