

Integrated Baseboard Management Controller Web Console

User Guide

For Intel® Server M50FCP and Intel® Server D50DNP Families

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Delivering Breakthrough Data Center System Innovation – Experience What's Inside!

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Revision History

Date	Revision	Changes
December	1.0	Production Release

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1. Introduction

Intel server boards and systems include an embedded web server that can be accessed using any supported browser. The user interface for the embedded web server is identified as the Integrated Baseboard Management Controller Web Console (Integrated BMC Web Console), which allows administrators to view system information including firmware versions, server health, diagnostic information, power statistics. It enables configuration of the BMC and BIOS, and also provides the ability for users to perform power actions, launch KVM, and set up virtual media redirection.

This user guide provides an overview of the Integrated BMC Web Console. It describes how to setup the server for secure access, how to access the web console, and how each supported feature is used.

The features and procedures described in this document apply to the following Intel server products:

- Intel[®] Server M50FCP Family
- Intel[®] Server D50DNP Family

Integrated BMC Web Console information for previous generation Intel server products can be found in versions of this document specific to those products.

For additional information and downloads visit:

https://www.intel.com/content/www/us/en/support.html

For further assistance, contact Intel Customer Support at http://www.intel.com/support/feedback.htm.

2. Server Management Overview

All Intel server products support embedded server management features. Core to the management features is the baseboard management controller (BMC). The BMC supports many system management features including intra-system sensor monitoring, fan speed control, system power management, and system error handling and messaging. It also provides platform management capabilities including remote access, monitoring, logging, and alerting features.

Note: For in-depth server management information, refer to the Technical Product Specification (TPS) for the specified Intel server product.

Server management capabilities of an Intel server board or Intel server system can be split in two groups:

- Standard management features (Included)
- Optional advanced management features that can be enabled with the purchase of an advanced management license key (iPC ADVSYSMGMTKEY).

2.1 Standard Management Features Overview

All Intel server products include standard server management features. These include support for:

Standard System Features

- Integrated BMC Web Console
- Virtual KVM over HTML5
- Redfish* 2.0 interface
- Support for IPMI 2.0 protocol
- Intel[®] Dynamic Power Node Manager
- Out-of-band BIOS/BMC Update and Configuration
- System Inventory
- Email Alerting
- Autonomous Debug Log

2.2 Advanced System Management Features Overview

With the purchase of an optional advanced system management license, the BMC supports a method to upload advanced system management files to enable features for real-time data collection and analysis, virtual media redirection and network share, and Out-of-band Hardware RAID Management. The license file can be uploaded through the embedded web console, Redfish, and Intel Server Configuration Utility. See Appendix A for complete installation instructions.

Advanced manageability features are supported over all NIC ports enabled for server manageability. These include on-board BMC-shared LAN ports, which share network bandwidth with the host system, and with the onboard dedicated management port.

Advanced Features that Require a Software License Key

- Virtual Media Local Image Redirection
- Virtual media over network share
- Out-of-band hardware RAID management
- License Status command for Intel Data Center Manger, compatible for RMM4/License

2.3 Supported Browsers

Virtual KVM over HTML5 and virtual media over HTML5 features require a browser to support the features of WebSocket and HTML5.

The following browsers are tested:

- Red Hat Enterprise* 8.5 64-bit: Mozilla Firefox* 91.2
- Ubuntu* 20.10 64-bit: Mozilla Firefox 90.0
- Windows 10 64-bit: Google Chrome* 101.0.4951.54 (official build) (64-bit)
- Windows 10 64-bit: Microsoft Edge* 101.0.1210.39 (official build) (64-bit)

3. Hardware Configuration for Server Management

This chapter describes the hardware configuration steps necessary to access the Integrated BMC Web Console remotely.

Two steps are necessary before the server management BMC LAN can be used:

- 1. One or both LAN channels must be configured as either DHCP or with static addresses.
- 2. At least one user must be enabled to use the LAN channels.

Configuring these options can be performed using either the embedded <F2> BIOS Setup Utility or by using the Intel[®] Server Configuration Utility, which can be downloaded from the following Intel website:

<u>https://www.intel.com/content/www/us/en/support.html</u> and initiating a search for "Intel[®] Server Configuration Utility".

3.1 Server Management Hardware Configuration Using BIOS Setup Utility

- 1. During the power-on self-test (POST), press **<F2>** to access the Main page of the embedded BIOS setup utility.
- 2. Navigate to the **Server Management** tab and select **BMC LAN Configuration** to enter the BMC LAN Configuration screen (see Figure 1).

BMC LAN Configuration				
HI Host LAN configuration IP Source IP Address Subnet Mask Gateway IP	<static> 0.0.0.0 0.0.0.0 0.0.0.0 0.0.0.0</static>	₿	View/Edit BMC DHCP host name. Press <enter> to edit. Host name should start with an alphabetic, remaining can be alphanumeric characters.</enter>	
Dedicated Management LAN Co	mfiguration		Host name length may be from 2 to 63 characters	
IP Source IP Address Subnet Mask Gateway IP Dedicated Management LAN I IPv6 Source IPv6 Address Gateway IPv6 IPv6 Profix Length	<pre></pre>	0 : 0000 : 00 0 : 0000 : 00)0)0	
BMC DHCP Host Name				
†∔=Move Highlight C	F10=Save Changes and Exit <enter>=Select Entry ppyright (c) 2006-2022, Intel</enter>	F: E: Corporat	9=Reset to Defaults sc=Exit ion	

Figure 1. BMC LAN Configuration Screen of the BIOS Setup Utility

- 3. For an IPv4 network:
 - If configuring the server management BMC LAN, scroll down to Dedicated Management LAN Configuration> IP source and then select either Static or Dynamic. If Static is selected, configure the IP address, Subnet mask, and Gateway IP as needed.
- 4. For an IPv6 network:
 - If configuring the server management BMC LAN, scroll to Baseboard LAN IPv6 configuration > IP source and then select Enabled. Then scroll to IPV6 source and select either Static or Dynamic. If Static is selected, configure the IPV6 address, Gateway IPV6, and IPV6 Prefix Length as needed.
- 5. Navigate back to the **Server Management** tab then select **User Configuration** to enter the User Configuration screen (Figure 2).

User Configuration				
Enable Complex Password User ID	<pre>KDisabled> User1</pre>	When enabled User password should match the complexitu		
Privilege	<administrator></administrator>	criteria. 8 to 20 characters		
User Status	<enabled></enabled>	& Must Contain Letters (Both		
User Name	test	Upper & Lower case),		
User Password		Numbers(0-9) and Special Characters		
liser III	llser2	Character 5		
Privilege	(Administrator)			
llser Status	(Enabled)			
llser Name	debuguser			
User Password				
User ID	User3			
Privilege	<administrator></administrator>			
User Status	<enabled></enabled>			
User Name	sherry			
User Password				
User ID	User4			
Privilege	<user></user>	1		
	F10=Saue Changes and Frit	F9=Reset to Nefaults		
tl=Move Highlight	(Enter)=Select Entru	Fsc=Fxit		
Co	muright (c) 2006-2022, Intel Co	rnoration		

Figure 2. User Configuration Screen of the BIOS Setup Utility

- 6. Under a User ID, enter a User Name
- 7. Press **<F10>** to save the configured settings and exit the BIOS setup utility
- 8. Reboot the server and re-enter the <F2> BIOS Setup Utility (See the Notes section on the following page)
- 9. Navigate back to the Server Management tab and select User Configuration
- 10. Under the selected **User ID** configure the following settings: (See the Notes section on the following page)
 - **Privilege** Select the privilege to be used. Administrator privilege is required to use KVM or media redirection enabled by the advanced management features.
 - User status Select Enabled.
 - **User password** Enter the desired password twice.

11. Press **<F10>** to save the configured settings and exit the BIOS setup utility. Reboot the server to use LAN ports with configured settings.

Notes:

- The User Name must be entered and saved before any additional User ID options can be configured. To save the User Name data, the BIOS Utility must be exited and the system must be rebooted, to re-enter the BIOS Utility.
- User names cannot be saved as "Null", or "root", or match any other existing user names.
- User names cannot exceed 16 characters and passwords cannot exceed 20 characters.

3.2 Server Management Hardware Configuration Using Intel[®] Server Configuration Utility

The Intel[®] Server Configuration Utility is a command-line tool that can be used to display and/or set a variety of system BIOS and management firmware settings. This utility can be used to configure the required server management features necessary to access the Integrated BMC Web Console. This utility is supported in EFI, Linux*, and Microsoft Windows operating systems. The commands used are the same for all versions.

The Intel® Server Configuration Utility can be downloaded from the following Intel website:

<u>https://www.intel.com/content/www/us/en/support.html</u> and initiating a search for "Intel[®] Server Configuration Utility".

Refer to the Intel[®] Server Configuration Utility User Guide for addition utility usage information.

Note:

The examples in the following sections use the dedicated server management NIC channel 3. If using a different LAN port, substitute the appropriate channel number:

- for NIC1 use channel 1
- for NIC 2 use channel 2

3.2.1 Configuring the IP Address

1. Set a static IP address and subnet mask on LAN channel 3.

syscfg /le 3 static <STATIC_IP> <SUBNET_MASK>

2. If needed, set the default gateway on LAN channel 3.

```
syscfg /lc 3 12 <DEFAULT_GATEWAY_IP>
```

3. Set the DHCP IP address source on LAN channel 3.

syscfg /le 3 dhcp

3.2.2 Configuring the User

1. Enable BMC user 4 on LAN channel 3.

syscfg /ue 4 enable 3

2. Set the password for BMC user 4. This example sets the password to ${\tt Test@123}.$

syscfg /u 4 "test" "Test@123"

3. Enable the admin privilege BMC user 4 on LAN channel 3.

syscfg /up 4 3 admin

4. Integrated BMC Web Console Overview

The Integrated BMC Web Console may be used to access the server sensors, server logs, and to launch a remote console (with keyboard, video, and mouse (KVM) access) to the target server. This section describes connecting to the Web Console and provides an overview of the layout and navigation of the user interface.

The examples in this chapter identify the user as "testuser".

4.1 Client Browsers

The Integrated BMC Web Console may be accessed using a standard web browser. To access the web console using a securely encrypted connection, use a browser that supports the HTTPS protocol. Strong security is only assured by using a 256-bit cipher strength (encryption).

Note: The web console is designed for a screen size of 1280 pixels by 1024 pixels or larger. In smaller screens, use the browser slider controls to see the full content of each webpage.

4.2 Web Console Access and Login

Note: The user name and password are case sensitive.

To access the Login screen of the Web Console, enter the IP address of the management port configured in Chapter 3 onto the address line of a web browser. To use a secure connection, type:

https://<IPaddress_or_Hostname>/

On the Web Console Login screen enter the User name and password, as configured in Chapter 3, and select a language option from the drop down box (see Figure 3).

intel. Integrated BMC Web Console		
	Please Login Username [Password [Language English v	
	logn	

Figure 3. Integrated BMC Web Console Login Page

Click the **Login** button. With the proper credentials entered, the Web Console home page will be displayed (See Figure 4).

After the initial login, system administrators can change passwords, create users, and have full control over access to the advanced management features (If enabled – See Appendix A).

4.3 Web Console Navigation

The Web Console homepage includes eight tabs along the top line for navigation within the web console (see Figure 4). A description for each tab can be found in Table 1.

A secondary set of page options specific to the selected tab are displayed on the left edge of the window (see Figure 4). The first item of the secondary page list is the default page that appears when the tab is selected.

A description for each tab's secondary menu options can be found in Chapter 5.

intel.Inte	egrated BMC Web Console	
System Server Health	Configuration Remote Control Virtual Media Server Diagnostics Miscellaneous Storage	🚱 Logout 🕒 Refresh 😮 Help 🕦 About
System Information System Components CPU Information DIMM Information NIC Information	 Summary KCS Policy Control Mode is Provisioning. This setting is intended for BMC provisioning and is Summary Host Power Status : Host is currently ON Advanced Management Key : Activated Device (BMC) Available : Yes BIOS ID : SE5C6301.86B 7627.D12.2204111441 	considered insecure for deployment.
NVMe Information Storage Information Current Users	BMC FW Rev : egs-1.07-28-g108d57-3cc10000 BMC Firmware Build Time : May 10 2022 19:44:00 UTC Backup BMC FW Rev : 1.07-00000028 CPLD FW Rev : FCP_v1p7 Mgmt Engine (ME) FW Rev : 06:00.03.071.0 Baseboard Serial Number : Overall System Health :	
Comunicate @ 2016_2022_1	Web Session Timeout 30 Minutes V	

Figure 4. Integrated BMC Web Console Homepage

A tool bar with additional web console usage options can be found on the right side of the top line of every web console page (see Figure 4). For descriptions of each option see Table 2.

Selecting the **Help** option from the top Tool Bar displays a side-bar on the right side of the window which provides useful information for items on the given page (See Figure 5)

intel. Inte	egrated BMC Web Console	
System Server Health	Configuration Remote Control Virtual Media Server Diagnostics Miscellaneous Storage	🔇 Logout 🕝 Refresh 😮 Help 🐧 About
System Information	Summary	System Information - Help Gose
System Components	KCS Policy Control Mode is Provisioning. This setting is intended for BMC provisioning and is considered insecure for deployment.	Host Power Status Shows the power status of the bost (on/off).
CPU Information	Host Power Status : Host is currently ON Advanced Management Key : Activated	Advanced Management Key Shows whether the advanced management functions
DIMM Information	Device (BMC) Available : Yes BIOS ID : SE5C6301.868.7627.D12.2204111441	are activated. Device (BMC) Available Indicates whether the BMC is available for normal
NVMe Information	BMC FW Rev : egs-1.07-28-g108d57-3cc10000 BMC Firmware Build Time : May 10 2022 19:44:00 UTC	management tasks. BIOS ID
Storage Information	Backup BMC FW Rev : 1.07-0000028 CPLD FW Rev : FCP v1p7	BIOS ID:BoardFamilyID.OEMID.MajorVer.MinorVer.RelNum.B
Current Users	Mgmt Engine (ME) FW Rev :06:00.03.071.0 Baseboard Serial Number :	BMC FW Rev Major and minor revision of the BMC firmware.
	Overall System Health : 🛑 😑 🔵	BMC Firmware Build Time The date and time of the installed BMC firmware.
	∟ Web Session Timeout	Backup BMC FW Rev Major and minor revision of the Backup BMC firmware.
	30 Minutes 🗸	CPLD FW Rev Major and minor revision of the CPLD firmware.
		Mgmt Engine (ME) FW Rev Major and minor firmware revision for the Management Engine (ME). Only available if the host is powered on.
		Baseboard Serial Number Serial number of this specific baseboard.
		Overall System Health Overall system health LED status is displayed.
		LED Solid Green - System Health LED LED Blinking Green - System Degraded LED LED Blinking Amber - Non-critical fault LED
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Figure 5. Integrated BMC Web Console Help

When the web console is working on a user request, a busy indicator bar appears as shown in Figure 6.



Figure 6. Busy Indicator Bar

Top Tab	Description	Secondary Page Options
System	Provides access to general information about the server. The tab automatically opens the System Information page.	 System Information System Components CPU Information DIMM Information NIC Information NVMe Information Storage Information Current Users
Server Health	Provides access to the sensors and event log. The tab automatically opens the Sensor Readings page.	Sensor ReadingsEvent Log

Table 1. Integrated BMC Web Console Tabs

Top Tab	Description	Secondary Page Options
Configuration	Provides access to configure various settings for the server. The tab automatically opens the Alerts page.	 Alerts Alert Email IPv4 Network IPv6 Network VLAN NTP Settings LDAP Advanced System Management Key Active Directory SSL Certification Users Security Settings Sensor Customization BMC Firmware Update BIOS/IFWI Firmware Update CPLD Update Syslog Server Configuration Thermal Customization
Remote Control	Provides access to the remote console and control of the server power state. The tab automatically opens the KVM page.	 KVM Server Power Control Launch SOL Virtual Front Panel
Virtual Media	Allows the user to share files locally or in network. Each image/folder will be emulated to the host as a USB device. The tab automatically opens the Local Image page.	Local ImageWeb ISO
Server Diagnostics	Provides access to server diagnostics information. The tab automatically opens the System Diagnostics page.	System DiagnosticsPOST CodesSystem Defaults
Miscellaneous	Provides access to node manager configuration and power statistics. The tab automatically opens the NM Configuration page.	NM ConfigurationPower Statistics
Storage(M50FCP only)	Provides access to storage configuration. The tab automatically opens the Adapter page.	AdapterPhysical DeviceLogical Device

Table 2. Integrated BMC Web Console Toolbar

Button	Function
Logout	End the current web console session. Click OK to confirm After logging out, the web console returns to the login screen.
	Refresh the current webpage, including any data shown on the page.
Refresh	Note: Using the web browser's refresh/reload button or pressing the function key <f5> to do a refresh/reload is not supported for reloading the web console pages. Using either of them returns the web console to the homepage.</f5>
Help	View a brief description of the current page in a frame at the right side of the browser window (Figure 5). Close the help frame by clicking the "X" in the upper right corner of the frame or by clicking the Help button again.
About	View the Intel copyright information and a statement about the use of open source code.

Notes:

• If no user activity is detected by the web console for 30 minutes, the current session is automatically terminated and the user must log in again for continued access to the web console.

• If a KVM remote console window is open, the web session does not automatically time out.

5. Integrated BMC Web Console Options

This chapter provides a detailed description for each Integrated BMC Web Console page. The descriptions are organized in sections corresponding to the eight tabs found on the top line of the web console window.

Refer to Section 4.3 for information describing web console interface navigation and for brief descriptions of the available tab pages and their secondary pages.

Note: Not all of the following sections are used by or related to features enabled by advanced management but have been added here for completeness.

5.1 System Tab

The System tab contains general information about the system as explained in the following subsections.

5.1.1 System Information

The System Information page displays a summary of general system information. This information includes:

- Host power status
- Advanced management key status
- BMC available status
- BIOS ID
- BMC firmware version and build time
- Backup BMC firmware version
- CPLD firmware version
- Intel Management Engine (Intel ME) firmware version
- Server Board serial number
- Overall system health status.

See Table 3 for complete descriptions of each summary field.

in	tel. Inte							
System	Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	🔇 Logout 🕝 Refresh 💡 Help 🚹 Abou
		ᅌ Summary	,					
System I	nformation	KCS Policy	Control Mode is F	Provisioning Th	nis satting is intand	ed for BMC prov	isioning and is	considered insecure for deployment
System C	omponents	Summa	ry	Tovisioning. T	is setting is intend	ed for blie prov	isioning and is	
CPU Info	rmation	н	ost Power Status : Ho	ost is currently Of	N			
DIMM Infe	ormation	Advanced	e (BMC) Available : Ye	ctivated es				
NIC Inform	mation	-	BIOS ID : SE	E5C6301.86B.7627	.D12.2204111441			
NVMe Inf	ormation	BMC Firm	nware Build Time : Ma	ay 06 2022 07:36:3	5 UTC			
Storage I	nformation	Baci	kup BMC FW Rev : 1.0	03-00000009				
Current U	Isers	Mgmt Eng	jine (ME) FW Rev : 06	5P_VTP7 6.00.03.071.0				
		Baseboa	rd Serial Number :					
		Overa	all System Health : 🎈					
		Web Se	ssion Timeout	our v				
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Figure 7. System Information Page

Table 3. System Information Fields

Information	Details						
Host Power Status	Power status of the host (on/off).						
Advanced Management Key	Indicates whether the software license has been activated.						
Device (BMC) Available	Indicates whether the BMC is available for normal management tasks.						
BIOS ID	Major and minor revision of the BIOS.						
BMC FW Rev	Major and minor revision of the BMC firmware.						
BMC Firmware Build Time	The build date and time of the installed BMC firmware.						
Backup BMC FW Rev	Major and minor revision of the backup BMC firmware.						
CPLD FW Rev	Major and minor revision of the CPLD firmware.						
Mgmt Engine (ME) FW Rev	Major and minor revision of the Intel Management Engine firmware.						
Baseboard Serial Number	Serial number of the baseboard in the system.						
	A general indication of the system heath:						
Overall System Health	Left (green) = System ready LED						
	Center (amber) = System fault LED						
	Right (blue) = Chassis ID LED						

5.1.2 System Components

The System Components page displays BMC system component information for: chassis/Server board, power supply unit (PSU), hot-swap backplane (HSBP), riser card, and other miscellaneous devices configured within the system. Information for each device includes: part number, serial number, manufacturer, model, type part. See Figure 8 for details.

intel.Inte	egrated BMC Web Console			
System Server Health	Configuration Remote Control Virtual Media	Server Diagnostics Miscellaneous	Storage	SLogout SRefresh SHelp 🖪 About
	System Components			
System Information				
System Components	Chassis/Baseboard:			
CPU Information	FCP_Baseboard			
DIMM Information	Chassis Part Number:			
NIC Information	Board Part Number:			
NVMe Information	Board Serial Number:			
Storage Information	Product Part Number:			
Current Users	Manufacturer: Intel Corporation			
	Model: M50FCP			
	Type: RackMount			
	PSU: Solum 1300W PSU1 Part Number: H70286-010 Serial Number: CNS1322A4AM4T0552 Mandaturer: SOLUM CO., LTD Model: PSSF132202A Type: PowerSupply		Solum 1300W PSU2 Part Number: FN3282-010 Serial Number: CN3322A4A4T0525 Mauriceure: SoLUM CO., LTD. Model: PSSF13232A Type: PowerSupply	
	HSBP:			
	FCP1U4X25_HSBP			
	Part Number: K48141-450 Serial Number: BOKV12203352			
	Manufacturer: Intel Corporation			
	Model: CYPHSBP1204			
	Type: RackMount			
	Misc:			-
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Figure 8. System Components Page

5.1.3 CPU Information

The CPU Information page shows data for each processor installed on the host system. This information includes: socket designation, manufacturer, version, processor signature, processor type, family, speed, number of cores, voltage, socket type, status, serial number, asset tag, and part number.



Figure 9. System CPU Information Page

5.1.4 DIMM Information

The DIMM Information page displays information for DIMMs installed in the host system. The DIMM information includes slot number, size, memory type, speed, manufacturer, asset tag, also memory serial and part numbers.

intel. Inte	egrated Bl	MC Web C	onsole		_				
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage			🔇 Logout 😋 Refresh 😮 Help 🚺 Abou
System Information	DIMM Info	rmation							Number of system DIMM-12
System Components	Slot Numb		-	Tuno	Speed 4	Manufacturor	Accet Tag	Social Number	Part Number of System Divin.32
CDU latamatica	CPU0 DIM	A1 32	.0GB	DDR5	4400	Samsung	012216	02DFC02B	M321R4GA3BB6-CQKEG
CPU Information	CPU0 DIM	- / A2 32	0GB	DDR5	4400	Samsung	012216	02DEBAAE	M321R4GA3BB6-COKEG
DIMM Information	CPU0 DIM	vi F1 32	.0GB	DDR5	4400	Samsung	012216	02DFBD7B	M321R4GA3BB6-CQKEG
NIC Information	CPU0 DIM		.0GB	DDR5	4400	Samsung	012216	02DFBEC1	M321R4GA3BB6-CQKEG
	CPU0 DIM		.0GB	DDR5	4400	Samsung	012216	02DFBAC8	M321R4GA3BB6-CQKEG
NVMe Information	CPU0 DIM	/ G2 32	0GB	DDR5	4400	Samsung	012216	02DFBB3A	M321R4GA3BB6-CQKEG
Storage Information	CPU0 DIM	_ // H1 32	0GB	DDR5	4400	Samsung	012216	02DFBC1D	M321R4GA3BB6-CQKEG
Current Users	CPU0_DIM	_ /_H2 32	OGB	DDR5	4400	Samsung	012216	02DFC075	M321R4GA3BB6-CQKEG
	CPU1_DIM		0GB	DDR5	4400	Samsung	012216	02DFBDE7	M321R4GA3BB6-CQKEG
	CPU1 DIM	/I A2 32	0GB	DDR5	4400	Samsung	012216	02DFBBE8	M321R4GA3BB6-CQKEG
	CPU1_DIM	/_B1 32	0GB	DDR5	4400	Samsung	012216	02DFBDFB	M321R4GA3BB6-CQKEG
	CPU1_DIM	/_B2 32	0GB	DDR5	4400	Samsung	012216	02DFBCA6	M321R4GA3BB6-CQKEG
	CPU0_DIM	/L_B1 32	0GB	DDR5	4400	Samsung	012216	02DFBA60	M321R4GA3BB6-CQKEG
	CPU1_DIMM	/_C1 32	0GB	DDR5	4400	Samsung	012216	02DFBB27	M321R4GA3BB6-CQKEG
	CPU1_DIMM	4_C2 32	0GB	DDR5	4400	Samsung	012216	02DFC030	M321R4GA3BB6-CQKEG
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5.1.5 NIC Information

The NIC Information page displays information for Networking add-in cards installed in the host system. This data includes PCI class code, slot number, vendor ID, device ID, current speed (in Mb per second), portIdx, media state, media access controller address (MAC address), firmware version.

intel. Inte	Intel Integrated BMC Web Console												
System Server Health	Configuration	Remote Control Virtual Media	Server Diagnostics	Miscellaneous	Storage			🔇 Logout 🔇	Refresh 😮 Help 🚯 About				
	SNIC Infor	mation											
System Information	•	indion .											
System Components	PCI Class	Code Slot Number	Vendor ID 🔹	Device ID	Current Speed (Mbps)	Portidx =	Media State 🔹	MAC Address	Firmware Version				
CPI Unformation	2	259	8086h	1572h	8000	2	Not Connected	68:05:ca:b1:ad:34	1.2585.0				
	2	785	15b3h	101bh	16000	4	Not Connected	0c:42:a1:95:03:60	20.31.10.14				
DIMM Information	2	785	15b3h	101bh	16000	1	Not Connected	0c:42:a1:95:03:61	20.31.10.14				
NIC Information													
NVMe Information													
Storage Information													
Current Users													
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Figure 11. System NIC Information Page

5.1.6 NVMe* Information

The NVMe Information page displays status information for each NVMe drive installed onto a backplane. Each group box displayed contains statistics for a single NVMe drive. The group box identifies the drive by HSBP number, and by drive slot number.

intel.Inte	egrated BMC Web Co	onsole			
System Server Health	Configuration Remote Control	Virtual Media Server Di	agnostics Miscellaneous	Storage	🔇 Logout 😮 Refresh 😮 Help 🕕 About
System Information	NVMe Solid State Drive	e State			_
System Components	Model:		Serial Number:		
CPU Information	PCle 0 Link Speed:	PCIe Gen 3	PCIe 0 Link Width:	PCle x4	
DIMM Information	PCle 1 Link Speed:	Unknown	PCle 1 Link Width:	PCIe x2	
NIC Information	NVMe Powered:	On	NVMe Functional:	Functional	
NVMs Information	NVMe Reset Required:	No Reset Required	Port 0 PCle Link Active	: PCle Link Up	
NVMe information	Device Class:	Mass Storage Device	Device Sub-class:	Non-volatile Memory Controller	
Storage Information	Port 1 PCIe Link Active:	PCIe Link Down	Manufacturer:	0.76	
Current Users	Device Location:	M2 SSD2	Firmware revision:	E1MU23BC	
	NVMe Information—				_
	Model:	INTEL SSDPF2KX038TZO	Serial Number:	PHAC110400AU3P8AGN	
	PCIe 0 Link Speed:	PCIe Gen 4	PCle 0 Link Width:	PCIe x4	
	PCle 1 Link Speed:	InActive	PCle 1 Link Width:	InActive	
	NVMe Powered:	On	NVMe Functional:	Functional	
	NVMe Reset Required:	No Reset Required	Port 0 PCIe Link Active	: PCle Link Up	
	Device Class:	Mass Storage Device	Device Sub-class:	Non-volatile Memory Controller	
	Device Programming Infe	NVMe Programming Interface Dolla Link Dawa	Drive Life Consumed:	0 %	
	Port 1 PCIe Link Active:	HERP1 SED1	Manufacturer:	INTEL ICV40200	
	Device Editation.	H3BF 1 33D 1	Filliware revision.	36 1 1 2 0 0	
					•
	Intel Companying All Dialete Deserved				
Copyrigm © 2016-2022 - I	inter Corporation. All Rights Reserved.				

Figure 12. System NVMe* Information Page

5.1.7 Storage Information

The Storage Information page displays information of storage devices installed in the host system. This information includes port destination, device index, connector type, protocol, device type, capacity (in GB), RPM, model, serial, PCI class code, vendor ID, device ID, firmware version.

			onsole							44	Y	H	<u>a</u> df
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnos	tics Miscel	llaneous Stora	ge				C Logout	C Refresh	3 Help 🚯 About
	😌 Storage Ir	nformation											
System Information													
System Components												Number (Of System Storage
CPU Information	Port Destina SATA1 Po	tion Device Index nt 6 0xFF	Connector Typ SATA	e Protocol AHCI	Device Type SSD	Capacity (GB) 894 GB	• RPM 0	Model Micron 5300 MTEDDAV960TDS	Serial 222438E8A9BE	PCI Class Code 0x00	Vendor Id 0x00	Device Id 0x00	Firmware Versio D3MU001
DIMM Information	PCIe S0 B9	0 D0 0xFF	PCle	NVMe	SSD	3576 GB	0	SAMSUNG MZQL23T8HCLS-	S64HNE0R807140	0x01	0x144D	0xA80A	GDC5602Q
NIC Information	PCle S0 B9	1 D0 0xFF	PCle	NVMe	SSD	3576 GB	0	SAMSUNG MZQL23T8HCLS- 00A07	S64HNE0R807142	0x01	0x144D	0xA80A	GDC5602Q
NVMe Information													
Storage Information													
Current Users													
	•										_		•

Figure 13. System Storage Information Page

5.1.8 Current Users

The Current Users page displays the users currently logged in to the BMC through the embedded web server. This data includes the User Name, connection type, KVM in use or not, local image ½ in use, and the User IP address.

intel. Inte	egrated B	MC Web C	onsole				
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	🔇 Logout 🕒 Refresh 😮 Help 🚹 About
	😌 Current U	sers					
System Information							
System Components	Use	er Name	Туре	KVM	I In Use	Local Image 1/2 In Use	IP Address
CPU Information	deb	uguser	Web(HTTPS)		0	No / No	10.254.209.122
DIMM Information							
NIC Information							
NVMe Information							
Storage Information							
Current Users							
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Figure 14. System Current Users Page

5.2 Server Health Tab

The Server Health tab includes secondary page options to view the System Sensor Readings and System Event Log windows.

5.2.1 Sensor Readings

The Sensor Readings page displays information for all monitored system sensors, including: current sensor state, Sensor Name, Sensor Status, and Current sensor reading See Figure 15.

intel.Int	egrated BMC Web Console								
System Server Health	Configuration Remote Control Virtual Media	Server Diagnostics Miscellaneous Sto	orage	🚱 Logout 🕒 Refresh 💡 Help	About				
Sensor Readings	Sensor Readings								
Event Log	Select a sensor type category: All Sensors Auto Refresh(sec): 60			Sensor Readings: 58 se	ensors				
	Healthy Name		Status +	Reading 🔹					
	OK Exit Air Temp		Normal	NA	*				
	OK HSBP 1 Temp		Normal	25.625 °C					
	OK System Airflow		Normal	143.484 cft_i/min	- 1				
	OK P105 PCH AUX		Normal	1.052 Volts					
	OK P12V AUX		Normal	12.1756 Volts					
	OK P12V PSU		Normal	12.0802 Volts					
	OK P1V8 PCH		Normal	1.806 Volts					
	OK P3V3		Normal	3.2972 Volts					
	OK P3VBAT		Normal	3.05 Volts					
	OK P5V		Normal	4.9987 Volts					
	OK PVCCD HV CPU0		Normal	1.149 Volts					
	OK PVCCFA EHV CPU0		Normal	1.816 Volts					
	OK PVCCIN CPU0		Normal	1.833 Volts					
	OK PVCCINFAON CPU0		Normal	1.074 Volts					
	OK PVNN PCH AUX		Normal	0.903 Volts					
	OK Anar? Temp		Normal	-21 578 °C	*				
	Refresh Show Thresholds								
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Figure 15. Server Health Sensor Readings Page (Thresholds Not Displayed)

Selecting the "**Show Thresholds**" button on the bottom of the windows will add the programmed threshold information for all monitored sensors to the table (See Figure 16).

intel. Int	egrated B	MC Web (Console								15-1		
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage					(Logout 🖸 Refres	h 😮 Help 🚯 About
Sensor Readings	Sensor R	Readings											
Event Log	Select a sens Auto Refresh	sor type category:	All Sensors 🗸									Sensor De	adings: 58 sensors
	Healthy	Na	ma .	Statue	Peading	*		ow NP -	Low CT	Low NC	High NC .	High CT	High ND
	OK	Exit A	ir Temp	Normal	NA	•	-	N/A	0	5	80	85	N/A 🔺
	ОК	HSBP	1 Temp	Normal	25.625 °C	;		N/A	0	5	100	105	N/A
	ОК	Syster	n Airflow	Normal	143.484 (:ft_i/min		N/A	N/A	N/A	N/A	N/A	N/A
	OK	P105 F	CHAUX	Normal	1.052 Vol	ts		N/A	0.966	0.986	1.114	1.134	N/A
	OK	P12	/ AUX	Normal	12.1756	/olts		N/A	10.8	10.956	13.088	13.4	N/A
	OK	P12	/ PSU	Normal	12.0802	/olts		N/A	10.8	10.956	13.088	13.4	N/A
	OK	P1V	8 PCH	Normal	1.806 Vol	ts		N/A	1.692	1.712	1.87	1.89	N/A
	ОК	P	3V3	Normal	3.2972 V	olts		N/A	2.97	3.048	3.444	3.6	N/A
	ОК	P31	/BAT	Normal	3.05 Volts	i		N/A	2.1	2.412	3.111	3.15	N/A
	OK	F	5V	Normal	4.9987 V	olts		N/A	4.5	4.656	5.222	5.3	N/A
	OK	PVCCD	HV CPU0	Normal	1.149 Vol	ts		N/A	1.04	1.06	1.195	1.239	N/A
	OK	PVCCFA	EHV CPU0	Normal	1.816 Vol	ts		N/A	1.7	1.72	1.898	1.928	N/A
	OK	PVCC	N CPU0	Normal	1.833 Vol	ts		N/A	1.393	1.549	2.006	2.104	N/A
	OK	PVCCINF	AON CPU0	Normal	1.074 Vol	ts		N/A	0.9	0.92	1.139	1.164	N/A
	OK	PVNN I	PCHAUX	Normal	0.903 Vol	ts		N/A	0.837	0.847	0.934	0.954	N/A
	OK	Anar	Temn	Normal	-21 578 °	n.		N/A	N/A	N/A	N/A	N/A	Ν/Δ
	Refresh	Hide Thresholds											
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Figure 16. Server Health Sensor Readings Page (Thresholds Displayed)

Table 4 lists the options available in this page

Option	Task
Select a sensor type category	Select the sensor type category to display in the list. The default is to display all sensors.
Auto Refresh (sec)	Select the time (in seconds) to wait between sensor reading updates. Choose 5, 10, 15, 30, 60, 150, 300, or never. The default refresh time is 60 seconds.
Refresh	Click to refresh the selected sensor readings.
Show Thresholds	Click to show the supported threshold assignments: low and high, critical (CT), non-critical (NC) and non-recoverable (NR).
Hide Thresholds	Click to return to the original display, hiding the threshold values.

Table 4. Server Health Sensor Readings Options

Selecting a specific sensor from the table will display a new page showing its readings for a specified time interval (See Figure 17). The default time interval is 60 seconds, but can be changed to a different value using the "**History Interval(sec)**" drop down box.



Figure 17. Server History & Live Reading

Table 4 lists the options available on this page.

Table 5. Server history & Live Reading Options

Option	Task
Back	Back to sensor reading page.
History Interval (sec)	Select the time (in seconds) to set history interval show in figure. Choose 5, 10, 30, 60. The default value is 60 seconds.

5.2.2 Event Log

The Event Log page displays systems events reported by the BMC and saved into a server management event log (See Figure 18). Selecting the "**Save Event Log**" button will copy the contents of the event log to a file using a JSON format.

System Server He	Ith Configuration	Remote Control	Virtual Media	Server Diagnostics Miscellaneous Storage	🔇 Logout 😋 Refresh 😮 Help 🚯 Ab
	ᅌ Event Log				
Sensor Readings					
Event Log	Severity catego	ry: al	Critical		
			1	lumber of entries per page 50 v << < 1 / 23 > >>	Total Event Log: 1117 event entr
	Timestamp	00-01-05+00-00	Severity =	Description +	
	1970-01-011	0.01.05+00.00	Informational	Power supply PS12 inserted	
	1970-01-011	0:00:46+00:00	Informational	Power supply PSE inserted	
	1970-01-011	0:00:44+00:00	Informational	CPU 1 Missing	
	1970-01-011	0:00:44+00:00	Informational	CPU 0 Presence	
	1970-01-01T	00:00:42+00:00	Critical	User root is enabled.	
	1970-01-01T	00:00:41+00:00	Informational	PSSF162205A PowerSupply with serial number CNS1625A4BM831126 was installed.	
	1970-01-01T	00:00:41+00:00	Informational	M50FCP Board with serial number was installed.	
	1970-01-01T	00:00:41+00:00	Informational	PSSF162205A PowerSupply with serial number CNS1625A4BI/831127 was installed.	
	1970-01-01T	00:00:35+00:00	Informational	Service phosphor-ipmi-net@eth1.service has exited unsuccessfully.	
	1970-01-01T	00:00:34+00:00	Informational	Service phosphor-ipmi-net@eth1.service has exited unsuccessfully.	
	1970-01-01T	00:00:33+00:00	Informational	Interface eth0 link status becomes linkUp.	
	1970-01-01T	00:00:25+00:00	Informational	The system interface is in the Provisioning state.	
	1970-01-01T	00:00:21+00:00	Informational	Power restore policy applied.	
	1970-01-01T	00:00:16+00:00	Informational	OCP NIC card Missing.	
	2022_04_29T	22-17-12+00-00	Informational vent Log Refre	RMC firmware undate to version 1 08 0000001 staned successfully	

Figure 18. Server Health Event Log Page

Table 6 lists the options available in this page.

Table 6. Server Health Event Log Options

Option	Task
Severity category	Select the severity of events to display in the list. Choose informational, warning, or critical.
Number of entries per page	Specify how many events are displayed per page.
Page selection	Navigate to other pages of recorded events. The selections are first page, previous page, next page, and last page.
Clear Event Log	Clear the event log.
Save Event Log	Save the event log to file.
Refresh Event Log	Refresh the event log.

5.3 Configuration Tab

The Configuration tab provides access to secondary page options used to configure various server management features, including: Email Alert, IPv4 and IPv6 networks, VLAN, NTP settings, installing an advanced system management key, SSL certification, users, security settings, sensor customization, system firmware update, system log server configuration, and thermal customization. The following sub-sections provides an overview for each management feature page.

5.3.1 Email Alert

The Email Alert page is used to identify system events that should trigger an alert and set the destination to send the alert. Up to two destinations can be selected for each LAN channel (See Figure 19).

intel. Inte	grated BMC Web Console
System Server Health	Configuration Remote Control Virtual Media Server Diagnostics Miscellaneous Storage
Email Alert	Alert Email Settings
IPv4 Network	SMTP settings
IPv6 Network	Enable
VLAN	SMTP Server IP:
NTP Settings	SMTP Server Port: 25
Advanced System Management Key	Sender Email Address:
SSL Certification	
Users	Select the events that will trigger alerts
Security Settings	Temperature Sensor Out of Range Voltage Sensor Out of Range
Sensor Customization	Fan Failure Power Supply Failure
BMC Firmware Update	PSU Redundancy Failure System Restart Processor Diamond Therm Trip
BIOS/IEWI Eirmware	Uncorrectable and Correctable Memory Errors CPU Error
Update	
CPLD Update	Check All Clear All
Syslog Server	
Configuration	Alert Destination #1
Thermal Customization	Send Email to:
	Alert Destination #2
	Send Empilier
	Save Send Test Alert

Figure 19. Alerts Page

Table 7 provides a descriptive overview for each configurable page option.

Table 7. Alerts Options

Option	Task
Enable	Enable/Disable SMTP Configuration, default value is unchecked, need to click save button to keep changes.
	The IP address of the remote SMTP Mailserver that the Alert email should be sent to, supports host name.
SMTP Server IP	 The IP address is made of four numbers separated by dots as in "xxx.xxx.xxx". 'xxx' ranges from 0 to 255. The first 'xxx' must not be 0.
SMTP Server Port	The IP port number for which the remote SMTP Mailserver is listening. The default port is 25.
Sender Email Address	The Sender address string is to be put in the "From:" field of outgoing Alert emails. The string should be of the form user@host.domain.tld.
Select the events that will trigger alerts	An alert will be triggered for each selected event.
Check All	Click this option or select all listed events
Clear All	Click this option to clear all listed events
Alert Destination #1/#2	Enter the email address that the alert is to be sent to. Up to two destinations can be selected for each LAN channel.

Integrated BMC Web Console User Guide for Intel® Server M50FCP and D50DNP Families

Option	Task
Save	Click to save any changes made.
Send Test Alerts	Click this option to send a simple test alert message to the configured destination(s).

5.3.2 IPv4 Network

The IPv4 Network page is used to configure the IPv4 network settings for the server management LAN interface to the BMC controller. The page includes options to automatically configure the IP address using DHCP (See Figure 20) or to manually enter a static IP Address by entering the required information into the specified fields (See Figure 21).

intel. Inte	egrated BMC We	b Console				
System Server Health	Configuration Remote Co	ontrol Virtual Media	Server Diagnostics	Miscellaneous	Storage	🚱 Logout 🕞 Refresh 💡 Help 🕦 About
Email Alert	IPv4 Network Setting	ngs				
IPv4 Network						
IPv6 Network	Hostname	bmc-maca4bf0191f475				
VLAN	MAC Address	eth0 ~				
NTP Settings	IPMI Channel	3				
Advanced System	NIC Description	Dedicated				
Management Key	Link Status	UP				
SSL Certification	Obtain an IP address at	utomatically (use DHCP)				
Users	Use the following IP add	dress				
Security Settings	IP Address	10.239.46.29				
Sensor Customization	Subnet Mask	255.255.255.0				
BMC Firmware Update	Gateway	10.239.46.241				
BIOS/IFWI Firmware	Primary DNS Server	10.248.2.5				
Update	Secondary DNS Server	10.239.27.228				
CPLD Update	Save					
Syslog Server Configuration						
Thermal Customization						
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Figure 20. IPV4 Network DHCP Page

intel. Inte	egrated BMC	Web Co	nsole				
System Server Health	Configuration Ren	note Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	SLogout SRefresh SHelp 1 About
Email Alert	IPv4 Network	Settings					
IPv4 Network							
IPv6 Network	Hostname	bmc-r	maca4bf0191f4/5				
VLAN	MAC Address	a4:bf	∑ :01:91:f4:75				
NTP Settings	IPMI Channel	3					
Advanced System Management Key	NIC Description Link Status	Dedic UP	ated				
SSL Certification	O Obtain an IP add	dress automatic	ally (use DHCP)				
Users	Use the followin	g IP address		_			
Security Settings	IP Address	10.23	9.46.30				
Sensor Customization	Subnet Mask	255.2	55.255.0				
BMC Firmware Update	Gateway	10.23	9.46.241				
BIOS/IFWI Firmware	Primary DNS Server	10.24	8.2.5				
Update	Secondary DNS Ser	ver 10.23	9.27.228				
CPLD Update	Save						
Syslog Server Configuration							
Thermal Customization							
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Figure 21. IPv4 Network Static Page

WARNING: Each network controller must be on a different subnet than all other controllers used for management traffic.

Table 8 provides a description for all configurable features and input buttons found on the page.

Table 8. IPv4 Network Settings Options

Option	Task
Host Name	The hostname is an RFC-1123-compliant string with less than 64 alphanumeric characters. Hyphen characters are allowed as long as the hyphen is not the first or final character in the hostname. The default value is "BMC" + MAC address.
Interface	Select the channel on which to configure the network settings. Lists the LAN channels available for server management. The LAN channels describe the physical NIC connection on the server. All channels are onboard NICs. The Baseboard Mgmt channel is a shared NIC configured for management and shared with the operating system.
MAC Address	The MAC address of the device (read only).
IPMI Channel	IPMI channel number (read only).
NIC Description	NIC dedicated to the BMC / host or shared between the host and BMC of LAN channel(s) (read only).
Link Status	NIC link status of LAN channel(s) (read only).
Obtain an IP address automatically (use DHCP)	Select the option to enable the IPv4 DHCP. IP Address, Subnet Mask, Gateway, and DNS Server input fields are disabled if the "Obtain an IP address automatically (use DHCP)" option is selected.
Use the following IP address	Select the option to configure the static IPv4 address. IP Address, Subnet Mask, Gateway, and DNS Server input fields are enabled to configure if the "Use the following IP address" option is selected.
	If configuring a static IP, enter an IP address for this channel.
IP Address	 The IP address is made of four numbers separated by dots as in "xxx.xxx.xxx.xxx". 'xxx' ranges from 0 to 255. The first 'xxx' must not be 0.
Subnet Mask	If configuring a static IP, enter the subnet mask of the device.
Gateway	If configuring a static IP, enter the gateway of the device.
Primary DNS Server	If configuring a static IP, enter the primary DNS server of the device.
Secondary DNS Server	If configuring a static IP, enter the secondary DNS server of the device.
Save	Click to save any changes made.

5.3.3 IPv6 Network

The IPv6 Network page is used to configure the IPv4 network settings for the server management LAN interface to the BMC controller (See Figure 22).

intel. Inte	egrated BMC V	Veb Console				
System Server Health	Configuration Remo	te Control Virtual Media	Server Diagnostics	Miscellaneous	Storage	😮 Logout 🕑 Refresh 😮 Help 🕕 About
Email Alert	IPv6 Network S	Settings				
IPv4 Network	-					
IPv6 Network	MAC Address	eth0 ∽ a4:bf:01:91:f4:75				
VLAN	IPMI Channel	3				
NTP Settings	NIC Description	Dedicated				
Advanced System Management Key	Link Status Obtain an IP addre	UP ess automatically (use DHCPv6/	SLAAC)			
SSL Certification	O Use the following I	Paddress				
Users	IP Address					
Security Settings	Prefix Length					
Sensor Customization	Gateway					
BMC Firmware Update	Primary DNS Server					
BIOS/IFWI Firmware Update	Secondary DNS Server	r				
CPLD Update						
Syslog Server Configuration						
Thermal Customization						
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Figure 22. IPv6 Network Page

WARNING: Each network controller must be on a different subnet than all other controllers used for management traffic.

Table 9 provides a description for all configurable features and input buttons found on the page.

Option	Task
Interface	Select the channel on which to configure the network settings. Lists the LAN Channels available for server management. The LAN channels describe the physical NIC connection on the server. All channels are onboard NICs. The Baseboard Mgmt channel is a shared NIC configured for management and shared with the operating system.
MAC Address	The MAC address of the device (read only).
IPMI Channel	IPMI channel number (read only).
NIC Description	NIC dedicated to the BMC / host or shared between the host and BMC of LAN channel(s) (read only).
Link Status	NIC link status of LAN channel(s) (read only).
Obtain an IP address automatically (use DHCP)	Select the option to enable the IPv6 DHCP. IP Address, Prefix, Gateway, and DNS Server input fields are disabled if the "Obtain an IP address automatically (use DHCPv6/SLAAC)" option is selected.
Use the following IP address	Select the option to configure the static IPv6 address. IP Address, Prefix length, Gateway, and DNS Server input fields are enabled to configure if the "Use the following IP address" option is selected.
	If configuring a static IP, enter an IP address for this channel.
IP Address	 IPv6 addresses consist of eight 4-digit hexadecimal numbers separated by colons. A "::" can be used for a single sequence of two or more zero fields.
Prefix Length	If configuring a static IP, enter the routing prefix length.
Gateway	If configuring a static IP, enter the gateway of the device.
Primary DNS Server	If configuring a static IP, enter the primary DNS server of the device.
Secondary DNS Server	If configuring a static IP, enter the secondary DNS server of the device.
Save	Click to save any changes made.

Table 9. IPv6 Network Settings Options

5.3.4 VLAN

The VLAN settings page is used to enable and configure the 802.1Q VLAN private network settings on the selected server management Physical Interface (See Figure 23).

System Sever Head Configuration Rencis Configuration Maccelaneous Strage O Loguet O Refresh O Head O Head O Refresh O Refresh O Head O Refresh O Refresh<	intel. Inte	egrated Bl	MC Web C	onsole				
Email Aird IPv4 Network IPv4 Network VLAN Lis: VLAN VLAN NTP Settings Advanady System Management Kystem SSL Certification VLAN ID Security Settings Security Sett	System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	G Logout G Refresh 😮 Help 🚯 About
IPv6 Network Physical Interface IPv6 Network VLAN tis VLAN ven0_1 I NTP Settings Advanced System Nanagement Key SSL Certification VLAN ID Security Settings Security Settings Security Settings BIOS/IFV/ Firmware Update Style Gustomization Thrmal Customization	Email Alert	VLAN Se	ttings					
Pv6 Network VLAN is: VLAN ^{VLAN 0} ^{eth0_1} ¹ ^{Imback} ^{VLAN 0} ^{eth0_1} ^{Imback} ^{Imback} ^{VLAN 10} ^{Imbackk} ^{VLAN 10} ^{Imbackk} ^{VLAN 10} ^{Imbackk} ^{VLAN 10} ^{Imbackk} ^{VLAN 10} ^{Imbackkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkkk}	IPv4 Network	Physical Inter	face	eth0 🗸				
VLAN Impact of the set of	IPv6 Network	VLAN List	Inclusion and a state	MAND				
NTP Settings Advanced System Management Key SSL Certification Users Security Settings Sensor Customization BMC Firmware Update BIOS/IFWI Firmware Update CPLD Update Syslog Server Configuration Thermal Customization	VLAN	e	th0_1	VLANID 1	Ē			
Advanced System Management Key SSL Certification VLAN ID Users Add Security Settings Sensor Customization BIOS/IFWI Firmware Update Syslog Server Configuration Thermal Customization	NTP Settings							
SSL Certification VLAN ID Users Add Security Settings Sensor Customization BMC Firmware Update BIOSIFWI Firmware Update CPLD Update Systog Server Configuration Thermal Customization	Advanced System Management Key							
Add Security Settings Sensor Customization BMC Firmware Update BIOSIFWIF Firmware Update Systog Saver Configuration Thermal Customization	SSL Certification	VLAN ID						
Security Settings Sensor Customization BMC Firmware Update BIOSITWI Firmware Update CPLD Update Syslog Server Configuration Thermal Customization	Users	Add						
Sensor Customization BMC Firmware Update BIOSIFWI Firmware Update CPLD Update Syslog Server Configuration Thermal Customization	Security Settings							
BMC Firmware Update BIOSIFWI Firmware Update CPLD Update Syslog Server Configuration Thermal Customization	Sensor Customization							
BIOS/IFWI Firmware Update CPLD Update Syslog Server Configuration Thermal Customization	BMC Firmware Update							
CPLD Update Syslog Server Configuration Thermal Customization	BIOS/IFWI Firmware Update							
Syslog Server Configuration Thermal Customization	CPLD Update							
	Syslog Server Configuration							
	Thermal Customization							
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Figure 23. VLAN Settings Page

Table 10 provides a description for all configurable features and input buttons found on the page.

Option	Task
Physical Interface	Select the channel on which to configure the network settings. Lists the LAN channels available for server management. The LAN channel describes the physical NIC connection on the server. All channels are onboard NICs.
VLAN ID	Specify the VLAN ID to use. Values are from 1 to 4094. Only one ID can be used at a time.
Add	Click to add a new VLAN.
Delete	Click to delete a VALN.

Table 10. VLAN Settings Options

5.3.5 NTP – Network Time Protocol

The NTP Settings page is used to change the devices current date and time settings. This page can be used to configure either date and time or the NTP server settings for the device. See Figure 24 for details.

intel.Inte	grated BMC Web Console	
System Server Health	Configuration Remote Control Virtual Media Server Diagnostics Miscellaneous Storage	🚱 Logout 🕞 Refresh 😮 Help 🚹 About
Email Alert	NTP Settings	
IPv4 Network	15:2:43	
IPv6 Network	2022 / 12 / 8 Thursday	
VLAN	Timezone: GMT+00:00 Casabianca/London	
NTP Settings		
Advanced System Management Key	Secondary NTP Server:	
SSL Certification	Automatically synchronize Date & Time with NTP Server	
Users	C - ON REPORTE VOIT ★ U ★ C + Salo Descas Administrativa (SALE), SALES 2.	
Security Settings	Refresh Save	
Sensor Customization		
BMC Firmware Update		
BIOS/IFWI Firmware Update		
CPLD Update		
Syslog Server Configuration		
Thermal Customization		
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Figure 24. NTP Settings Page

Table 11 provides a description for all configurable features and input buttons found on the page.

Table 11. Date and Time Options

Option	Task
Timezone	Time zone contains the UTC offsets for NTP server, which can be used to display the exact local time.
	Specify the primary NTP servers for the device. NTP server fields support the following:
Primary NTP Server	• IP address (both IPv4 and IPv6 format).
· · · · · · · · · · · · · · · · · · ·	FQDN (fully qualified domain name) format.
	 FQDN value ranges from 1 to 128 alphanumeric characters.
	Specify the secondary NTP servers for the device. NTP server fields support the following:
Secondary NTP Server	• IP address (both IPv4 and IPv6 format).
Secondary NTP Server	FQDN format.
	• FQDN value ranges from 1 to 128 alphanumeric characters.
Automatically synchronize	Check this option to automatically synchronize date and time with the NTP server.
Refresh	Reload the current date and time settings.
Save	Click to save any changes made.

Notes:

- Secondary NTP server is an optional field. If the primary NTP server is unavailable or not working, then the secondary NTP server is tried.
- Once the NTP settings configuration is saved successfully, then the system automatically re-directs the user to the web login page.

5.3.6 Advanced System Management Key

The Advanced System Management Key page is used to upload a new advanced system management key and show the current activated features (See Figure 25).

int	el. Inte	egrated Bl	MC Web Co	onsole				
System	Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	🚱 Logout 🕝 Refresh 😮 Help 🚹 About
Email Alert IPv4 Netwo IPv6 Netwo VLAN	t ork ork	 Advanced Use this page to Key Upload Last Update Drop a file on 	System Mana o upload new key to d Time : o this page Ch	gement Key activate advance	d system manageme chosen	nt features		
Advanced Managem	ngs I System ent Key	or select Cho Browse	ose File /	pload				
SSL Certifi	ication	- Activated I	Features				_	
Users		Activated						
Security Se	ettings	BMC Virtual	Media NOT Activ	vated				
Sensor Cu	stomization	Active Direct	tory NOT Activate	ed				
BMC Firm	ware Update	Out-of-band	Hardware RAID N	Management NO	T Activated			
BIOS/IFWI Update	I Firmware							
CPLD Upd	late							
Syslog Ser Configurati	rver ion							
Thermal C	ustomization							
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Figure 25. Advanced System Management Key Page (uninstalled)

Table 12 provides a description for all configurable features and input buttons found on the page.

	Table 12. Advanced System Management Key Options
Option	Task
Last Upload Time	Show the last time that the advanced system management key was uploaded (read only).
Choose File	Choose the file to upload.
Upload	Upload the advanced system management key to the BMC for the update to start.
Activated Features	Lists the activation status of the advanced functions before and after the advanced system management key is uploaded.

For more information see Appendix A Advanced Management License Key – Order, Registration, and Installation.

Once the Advanced System Management key is installed, it will show as "**Activated**" on the information screen of the **System** tab (See Figure 26).

intel. Inte	grated BMC Web	Console							F
System Server Health	Configuration Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage			Cologout ORefresh O Hel	p 🚯 About
	Summary								
System Information	KCS Policy Control Mode	s Provisionina. Tl	his setting is intende	ed for BMC provi	sioning and	l is considered i	insecure for deploymer	nt.	
System Components	Summary	jjj			g		7		
CPU Information	Host Power Status	Host is currently ON							
DIMM Information	Advanced Management Key Device (BMC) Available	: Activated : Yes							
NIC Information	BIOS ID	SE5C7411.86B.9223	3.D02.2211231353						
NVMe Information	BMC Firmware Build Time	: Nov 23 2022 19:41:2	-6260000 28 UTC						
Storage Information	Backup BMC FW Rev	egs-1.04-0-0000							
Current Users	Mgmt Engine (ME) FW Rev	:06.00.03.273.0							
	Baseboard Serial Number	: BQFX22100083							
	Overall System Health	: 💗 🛑 🔵							
	Web Session Timeo	ut					7		
		so minutes 🗸							
		30 Minutes 💙							

Figure 26. Advanced System Management Key Page (installed)

5.3.7 SSL Certification

This page is used to upload certificate to BMC, the certificates include server certificate and CA certificate. Server certificate can only be replaced, only one Server certificate at same time, deleting server certificate is not supported. CA certificate can be added and have multiple CA certificate at same time. See Figure 27, Figure 28 for details.

intel. Inte	egrated BMC Web Console	
System Server Health	Configuration Remote Control Virtual Media Server Diagnostics Miscellaneous Storage	🕲 Logout 🕲 Refresh 😮 Help 🕕 Al
Email Alert IPv4 Network IPv6 Network VLAN NTP Settings	Server Certificate Certification Valid From 2022-11-03 08 33:53+00:00 Certification Valid Until 2032-10-31 08:33:53+00:00 New SSL Certificate Choose File No file chosen New Private Key Choose File No file chosen	
Advanced System Management Key	Upload	
SSL Certification	S CA Certificate	
Users	Certificate Issued By Issued To Valid From Valid Until Delete	
Security Settings	TrustStore bmctest- bmctest- 2022-09-20 2027-09-20 Certificate CA CA 04:39:00+00:00 04:48:59+00:00	
Sensor Customization		
BMC Firmware Update		
BIOS/IFWI Firmware Update		
CPLD Update	Add New Certificate	
Syslog Server Configuration		
Thermal Customization	-	
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Figure 27. SSL Certification Page

intel.	tegrated BMC Web Console	1
System Server Health	Configuration Remote Control Virtual Media Server Diagnostics Miscellaneous Storage	
	Server Certificate	
Email Alert IPv4 Network IPv6 Network VLAN NTP Settings Advanced System Management Key SSL Certification	Certification Valid From 2022-11-03 08:33:53+00:00 Certification Valid Until 2032-10-31 08:33:53+00:00 New SSL Certificate Choose File No file chosen Choose File No file chosen Upload Ch Certificate Choose File	
- Certification	Certificate Issued By Issued To Valid From Valid Until Delete	
Security Settings	Certificate CA CA 04:39:00+00:00 04:48:59+00:00	
Sensor Customization		
BMC Firmware Update		
BIOS/IFWI Firmware Update	Add New Certificate	
CPLD Update		
Syslog Server Configuration	Choose Certificate Choose File No file chosen	
Thermal Customization	CA Upload	
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Figure 28. SSL Certification Page (Add New CA Certificate)

Table 13 provides a description for all configurable features and input buttons found on the page.

Option	Task
Choose File (New SSL Certificate)	Select SSL Certificate file to upload.
Choose File (New Private Key)	Select Private Key file to upload
Upload	Click to upload a new server certificate file to the BMC.
Add New Certificate	Click the Add New Certificate button to show the CA upload buttons.
Choose File (New CA Certificate file)	Select CA certificate file to upload.
CA Upload	Click to upload a new CA certificate file to the BMC.
Delete	Click the Delete button in the CA certificate table to delete the individual certificate.

Table 13. SSL Certificate Options

5.3.8 Users

The Users page lists all configured users. Information displayed for each User includes: User ID, User Name, User Status, and their Network Priviledge designation (See Figure 29).

intel. Inte	egrated BM	1C Web C	onsole						1
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage		G Logout G Refresh 😮 Help	About
Email Alert	User List							Number of configured u	sers: 2
IPv4 Network		User ID		Use	r Name 😑		User Status	Network Privilege	
IPv6 Network		2		f	fwupd		Enable	No Access	
VLAN		<u> </u>		é	admin ~		Enable	Administrator	
NTP Settings									
Advanced System Management Key									
SSL Certification									
Users									
Security Settings									
Sensor Customization									
BMC Firmware Update									
BIOS/IFWI Firmware Update									
CPLD Update	Add User	Modify User	Delete User						
Syslog Server Configuration									
Thermal Customization									
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Figure 29. User List Page

This page also provides the options to add, modify, and delete users.

To add a user, select the empty line in the list and click the "**Add User**" button. An Add New User page will open where the user information can be entered (See Figure 30).

int		egrated Bl	MC Web Co	onsole			
System	Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage
Email Aler	t	Add New	User				
IPv4 Netw	vork	Enter the int	formation for the new us	ser below and press A	Add. Press Cancel to return	to the user list.	
IPv6 Netw	vork						
VLAN		User Name					
NTP Settin	ngs	Password:					
Advanced Managem	System ent Key	Confirm Pass	word:				
SSL Certif	fication	Network Privil	reges: Administrato				
Users		Add	ancel				
Security S	ettings						
Sensor Cu	ustomization						
BMC Firm	ware Update						
BIOS/IFW Update	I Firmware						
CPLD Upo	date						
Syslog Se Configurat	tion						
Thermal C	Customization						
Convrig	nht © 2016-2022 -	Intel Corporation Al	Il Rights Reserved				

Figure 30. Add New User Page

To modify a user, select a user in the list and click the "**Modify User**" button. A Modify User page will open where the information of the selected user can be changed (See Figure 31).

intel.m	tegrated BMC I	Web Consc	ole		
System Server Health	Configuration Rem	ote Control Virtua	al Media Server Diagnostics	Miscellaneous Storage	🔇 Logout 😋 Refresh 😮 Help 🕕 About
Email Alert	Modify User				
IPv4 Network	User Name:	fwupd			
IPv6 Network	Change Password				
VLAN	Password:				
NTP Settings	Confirm Password:				
Advanced System Management Key	Network Privileges: User Enable:	No Access ~ Enable ~			
SSL Certification	Modify Canc	el			
Users					
Security Settings					
Sensor Customization					
BMC Firmware Update					
BIOS/IFWI Firmware Update					
CPLD Update					
Syslog Server Configuration					
Thermal Customization	_				
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Figure 31. Modify User Page

To delete a user, select the user in the list and click the "**Delete User**" button. A pop-up box will appear asking for confirmation to delete the selected user (See Figure 32).

intel. Integrated BMC Web Console									
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage			O Logout O Refresh O Help O About
Email Alert	\ominus User List								Number of configured users: 2
IPv4 Network		User ID		Use	er Name		User Status		Network Privilege
IPv6 Network		2			fwupd		Enable		No Access
VLAN		~			admin ~		Enable ~		~
NTP Settings									
Advanced System Management Key					Confirm?		×		
SSL Certification					Are you su	re to delete	e this		
Users					user?				
Security Settings									
Sensor Customization						Cancel	OK		
BMC Firmware Update									
BIOS/IFWI Firmware Update									
CPLD Update	Add User	Modify User	Delete User						
Syslog Server Configuration									
Thermal Customization									
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Figure 32. Delete User Page

5.3.9 Security Settings

The Security Settings page is used to view and modify the following security settings: KCS policy control mode, host interface, login attempt, port settings, password rules, and optional network services (See Figure 33).

ntel, Inte	grated BMC Web Cons	ole	
em Server Health	Configuration Remote Control Vie	al Media Server Diagnostics Miscellaneous Storage	O Logout O Refresh O He
	Security Settings		
il Alert	KCS Policy Control Mode is Provi	ioning. This setting is intended for BMC provisioning and is considered insecure for deployment.	
Network	KCS Policy Control Mode-		
Network	KCS Mode	Provisioning	
Settings	Host Interface		
ced System gement Key	noat interface		
ertification	Login Attempt		
	Failed Login Attempts	10	
ity Settings	User Lockout Time (sec)	300	
or Customization			
Firmware Update	Port Settings		
IFWI Firmware	HTTPS (Secure) Port	443	
e		2200	
Update	SOL SSH Port	2200	
g Server			
al Customization	Password Rules		
tai Customization	Complexity	Low 🗸	
	Password History		
	Optional Network Service		
	SOL SSH	Enable	
	IBMI over LAN		
		Liable	
	Remote Media	Z Enable	
	Save		
	al Companyian All Diable Deserved		

Figure 33. Configuration Security Settings Page

Table 14 provides a description for all configurable features and input buttons found on the page.

Table 14. Configuration Security Settings Options

Option	Task
	KCS policy control modes allow an authenticated BMC administrative user to control the level of protection from IPMI commands executed over the KCS channels. Within this generation of BMC firmware, three different KCS policy control modes are supported:
	• Provisioning – This configuration setting is intended for normal IPMI-compliant communications between the host operating system and the BMC. This mode should be used when provisioning the BMC configuration for deployment.
KCS Mode	 Provisioned Host Disabled – This configuration setting disables the IPMI KCS command interfaces between the host operating system and the BMC. This is a configuration that does not comply with IPMI and impacts the operation of the server management software running on the host operating system. This mode only applies to the IPMI commands over the KCS interfaces and does not apply to the authenticated network interfaces to the BMC. Provisioned Host Allowlist – This configuration setting enables the use of an access control list by the BMC firmware that allows applications executing on the host operating system to have access to a limited set of IPMI commands using the KCS interfaces. This is a configuration that does not comply with IPMI and may impact the operation of the server management software running on the host operating system. This mode only applies to the IPMI commands over the KCS interfaces and does not apply to the authenticated network interfaces to the BMC.
Host Interface	Enable/disable host interface for eth2.
Failed Login Attempts	Input the allowed number of failed login attempts. This is the number of failed login attempts a user is allowed before being locked out. Zero means no lockout. Failed login attempts should be from 0 to 255. The default is 3 attempts.
User Lockout Time (sec)	Set the time in seconds that the user is locked out before being allowed to log in again. Zero means that user lockout time is disabled. If a user is automatically disabled due to the bad password threshold, the user remains disabled until re-enabled via the Set User Access command. User lockout time should be from 0 to 65535 seconds. The default is 60 seconds.

Option	Task					
HTTPS (Secure) Port	Set the port used for HTTPS web sessions (default: 443). Changing this setting immediately terminates all current web sessions.					
SOL SSH Port	Set the port used for serial-over-LAN secure socket shell sessions.					
Complexity	Set complexity password level: medium, high, or low.					
Password History	For security considerations, the feature of password history (0–5) helps to avoid setting a password that is duplicate with one used earlier.					
SOL SSH	Enable/disable the SOL SSH service.					
IPMI over LAN	Enable/disable the RMCP/RMCP+ service.					
Remote Media Enable/disable the virtual media service.						
Save	Click to save any changes.					

5.3.9.1 Integrated BMC Web Console Access under KCS Provisioned Host Allowlist/Provisioned Host Disabled Modes

Access to most of the Integrated BMC Web Console contents is allowed across all KCS modes, except for Web Console page options that are limited to conditional access when the KCS mode is set to Provisioned Host Disabled mode or Provisioned Host Allowlist mode

KCS Policy Control Mode – Provisioned Host Disabled

This configuration setting disables the IPMI KCS command interfaces between the host operating system and the BMC. This is a configuration that is non-compliant with IPMI that impacts the operation of the server management software running on the host operating system. This only applies to the IPMI commands over the KCS interfaces and does not apply to the authenticated network interfaces to the BMC.

KCS Policy Control Mode – Provisioned Host Allowlist

This configuration setting enables the use of an access control list by the BMC firmware that allows applications executing on the host operating system to have access to a limited set of IPMI commands using the KCS interfaces. This is a configuration that is non-compliant with IPMI and may impact the operation of the server management software running on the host operating system.

- Server Power Control page Power On Server/Force-enter BIOS Setup option is grayed out when KCS = Provisioned Host Disabled.
- Server Power Control page Reset Server/Force-enter BIOS Setup option is grayed out when KCS = Provisioned Host Disabled.

intel. Inte	egrated E	BMC Web Co	onsole		_	
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	O Logout O Refresh O Help 1 About
KVM	Power (Control and State	us			
Server Power Control	Host is cu	irrently ON				
Launch SOL	Reset	Server				
Virtual Front Panel	- F	orce-enter BIOS Setup]			
	O Power	Off Server - Immediate				
	O Gracef	ul Shutdown				
	O Power	On Server				
	- F	orce-enter BIOS Setup]			
	O Power	Cycle Server				
	Perform	Action				
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Figure 34. Server Power Control Page

5.3.10 Sensor Customization

The Sensor Customization page is used to upload a sensor data repository (SDR) records file to the BMC. The file is used to load customized sensor information for both existing monitored sensors as well as sensors supported by third party add-in cards (See Figure 35).

	grated BMC W	leb Console				
System Server Health	Configuration Remot	te Control Virtual Media	Server Diagnostics	Miscellaneous	Storage	Cologout CoRefresh Co Help Co About
Email Alert	Sensor Customiz	zation sensor data repository rec	ords file			
IPv4 Network	- Sensor Customiz	ation				
IPv6 Network	Sensor Customization		la fila abasan			
VLAN	Sensor Customization	Choose File	to the chosen			
NTP Settings	Upload					
Advanced System Management Key						
SSL Certification						
Users						
Security Settings						
Sensor Customization						
BMC Firmware Update						
BIOS/IFWI Firmware Update						
CPLD Update						
Syslog Server Configuration						
Thermal Customization						
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Figure 35. Sensor Customization Page

Table 15 provides a description for all configurable features and input buttons found on the page.

Table 15. Sensor Customization Options

Option	Task			
Sensor Customization File	Click the Choose File button to select the sensor data record JSON file to upload.			
Upload	Click to upload file to the BMC.			

5.3.11 BMC Firmware Update

The BMC Firmware Update page is used to upload new BMC firmware images for an online-update of the BMC firmware (See Figure 36).

intel. Inte	egrated Bl	MC Web C	onsole					H
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	🕑 Logout	C Refresh
Email Alert IPv4 Network	BMC Firm Use this page to	ware Update	ware.					
IPv6 Network	BMC FW Rev	: e	gs-1.36-0-g6a925	4-c2bd0000				
VLAN	BMC Firmwar	e Build Time : N	lov 23 2022 19:4	1:28 UTC				
NTP Settings	BMC Lindete		Pacovoru Z P.	and Immediately				
Advanced System Management Key	Drop a file on	this page or	Choose File No	file chosen				
SSL Certification	select Choose	e File /	Upload					
Users	Browse							
Security Settings								
Sensor Customization								
BMC Firmware Update								
BIOS/IFWI Firmware Update								
CPLD Update								
Syslog Server Configuration								
Thermal Customization								
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Figure 36. BMC Firmware Update Page

After a BMC firmware file has been selected or dropped on to the page, and the "**Upload**" option has been selected, the BMC will begin the update process. An upload progress bar will appear on the page.

The update process can take several minutes to complete. When finished, the BMC will restart to run the new firmware version. Depending on if "Reset Immediately" is checked, BMC restart will happen immediately, or on next host DC cycle. Progress is reported up until the time of the restart, after which it takes a couple of minutes for the embedded web server to start responding again. All web sessions are terminated with a BMC restart. Users must log in again to verify that the firmware update was successful.

Table 16 provides a description for all configurable features and input buttons found on the page.

Option	Task					
BMC FW Rev	Displays the current firmware version (read only).					
BMC Firmware Build Time	Displays the firmware build time (read only).					
BMC Update Options	 Recovery Select this option to update both the primary and recovery regions of the BMC firmware. Reset Immediately Select this option to reset the system immediately after the firmware update has completed. 					
Drop a file on this page or select Browse	Use this option to browse for a file to upload or to drop a new firmware image on to the page.					
Upload	Upload the BMC firmware update image file to the BMC for the update to start.					

Table 16. BMC Firmware Update Options

Notes:

- By default, the BMC Update option "Reset Immediately" is unchecked, allowing other operations to be performed after the firmware image is uploaded successfully. With this option the system must be rebooted to load and check the new firmware.
- By selecting the "Reset Immediately" update option, the BMC will automatically reset and load the new firmware directly after the BMC updated has completed.

5.3.12 BIOS/IFWI Firmware Update

The BIOS/IFWI Firmware Update page is used to upload and update the BIOS/IFWI firmware (See Figure 37).

intel. Inte	egrated BN	1C Web Co	onsole				S- CEEF
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	🕲 Logout 🕑 Refresh 😮 Help 🌘
Email Alert	BIOS/IFWI	Firmware Up	date 'IFWI firmware				
IPv4 Network	BIOS/IFWI	Firmware Up	odate				
IPv6 Network	BIOS Rev :	S	E5C7411.86B.92	23.D02.2211231353	i		
NTP Settings	Mgmt Engine (ME) FW Rev: 00	6.00.03.273.0	set Immediately			
Advanced System Management Key			Choose File No 1	ile chosen			
SSL Certification	select Choose	File / Browse	Upload				
Users							
Security Settings							
Sensor Customization							
BMC Firmware Update							
BIOS/IFWI Firmware Update							
CPLD Update							
Syslog Server Configuration							
Thermal Customization							
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Figure 37. BIOS/IFWI Firmware Update Page

After a new image file as been selected or dropped onto the page, and the "**Upload**" button has been selected, the web service will begin the update process which may take several minutes to complete.

If the BIOS update option "Reset Immediately" is selected, the system will automatically reboot directly after the update process has completed. Login to the web console to verify that the BIOS/IFWI firmware update was successful.

If the BIOS update option "Reset Immediately" is not selected, the system must be manually rebooted after the update process has completed. . Login to the web console to verify that the BIOS/IFWI firmware update was successful

Table 17 provides a description for all configurable features and input buttons found on the page.

Option	Task					
BIOS Rev	Display the current BIOS version (read only).					
Mgmt Engine (ME) FW Rev	Display the current ME firmware version (read only).					
BIOS Update Option	 Recovery. Select this option so the backup region of the current BIOS is updated together. Reset Immediately. Select this option so the system resets immediately after the BIOS update is completed. 					
Drop a file on this page or select Browse	The option to select and upload or drop a new firmware image on the page.					
Upload	Upload the BIOS/IFWI firmware image file.					

Table 17. BIOS/ME Firmware Update Options

5.3.13 CPLD Update

The CPLD Update page is used to upload and update the new complex programmable logic device (CPLD) firmware (See Figure 38).

intel. Inte	grated BMC We	eb Console				
System Server Health	Configuration Remote 0	Control Virtual Media	Server Diagnostics	Miscellaneous	Storage	🔇 Logout 🕒 Refresh 😮 Help 🚯 About
System Server Health Email Alert IPv4 Network IPv6 Network VLAN NTP Settings Advanced System Management Key SSL Certification Users Security Settings Sensor Customization Evaluation Seture Se	Configuration Remote 6 CPLD Update Use this page to upload net CPLD Update CPLD FW Rev : CPLD Update Option : Drop a file on this page or select Choose File / Browse	Control Virtual Media w CPLD firmware FCP_v2p2 ○ Recovery S Reset I Choose File No file ch Upload	mmediately osen	Miscellaneous	Storage	Cogout CRefresh Pfelp About
BIOS/IFWI Firmware Opdate BIOS/IFWI Firmware Update CPLD Update Syslog Server Configuration						
Thermal Customization	ntel Corporation. All Rights Res	served.				

Figure 38. CPLD Update Page

When dropping a new CPLD firmware image on the page or selecting one to upload, the BMC begins its CPLD firmware image upload process, which takes a couple of minutes. A message is displayed after the firmware image is uploaded successfully.

If the CPLD update option is set to Reset Immediately", the system will reboot immediately after the firmware update process has completed. Log in to the web console to verify that the CPLD firmware update was successful.

If the CPLD update option "Reset Immediately" is not selected, then a manual system reboot (DC cycle) is required after the CPLD firmware update has completed. Log in to the web console to verify that the CPLD firmware update was successful.

Table 18 provides a description for all configurable features and input buttons found on the page.

Option	Task
CPLD FW Rev	Display the current firmware version (read only).
CPLD Update Option	 Recovery. Select this option so the backup region of the current CPLD is updated together. Reset Immediately. Select this option so the system resets immediately after the firmware update is completed.
Drop a file on this page or select Browse	The option to select and upload or drop a new firmware image on the page.
Upload	Upload the CPLD firmware update image file to the BMC for the update to start.

Table 18. CPLD Update Options

5.3.14 Syslog Server Configuration

Use the Syslog Server Configuration page to enable the Remote Syslog service or to configure the IP of the Syslog Server. This page allows logging of all logins to the BMC or any configurations to be logged to the Syslog server (See Figure 39).

Before using the syslog service in the server, it must be configured with the following steps:

- 1. Open the configuration file by vim /etc/rsyslog.conf
- 2. Open Modload imudp/UDPServeRun 514/ModLoad imtcp/InputTCPServerRun 514
- 3. Service syslog restart
- 4. Set syslog server from Integrated BMC Web Console > Configuration > Syslog Server Configuration
- 5. Type /var/log/messages to see the log

intel. Inte	grated BN	1C Web C	onsole				
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	O Logout O Refresh
Email Alert	Syslog Ser	ver Configura	ntion rver IP				
IPv4 Network	-Svelog Serv	ver Configura	tion				
IPv6 Network	Enable Remote	Svelog	cion				
VLAN	Current Sucley	a Conver ID:					
NTP Settings	Current Sysio	g Server IP:		0.0.0.0			
Advanced System Management Key	New Syslog Se	erver IP:					
SSL Certification	Save						
Users							
Security Settings							
Sensor Customization							
BMC Firmware Update							
BIOS/IFWI Firmware Update							
CPLD Update							
Syslog Server							
Comguration							

Figure 39. Syslog Server Configuration Page

Table 19 provides a description for all configurable features and input buttons found on the page.

Table 19. Syslog Server Configuration Options

Option	Task
Enable Remote Syslog	To enable/disable remote syslog, check or uncheck Enable Remote Syslog.
Current Syslog Server IP	Display the current IP address of the syslog server.
New Syslog Server IP	Input the new syslog server IP address.
Save	Save the current settings.

5.3.15 Thermal Customization

The Thermal Customization page is used to optimize the thermal/acoustic solution for a particular chassis/board combination. Customized sensors can be added, deleted, or modified (See Figure 40).



Figure 40. Thermal Customization Page

Table 20 provides a description for all configurable features and input buttons found on the page.

Table 20. Thermal Customization Options

Option	Task
Thermal Customization File	Choose thermal customization JSON file to upload.
Upload	Click to upload the file to the BMC.

5.4 Remote Control Tab

The Remote Control tab provides access to secondary page options used to launch various server management control features, including: remote console KVM redirection, power control initialization, Serial-Over-Lan (SOL), and to access the virtual front panel. The following sub-sections provides an overview for each management feature page.

5.4.1 KVM

The KVM page is used to launch the remote console for keyboard, video, and mouse (KVM) redirection. Once launched, the keyboard, video, and mouse functions of a remote server can be utilized within the local window.

Note: See Appendix B. Remote Console (KVM) Operation, for additional information.

Click the **Start button** to implement the KVM window on the current page, and then click **Open In New Window** to open on screen a new KVM window. Figure 41 shows the details.



Figure 41. Remote Control KVM Page

Table 21 provides a description for all configurable features and input buttons found on the page.

	Tab	le	21.	KVM	Page	Options
--	-----	----	-----	-----	------	----------------

Option	Task	
Start/Stop	Activate or stop the KVM function.	
Send Macro	Send the keyboard macro selected in this drop-down list to the KVM remote console.	
Keyboard	Select a language from the different languages available for the virtual keyboard.	
Power Control	Control the host power.	
Force-Enter BIOS Setup	DC cycle the server and force to enter in the BIOS setup utility page.	
Open In New Window	Open the KVM remote console in a pop-up window.	

5.4.2 Server Power Control

The Server Power Control page shows power status and provides power/reset control of the server (See Figure 42).



Figure 42. Remote Control Server Power Control Page

Table 22 proviodes a description for all power control operations that can be performed from the page.

Option	Task
Reset Server	Hard reset the host without powering off.
Power Off Server - Immediate	Immediately power off the host.
Graceful Shutdown	Soft power off the host.
Power On Server	Power on the host.
Power Cycle Server	Immediately power off the host and power it back on after one second.
Force-enter BIOS Setup	Enter the BIOS setup utility after resetting/powering on the server.
Perform Action	Execute the selected remote power command.

Table 22. Server Power Control Options for Remote Control

Note: All power control actions are done through the BMC and are immediate actions. Intel suggests to gracefully shut down the operating system using the KVM interface or other interface before initiating power actions.

5.4.3 Launch SOL

The Launch SOL page is used to initialize the serial-over-LAN (SOL) console to manage a server remotely. This page displays the screen content of the remote server (See Figure 43).

intel.Inte	ntel, Integrated BMC Web Console				
System Server Health	Configuration Remote Control Virtua	I Media Server Diagnostics	Miscellaneous Storage	G Logout G Refresh G Help 1 About	
	Launch SOL				
KVM	Stop SOL				
Server Power Control	/				
Launch SOL		Server Management	l III		
Virtual Front Panel	\		/		
	IPMI Security Policy:Provi	sioning	When enabled system gets reset upon encountering		
	Reset on CATERR	<enabled></enabled>	Catastrophic Error		
	Reset on ERR2 Enforced Password Support	<enabled> <disabled></disabled></enabled>	(CATERR); when disabled system does not get reset on		
	Resume on AC Power Loss	<stay off=""></stay>	CATERR.		
	Power Restore Delay Power Restore Delay Value	<disabled> [60]</disabled>			
	Clear System Log				
	FRB-2 Enable	<enabled></enabled>			
	FRB-2 Timeout Value	<6 minutes>	v		
Consciente © 2015-2022 - L	F10 ^v=Move Highlight <en Copyright (Open In New Window tel Comparation All Binkin Resound</en 	=Save Changes and Exi ter≻=Select Entry c) 2006-2022, Intel C	t F9=Reset to Defaults Esc=Exit		

Figure 43. Remote Control Launch SOL Page

Table 23 provides a description for each SOL operations that can be performed from the page.

Table 23. SOL Options

Option	Task
Start/Stop SOL	Start or stop the SOL console function.
Open In New Window	Open the SOL console in a new pop-up window.
Close Window	Close the SOL pop-up window.

To open an additional window, click the **Open In New Window button** (see Figure 44).

https://10.112.107.19/page/sol_new_window	.html - Google Chrome	
Not secure https://10.112.107.19/p	age/sol_new_window.htm	ml
erial Over LAN Console		
	Server Manageme	nt /
IPMI Security Policy:Provi	sioning	When enabled system gets reset upon encountering
Reset on CATERR Reset on ERR2 Enforced Password Support	< <u>Enabled></u> <enabled> <disabled></disabled></enabled>	Catastrophic Error (CATERR); when disabled system does not get reset on
Resume on AC Power Loss Power Restore Delay Power Restore Delay Value	<stay off=""> <disabled> [60]</disabled></stay>	CATERR.
Clear System Log		
FRB-2 Enable FRB-2 Timeout Value	<enabled> <6 minutes></enabled>	, I
riu ^v=Move Highlight <en< td=""><td>ter>=Select Entry</td><td>Exit F9=Reset to Deraults Esc=Exit</td></en<>	ter>=Select Entry	Exit F9=Reset to Deraults Esc=Exit
Close Window	<i>c) 2000 2022, 1</i>	

Figure 44. Launch SOL in Pop-Up Window

The SOL console emulates connection to a serial terminal on the remote server. The responsiveness may be slightly delayed depending on the bandwidth and latency of the network between the Integrated BMC Web Console and remote console.

Note: Before launching SOL, ensure that SOL for baseboard management control is **Enabled** on the **Configuration > SOL** page.

5.4.4 Virtual Front Panel

The Virtual Front Panel page provides virtual access to the system front panel, providing the ability to virtually view LED states and provide the ability to perform the functions of all front panel buttons (See Figure 45).



Figure 45. Remote Control Virtual Front Panel Page

Table 24 provides a description for all configurable features and input buttons found on the page.

Option	Task
Power	Power on or power off.
Reset	Reset the server while the system is on.
Chassis ID	 When the Chassis ID button is pressed, the chassis ID LED changes to solid on. If the button is pressed again, the chassis ID LED turns off.
Power LED	 The power LED shows the system power status. If the power LED is green, the system is on. If the power LED is gray, the system is off.
Status LED	 The status LED reflects the system status LED status and it is automatically in synchronization with the BMC every 2 seconds. If any abnormal occurs in the system, then the Status LED state changes accordingly.
Chassis ID LED	 The chassis ID LED shows the current system chassis ID status. If the chassis ID LED is blue, the chassis ID is indefinite on. If the chassis ID LED is gray, the chassis ID is off.

Table 24. Remote Control Virtual Front Panel Options

5.5 Virtual Media Tab

Note: This tab option and its secondary pages will only be available after the feature is enabled with the installation of the optional Advanced Management License Key.

The Virtual Media tab provides access to secondary page options to share local ISO and IMG/IMA files over HTML5 and share ISO/IMG/IMA file from the network using other supported protocols. The following subsections provides an overview for each.

5.5.1 Local Image

The Local Image page is used to share local ISO and IMG/IMA files over HTML5, which only includes one Virtual Media over HTML5 page. Each image/folder is emulated to the host as a USB device (See Figure 46).

in		egrated E						
System	Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	🔇 Logout 🕒 Refresh 💡 Help 🚯 About
Local Ima	age	Local Ima Launch t	age he operation w	vindow of loc	al image over H	TML5		
Web ISO		Launch W	/indow to Mount Loca	al Image				
Copyrig	ght © 2016-2022 - I	ntel Corporation.	All Rights Reserved.					

Figure 46. Local Image Page

To open the operation window, click the "**Launch Window to Mount Local Image**" button. This action starts the upload of local files to the BMC over HTML5. Up to two devices may be mounted simultaneously (See Figure 47).

intel.	AFT								
System Server He	alth Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage		C Logou	t 🕞 Refresh 😮 Help 🚯 Abou
Local Image	Local In Launch	 Virtual Media over HTML! Mot secure https:// 	5 - Google Chrome /10.239.138.30/page,	/man_vm_html5.html			-	□ × @	
Web ISO	Launch	Local Im	nage Warning: Do N	IOT close this wind	ow while using the	e local image o	ver HTML5		
		Device 1 Device 2							
		Select type Select med	e 💙 dia						
		Plug in							
Copyright © 2016-2	022 - Intel Corporation.	All Rights Reserved.							

Figure 47. Launch Window to Mount Local Image Page

Table 25 provides a description for all configurable features and input buttons found on the page.

Table 25. Local Image Options

Option	Task
Device 1/Device 2	Select the virtual device to mount the file.
Select type	Choose the file type (ISO or IMG/IMA) of the file to mount.
Select media	Choose the local file to mount.
Plug in/Plug out	Mount/unmount the file.

5.5.2 Web ISO

The Web ISO page is used to share ISO/IMG/IMA file from the network by using NFS, SMB, or HTTPS protocols. Two devices are available to use (See Figure 48).

intel. Inte	egrated BMC Web Console		
System Server Health	Configuration Remote Control Virtual Media	Server Diagnostics Miscellaneous Storage	Cogout C Refresh P Help 1 About
Local Image Web ISO	Web ISO Device 1 No disk emulation set. Refresh Status Share host Path to image Mount Type O NFS O CIFS O HTTPS User Password Mount Unmount	Device 2 No disk emulation set. Refresh Status Share host Path to image Mount Type O NFS O CIFS O HTTPS User Password Mount Unmount	_

Figure 48. Web ISO

Table 26 provides a description for all configurable features and input buttons found on the page.

Table 26. Web ISO Options

Option	Task
Refresh Status	Refresh the device status.
Share host	The host IP of the NFS/CIFS/HTTPS server.
Path to image	The file path in the NFS/CIFS/HTTPS server.
Mount Type	Select one protocol in NFS, CIFS, and HTTPS.
User	User name of the NFS/CIFS/HTTPS server user.
Password	Password of the NFS/CIFS/HTTPS server user.
Mount/Unmount	Mount/unmount the selected file.

5.6 Server Diagnostics Tab

The Server Diagnostics tab provides access to secondary pages used to access various server diagnostic support options, including: a page to generate enhanced system debug log files, a page to view POST codes for the last two boot system cycles, and a page to reset all BMC settings back to their factory deafults. The following sections provide an overview for each page options.

5.6.1 System Diagnostics

The System Diagnostics page allows administrators to collect enhanced system debugging information for analysis by an Intel engineer or Intel partner for enhanced debugging support. The files generated are compressed, encrypted, and password protected and are not intended to be viewable by the end user. See Figure 49 to view the page layout.

intel. Inte	egrated BMC Web Console	
System Server Health	Configuration Remote Control Virtual Media Server Diagnostics Miscellaneous Storage	O Logout O Refresh O Help D About
System Diagnostics POST Codes	System Diagnostics Log files should be sent to the system manufacturer for analysis.	
System Defaults	System Debug Log Last Log: 2022-09-06 19:59:32 DebugLogs_2022-09-06_19_59_32.tar.gz	
	Generate Log	
Copyright © 2016-2022 - Ir	ntel Corporation. All Rights Reserved.	

Figure 49. Server System Diagnostics Page

To generate the diagnostic log files, click the "**Generate Log"** button. It may take several minutes for the debugging information to be collected. After the debug data collection has completed, the resulting compressed archive file can then be downloaded to the system by clicking the displayed "**Last Log**" link. The downloaded file can then be sent to the system manufacturer or an Intel support engineer for analysis.

The data that may be captured using this feature includes but is not limited to:

- System version information
- CPU Crash Dump
- IPMI FRU information
- BIOS POST code
- System Event Log
- System Management BIOS (SMBIOS) tables
- BMC sensor readings
- BMC journal log

5.6.2 **POST Codes**

The POST Codes page displays the power-on self-test (POST) results for the last two system boot cyles. See Figure 50 to view the page layout.

Holding the cursor over a POST code or description highlights all other occurrences of that same POST code. Selecting a POST code or description causes the highlight to persist until another code is selected.

intel. Integrated BM	1C Web Console						
System Server Health Configuration	Remote Control Virtual Media	Server Diagnostics	Miscellaneous	Storage	C Logout O Refresh	Help 🚯 About	
System Diagnostics POST Codes System Defaults System Defaults	OST Codes			Curree 0x01 0x02 0x03 0x04 0x05 0x06 0x00 0x02 0x7F 0x15 0x19 0x44 0x4D 0x44 0x4D 0x15 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x54 0x44 0x44 0x15 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55 0x55	Code First POST code after CPU reset Microcole load begin CRAM initialization begin PEI Cacke When Disabled SEC core At Power On Begin Early CPU initialization during SEC Phase. Clear POST Code Microcode load begin BIOS internals BIOS concet Device CRAM initialization begin BIOS internals BIOS internals BIOS internals		

Figure 50. Server Diagnostics POST Codes Page

5.6.3 System Defaults

The System Defaults page provides options to reset all or partial BMC settings to their factory defaults. See Figure 51 to view the page layout.

intel. Integrated BMC Web Console											
System	Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	Cogout CoRefresh CoHelp CoAbout			
System I POST Cc System I	biagnostics odes Defaults	Factory Restore	Default Default - Partial	C Restore Default	- Full						
Copyri	ght © 2016-2022 - I	ntel Corporation.	All Rights Reserved.								

Figure 51. Server Diagnostics Default Page

The "**Restore Default – Partial**" option keeps the existing LAN and User settings and resets all other settings to their factory defaults.

The "**Restore Default – Full**" option resets all BMC settings to their factory defaults.

To reset all BMC settings to factory defaults, click the "Restore" button.

Caution: Once the action to reset BMC settings to factory defaults has completed, the action cannot be undone.

Once complete, all remote management, including the web server, are not accessible until users and network settings are restored locally. Settings reset include, but are not limited to:

- All network addresses and settings.
- Power restore policies.
- Platform event filters.
- Alert destinations.

Note: Restore BMC setting to factory defaults does not affect the BMC system event log (SEL), sensor data repository, or any Intel[®] Node Manager (Intel[®] NM) settings and policies.

5.7 Miscellaneous Tab

The **Miscellaneous** tab provides access to secondary pages used to set Intel Node Manager policies and view the latest power consumption statistics of the server. The following subsections provide an overview for each page..

5.7.1 NM Configuration – Intel[®] Node Manager

The NM page is used to view, add, and configure Intel[®] Node Manager policies. See Figure 52 to view the page layouts.

The policy table in the window lists all policies previously configured. If no policies have been created, enter the desired policy information into the data fields below the table. See Table 27 for information about each data field. Selecting a previous configured policy from the policy list will automatically fill in the policy data fields.

List of Policies							
							F
Policy II) (i)	Timers	Enable		Shutdown	Alert	Power Limit (Watt)
3			500		0	0	2100
Add/Edit Node Ma	nager Policies.						
Policy ID	Enable	Shutdown	Log Event				
Power Limit (Watt):	-						
Line Dation Ownered Trave		0.15					
	Trees 2		□ T=== t	□ T==== €	ī		
Monday	Monday	Monday	Monday	Monday			
Tuesday	Tuesday	Tuesday	Tuesday	Tuesday			
Wednesday	Wednesday	Wednesday	Wednesday	Wednesday			
Thursday	Thursday	Thursday	Thursday	Thursday			
Thursday	Friday	Friday	E Friday	Friday			
Friday	Saturday	Saturday	Saturday	Saturday			
Friday Saturday	Contrody		Sunday	Sunday			
Friday Saturday Sunday	Sunday	Sunday					
Friday Saturday Sunday Start Time	Sunday Start Time	Sunday Start Time	Start Time	Start Time			
Friday Saturday Start Time 00 ~ 00 ~ End Time	Sunday Start Time 00 ~ 00 ~ End Time	Sunday Start Time 00 \sigma : 00 \sigma End Time	Start Time	Start Time			
Friday Saturday Start Time 00 ~ :00 ~ End Time 00 ~ :00 ~	Sunday Start Time 00 ~ 00 ~ End Time 00 ~ 00 ~	Start Time 00 ~ : 00 ~ End Time 00 ~ : 00 ~	Start Time 00 ∽ ≥ 00 ∽ End Time 00 ∽ ≥ 00 ∽	Start Time 00 \(\low \); 00 \(\low \) End Time 00 \(\low \); 00 \(\low \)			
Saturday Saturday Sunday End Time 00 ~: 00 ~ End Time 00 ~: 00 ~	Sunday Start Time 00 ↔ 00 ↔ End Time 00 ↔ 00 ↔	Sunday Start Time 00 ~ : 00 ~ End Time 00 ~ : 00 ~	Start Time 00 ~ \$ 00 ~ End Time 00 ~ \$ 00 ~	Start Time 00 00 End Time 00 00 00			

Figure 52. Intel[®] Node Manager Configuration Page

Table 27 provides a description for all configurable features and input buttons found on the page.

Option	Task
List of Policies	This table lists the currently configured policies. Selecting an item from the table populates the editable fields in the following settings section.
Policy ID	 The policy ID to add/edit/delete. Valid range is 0–255. In the policy table, policy IDs with an asterisk (*) are policies set externally using a non-platform domain. Changing parameters on these policies does not affect their triggers, trigger limits, reporting periods, correction timeouts, or aggressive CPU throttling settings.
Enabled	Check this box if the policy is to be enabled immediately.
Shutdown	Enable a system shutdown if the policy is exceeded and cannot be corrected within the correction timeout period. The operating system is given 30 seconds to shut down gracefully. If the system is still not shut down after 30 seconds, the BMC initiates an immediate shutdown.
Log Event	Enable the node manager to send a platform event message to the BMC when a policy is exceeded.
Power Limit (Watt)	The desired platform power limit, in watts.
Use Policy Suspend Periods	 If enabled, configure policy suspend periods. Each policy may have up to five suspend periods (see Figure 52). Suspend periods are repeatable by day-of-week. Start and stop times are designated in 24-hour format, in increments of 6 minutes. To specify a suspended period crossing midnight, two suspend periods must be used.
Save	Click to save any changes made.
Delete	Select a policy in the list and click to delete.
Cancel	Click to discard the changes.

Table 27. Intel[®] Node Manager Configuration Options

5.7.2 **Power Statistics**

The Power Statistics page displays data tables for the latest system power consumption statistics by subsystem (CPU, Memory, and Entire Platform), and power input for each installed power supply. See Figure 53 to view the page layout.

intel Integrated BMC Web Console											
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage			G Logout G Refresh Relp 1 About		
NM Configuration	Power	Statistics									
Power Statistics											
		Subsystem	Cun	rent Power Consumption	n Average	Maximum	Minimum	Timestamp	Period		
		CPU		249	253	376	248	Tue,Sep,06,2022,20:06:16	15 minutes 31 seconds		
		Entire Platform		563	542	1116	9	Tue,Sep,06,2022,20:06:16	1 days 5 hours 19 minutes 43 seconds		
		Memory		43	43	44	42	Tue,Sep,06,2022,20:06:16	15 minutes 31 seconds		
		Power Supply Input Current Power Consumption									
		Solum 1600\	N PSU1		286.5						
		Solum 1600\	V PSU2		277.5						
		Total Input	Power		564						
Copyright © 2016-2022 -	Intel Corporation.	All Rights Reserved.									

Figure 53. Power Statistics Page

Appendix A. Advanced Management License Key – Order, Registration, and Installation

How to Order Advanced System Management Key

There are two options available to order the Advanced Management License Key:

- **CTO/L9:** When ordering a fully integrated system from Intel using its on-line Configure-to-Order (CTO) tool, select the **AdvSysMgmtKey** as an additional option. The Intel factory will then automatically upload the license key on to the system during the system integration process.
- Add-on Accessory: The Advanced Management License Key (iPC ADVSYSMGMTKEY) can be ordered separately from the system as an add-on accessory. This option requires that the lincense key be manually installed on the system. See for following sections for complete ordering and installation instructions.

Order and Register the License Key as an Add-on Accessory (Not via CTO)

- 1. Place an order for the Intel[®] Advanced Management Licence Key (Electronic Delivery). Intel Product Code: **ADVSYSMGMTKEY**
- 2. Receive an email with instructions to download the product key.
- 3. From the email, Click the **Register** link (see Figure 54) to go to https://lemcenter.intel.com

Purchase Order - PO#				
Intel Registration Center [Cons] <noreply-lem-cons@lemcenter.intel.com> To To To To Click here to download pictures. To help protect your privacy, Outlook prevented automatic download of some pictures in this message.</noreply-lem-cons@lemcenter.intel.com>	S Reply	≪ Reply All	→ Forward Tue 2/9/2021 10	 29 AM
Purchase Order				
This email includes all of your purchase information. Keep this email for future reference. Note that you need the serial number to install your new software.				
Product : Intel Server Integrated Baseboard Management Controller (BMC) Advanced Features Quantity : 1 Product Key 1 : de08176f-db78-4911-ad26-90030d504852 <u>Register</u>				
Product already installed? You can use the new serial number to activate a previously in Click Register a Floating/concurrent user license you will need to have the host nation of the control of the co	eive product upo ation about the	dates and support license manager	1	
Order Summary Product : Intel Server Integrated Baseboard Management Controller (BMC) Advanced Features Product Key 1: de08176f-db78-4911-ad26-90030d504852 Register Entitlement Activation Info: During activation, please use default fingerprint available in LEM user portal. SKU: JADVSYSMGMTKEY Vendor: Internal Version : 2.42 Number of Seats : 1 Quantity : 1 Support Code : Full Support Support End Date : Never Expire Fulfilment Type : Order Number : 2aae72a9a235497eaede SAP Order Number : NA Comments :				

Figure 54. Example Email

4. Login using an existing Intel account or Create a new one. An email address is required

5. From the Registration Screen, Click the "Register" button to register the pre-entered license key number (see Figure 55)

intel	PRODUCTS SUPPOR	RT SOLUTIONS DEVELOPERS PARTNER	tS				Q. Search Intel.com
			INTEL REGISTRATIO	N CENTER - USER P	ORTAL		
My En	ntitlements		🔵 Use EID	de08176f-db78-4911	1-ad26-90030d504852	Register	Welcome, Brian
	Product Key (SN)	Product Name	Product Version	Registered Date	Support Expiration Date	Action	Key automatically
>	CJWH-D4NZCZVR	Intel® Media Server Studio – Community Edition	2015	11/20/2015	11/20/2016		filled in. Click Register
>	CJWH-PK9GPHLG	Intel® Media Server Studio – Community Edition	2015	09/05/2015	09/05/2016		My Profile ~
>	CJWH-Z6HZ3SMN	Intel® Media Server Studio – Community Edition	2015	07/14/2015	07/14/2016		Resources V
>	CDHV-R45W6HNW	Intel® Virtual KVM Gateway for Reseller	1.0	10/04/2014	10/04/2019		Questions & Answers
>	VFTS-XZ36LPT6	Intel® Data Center Manager Console	1.1	08/01/2013	10/30/2013		Questions a russiers -
>	C3K8-4VZWK3JG	Intel® SW Dev Tools License Servers	2.0	07/10/2012	07/09/2013		
>	C4LN-Z7SGGW3P	Intel® Graphics Performance Analyzers	2012	07/10/2012	07/09/2013		
>	C4LN-242GJJL5	Intel® Graphics Performance Analyzers	2012	04/19/2012	04/18/2013		
>	CCH7-FM677D9X	Cryptography for Intel® Parallel Composer	2011	04/19/2012			
>	CCH7-WL7BNCB6	Cryptography for Intel® Parallel Composer	2011	04/19/2012			
>	CCH7-GGD5H86L	Cryptography for Intel® Parallel Composer	2011	04/19/2012			
>	C4LN-V3P58HJC	Intel® Graphics Performance Analyzers	2012	04/19/2012	04/18/2013		
>	C4LN-PFS73732	Intel® Graphics Performance Analyzers	2012	04/19/2012	04/18/2013		
ж	< 1 ► ► 20 ▼ item	is per page				1 - 13 of 13 items	

Figure 55. Register Key

intel PRODUCTS SUPPORT SOLUTIONS DEVELOPERS PARTNERS Q Search Intel.com INTEL REGISTRATION CENTER - USER PORTAL My Entitlements Welcome, Brian Use EID Enter Product Key (SN)/EID Regist Entitlements Licenses Product Ve **Registered** Dat Downloads de08176f-db78-4911-ad26-90030d50 02/09/2021 NA 2.42 My Profile 🗸 Resources 🗸 Product Key (SN) End Date Product / • Questions & Answers V rd Management Control... de08176f-db78-4911-ad26-90030d504852 02/09/2021 NA Intel Server I CJWH-D4NZCZVR Server Studio – Community Edition 2015 11/20/2015 11/ CJWH-PK9GPHLG Intel® I - Community Edition 2015 09/05/2015 CJWH-Z6HZ3SMN Intel® Media Serve 2015 07/14/2015 07/14/201 CDHV-R45W6HNW Intel® Virtual KVM Gateway Expand Product Key, 4 1 2 3 ▶ ► 5 ▼ items per page 1 - 5 of 14 items scroll to bottom. Click Activate

6. Activate the license (see Figure 56)

Figure 56. Activate Key

7. Download the license associated with the specified product key (see Figure 57)

tivation ID :	5b6b80fe-39e1-4e06-88d0-c5d6c0ebe039		
ntact :	brian.j.vandecoevering@intel.com		
sociated Products		ctivate	
roduct Name : Intel Ser	ver Integrated Baseboard Management Controller (BMC) Advanced Features 2.42		
Product Key :	de08176f-db78-4911-ad26-90030d504852		
Activation Quantity :	1		
icense File			
AAAoAQIAAAAAAB8BAAA	LCAAAAAABGAAAABgBqAIICAAAAAAAagIIAAAAeDVmSkZRcUIYAAAARnRtz	8	
VAAAAkQAAAAIAAAAAA	AQAAAANAFAAfwaAAHsAAAAFAJAGAQAAAAMAAABMAAAASAAAAAAAAAAAA	1-30	
D4AAAAEAAAABAAJAAAA AAgEEAAAAAQACABsAAA	IKAAAAAQAAABBAAABBAAAAAEABAEEAAAAAQD8AAQAAAABAP4ABAAAAAE IAXAAAAAqAAAAAACAAAAHF1YW50aXR5AQAAADEQAAAAZqqRvYxOSc+5im		Download License
IHw+vfyQgAAAADAAIAA	gACAA4BAAAKAQAAAgAEAAAAAAAAAAAAC2Y7nEBL8mxMyifSMxvEmRV4KnXfV2		Download License i
8y2mUOA2hqhP2SX2rTv eDzk0XgoY/2r1qp1jj5+iS	V0wa1YCmUlW6Qm1s6BmA0mAdPeWwyDIysRA5fLsdQpyfTMwp+WdXgiisAc igjh/W57cCd9KGxGSvregKuhEVxGrdvUW4w0f533ZRqAS1hyQruV4/psb9bf5T		
+IH6q/77h/w6bodn3Zs6 PBfMpJWUJxrGK0eOwYz	f+KJDoKQHijvFoDPgY8alCubZb1VHU6ruaoDnogy3CAuTKEIfcR4vbPvjE5We2 bWLM8rmIW0xsBj54H4f8DZuWjzv0aLDXIbRrYh/eO3OaBJZCPZA=		
	nonen an non het er same verken not Virtu if Spati≉ upgebrigten og er engengening gerupp som som		

Figure 57. Download Key

- 8. Use the Integrated BMC Web Console or Intel Server Configuration Utility to upload the key to the BMC.
 - \circ $\,$ Only single license file per order is needed to activate multiple systems.

Note: If any key or email is lost, Intel can generate new product keys as needed.

Advanced Management Key Installation

Three available options can be used to upload the key onto the server:

- Integrated BMC Web Console for Intel server boards
- Intel Server Configuration Utility
- Redfish* Interface

Installation Using the Integrated BMC Web Console

The following procedure may be used to upload and confirm activation of the Advanced System Management Key using the Integrated BMC Web Console.

	grated BN	1C Web Co	onsole				
System Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	😮 Logout 🕲 Refresh 😧 Help 🚯 About
IPv4 Network	Advanced Use this page to	System Manague	gement Key activate advance	d system manageme	nt features		
IPv6 Network VLAN NTP Settings LDAP	Key Upload Last Update T Drop a file on or select Choo	ime : Tue : this page Ch ose File /	Sep 6 19:13:12	2022 chosen			
Advanced System Management Key Active Directory	Browse	eatures	Dioad				
SSL Certification Users Security Settings Sensor Customization	BMC Virtual Active Direct Out-of-band H	Media Activated ory Activated 4ardware RAID M	Janagement Act	ivated			
BMC Firmware Update	L						
Update CPLD Update							
Syslog Server Configuration							
Thermal Customization	ntel Corporation, All	Rights Reserved.					

Figure 58. Integrated BMC Web Console Advanced System Management Key Page

Use Figure 63 as a reference for the following procedure.

- 1. Login to the Integrated BMC Web Console
- 2. Navigate to the **Configuration** tab and select the **Advanced System Management Key** page
- 3. Click the Choose File button to select the software key file
- 4. Select the .v2c license key file from the file browser, then click the Open button
- 5. Click the **Upload** button to upload the License Key to the BMC.
- Navigate back to the System Tab. On the System Information page, view the System Summary information box to confirm the Advanced Management Key was successfully Activated. See Figure 63.



Figure 59. Web Console System Information Page

Installation Using the Intel[®] Server Configuration Utility

The following procedure may be used to upload and confirm activation of the Advanced System management Key using the syscfg command line utility.

To download the latest utility package, go to https://downloadcenter.intel.com/ and initiate a search for "Intel Server Configuration Utility".

Prerequisities:

- Ensure the user has Administrator or Root privileges for the chosen operating system
- Ensure the KCS Policy Control Mode is set to "Provisioning"

Procedure:

- 1. Install the Intel[®] Server Configuration Utility on to the target server system. See the Intel[®] Server Configuration Utility User Guide for complete utility installation instructions.
- 2. Navigate to the sub-directory where the Server Configuration Utility was installed
- 3. From a command prompt type the following command line (See Figure 64)

syscfg /lic <key file name>

Where "file name" can just be the name of the license file if copied to the same directory as the syscfg command file, or the complete path of where the license key was copied can be entered along with the file name.

Examples:

- syscfg /lic file_name.v2c
- syscfg /lic /directory_name/file_name.v2c

[root@localhost Syscfg V16.0.6 AllOS]# syscfg /lic ASM.v2c

Server Configuration Utility Version 16.0.6 Copyright (c) 2022 Intel Corporation

Key Transfer... Starting key upload: Key Upload done

Figure 60. Upload Advanced Management License Key Using SYSCFG Utility

 4. To confirm activation of the Advanced Management License Key, type the following command line. See Figure 65.
 syscfg /d lic

[root@localhost Syscfg_V16.0.6_AllOS]# syscfg /d lic

Advanced Management Key Status

Type: ASM key

Active status: Activated

Last upload: 09/07/2022-06:49:41

Figure 61. Confirm Activation of Advanced Management Key Using SYSCFG Utility

Installation Using Redfish*

The following steps may be used to upload and confirm activation of the Advanced System Management Key using Redfish*.

Prerequisites:

• If not already present, install the "curl" utility onto the system from which the commands will be run.

Issue the following command to upload the Advanced management Key to the BMC

curl -k -u **username:password** https://**BMC_IP**/redfish/v1/UpdateService/SoftwareInventory/AdvancedSystemManagementKey/Acti ons/Oem/Intel.Oem.AdvancedSystemManagementKey -H "Content-Type: multipart/form-data" -F 'updateFile=@**filepath**' -X POST

See screenshot in Figure 66, where:

- username = admin
- password = Password@123
- BMC_IP = 10.239.46.29
- filepath = /home/test/ASM.v2c

Notes:

- The command line above is a single command line, no return after "password " and " https..."
- username:password in the command line above should be replaced with the name of the user and their password

```
>]$curl -k -u admin:Password@123 https://10.239.46.29/redfish/v1/UpdateService
SoftwareInventory/AdvancedSystemManagementKey/Actions/Oem/Intel.Oem.AdvancedSyst
emManagementKey -H "Content-Type: multipart/form-data" -F 'updateFile=@/home/te
st/ASM.v2c' -X POST | python -m json.tool
 % Total
                               Average Speed
                                                Time
                                                        Time
                                                                 Time
                                                                       Current
                                Dload Upload
                                                Total
                                                        Spent
                                                                 Left
                                                                       Speed
100
                151 100
                           780
                                        3263 --:--:-- --:---
                                  631
                                                                         3911
   "@odata.id": "/redfish/v1/TaskService/Tasks/0",
   "@odata.type": "#Task.v1 4 3.Task",
   "Id": "0",
   "TaskState": "Running",
   "TaskStatus": "OK"
```

Figure 62. Redfish Command to Upload the Advanced System Management Key

Issue the following command to verify the activation status of the Advanced System Management key.

curl -k -u **username:password**

https://**BMC_IP**/redfish/v1/UpdateService/SoftwareInventory/AdvancedSystemManagementKey -H "content-type: application/json" -X GET | grep LicenseStatus

[~]	\$curl -	k –u	admin:P	asswo	rd@12	3 https	://10.239	9.46.29/	redfish/v	v1/Updat	eService/
Sof	twareIn	vento	ry/Adva	ncedS	ystem	Managem	entKey -I	H "conte	nt-type:	applica	tion/json
" -]	X GET	grep	Licens	eStat	us						
olo	Total	olo	Receive	d % X	ferd	Averag	e Speed	Time	Time	Time	Current
						Dload	Upload	Total	Spent	Left	Speed
100	1023	100	1023	0	0	4942	0	-::	::	::-	- 4942
	"Lic	enseS	tatus":	"ACT	IVATE	D",					

Figure 63. Redfish Command to Verify Activation of Advanced Server Management Key

Appendix B. Remote Console (KVM) Operation

The remote console is the redirected keyboard, video, and mouse (KVM) of a remote host system. Starting the remote console KVM to display the screen content of the host system, the remote console acts as if the administrator were sitting directly in front of the screen of the remote system with .

Launch the Redirection Console

From the KVM Page under the **Remote Control** tab of the Web Console, launch the remote console KVM redirection window by clicking the **Start** button (Figure 64).

int	e Integrated BMC Web Console										
System	Server Health	Configuration	Remote Control	Virtual Media	Server Diagnostics	Miscellaneous	Storage	🔇 Logout 😋 Refresh 😮 Help 🕦 About			
KVM Server Por Launch SC Virtual Fro	wer Control DL nt Panel	Start	utton to launch the KVM	and manage the s	erver remotely.						
Copyrig	ht © 2016-2022 - Ir	ntel Corporation. A	All Rights Reserved.								

Figure 64. Remote Control Console Redirection Page

When the Start button is clicked, the remote server screen displays in the current page. See Figure 65.



Figure 65. Remote Control Console Redirection Page

The "**Open In New Window**" button at the bottom of the page can be used to pop-up a new window. See Figure 66.



Figure 66. Remote Console Window

Main Window

Starting the remote console opens a host window like the Linux* operating system window shown in Figure 67.



Figure 67. Remote Console Main Window

The host window displays the screen content of the remote server. The remote console responds as if it were at the remote server. The responsiveness may be slightly delayed depending on the bandwidth and latency of the network between the Integrated BMC Web Console and the remote console.

Remote Console Control Bar

The bottom of the remote console window contains a control bar for viewing the status of the remote console and to configure remote console settings. The following subsections describe each control task.

Keyboard Macro 🗸	Keyboard V	Power Control	~	Force-enter BIOS Setup

Figure 68. Remote Console Control Bar

Macro Menu

Click the Keyboard Macro drop-down list to open the keyboard macro menu as shown in Figure 69.



Figure 69. Remote Console Macro Menu

Using the options in this menu, the user can simulate special key combinations to the remote operating system, which include:

- <Alt+Tab>
- <Ctrl+Alt+Del>
- <Alt+Space>
- <Alt+Esc>
- <Alt+Enter>
- <Print>
- <alt+F4>
- <Ctrl+Esc>
- <Ctrl+Tab>

Keyboard Menu

Click the **Keyboard** drop-down list to open the keyboard menu as shown in Figure 70.



Figure 70. Keyboard Options Menu

Use the options in this menu to open a virtual keyboard and specify its language. See Figure 71 for details.

Not secure https://10.1																
	12.107.162/page	e/man_ik	.vm_new_v	vindow	html											
												Sed Hat Enterpris	e Linux			
yboard Macro ♥ [English ♥]	Power Control	▼ Force	e-enter BIO	S Setup			3	¢							ļ	
yboard Macro 🗸 English 🔍	Power Control	► Force	e-enter BIO f3 f4	S Setup f5	f6	f7	8	۵ fs	F 10	f11	f12	print	scroll	pause		
yboard Macro ♥ English ♥	Power Control Esc f1 · 1 2	 Force f2 3 	e-enter BIO f3 f4 4 5	S Setup f5 6	f6 7	f7 8	f8 9	(1000)	 → → f10 - = 	f11 bac	f12 ckspace	print	scroll	pause up		
yboard Macro ♥ (English ♥)	Power Control Esc f1 1 2 Tab q	 Force f2 3 W 	e-enter BIO f3 f4 4 5 e r	S Setup f5 6 t	f6 7 y	f7 8 u	f8 9 i	fs 0	9 f10 - = p	f11 bac	f12 kspace	print ins del	scroll home end	pause up down		
yboard Macro ♥ English ♥	Power Control Esc f1 1 2 Tab q Caps Lock	 Force f2 3 W a 	e-enter BIO f3 f4 4 5 e r s d	S Setup f5 6 t	f6 7 y g	f7 8 u h	f8 9 i	() () () () () () () () () () () () () (F10	f11 bac [f12 kkspace] \ Enter	print ins del	scroll home end	pause up down		
yboard Macro ♥] (English ♥) [Power Control Esc f1 1 2 Tab q Caps Lock shift z	 Force f2 3 W a X 	e-enter BIO2 f3 f4 4 5 e r s d c	S Setup f5 6 t f	f6 7 y g b	f7 8 u h n	f8 9 i j l m	() () () () () () () () () () () () () (f10 = p l . 	f11 bac [/	f12 kkspace] \ Enter shift	print ins del	scroll home end	pause up down		

Figure 71. Keyboard Option

Power Control Menu

Click the **Power Control** drop-down list to open the power control menu as shown in Figure 72.

Power Control	
Power On	
Power Off	
Software Shutdown	
Power Reset	
Power Control	×

Figure 72. Remote Console Power Control Menu

Table 28 describes the power control operations that can be performed.

Note: All power control actions are immediate actions done through the BMC. Intel suggests to gracefully shut down the operating system using the KVM interface or other interface before initiating power actions.

Option	Task
Power ON	Power on the host.
Power OFF	Immediately power off the host.
Software Shutdown	Soft power off the host.
Power Reset	Hard reset the host without powering off.

Table 28. Remote Console Power Control

Force-Enter BIOS Setup Utility Option

KVM also provides a Force-Enter BIOS Setup button. Clicking the button triggers a system DC cycle and stops in the BIOS Setup page. At the same time a pop-up window shows in the KVM page. See Figure 73 and Figure 74 for details.

Keyboard Macro V Keyboard V Power Control V Force-enter BIOS

Figure 73. Force-Enter BIOS Setup Button

Success! ×
"Force-Enter BIOS Setup has been pressed, Host is rebooting. It will take some time to boot into BIOS Setup.

Figure 74. Force-Enter BIOS Setup Pop-Up Window

Appendix C. Glossary

Term	Definition
ВМС	Baseboard Management Controller
CPLD	Complex programmable logic device
Intel® CTO	Intel Configure To Order Tool – An on-line tool used to order fully integrated L9 systems directly from Intel.
Intel [®] DCM	Intel® Data Center Manager
DHCP	Dynamic Host Configuration Protocol
DNS	Domain Name System
FQDN	Fully qualified domain name
НВА	Host bus adapter
HSBP	Hot-swap backplane
I/O	Input/output.
IPMI	Intelligent Platform Management Interface
KCS	Keyboard Controller Style
KVM	Keyboard, Video, Mouse
LAN	Local Area Network
LDAP	Lightweight Directory Address Protocol
МАС	Media access controller
Intel® ME	Intel® Management Engine
NIC	Network Interface Controller
Intel® NM	Intel® Node Manager
NTP	Network Time Protocol
NVMe*	Non-Volatile Memory Express*
ООВ	Out of band – no operating system interaction on server
PCIe*	Peripheral Component Interconnect Express*
POST	Power-on self-test
SEL	System event log
SDDC	Software-defined data center
SDR	Sensor data record
SMBIOS	System Management BIOS
SOL	Serial-over-LAN
SSH	Secure socket shell
SSL	Secure Sockets Layer
TCP/IP	Transmission Control Protocol/Internet Protocol
UDP	User Datagram Protocol
VLAN	Virtual Local Area Network