Intel® Management Module
Installation and User's Guide

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Intel® Management Module Installation and User's Guide

Introduction

The Intel® Management Module is an upgrade to the National Semiconductor PC87431 mini-BMC management controller on the Intel® Server Board SE7520AF2, Intel® Server Board SE7520BD2, Intel® Server Board SE7520JR2, and Intel® Server Board SE8500HW4. The Intel Management Module plugs into a connector on the server board. The Intel Management Module is available in two versions:

- Professional Edition
- Advanced Edition

Intel® Management Module Features

Professional Edition Features

The Professional Edition includes the following features:

- All the features provided by the mBMC
- Support for IPMI v2.0 specification
- Additional sensors
- Temperature-based fan speed control by the BMC
- Additional FRU records are visible to the management controller and management software applications (for example, Power Supply, DIMM, and hot-swap controller FRU's).
- The size of the System Event Log (SEL) is increased from 92 entries to 3276 entries
- The number of BMC users is increased from one anonymous user to four users (each with configurable user names and passwords on each LAN or Serial channel)
- The IPMI 2.0 serial features are supported. The serial port can be used for console redirection, Terminal-mode CLI, dial paging, Serial Over LAN (SOL), and other management functions.
- The Intelligent Chassis Management Bus (ICMB) is supported
- PCI SMBus is accessible to the management controller. This allows PCI add-in cards that support manageability to log events to the System Event Log (SEL).
- BIOS logging of POST progress codes is added to the existing capability of logging only the BIOS POST errors
- Front panel functionality is enhanced (*See*: Secure Mode Button Actions in the platform *Technical Product Specification*)
- For systems with the SATA or SCSI hot-swap controller (HSC), the HSC sensors are visible to server management software and HSC events are logged in the SEL.

Advanced Edition Features

The Advanced Edition adds all the features listed above for the Professional Edition, plus the following features:

- BMC-resident SNMP support for out-of-band access using 3rd party applications such as Hewlett-Packard* OpenView*

- Embedded web server to access system health, view the SEL, and issue IPMI commands

- Embedded Command Line Interface (using a Telnet server running on the BMC) to allow direct terminal access to the BMC

- Alerting via Email

- Intel® Advanced Remote Server Control adds remote KVM functionality

- High-speed access to a dedicated NIC for the BMC on the Advanced Edition module

The Intel Advanced Remote Server Control, email alerting, embedded CLI, embedded web, BMC-resident SNMP agent, SOL, and other firmware-resident features are available Out-of-Band (OOB). This means that these features are available even when the Operating System is not running or the AC power is off.

Getting the Latest Information and Support

The latest information on each server board and Intel software is available at:

http://support.intel.com/support/motherboards/server

Platform Compatibility and System Requirements

The Intel Management Modules are compatible with the following Intel server boards:

- Intel Server Board SE7520AF2
- Intel Server Board SE7520BD2
- Intel Server Board SE7520JR2
- Intel Server Board SE8500HW4

Table 1 on page 7 lists the minimum system requirements.

Table 1. Minimum System Requirements

To use this feature…	You will need…
Intel Advanced Remote Server Control	ISM 8.20 Intel Advanced Remote Server Control component installed on the Administration Console
	Intel Management Module Advanced Edition installed on the managed server
Embedded Web Server	Intel Management Module Advanced Edition installed on the managed server
Embedded CLI (Telnet Server)	Intel Management Module Advanced Edition installed on the managed server
Email Alerting	Intel Management Module Advanced Edition installed on the managed server
Serial Over LAN	Intel Management Module Advanced Edition or Professional Edition installed on the managed server

Installation Procedures

Before You Begin

Read the "Warnings and Safety Cautions" section in the user's guide for your server baseboard.

Location of Intel Management Module Header

The following illustrations show the location of the Intel Management Module header on the Intel Server Board SE7520AF2, Intel Server Board SE7520BD2, Intel Server Board SE7520JR2, and Intel Server Board SE8500HW4.

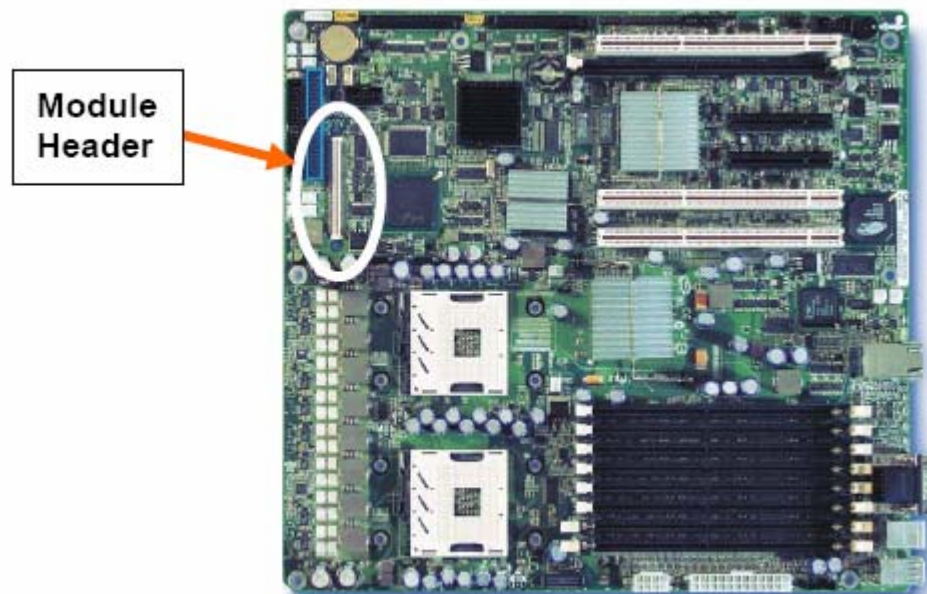**Figure 1. Location of Intel Management Module Connector on
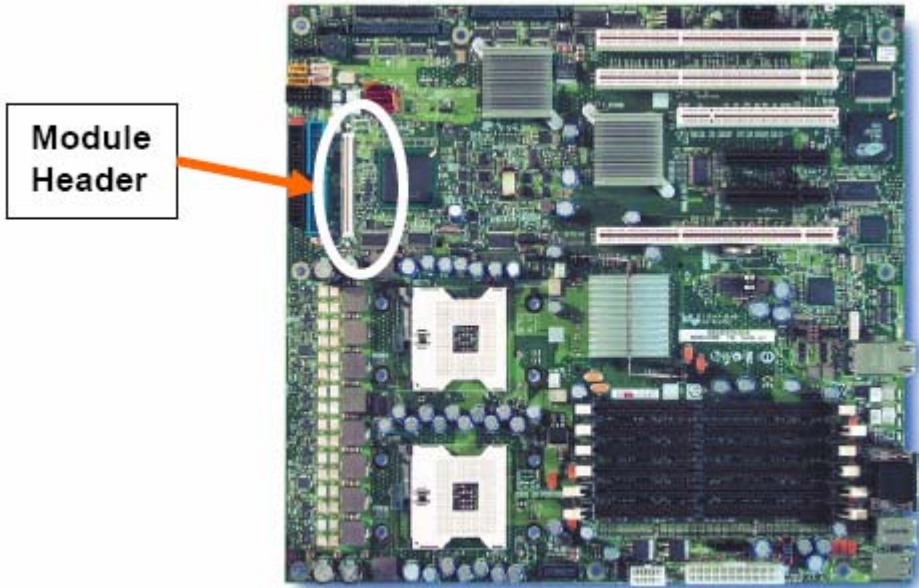the Intel Server Board SE7520AF2**

Figure 2. Location of Intel Management Module Connector on the Intel Server Board SE7520BD2
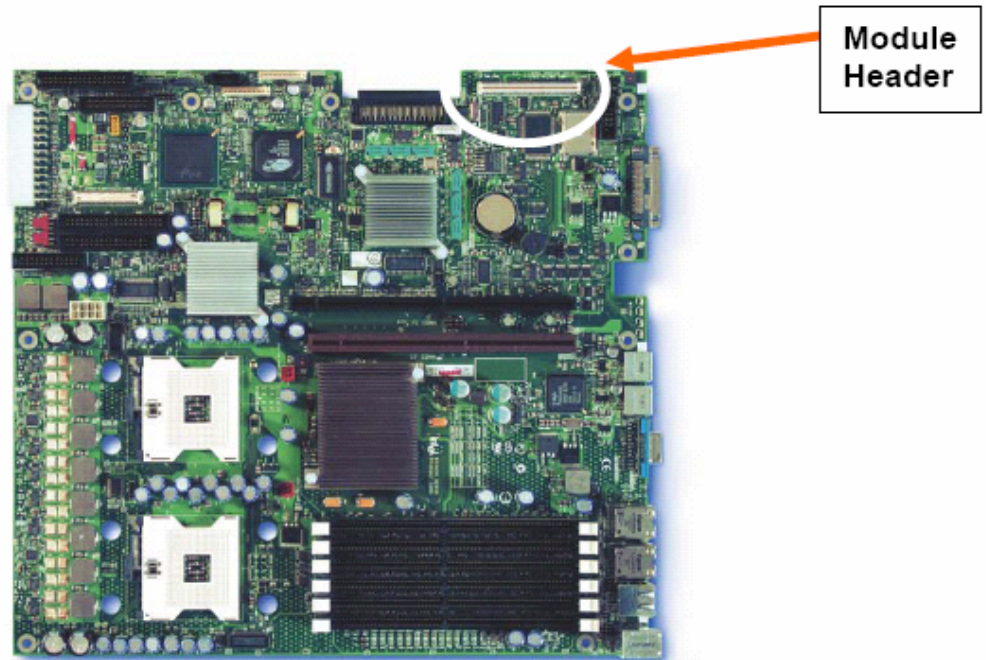

Figure 3. Location of Intel Management Module Connector on the Intel Server Board SE7520JR2

Module Header
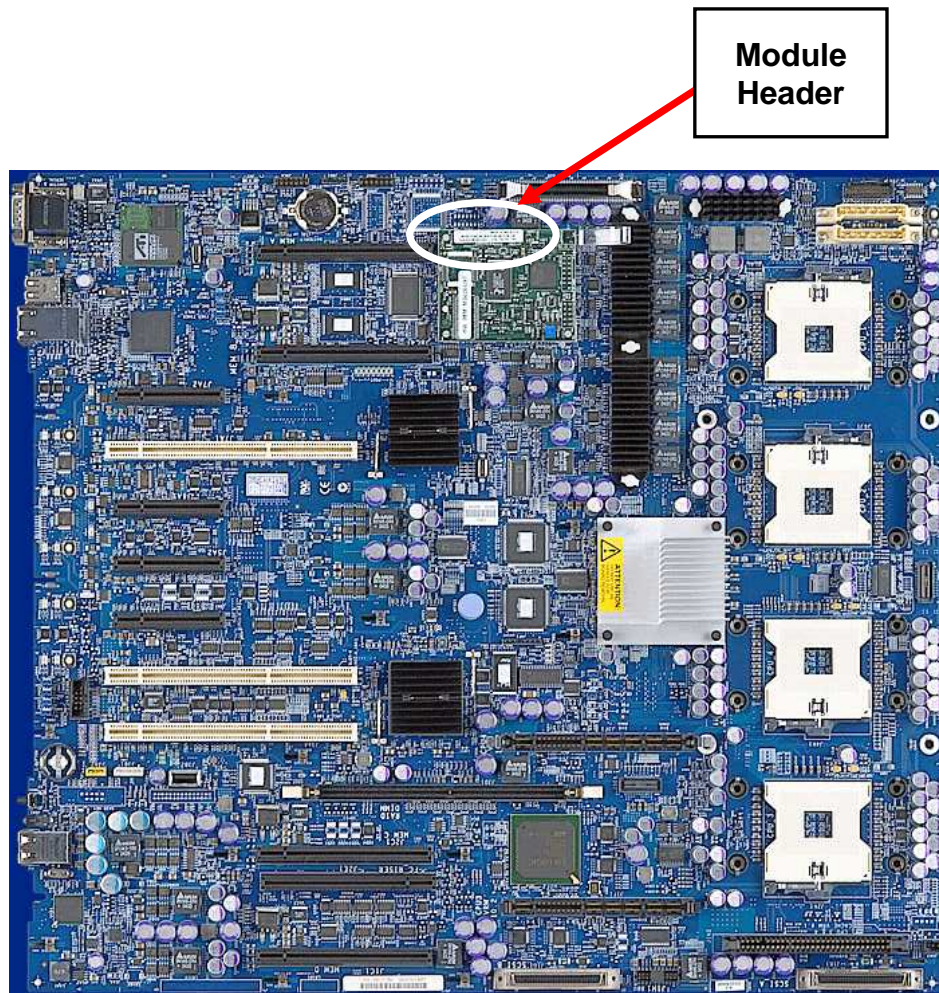
**Figure 4. Location of Intel Management Module Connector on
the Intel Server Board SE8500HW4**

Installing the Intel Management Module—Professional Edition

The Professional Edition consists of the following components:

- 1 nylon standoff

- Intel® Management Module Professional Edition. The following illustration shows the location of the standoff and retraction strap on the Professional Edition module (the location is the same on the Advanced Edition module). The upper illustration shows the bottom of the module. The lower illustration shows the top of the module.

KEY: A.) Location of the extraction strap
B.) Location of the nylon standoff
C.) Location of the module connector to the server board

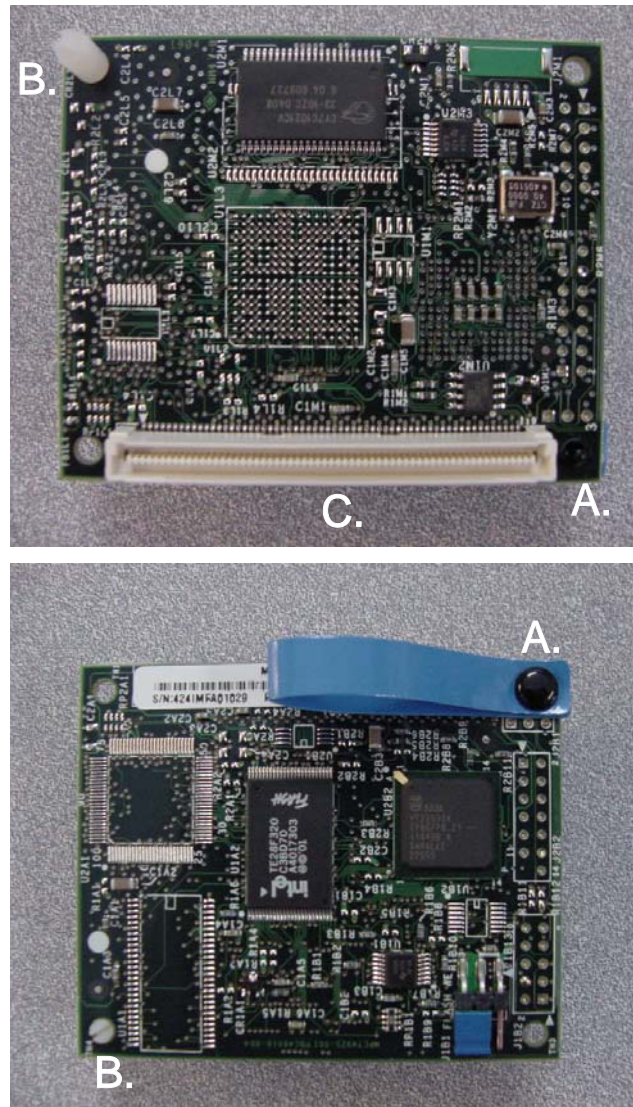**Figure 5. Location of the Connector, Extraction Strap, and Standoff on the Intel Management Module (Professional Edition)**

To prepare for the installation, you will need the following:

- The utilities for your server board (available on the Intel® Server Deployment Toolkit CD shipped with your server board)

- The latest FRU/SDR package, firmware update files, and Release Notes from http://support.intel.com/support/motherboards/server.

To install the Professional Edition module, do the following:

1. Power down the system.

2. Remove AC power.

3. Open the chassis to gain access to the Intel Management Module Connector.

4. Insert the nylon standoff into the baseboard to support the Intel Management Module. Choose the hole farthest away from the strap after the Intel Management Module is inserted into the connector.

5. Align the Management Module over the baseboard connector and the nylon standoff.

6. Press down on the Management Module to fully seat the connector and standoff.

7. Close the chassis, reconnect the AC power, and power-on the system.

8. Update the firmware and FRU/SDR for your server board. Use the latest files and instructions for your server board that you downloaded from http://support.intel.com/support/motherboards/server.

9. Install ISM 8.20 from the ISM 8 Installation CD, or run the Intel® Server Configuration Wizard (SCW) from the Intel Server Deployment Toolkit CD to configure the new features on the Professional Edition module.

Removing the Intel Management Module—Professional Edition

To remove the Professional Edition module, do the following:

1. Power down the system.

2. Remove AC power.

3. Open the chassis to gain access to the Intel Management module.

4. Pinch the end of the standoff and *slightly* raise the Management Module to disengage the standoff. To avoid damage to the connector, do not lift the edge the board that is farthest from the connector (near the standoff).

5. Using the strap attached to the module, gently pull up to slightly disengage the end of the connector closest to the strap. Using your fingers, grasp the board near the other end of the connector and gently rock the board back and forth until the connector is completely disengaged.

6. Close the chassis and reconnect the AC power.

Installing the Intel Management Module—Advanced Edition

The Advanced Edition Module consists of the following components:

- 1 Nylon Standoff

- Intel® Management Module Advanced Edition

  The following illustration shows the location of the standoff, connector, and retraction strap on the Advanced Edition module.

  KEY: A.) Location of the extraction strap
  B.) Location of the nylon standoff
  C.) Location of the module connector to the server board
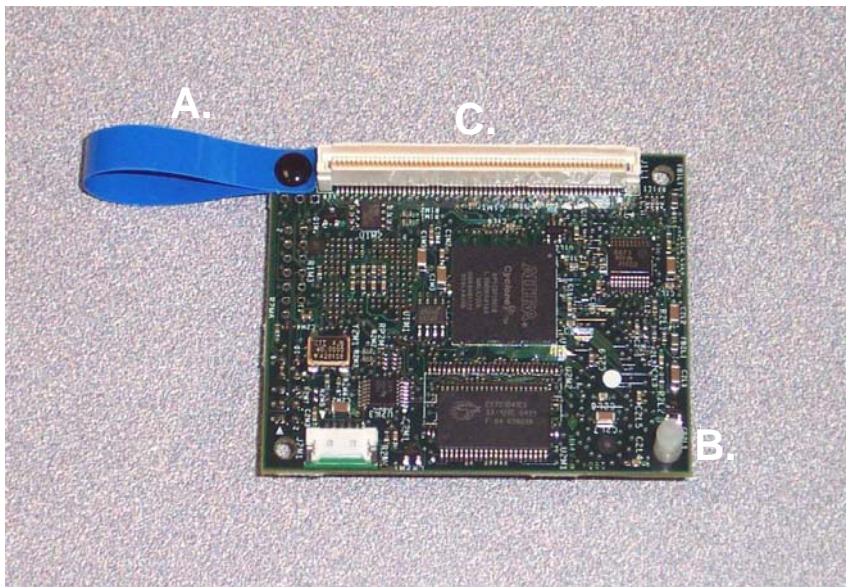
Figure 6. Location of the Connector, Extraction Strap, and Standoff on the Intel Management Module (Advanced Edition)

NOTE

This NIC card and associated hardware listed below are not used with the SE8500HW4 server board, which has a dedicated system management NIC on the server baseboard.

- Intel Management Module Network Interface Card.
- 2 Screws
- Rear filler panel with LAN connection knockout (not required for SR1400 and SR2400 chassis)

  The following illustration shows the network interface card, filler panel, and screws.

Figure 7. Intel Management Module Network Interface Card, Rear Filler Panel, and Screws

- 2 I2C Cables (one long and one short cable)

To prepare for the installation, you will need the following:

- The utilities for your server board (available on the Intel Server Deployment Toolkit CD shipped with your server board)
- The latest FRU/SDR, firmware update files, and Release Notes (download from http://support.intel.com/support/motherboards/server)
- A Medium Phillips screwdriver to attach the NIC card to the rear filler panel

To install the Advanced Edition module, do the following:

1. Power down the system.

2. Remove AC power.

3. Open the chassis to gain access to the Intel Management Module Connector and the rear panel.

4. For Intel Server Chassis SR1400 or Intel Server Chassis SR2400 with Intel Server Board SE7520JR2: follow the instructions in the chassis *Product Guide* to remove the Add-in Card Riser. Insert one nylon standoff in the baseboard to support the Management Module.

5. If you are installing in a SE8500HW4 platform, skip this step. Connect the cable between the Management Module and the NIC card. If you are installing the NIC in the SR1400 or SR2400 chassis, use the short cable, otherwise use the longer cable.

6. Align the Management Module over the baseboard connector and the nylon standoff.

7. Press down on the Management Module to fully seat the connector and standoff.

8. For Intel Server Chassis SR1400 or Intel Server Chassis SR2400 with Intel Server Board SE7520JR2, install the NIC on the rear panel using 2 screws. The following illustration shows the location of the network connector (NIC3) on the rear panel of the Intel Server Chassis SR1400.

NIC3
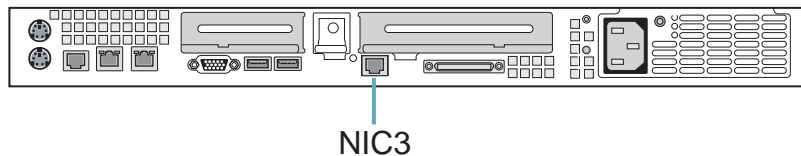
Replace the Add-in Card Riser.

9. For all other chassis types, except SE8500HW4 platforms:
   a. Connect the NIC to the filler panel with two screws.
   b. Install the NIC and filler panel in a full-height PCI rear panel slot.

10. Connect the LAN cable to the NIC.

11. Close the chassis, reconnect the AC power, and power-on the system.

12. Update the firmware and FRU/SDR for your server board. Use the latest files and instructions for your server board that you downloaded from http://support.intel.com/support/motherboards/server.

13. For headless operation (no keyboard), enter BIOS Setup (press F2 during POST) and change the "POST Error Pause" option to "disable."

14. Run the Intel Server Configuration Wizard (SCW) from the Intel Server Deployment Toolkit CD to configure the new features on the Advanced Edition module.

NOTE

To ensure that the NIC on the Advanced Edition module is properly configured, answer "No" to the following SCW question: "Intel Server Manager Application software and/or agents will be installed on this server."

NOTE

If you want to use Intel Advanced Remote Server Control (the ISM remote keyboard, video, and mouse software) with this IMM, when you run SCW, specify a static IP address for the NIC on the Advanced Edition module.

15. Run the ISM 8 Installation CD to install the Embedded SNMP MIB file and Intel Remote Server Control client viewer application.

Removing the Intel Management Module—Advanced Edition

To Remove the Advanced Edition module, do the following:

1. Power down the system.

2. Remove AC power.

3. Open the chassis to gain access to the Intel Management Module.

4. Disconnect the cable to the NIC.

5. Pinch the end of the standoff and *slightly* raise the Management Module to disengage the standoff.

6. Using the strap attached to the module, gently pull up to disengage the connector. Using your fingers, lift up the other end of the connector and gently rock the connector back and forth until the connector is completely disengaged. To avoid damage to the connector, do not lift the edge the board that is farthest from the connector.

7. Close-up the chassis and reconnect the AC power.

Intel Advanced Remote Server Control

The Intel Advanced Remote Server Control feature provides Keyboard, Video, Mouse (KVM) redirection over the network to a remote client running the Intel Advanced Remote Server Control viewer application.

Run the Intel Server Configuration Wizard (SCW) on the Intel Server Deployment Toolkit CD to enable the KVM feature. To use Intel Advanced Remote Server Control with the Advance Edition module, when you run SCW, specify a static IP address for the NIC on the IMM.

The client-side utility for using this feature is launched either from the Intel® Server Manager (ISM) 8.20 console or from a web browser. Use the ISM 8 Installation CD to install this component of ISM 8.20.

Email Alerting

Simple Mail Transport Protocol (SMTP) is a host-to-host email protocol over TCP. SMTP alerting allows you to send simple email alerts to preconfigured email destinations.

Use the Intel Server Configuration Wizard to configure the email alerting feature. You can configure the following parameters:

- Number of supported alert configurations
- Email From, To, and Subject lines
- Alerting machine name

The body of the alert message consists of the System Event Log (SEL) entry (English only) for the event that caused the alert.

NOTE

Email alerting is only available on the network attached to the Advanced Edition module NIC.

Embedded SNMP

You can connect to the managed server and use either an OS-resident SNMP agent or the Embedded (BMC-resident) SNMP agent. Table 2 summarizes the features available in the two SNMP access methods.

Table 2. Features Available with BMC and OS Agents

Feature	BMC SNMP Agent	OS SNMP Agent
Access Sensor Data	Yes	Yes
View threshold settings	Yes	Yes
Modify threshold settings (Voltage, Temperature, System Fan)	No	Yes
Read the SMBIOS tables	No	Yes
Provide overall system health status	No	Yes
SET	Yes (Limited)	Yes
SNMP access without OS running on Managed Server	Yes	No
Uses dedicated NIC	Yes	No

Configuring SNMP

For instructions on installing and using the OS-specific SNMP Subagents, refer to the *Installing and Configuring the Intel® Server Manager 8 SNMP Subagents* document (SNMP_Subagent_Install_and_Config_Guide.pdf) on the ISM 8 Installation CD.

To use the BMC-resident SNMP agent, install the BMC.MIB file using the ISM 8 SNMP installation option.

Run the Server Configuration Wizard (SCW) on the Intel Server Deployment Toolkit CD to configure the BMC SNMP Agent. The SCW will allow the user to configure the following:

- Enable SNMP
- Configure the SNMP port number for Get/Set commands
- Configure LAN alerting for SNMP Traps
- Set the SNMP Trap destination

Using the BMC-Resident SNMP Agent

To use the BMC-resident SNMP Agent, do the following:

1. Connect the NIC on the Advanced Edition module to the network.

2. Launch your SNMP-aware network management station (for example, Hewlett-Packard's OpenView) on a remote administrative system.

3. Copy the BMC.MIB file from the Intel Server Deployment Toolkit CD to your local hard drive. Load this MIB into your NMS application.

4. Set the SNMP community string to "public" to read the sensor data, or "private" to use the SNMP SET commands.

The user has two SNMP SET commands available when using the BMC-resident SNMP agent:

- Set the SNMP-only machine name variable to help confirm which managed server is being addressed by a particular SNMP request.
- Set Chassis ID LED to turn on/off the front panel ID LED.

Embedded CLI (Telnet)

Configuring the Embedded CLI (Telnet) Feature

Run the Server Configuration Wizard (SCW) on the Intel Server Deployment Toolkit CD to configure the Embedded CLI Telnet Server.

The SCW allows you to:

- Enable the Telnet Server in firmware
- Configure the Telnet port number

Using the Embedded CLI (Telnet) Feature

The firmware on the Advanced Edition module includes a telnet server. The telnet server provides you with both in-band and out-of-band monitoring and control of the server by using Intel's proprietary Command Line Interface (CLI) syntax called Common CLI (CCLI). The telnet server also allows you to establish a Serial Over LAN (SOL) session.

To use the embedded CLI feature, do the following:

1. Connect to the Telnet server.
   For example, to Telnet to a server at IP address 222.222.222.36 from the command prompt, type the following:
   ```
   Telnet 222.222.222.36
   ```

2. Log-in to the server. The Telnet server will ask for the BMC user name and password for LAN channel 3 (this is the NIC attached to the Advanced Edition module). (Use the SCW to configure the user names and passwords.)
   The server responds with the CLI prompt:
   ```
   CLI>
   ```

3. Type a CLI command (the CLI syntax is listed in Appendix A on page 26). For example:

   ```
   CLI>health
   ```
   The server return codes and responses are listed in Appendix A on page 26.

NOTE

The CLI syntax for the embedded Telnet server is slightly different than the syntax defined in the IPMI 1.5 specification for terminal mode CLI.

Embedded Web Server

Configuring the Embedded Web Server

Run the Intel Server Configuration Wizard (SCW) from the Intel Server Deployment Toolkit CD to configure the Embedded Web Server.

The SCW allows you to:

- Enable the web server in firmware
- Configure the HTTP Port number

Using the Embedded Web Server

Introduction

The Embedded Web Server has six firmware-resident web pages:

- System Summary Page—displays the overall system health and health indicators for individual sensors
- System Event Log—displays selected number of records from the System Event Log
- Power—provides power and reset controls
- IPMI Command—accepts IPMI hex commands or Native CLI commands and returns a response
- Configuration—provides configuration controls for the Embedded Web Server
- Help—provides on-line help

Each page has navigation links on the left side for quick navigation to another page plus an overall health indicator (directly above the navigation links).

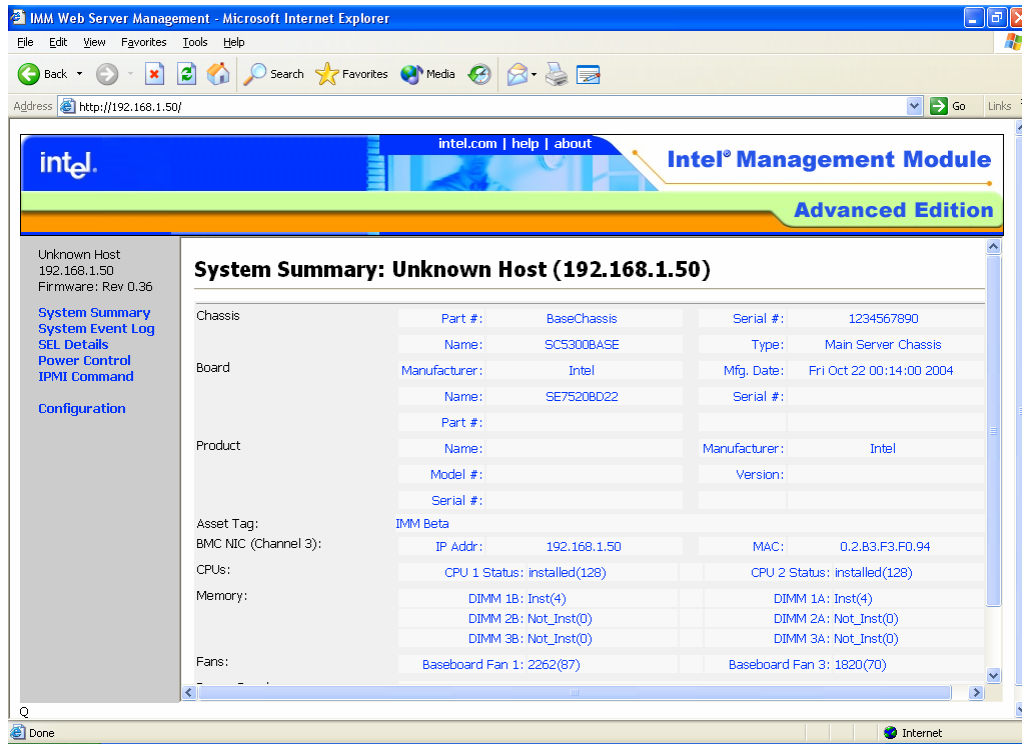The following figure shows the System Summary Page.

Figure 8. System Summary Page for the Embedded Web Server

Using the Web Page Interface

To access the Embedded Web Server, do the following:

1. Go to the following URL:
   http://*hostname* [**:***portnumber]*
   where *hostname* is the IP address or domain name for the server.

   If you have configured the port number to be some number other than port 80, add the port number to the URL. If you encounter problems connecting to the server, try disabling automatic configuration of the browser LAN settings.

2. The Embedded Web Server will prompt you for the BMC user name and password the first time you connect to the server. To log-in as the anonymous user with a Null password, simply leave the user name and password text boxes blank and press Enter.

NOTE

The Embedded Web Server checks the privilege level of the user before executing every command. The Embedded Web Server will prompt you again if you have logged in with insufficient privilege level to execute the requested command.

3. The Embedded Web Server will display the System Summary page after the user is authenticated.

Using the Embedded Web Server Scripting Interface

The Embedded Web Server can be accessed from a scripting language such as Perl or JavaScript. The client script sends a GET or POST request to the server. The server returns either an HTML web page or an XML response.

To return an HTML Page, use one of the following formats:

http://*hostname*/ipmiPage?cmd=*xx.xx.xx.xx.xx*?onload=*functionName*
   where *xx.xx.xx.xx.xx* is an IPMI 2.0 command in hexadecimal that is supported by the platform

http://*hostname*/webCmdPage?cmd=getSEL&first=*num*&last=*num*&onload=*functionName*

http://*hostname*/webCmdPage?cmd=clearSEL&onload=*functionName*

http://*hostname*/webCmdPage?cmd=changeVars&*subcommand*=value&onload=*functionName*

   where *subcommand* is one of the following:

         HealthyUpdateRate=*num*
         WarningUpdateRate=*num*
         CriticalUpdateRate=*num*
         UsrUrl1=*url* (on-line help page URL)
         UsrVal1=*string* (navigation bar label, the default is "help")
         UsrUrl2=*url* (the default is support.intel.com)
         UsrVal2=*string* (navigation bar label, the default is "intel.com")
         3:Hostname=*string* (this only changes an internal web page variable)
         3:Domainname=*string* (this only changes an internal web page variable)

The following syntax returns an XML response (*see* Table 3):

http://*hostname*/ipmiHex?cmd=*xx.xx.xx.xx.xx*
   where ***xx*** represents one byte (two hex digits) of the IMPI 2.0 command (separate each pair of hex digits with a period)

Table 3. Web Server Responses

Command	Response
ipmiPage	Argument 1 = completion code
	Argument 2 = the command that was executed
	Argument 3 = the command response
webCmdPage	Argument 1=an error code of 0 or 1 indicates no error
	Argument 2=an error string associated with the code
	Argument 3= the response data
ipmiHex	<ipmiResp completionCode="*YY*">*XX-XX-XX…*</ipmiResp>
	(The completion code YY and the returned data bytes XX are defined in the IPMI specification.)

HTML Example. In this example, the client-side page loads the page returned by the Embedded Web Server into a frame.

```
<FRAMESET …><FRAME …>

<A HREF=http://222.222.39.10/ipmiPage?cmd=20.C0.64.07.00.00&onload=doOnLoad>

IPMI Command to check if web is enabled</A></FRAME>…</FRAMESET>
```

Perl Script Example. In the following example, a Perl script sends an HTTP GET to the server.

```
Use IO::Socket;

$sock = new IO::Socket::INET (PeerAddr => '222.222.39.10",

                               PeerPort => 80,

                               Proto    => 'tcp'
                              );

die "Socket could not be created." Unless $sock;

print $sock "GET /ipmiHex?cmd=20.C0.64.07.00.00 HTTP/1.0"
```

NOTE

The default authentication is MD5 Digest authentication. This means that command line scripting tools must be able to handle Authentication failures and respond to the server requests.

Appendix A: Command Line Interface Syntax

The following Command Line Interface Syntax is used as the default for Terminal Mode CLI, embedded CLI (using the BMC-based Telnet server), and the embedded HTTP server IPMI Command page. Note that this syntax is slightly different than the IPMI 1.5 CLI syntax, or the CLI syntax used with the dpccli proxy (an optional component of ISM 8.20). Table 4 lists the standard return values. Table 5 lists the CLI command syntax.

Table 4. Standard Return Values for CLI Commands

- ok
- unsupported command
- unrecognized command
- command time-out
- insufficient privilege
- session in progress

Table 5. Command Line Interface Syntax

Cmd	IPMI Privilege Level	Option(s)	Short Description	Output
help			Display list of valid commands.	IPMI Rev: x.x FW Rev: xx.xx Commands …
		-C <command>	Returns a brief description of command	Command: xx
health	User		Display the health of the target.	PWR:zzz H:xx T:xx V:xx PS:xx C:xx D:xx S:xx O:xx Where:
				PWR is system POWER state H is overall Health T is Temperature V is Voltage PS is Power Supply subsystem C is cooling subsystem (Fans) D is Hard Drive / RAID Subsystem S is physical Security O is Other (OEM)

Cmd	IPMI Privilege Level	Option(s)	Short Description	Output
				zzz is: "ON", "OFF" (soft-off or mechanical off), "SLP" (sleep - used when can't distinguish sleep level), "S4", "S3", "S2", "S1", "??" (unknown) and xx is: ok, nc, cr, nr, uf, or ?? where:
				"ok" = OK (monitored parameters within normal operating ranges) "nc" = non-critical ('warning': hardware outside normal operating range) "cr" = critical ('fatal': hardware exceeding specified ratings) "nr" = non-recoverable ('potential damage': system hardware in jeopardy or damaged)
				"uf" = unspecified fault (fault detected, but severity unspecified) "??" = status not available/unknown (typically because system power is OFF)
		-f	Display "full" health status	Health :xx Temperature :xx Voltage :xx …
id	Callback		Display the unique identifier for this target (UUID)	xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx
boot	Operator		Attempts to reboot the system using OS shutdown by default	
		-f	Force boot, do not attempt OS shutdown	
		-console	During boot, switch to system console output	
reset	Operator		Initiate a system reset	
		-console	During reset, switch to system console output	

Cmd	IPMI Privilege Level	Option(s)	Short Description	Output
shutdown	Operator		Power off by issuing an orderly shutdown to the OS	See Note at the end of the table.
		-f	Force OS shutdown. (Switch power off)	
power	Operator	-on	Switch power on	
		-console	Set session to system console for power-on	
		-off	Switch power off (no OS shutdown)	
		-cycle	Switch power off, then on (no OS shutdown)	
		-state	Display target's current power state	ON OFF
			End current session	
console (Only Telnet allows this command)	Callback		Switch the session to system console. "~." switches back to CLI mode.	
exit (quit)	Callback		End current session	
logon (Only Terminal Mode allows this command set)	Callback	-u <username> -n -p <password>	Start a session	

Cmd	IPMI Privilege Level	Option(s)	Short Description	Output
network	Operator		Displays the current network channel configuration of the BMC. If not LAN channel, it uses the primary NIC channel	IP Address: x.x.x.x IP Address Source: (Static| DHCP | BIOS | Other) MAC Address: xx:xx:xx:xx:xx:xx Subnet Mask: x.x.x.x Gateway: x.x.x.x
		-p <params>	Display the requested parameter (mac | ip | subnet | gateway).	
interrupt	Operator		Causes the BMC to generate an IPMI diagnostic interrupt (NMI for IA-32 systems)	
		-console	Switches to console mode and issues the interrupt	
version	Callback		Displays the Native CLI version number	Native CLI version x.x.
displaylog	User		Display SEL records.	Hex characters for each record, separated by linefeed characters.
		-all	All SEL records	
		-a | -d	Ascending or Descending (default) order	
		- s <first> <last>	Displays a set of SEL records	
clearlog	User		Clears SEL records	
identify	Operator		Activate a local indicator to identify target system (if supported by hardware)	

Cmd	IPMI Privilege Level	Option(s)	Short Description	Output
		-on [#]	Switch indicator on; turn off in # seconds	
		-off	Switch indicator off	
		-state	Display current state of indicator	ON (Application) ON (Button) OFF

NOTE

Performing a graceful OS shutdown requires that an Intel supplied OS agent be present. If this agent is not present or is unable to/does not respond after 7 seconds, an error message will be displayed for the user and the command will terminate, no reset or power-off will be performed. Graceful shutdown commands will not perform hard resets or power off if OS shutdown does not complete.

References

- *Intel® Server Board SE7520BD2 Technical Product Specification* (available on *support.intel.com*)
- *Intel® Server Board SE7520JR2 Technical Product Specification* (available on *support.intel.com*)
- *Intel® Server Board SE7520AF2 Technical Product Specification* (available on *support.intel.com*)
- *Intel® Server Board SE7520AF2 User Guide* (provided with the server board and available on support.intel.com)
- *Intel® Server Board SE7520JR2 User Guide* (provided with the server board and available on support.intel.com)
- *Intel® Server Board SE7520BN2 User Guide* (provided with the server board and available on support.intel.com)
- *Intel® Server Board SE8500HW4 User Guide* (provided with the server board and available on support.intel.com)
- *Getting Started with Intel® Server Manager 8 (ISM 8)* (ism_getting_started_guide.pdf). This document is installed by the ISM installer from the ISM CD provided with the server board.
- *Installing and Configuring the Intel® Server Manager 8 SNMP Subagents* (SNMP_Subagent_Install_and_Config_Guide.pdf). This document is installed by the ISM installer from the ISM CD provided with the server board.
- *IPMI—Intelligent Platform Management Interface Specification Second Generation v2.0*, see http://support.intel.com/support/motherboards/server for the latest specification and errata.

Glossary

Term	Definition
BIOS	Basic Input Output System
BMC	Baseboard Management Controller
CLI	Command Line Interface
DIMM	Dual In-line Memory Module
FRU	Field Replaceable Unit
HSC	Hot-swap Controller
I2C	Inter-Integrated Circuit Bus
ICMB	Intelligent Chassis Management Bus
ID	Identification
IPMI	Intelligent Platform Management Interface
ISM	Intel® Server Manager
KVM	Keyboard Video Mouse
LED	Light Emitting Diode
mBMC	mini-Baseboard Management Controller (National Semiconductor PC87431)
MIB	Management Information Base
NIC	Network Interface Card
NMS	Network Management Station
OOB	Out of Band (management of the server without the server Operating System)
PCI	Peripheral Component Interconnect bus
SATA	Serial ATA (Advanced Technology Attachment)
SDR	Sensor Data Record
SEL	System Event Log
SCSI	Small Computer System Interface
SCW	Intel® Server Configuration Wizard
SNMP	Simple Network Management Protocol
SMBus	System Management Bus
SMTP	Simple Mail Transfer Protocol
TPS	Technical Product Specification