(September 28, 2018)

SERVER MANAGEMENT

1. Overview

The NEC Express5800 Server Series provides comprehensive server management functions with hardware management by a server management chipset and server management by software.

The hardware-based server management is performed by a chipset called Baseboard Management Controller (BMC) and the BMCs supported by the NEC Express5800 Server Series are EXPRESSSCOPE Engine 2, EXPRESSSCOPE Engine 3 and BMC/CMC embedded to Express5800/D120h. The EXPRESSSCOPE Engine 2, EXPRESSSCOPE Engine 3 and BMC/CMC embedded to Express5800/D120h provide advanced server management functions such as remote control, remote console and remote media functions, which are available regardless of the state of the OS. Additionally, in some models of the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 3 mounted, the power consumption control function is enhanced by being integrated with software such as NEC ESMPRO Manager Ver. 6.

The software-based server management is performed by server management software called NEC ESMPRO Manager, NEC ESMPRO Agent, NEC ESMPRO ServerAgentService, and NEC ESMPRO Agent Extension.

The server management functions are provided by the NEC ESMPRO Manager on the management PC communicating with the NEC ESMPRO Agent, NEC ESMPRO ServerAgentService or NEC ESMPRO Agent Extension on the managed server while the OS is running on the NEC Express5800 Server Series.

Along with the server management functions of the existing software, the operability is improved in the NEC ESMPRO Manager Ver. 5 and later by integrating the hardware management functions provided by the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3.

In addition, the BMCs are compliant with the Intelligent Platform Management Interface (IPMI) specification, which is an industry standard server management interface.

2. NEC Express5800 Server Series Server Management Products

For the NEC Express5800 Server Series, the server management products below are provided. The combinations of the products deliver advanced server management capabilities. The available combinations differ depending on the model. For the available combinations, refer to the table "Server Management Products Support Matrix for Product Combination" at the end of this chapter.
For D120h, please refer to Appendix A Table A-7 and Table A-8.

Hardware Products
● EXPRESSSCOPE Engine 3

Supported Models: E110d-1, R110d-1E, GT110d, GT110d-S, R120d-1M, R120d-2M, R120d-1E, R120d-2E, T120d, E120d-M, R110e-1E, GT110e, GT110e-S, E120d-1, T110f-S, T110f-E, R110f-1E, R120e-1M, R120e-2M, T120e, R120e-1E, R120e-2E, E120e-M, T110g-S, T110g-E, R110g-1E, R120f-1M, R120f-2M, E120f-M, R120f-1E, R120f-2E, T120f, R110h-1, T110h, T110h-S, E120g-M, R120g-1M, R120g-2M, R120g-2E, T120g, R120g-1E, T110i-S, T110i, R110i-1

● EXPRESSSCOPE Engine 2

Supported Models: T120a-M, T120a-E, T120b-M, T120b-E, T110b, T110c, GT120a, GT120b, R140a-4, R140b-4, R120a-2, R120a-1, R120b-2, R120b-1, R110b-1, R110c-1, iR120a-1E, R110a-1H, iR110a-1H, E110b-1, E120b-1, E110b-M

The EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3, which are BMCs that are compliant with the IPMI Ver. 2.0, provide remote management functions described below.

The remote management functions are available by connecting to the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 from the management PC through the Web server, Telnet server and SSH server functions on the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3. No additional management software is required.

For the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 mounted, the security is improved by an on-board management LAN port dedicated to the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3, separately from the standard LAN port. In addition, the reliability and availability are also increased, as the remote management is available even in the event of a failure on the standard LAN port.

■ **User Interface**

• **Web Server Function**

The EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3 can be accessed from a standard Web browser.

The SSL is also supported, and therefore, secure access is available via HTTPS.

In addition, the user account management functions provide login control and operations control by user level, which can be set for each user account.

- **Command Line Interface (CLI)**

  The direct login to the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3 via Telnet/SSH is available.

  The server management via the industry standard protocol which is compliant with DMTF SMASH (*1) is available after the login.

  The interoperability with the management software can be improved by using the CLI to control the power, collect the information on the state of the NEC Express5800 Server Series, collect the logs, etc.

■ **Remote Control**

- **Remote Power ON/Forced Power OFF Functions**

  The server reset, power ON/OFF, memory dump, etc. are available.

- **Remote Console Functions**

  The remote views and operations of a local keyboard, video and mouse are available.

  The views and operations of the POST process and BIOS setup screen are available from the Telnet/SSH client.

  The character-based OS console functions can be operated via LAN and the views of the OS boot, OS operations and panic screen is available on the OSes below. In this case, the serial COM2 port will be dedicated to the remote console functions.
    - Windows Server 2003 Emergency Management Services (EMS)
    - Windows Server 2008 Emergency Management Services (EMS)
    - Linux OS

- **Remote KVM Console Functions** (*2)

  The remote views and operations of a local keyboard, video and mouse are available. The seamless views and operations of the POST process, the BIOS setup and OS screen are available. The operations can be performed regardless of the state of the OS, as these functions are achieved at the hardware level.

  The resolutions supported by the EXPRESSSCOPE Engine 2 are as follows.

1280 × 1024 pixels	256 colors, 16 bit-color
1152 × 864 pixels	256 colors, 16-bit color, 24-bit color (*)
1024 × 768 pixels	256 colors, 16-bit color, 24-bit color, 32-bit color
800 × 600 pixels	256 colors, 16-bit color, 24-bit color, 32-bit color
640 × 480 pixels	256 colors, 16-bit color, 24-bit color, 32-bit color

(*) When you change the display settings to 1280 × 1024 pixels 24-bit color while you log in to the EXPRESSSCOPE Engine 2, the remote KVM console can be displayed successfully, however, the local console cannot be displayed until you log out of the EXPRESSSCOPE Engine 2.

The resolutions supported by the EXPRESSSCOPE Engine 3 are as follows.

1600 × 1200 pixels	256 colors, 16-bit color
1280 × 1024 pixels	256 colors, 16-bit color, 24-bit color
1152 × 864 pixels	256 colors, 16-bit color, 24-bit color
1024 × 768 pixels	256 colors, 16-bit color, 24-bit color, 32-bit color
800 × 600 pixels	256 colors, 16-bit color, 24-bit color, 32-bit color
640 × 480 pixels	256 colors, 16-bit color, 24 bit-color, 32-bit color

- **Remote Media Functions** (*2)

An FD/CD/DVD drive, ISO image and flash memory (USB flash drive (*3)) connected to a management PC can be recognized as a drive connected to the managed server. For details, refer to "6. Remote KVM Console Functions and Remote Media Functions."

■ Server Monitoring Functions

- **Remote Information Collection**

The IPMI information, system information and system environment information can be collected and viewed.

- IPMI information: Information on the logs, sensor, maintenance parts, etc.
- System information: Information on the products, firmware, CPU, memory, MAC address, etc.
- System environment information: Information on the temperature, voltage, fan, power, power supply, HDD, etc.

- **Server State Information Collection and Views**

The following types of the server state can be viewed.

- Power state (DC ON/OFF), LED state (colors, solid/blinking), LCD display messages

- **Power Consumption View and Power Capping**

For the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 3 mounted, the power consumption can be viewed and the power capping can be set. In addition, the transition of the power consumption can be displayed in graph and the measured data can be downloaded. (*7)

■ Failure Detection and Reporting

- **SNMP Reporting**

The failure notification is available by SNMP trap via LAN or WAN (using a modem with PPP connection) (*6) in the event of a failure.

- **E-Mail Alert Function**

The failure notification is available by e-mail, which will be sent to your specified addresses, in the event of a failure.

■ Installation Assistance

- **Remote Management Settings in the BIOS**

  The remote management initial settings are available in the BIOS setup menu. In addition, with the EXPRESSSCOPE Engine 3, a part of the BIOS settings can be changed from the Web browser.

- **Management Port Sharing**(*4)

  For some models, the management port can also be used as a standard LAN port. (*5)

(*1) The Systems Management Architecture for Server Hardware (SMASH) is a Command Line Protocol (CLP) defined by Distributed Management Task Force (DMTF).
(*2) To use this function, the NEC Remote KVM and Media License Key (N8115-03 or N8115-04) is required.
(*3) The multi-partition USB flash drive is not supported.
(*4) It is not recommended from a security point of view.
(*5) This function is not supported by R110a-1H and iR110a-1H.
(*6) This function is not supported by the EXPRESSSCOPE Engine 3.
(*7) This function is supported by R120d-1M, R120d-2M, R120d-1E, R120d-2E, T120d, E120d-M, R110e-1E, GT110e, GT110e-S, E120d-1, T110f-S, T110f-E, and R110f-1E, R120e-1M, R120e-2M, T120e, R120e-1E, R120e-2E, E120e-M, T110g-E, T110g-S, R110g-1E, R120f-1M, R120f-2M, E120f-M, R120f-1E, R120f-2E, T120f, R110h-1, T110h, T110h-S, E120g-M, R120g-1M, R120g-2M, R120g-2E, T120g, R120g-1E, T110i-S, T110i, R110i-1.

Management Software Products

● NEC ESMPRO Manager Ver. 6, NEC ESMPRO ServerAgentService, and NEC ESMPRO Agent Extension

Supported Models: R120f-1M, R120f-2M, E120f-M, R120f-1E, R120f-2E, T120f, R110h-1, T110h, and T110h-S, E120g-M, R120g-1M, R120g-2M, R120g-2E, T120g, R120g-1E, T110i-S, T110i, R110i-1

The NEC ESMPRO Manager Ver. 6 delivers integrated server management of software and hardware by interacting with the NEC ESMPRO Agent, NEC ESMPRO Agent Extension and NEC EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 mounted in the NEC Express5800 Server Series. As it is accessible from the web browser interface, it increases the operability and flexibility in your environment.

The hardware management can be performed by the NEC ESMPRO Agent communicating via SNMP while the OS is running on the existing models supported by the NEC ESMPRO Agent. However, for the models supported by the NEC ESMPRO ServerAgentService, the network setting as well as network connection of the EXPRESSSCOPE Engine 3 need to be configured as the hardware management is performed via the EXPRESSSCOPE Engine 3.

Furthermore, with the NEC ESMPRO Agent Extension installed on the NEC Express5800 Server Series, scheduled running and remote console operations of the NEC Express5800 Server Series can also be performed by the NEC ESMPRO Manager Ver. 6.

NEC ESMPRO Website:
For the latest information and details on the NEC ESMPRO Manager Ver. 5 and 6, refer to the Web site below.
http://www.nec.com/en/global/prod/express/management/smsa/index.html (*)
For the support matrix of each hardware model and software, refer to "Server Management Products Support Matrix for Product Combination."

The latest version of the NEC ESMPRO Manager Ver. 5 and 6 can be downloaded at the Web site below.
http://www.58support.nec.co.jp/global/download/index.html

● NEC ESMPRO Manager Ver. 5 and Ver. 6, NEC ESMPRO Agent and NEC ESMPRO Agent Extension

Supported Models:
  E110d-1, R110d-1E, GT110d, GT110d-S, R120d-1M, R120d-2M, R120d-1E, R120d-2E, T120d, E120d-M, R110e-1E, GT110e, GT110e-S, E120d-1, T110f-S, T110f-E, R110f-1E, T120a-M, T120a-E, T120b-M, T120b-E, T110b, T110c, GT120a, GT120b, 110Ge, GT110b, GT110b-S, , T120e, R120e-1E, R120e-2E, E120e-M, HR120a-1, HR120b-1, R140a-4, R140b-4, R120a-2, R120a-1, R120b-2, R120b-1, R110b-1, R110c-1, R110a-1H, iR110a-1H, iR120a-1E, E110b-1, E120b-1, E110b-M(*), E120b-M, R120e-1M, R120e-2M, T110g-S, T110g-E, R110g-1E

The NEC ESMPRO Manager Ver. 5 and Ver. 6 deliver integrated server management of software and hardware by interacting with the NEC ESMPRO Agent, NEC ESMPRO Agent Extension, and EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 mounted in the NEC Express5800 Server Series. As it is accessible from the web browser interface, it increases the operability and flexibility in your environment.
   (*) E110b-M model is not supported by the NEC ESMPRO Agent and NEC ESMPRO Agent Extension.

The server management can be performed by the NEC ESMPRO Manager Ver. 5 communicating with the NEC ESMPRO Agent via SNMP while the OS is running on the NEC Express5800 Server Series. In an environment with the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 mounted in the NEC Express5800 Server Series, hardware management functions of the NEC ESMPRO Agent are extended.

In an environment with the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 mounted in the NEC Express5800 Server Series, remote management including hardware monitoring and control can be performed by the NEC ESMPRO Manager Ver. 5 communicating with the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 via RMCP, even when the DC power of the NEC Express5800 Server Series is turned OFF or the NEC ESMRO Agent is not available. Furthermore, with the NEC ESMPRO Agent Extension installed on the NEC Express5800 Server Series, scheduled running and remote console operations of the NEC Express5800 Server Series can also be performed by the NEC ESMPRO Manager Ver. 5. For details, refer to the NEC ESMPRO Web site below.

NEC ESMPRO Website:
For the latest information and details on the NEC ESMPRO Manager Ver. 5 and Ver. 6, refer to the Web site below.
http://www.nec.com/en/global/prod/express/management/smsa/index.html (*)
For the support matrix of each hardware model and software, refer to "Server Management Products Support Matrix for Product Combination."

The latest version of the NEC ESMPRO Manager Ver. 5 and Ver. 6 can be downloaded at the Web site below.

http://www.58support.nec.co.jp/global/download/index.html

Server Management Products Support Matrix for Product Combination

The available products differ depending on the model. You can select the combination of the products flexibly according the model.

⊙ Supported as standard   O Supported optionally (downloadable) - Not supported

Model	Managed Server					Management PC	
	EXPRESS SCOPE Engine 3	EXPRESS SCOPE Engine 2	NEC ESMPRO ServerAgentService	NEC ESMPRO Agent Ver.	NEC ESMPRO Agent Extension(*1)	NEC ESMPRO Manager Ver. 6	NEC ESMPRO Manager Ver. 5
D120h	*6	-	⊙	-	-	⊙	-
T110i-S	⊙	-	⊙	-	⊙	⊙	-
T110i	⊙	-	⊙	-	⊙	⊙	-
R110i-1	⊙	-	⊙	-	⊙	⊙	-
R120g-1E	⊙	-	⊙	-	⊙	⊙	-
E120g-M	⊙	-	⊙	-	⊙	⊙	-
R120g-1M	⊙	-	⊙	-	⊙	⊙	-
R120g-2M	⊙	-	⊙	-	⊙	⊙	-
R120g-2E	⊙	-	⊙	-	⊙	⊙	-
T120g	⊙	-	⊙	-	⊙	⊙	-
R110h-1	⊙	-	⊙	-	⊙	⊙	-
T110h	⊙	-	⊙	-	⊙	⊙	-
T110h-S	⊙	-	⊙	-	⊙	⊙	-
R120f-1E	⊙	-	(*2)	(*2)	⊙	⊙	-
R120f-2E	⊙	-	(*2)	(*2)	⊙	⊙	-
T120f	⊙	-	(*2)	(*2)	⊙	⊙	-
R120f-1M	⊙	-	(*2)	(*2)	⊙	⊙	-
R120f-2M	⊙	-	(*2)	(*2)	⊙	⊙	-
E120f-M	⊙	-	(*2)	(*2)	⊙	⊙	-
A2040d	(*3)	-	⊙	-	⊙	⊙	-
A2020d	(*3)	-	⊙	-	⊙	⊙	-
A2010d	(*3)	-	⊙	-	⊙	⊙	-
A1040d	(*3)	-	⊙	-	⊙	⊙	-
A2040c	(*3)	-	(*2)	(*2)	⊙	⊙	⊙
A2020c	(*3)	-	(*2)	(*2)	⊙	⊙	⊙
A2010c	(*3)	-	(*2)	(*2)	⊙	⊙	⊙
A1040c	(*3)	-	(*2)	(*2)	⊙	⊙	⊙
A2040b	(*3)	-	-	4.x	⊙	⊙	⊙
A2020b	(*3)	-	-	4.x	⊙	⊙	⊙
A2010b	(*3)	-	-	4.x	⊙	⊙	⊙
A1040b	(*3)	-	-	4.x	⊙	⊙	⊙
T110g-S	⊙	-	-	4.x	⊙	⊙	⊙
T110g-E	⊙	-	-	4.x	⊙	⊙	⊙
R110g-1E	⊙	-	-	4.x	⊙	⊙	⊙
T120e	⊙	-	-	4.x	⊙	⊙	⊙
R120e-1E	⊙	-	-	4.x	⊙	⊙	⊙
R120e-2E	⊙	-	-	4.x	⊙	⊙	⊙
E120e-M	⊙	-	-	4.x	⊙	⊙	⊙

HR120a-1	-	(*4)	-	4.x	◎	◎	◎
HR120b-1	-	(*4)	-	4.x	◎	◎	◎
R120e-1M	◎	-	-	4.x	◎	◎	◎
R120e-2M	◎	-	-	4.x	◎	◎	◎
T110f-S	◎	-	-	4.x	◎	◎	◎
T110f-E	◎	-	-	4.x	◎	◎	◎
R110f-1E	◎	-	-	4.x	◎	◎	◎
E120d-1	◎	-	-	4.x	◎	◎	◎
E120d-M	◎	-	-	4.x	◎	◎	◎
R110e-1E	◎	-	-	4.x	◎	◎	◎
GT110e	◎	-	-	4.x	◎	◎	◎
GT110e-S	◎	-	-	4.x	◎	◎	◎
R120d-1E	◎	-	-	4.x	◎	◎	◎
R120d-2E	◎	-	-	4.x	◎	◎	◎
T120d	◎	-	-	4.x	◎	◎	◎
A1080a-S	-	(*5)	-	4.x	◎	◎	◎
A1080a-D	-	(*5)	-	4.x	◎	◎	◎
A1080a-E	-	(*5)	-	4.x	◎	◎	◎
R120d-1M	◎	-	-	4.x	◎	◎	◎
R120d-2M	◎	-	-	4.x	◎	◎	◎
E110d-1	◎	-	-	4.x	◎	◎	◎
R110d-1E	◎	-	-	4.x	◎	◎	◎
GT110d	◎	-	-	4.x	◎	◎	◎
GT110d-S	◎	-	-	4.x	◎	◎	◎
E110d-1	◎	-	-	4.x	◎	◎	◎
T120a-M	-	◎	-	4.x	◎	◎	◎
T120a-E	-	◎	-	4.x	◎	◎	◎
T120b-M	-	◎	-	4.x	◎	◎	◎
T120b-E	-	◎	-	4.x	◎	◎	◎
GT120a	-	◎	-	4.x	◎	◎	◎
GT120b	-	◎	-	4.x	◎	◎	◎
T110b	-	◎	-	4.x	◎	◎	◎
T110c	-	◎	-	4.x	◎	◎	◎
GT110b	-	-	-	4.x	-	◎	◎
GT110b-S	-	-	-	4.x	-	◎	◎
R140a-4	-	◎	-	4.x	O	◎	◎
R140b-4	-	◎	-	4.x	◎	◎	◎
R120a-2	-	◎	-	4.x	◎	◎	◎
R120a-1	-	◎	-	4.x	◎	◎	◎
R120b-2	-	◎	-	4.x	◎	◎	◎
R120b-1	-	◎	-	4.x	◎	◎	◎
E110b-1	-	◎	-	4.x	◎	◎	◎
E120b-1	-	◎	-	4.x	◎	◎	◎
E110b-M	-	◎	-	-	-	◎	◎
E120b-M	-	(*4)	-	4.x	◎	◎	◎
R110b-1	-	◎	-	4.x	◎	◎	◎

R110c-1	-	⊙	-	4.x	⊙	⊙	⊙
R110a-1H	-	⊙	-	4.x	O	⊙	⊙
iR120a-1E	-	⊙	-	4.x	⊙	⊙	⊙
iR110a-1H	-	⊙	-	4.x	O	⊙	⊙

(*1) The latest version of the NEC ESMPRO Agent Extension can be downloaded at the Web site below.
http://www.58support.nec.co.jp/global/download/index.html

(*2) The NEC ESMPRO ServerAgentService should be used for Windows OS; and NEC ESMPRO Agent
Ver. 4 for Linux OS.

(*3) The NEC EXPRESSSCOPE Engine SP3 is mounted.

(*4) The dedicated BMC is mounted. (E120b-M, HR120a-1, HR120b-1)

(*5) The EXPRESSSCOPE Engine SP2 is mounted.

(*6) D120h's Baseboard Management Controller is 'BMC and CMC', not EXPRESSSCOPE Engine series.

3. Reliability Availability Serviceability (RAS) Functions

The NEC Express5800 Server Series provides enhanced RAS functions in the BIOS functions, EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3. For the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 mounted, the server management including turning OFF the DC power, booting and shutting down the OS is available.

CPU/Memory Check BIOS Start-Up	OS Start-Up	System in Operation		OS Shutdown (Power OFF)
DC OFF	POST Process	Boot Process	Being Operated (OS Running)	Shut Down	DC OFF

Monitoring/Reporting by NEC ESMPRO

Server Management   **Server Management**
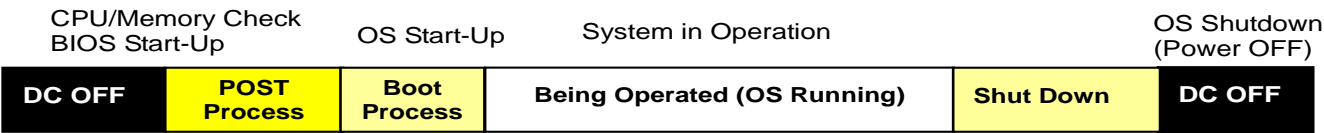
For NEC Express5800 Server Series with simplified version of BMC and with no EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3

Monitoring/Reporting by NEC ESMPRO

Server Management

For NEC Express5800 Server Series with EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3

Server management can be performed as long as the AC power is supplied, even while the DC power is OFF.

# 4. NEC Express5800 Server Series Server Management Environment

The NEC Express5800 Server Series can provide full-fledged management environment by selecting a combination of the management products. An advanced management environment is also available by using the NEC ESMPRO Manager Ver. 5 or Ver. 6 properly, according to the state of the NEC Express5800 Server Series; such as the OS booting or the POST process in progress.

● Environment with "NEC ESMPRO Manager Ver. 5 and 6" + "EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3"

By using the NEC ESMPRO Manager Ver. 5 and Ver. 6, the monitoring can be performed in a medium and large scale environment while the OS is running, during the time from turning ON the power of the NEC Express5800 Server Series until the POST process is completed and while the DC power is turned OFF.

For the connection interfaces, LAN and serial port connection (with an RS232C crossover cable and a modem) (*2) are supported. With the LAN connection, the Web server function provided by the NEC ESMPRO Manager Ver. 5 and Ver. 6 allow the management server to be accessed from a standard Web browser to view and control the states of multiple servers of the NEC Express5800 Server Series.

To view and control the state of the NEC Express5800 Server Series, the specific Web server function implemented in the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3 is also available. The NEC ESMPRO Manager Ver. 5 and Ver. 6 and later provide a link to access the Web server.
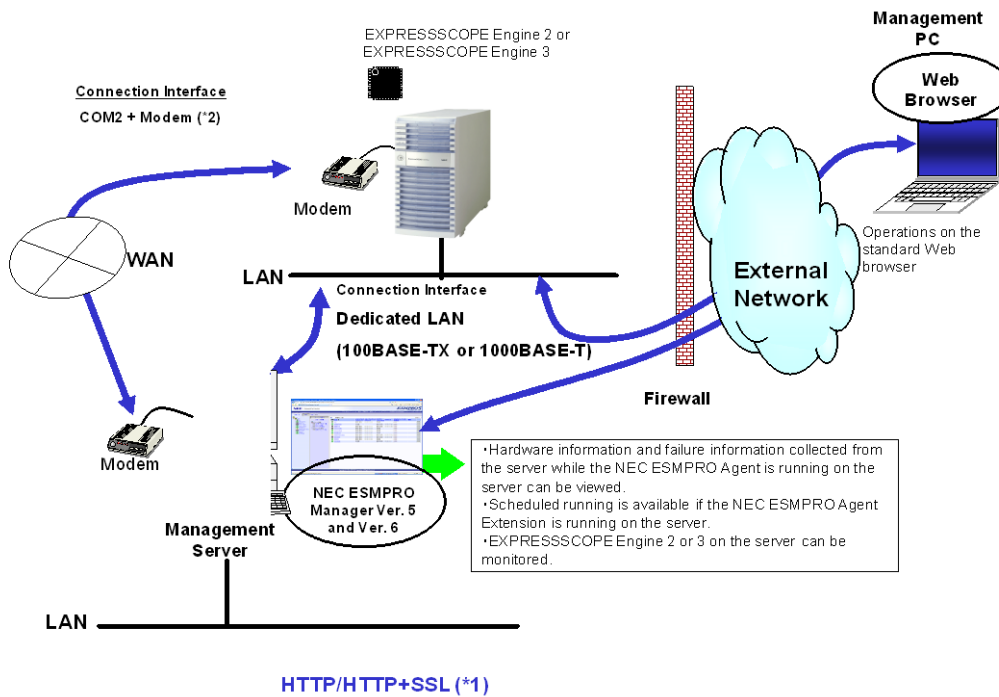
(*1) To access the Web server of the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 through the firewall from the Web browser, the firewall rules must be configured in order that the packets with the specific port numbers used for HTTP and management to be allowed to pass through the firewall. For the port numbers used, refer to the "User's Guide" of the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3, which is provided with the NEC Express5800 Server Series.

(*2) The connection interface using COM2 + Modem is supported only by the EXPRESSSCOPE Engine 2.

5. Remote Power ON

The power of the NEC Express5800 Server Series can be remotely turned ON by the EXPRESSSCOPE Engine 2, EXPRESSSCOPE Engine 3, NEC ESMPRO Manager Ver. 5 and Ver. 6. The execution method differs depending on the management software product.

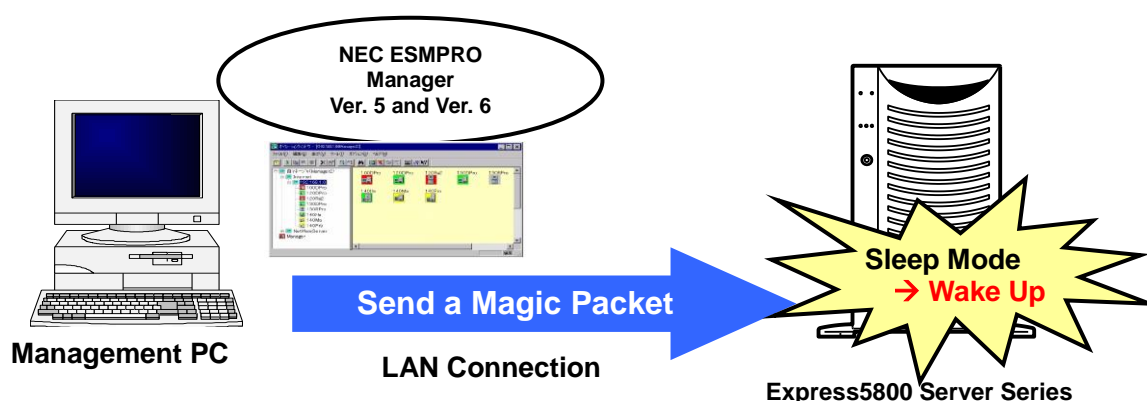**Methods for executing the remote power control of the management software**

Management SW \ Method	Remote Wake Up Function (Magic Packet)	Remote Control Functions (Interact with BMC)
Web Browser of the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3	-	○
NEC ESMPRO Manager Ver. 5 and Ver. 6	○	○

● Remote Power ON by the Remote Wake Up Function

The remote wake up function is to remotely turn ON the power of the networked system in sleep mode by sending a specialized packet called "Magic Packet frame" that contains the MAC address of the destination system.
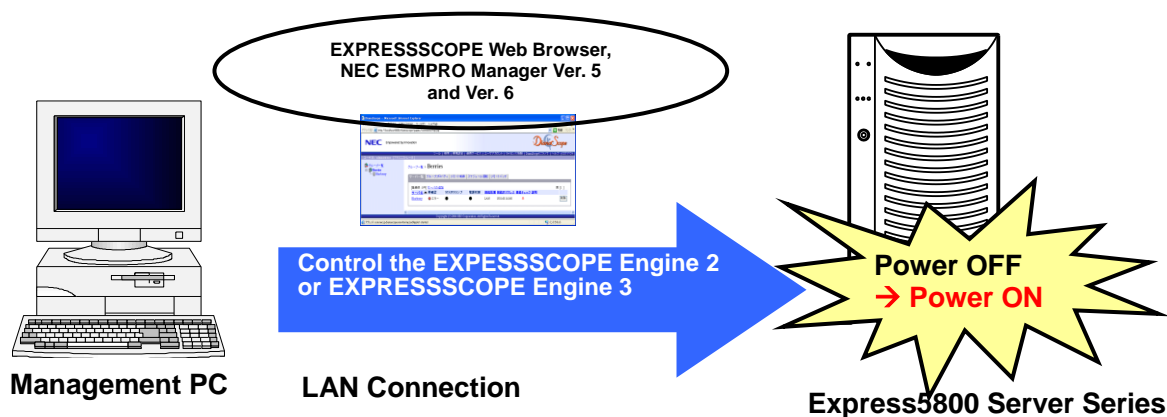
The Remote Wake Up function is available from "Remote Wake UP" of the NEC ESMPRO Manager Ver. 5 and Ver. 6.
This function is also called Wake ON LAN. For the Windows OS that supports the ACPI, this function supports turning ON the power of the system in sleep mode.

NEC ESMPRO Manager Ver. 5 and Ver. 6

Management PC

Send a Magic Packet

LAN Connection

Sleep Mode → Wake Up

Express5800 Server Series

● Remote Power ON by the Remote Control Functions

For the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 mounted, the power can be remotely turned ON by using a standard Web browser, NEC ESMPRO Manager Ver. 5 or Ver. 6. By using the remote control functions of the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE 3, the operation that is equivalent to pressing the power switch of the NEC Express5800 Server Series can be performed even after complete shutdown of the OS (the power is turned OFF).

EXPRESSSCOPE Web Browser, NEC ESMPRO Manager Ver. 5 and Ver. 6

Control the EXPESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3

Power OFF → Power ON

**Management PC**   **LAN Connection**   **Express5800 Server Series**

6. Remote KVM Console Functions and Remote Media Functions

The EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3 provide the remote KVM console and remote media functions by the NEC Remote KVM and Media License Key(*1).
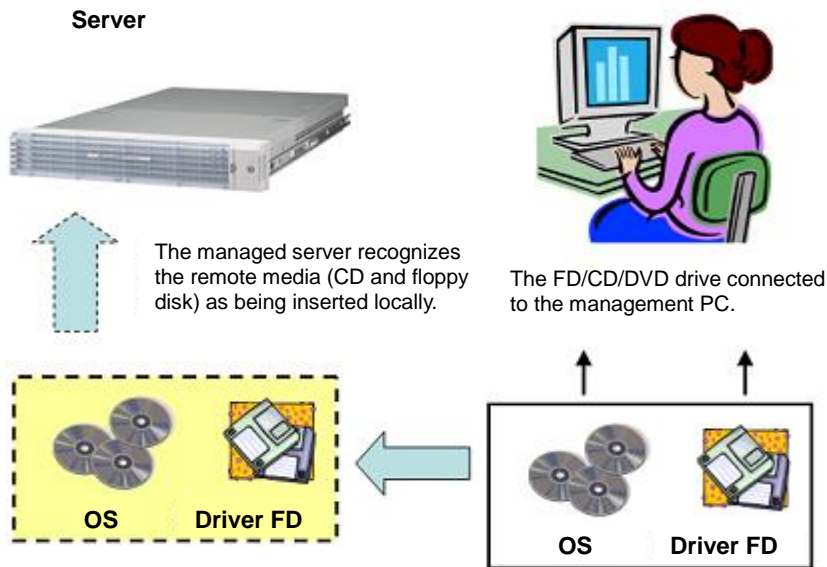
● Remote KVM Console Functions

The remote KVM console functions allow the image on the local console, including the Power On Self Test (POST) screen, BIOS setup screen, OS (including Windows, Linux, DOS) screen, and Blue Screen of Death at the kernel panic to be displayed on the console of the management PC regardless of the state of the server.

Redirect
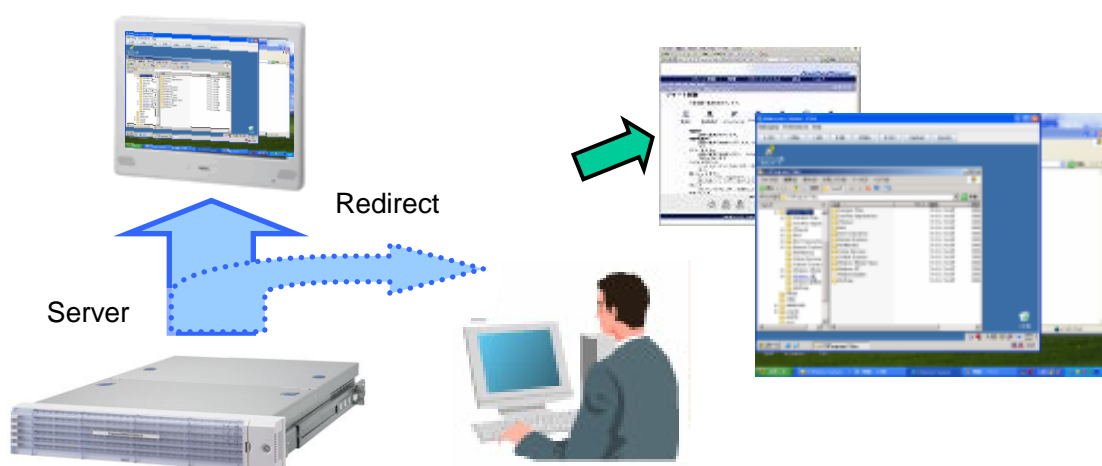
Server

● Remote Media Functions

The remote media functions allow an FD/CD/DVD drive to be virtually recognized as a drive locally connected to the managed server (*2). By using the functions, the system can be booted from an FD/CD/DVD over the network. In addition, the data in a flash memory (USB flash drive) can be transferred, and therefore, configuration files, OS patches, etc. can be installed easily (*3).

Server

The managed server recognizes the remote media (CD and floppy disk) as being inserted locally.

The FD/CD/DVD drive connected to the management PC.

OS   **Driver FD**

OS   **Driver FD**

(*1) The NEC Remote KVM and Media License Key (N8115-03 and N8115-04) is a license key (for one server) that enables the server to use the optional functions (remote console and remote media functions) of the EXPRESSSCOPE Engine. Note that the remote KVM console functions are not available if a graphics accelerator is mounted in the server.

(*2) For the EXPRESSSCOPE Engine, a remote medium is recognized as a multi-LUN USB device. The medium may not run properly on the OS or application where access control over multi-LUN USB device is enforced.

(*3) The multi-partition USB flash drive is not available.

7. NEC ExpressUpdate Functions

The NEC ExpressUpdate functions allow the NEC Express5800 Server Series' system BIOS and BMC firmware version to be managed easily. The functions are provided as part of functions of the NEC ESMPRO Manager Ver. 5.1 and later.

By using the NEC ExpressUpdate functions, the system BIOS and firmware can be updated at once easily through an intuitive user interface. In addition, the network bandwidth and disk capacity required for the management can be minimized, as only update packages required for the managed server are selected to be downloaded from the update package server. For details, refer to the White Paper "NEC ExpressUpdate Functions and Features (*1)."

For the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 3 mounted, the system BIOS and BMC firmware can be updated (via Out-Of-Band) without installing the NEC ExpressUpdate Agent on the managed server.
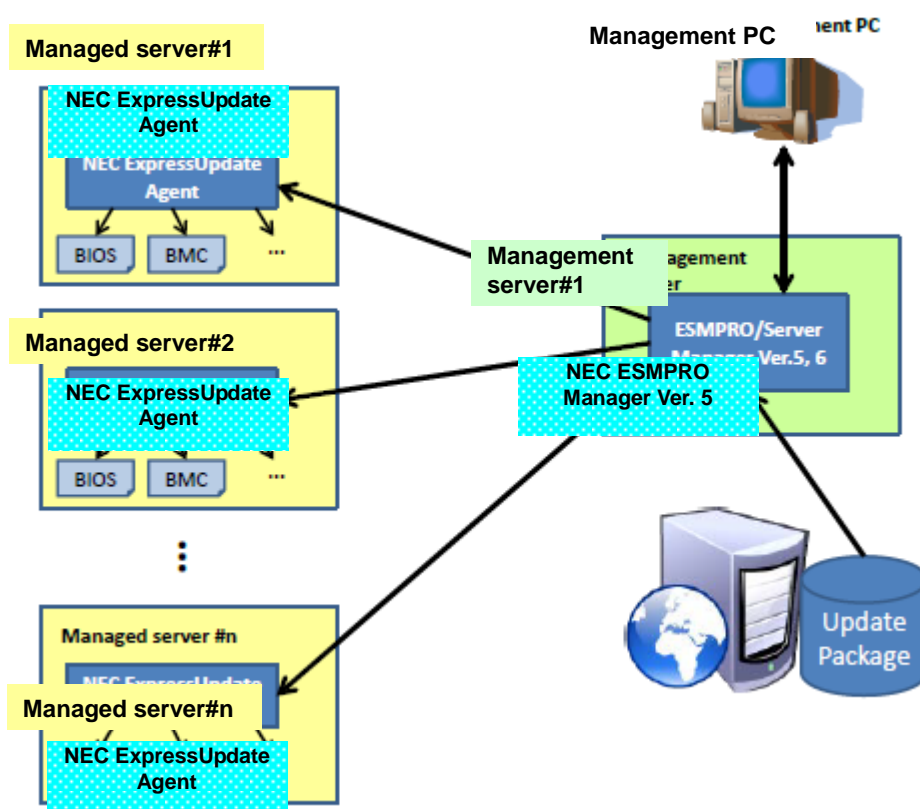
(*1) For the White Paper "ExpressUpdate Functions and Features," refer to the document at the URL below.

http://www.58support.nec.co.jp/global/download/pdf/ExpressUpdateWP.pdf

8. Power Management and Monitoring

With the EXPRESSSCOPE Engine 3, the power consumption can be monitored, the data can be acquired and the power capping can be set. For the functions provided, refer to the White Paper at the

URL below.

http://www.58support.nec.co.jp/global/download/pdf/node_manager_WP.pdf
"Introduction to the Power Monitoring and Power Control Function"

Appendix A. Main Functions for Server Management (Support Matrix)

This appendix describes the main functions for server management that are available with combination of the hardware functions and management software.

Table A-1: About the main functions for server management that are available when using none of the management software for each model.
Table A-2: About the main functions for server management that are available when using the NEC ESMPRO Manager Ver. 5 and Ver. 6 (management software).
Table A-3: About the main functions for the NEC Express5800 Server management that are available when using the NEC ESMPRO Manager Ver. 6 on the servers released after September 2014 (management software).
Table A-4: About the main management functions of the Consolidated Power Supply Unit.
Table A-5: About the main functions for the Express5800/E120b-M server management.
Table A-6: About the main functions for the Express5800/HR120a-1 and HR120b-1 server management.
Table A-7 and A-8: About the main functions for the Express5800/D120h.

● Table A-1: Main Functions for Server Management (with no management software)

		GT110b, GT110b-S	T110b, T110c, T120a-M, T120a-E, T120b-M, T120b-E, GT120a, GT120b, E110b-1, R110b-1, R110c-1, R120a-1, R120a-2, R120b-1, R120b-2, R140a-4, R140b-4, R110a-1H, iR110a-1H, iR120a-1E, E120b-1, E110b-M		GT110d, GT110d-S, R110d-1E, E110d-1, R120d-1M, R120d-2M, R120d-1E, R120d-2E, T120d, E120d-M, R110e-1E, GT110e, GT110e-S, E120d-1, T110f-S, T110f-E, R110f-1E, R120e-1M, R120e-2M, T120e, R120e-1E, R120e-2E, E120e-M, T110g-S, T110g-E, R110g-1E, R120f-1M, R120f-2M, E120f-M, R120f-1E, R120f-2E, T120f, R110h-1, T110h, T110h-S, E120g-M, R120g-1M, R120g-2, R120g-2E, T120g, R120g-1E, T110i-S, T110i, R110i-1	
○: Supported - : Not supported		Standard	EXPRESSSCOPE Engine 2 Standard	EXPRESSSCOPE Engine 2 Extended (*9)	EXPRESSSCOPE Engine 3 Standard	EXPRESSSCOPE Engine 3 Extended (*9)
Server Monitoring Functions	Power Unit Monitoring	-	○(*11)	○(*11)	○	○
	Temperature Monitoring	-	○	○	○	○
	Voltage Monitoring	-	○	○	○	○
	Fan Monitoring	-	○	○	○	○
	Chassis Cover Monitoring	-	○	○	○	○
	Water Cooling Unit Monitoring	-	-	-	-	-
	CPU/Memory/Bus Monitoring	-	○	○	○	○
	HDD Health Monitoring	-	○(*8)	○(*8)	○	○
	Power Monitoring	-	○(*12)	○(*12)	○	○
	CPU/Memory/File/LAN Utilization/State Monitoring	-	-	-	-	-
	Hardware Configuration Information Collection	-	○	○	○	○
	Hardware Log Information Collection	-	○	○	○	○
Stall Monitoring/ Auto-Reboot Functions	BIOS/POST Stall Monitoring	-	○	○	○	○
	Boot Monitoring	-	-	-	-	-
	OS Stall Monitoring	-	-	-	-	-
	Shutdown Monitoring	-	-	-	-	-
Reporting Functions(*1)	Hardware Failure	-	○	○	○	○
	Boot Failure	-	○	○	○	○
	Kernel Panic	-	○	○	○	○
Connected via:	LAN	-	○(SNMP/E-Mail)	○(SNMP/E-Mail)	○(SNMP/E-Mail)	○(SNMP/E-Mail)
	COM Port (via Modem)	-	○(PPP)	○(PPP)	-	-
Remote Console Functions/ Remote Media Functions(*1)	POST/BIOS Setup	○(*5)	○(*10)	○	○(*10)	○
	DOS-Based Utilities	○(*5)	○(*10)	○	○(*10)	○
	Boot Screen, Panic Screen	-	○(*2)(*10)	○	○(*2)(*10)	○
	CUI (OS Console)(*2)	○(*5)	○(*2)(*10)	○(*7)	○(*2)(*10)	○(*7)
	GUI (OS Console)	-	-	○(*7)	-	○(*7)
	Remote Media (CD/DVD/FD)	-	-	○(*7)	-	○(*7)
	Remote Media (Flash Memory)	-	-	○(*7)	-	○(*7)
Connected	LAN	-	○	○	○	○

via:	COM Port (via Modem)	○(*5)	○(*5)	○(*5) (*6)	○(*5) (*6)	○(*5) (*6)
Remote Control Functions/ Remote Diagnosis Functions	System Reset(*1)	-	○	○	○	○
	Power ON/Forced Power OFF(*1)	-	○	○	○	○
	OS Shutdown	-	○	○	○	○
	DUMP Switch(*1)	-	○	○	○	○
	UID Switch(*1)	-	○	○	○	○
	STATUS LED State Information Collection (*1)	-	○	○	○	○
	Virtual LCD Information Collection(*1)	-	○	○	○	○
	BIOS Information/Hardware Configuration Information Collection	-	-	-	-	-
	Control from Web Browser(*1)(*18)	-	○	○	○(*19)	○(*19)
	Operations from Command Line Interface (*1)(*20)	-	○	○	○	○
	Remote Batch(*1)	-	-	-	-	-
	Scheduled Running	-	-	-	-	-
	Shows RAID info	-	-	-	○(*21)	○(*21)
	Shows LOM info	-	-	-	○(*22)	○(*22)
	Power Management	-	○	○	○	○
	Power Control	-	○(*16)	○(*16)	○(*17)	○(*17)
	ExpressUpdate	-	-	-	○(*15)	○(*15)
	Remote BIOS Settings (a part of settings only)	-	-	-	○	○
Connected via:	LAN	-	○	○	○	○
	COM Port (via Modem)	-	-	-	-	-
Integrated Server Management	Multi-Server Remote Control	-	-	-	-	-
	Multi-Server Monitoring	-	-	-	-	-
	Multi-Server Remote Batch	-	-	-	-	-
	Multi-Server Scheduled Running	-	-	-	-	-
	Multi-Server Power Management	-	-	-	-	-
	Multi-Server ExpressUpdate	-	-	-	-	-
Maintenance/Installation Assistance Functions	Off-Line Maintenance Utility	-	-	-	○	○
	Remote Boot (PXE Boot)	○	○(*13)	○(*13)	○(*13)	○(*13)
	EXPRESSSCOPE Profile Key	-	-	-	○	○
Remote Wake Up	Wake On LAN(*3)	○	○	○	○	○
	Wake On Ring	○	○(*14)	○(*14)	○(*14)	○(*14)
LDAP/Active Directory Authentication		-	-	-	○	○
Dedicated RAS Processor Mounted (Independent Operation)		-	○	○	○	○
IPMI Support		-	Ver. 2.0	Ver. 2.0	Ver. 2.0	Ver. 2.0

(*1) This function is available regardless of the state of the OS running on the NEC Express5800 Server Series (ex. regardless of whether the OS is absent, running or malfunctioning).

(*2) This function is supported by the Windows OS (Windows Server 2003 and later) and Linux OS only. For the Windows OS, this function can be supported by using the Special Administration Console (SAC). For the Linux OS, this function can be supported by using the serial console.

(*3) For the Windows OS that supports the ACPI, the OS can wake up from the sleep mode by remote PC operation (via LAN). For some models, the wake on LAN function is restricted immediately after turning ON the AC power.

(*4) The LEDs on the front of the NEC Express5800 Server Series allow easy identification of failed parts in the event of a failure.

(*5) To use this function, commonly used terminal software (Tera Term, Hyper Terminal, etc.) and a connection using the COM port (via modem) are required. The function may be restricted depending on the utility. For example, some of the characters may be garbled.

(*6) The GUI (OS console) and remote media (CD/DVD/FD) are not available via COM port.

(*7) To use the NEC Express5800 Server Series in a virtualized environment, using a mouse by the remote KVM console functions and remote media functions are not available.

(*8) This function is supported in configuration that supports HDD hot-swapping.

(*9) This item should be noted when the NEC Remote KVM and Media License Key, N8115-03 (for EXPRESSSCOPE Engine 2) or N8115-04 (for EXPRESSSCOPE Engine 3), is installed.

(*10)When using this function, the COM2 port, which is mounted in the managed server as standard, is not available. To connect a device such as UPS to the COM1 port, "RS-232C Connector Kit" is required.

(*11)The monitoring can be performed only with redundant power configuration.

(*12)The monitoring can be performed for T110b, T110c, R120a-1, R120a-2, R120b-1, R120b-2, T120a-E, T120a-M, T120b-E, T120b-M and R140b-4 with redundant power configuration, and for R110b-1, R110c-1, E110b-1, iR120a-1E and E120b-1.

(*13)This function is supported by the standard LAN port mounted in the NEC Express5800 Server Series.

(*14)This function is supported by the standard LAN port mounted in the NEC Express5800 Server Series except R120f-1M, R120f-2M, E120f-M, R120f-1E, R120f-2E, T120f, R110h-1, T110h, T110h-S, E120g-M, R120g-1M, R120g-2M, R120g-2E, T120g, R120g-1E, T110i-S, T110i, and R110i-1.

(*15) Only update of the system BIOS and BMC firmware (via Out-Of-Band) is supported.

(*16) This function is supported only by some models.

(*17) This function is enhanced in comparison with that of the supported NEC Express5800 Server Series with the EXPRESSSCOPE Engine 2 mounted.

(*18)Supports HTTPS

(*19) *Four (4) users can login to EXPRESSSCOPE Engine at the same time (R120f-1M, R120f-2M, E120f-M, R120f-1E, R120f-2E, T120f, R110h-1, T110h, T110h-S, E120g-M, R120g-1M, R120g-2M, R120g-2E, T120g, R120g-1E, T110i-S, T110i, R110i-1).
* 3 users can login at the same time (Other machine with EXPRESSSCOPE Engine 3).

(*20)Supports SSH with AES.

(*21)This function shows RAID information on EXPRESSSCOPE Engine 3 Web Console (R120f-1M, R120f-2M, E120f-M, R120f-1E, R120f-2E, T120f, R110h-1, T110h, T110h-S, E120g-M, R120g-1M, R120g-2M, R120g-2E, T120g, R120g-1E, T110i-S, T110i, R110i-1)

(*22)This function shows LAN on Mother information on EXPRESSSCOPE Engine 3 Web Console (R110f-1E, R110g-1E, R120d-1M, R120d-2M, R120e-1M, R120e-2M, , T120e, R120d-1E, R120d-2E, R120e-1E , R120e-2E, E120d-M, E120e-M, E120d-1, R120f-1M, R120f-2M, E120f-M, R120f-1E, R120f-2E, T120f, R110h-1, T110h, T110h-S, E120g-M, R120g-1M, R120g-2M, R120g-2E, T120g, R120g-1E, T110i-S, T110i, R110i-1).

● Table A-2: Main Functions for Server Management (with NEC ESMPRO Manager Ver. 5 and Ver. 6)

○: Supported
 - : Not supported

		GT110b, GT110b-S	T110b, T110c, T120a-M, T120a-E, T120b-M, T120b-E, GT120a, GT120b, E110b-1, R110b-1, R110c-1, R120a-1, R120a-2, R120b-1, R120b-2, R140b-4, R140b-4, R110a-1H, iR110a-1H, iR120a-1E, E120b-1, E110b-M		GT110d ,GT110d-S, R110d-1E, E110d-1, R120d-1M, R120d-2M, R120d-1E, R120-2E, T120d, GTE120d-M, R110e-1E, GT110e, GT110e-S, E120d-1, T110f-S, T110f-E, R110f-1E, R120e-1M, R120e-2M, T120e, R120e-1E, R120e-2E, E120e-M, T110g-S, T110g-E, R110g-1E	
		Standard	EXPRESSSCOPE Engine 2 Standard	EXPRESSSCOPE Engine 2 Extended (*12)	EXPRESSSCOPE Engine 3 Standard	EXPRESSSCOPE Engine 3 Extended (*12)
Server Monitoring Functions	Power Unit Monitoring	-	○(*15)	○(*15)	○	○
	Temperature Monitoring	○	○	○	○	○
	Voltage Monitoring	○	○	○	○	○
	Fan Monitoring	○	○	○	○	○
	Chassis Cover Monitoring	○	○	○	○	○
	Water Cooling Unit Monitoring	-	-	-	-	-
	CPU/Memory/Bus Monitoring	○	○	○	○	○
	HDD Health Monitoring	○	○	○	○	○
	Power Monitoring	-	○(*13)	○(*13)	○	○
	CPU/Memory/File/LAN Utilization/State Monitoring(*1)(*16)	○	○	○	○	○
	Hardware Configuration Information Collection	○	○	○	○	○
	Hardware Log Information Collection	○	○	○	○	○
Stall Monitoring/ Auto-Reboot Functions(*16)	BIOS/POST Stall Monitoring	○	○	○	○	○
	Boot Monitoring	○	○	○	○	○
	OS Stall Monitoring	○	○	○	○	○
	Shutdown Monitoring	-	○	○	○	○
Reporting Functions(*2)	Hardware Failure	○(*1)	○	○	○	○
	Boot Failure	-	○	○	○	○
	Kernel Panic	-	○	○	○	○
Connected via:	LAN	○(SNMP/ E-Mail)(*7)	○(SNMP/E-Mail)	○(SNMP/E-Mail)	○(SNMP/E-Mail)	○(SNMP/E-Mail)
	COM Port (via Modem)	-	○(PPP)	○(PPP)	-	-
Remote Console Functions/ Remote Media Functions(*2)	POST/BIOS Setup	○(*8)	○(*14)	○	○(*14)	○
	DOS-Based Utilities	○(*8)	○(*14)	○	○(*14)	○
	Boot Screen, Panic Screen	-	○(*3)(*14)	○	○(*3)(*14)	○
	CUI (OS Console)(*3)	○(*8)	○(*3)(*14)	○(*10)	○(*3)(*14)	○(*10)
	GUI (OS Console)	-	-	○(*10)	-	○(*10)
	Remote Media (CD/DVD/FD)	-	-	○(*10)	-	○(*10)
	Remote Media (Flash Memory)	-	-	○(*10)	-	○(*10)
Connected via:	LAN	○	○	○	○	○
	COM Port (via Modem)	○(*8)	○(*9)	○(*9)	○(*9)	○(*9)
Remote Control Functions/ Remote Diagnosis Functions	System Reset(*2)	-	○	○	○	○
	Power ON/Forced Power OFF(*2)	-	○	○	○	○
	OS Shutdown	-	○	○	○	○
	DUMP Switch(*2)	-	○	○	○	○
	UID Switch(*2)	-	○	○	○	○
	STATUS LED State Information Collection (*2)	-	○	○	○	○
	Virtual LCD Information Collection(*2)	-	○	○	○	○
	BIOS Information/Hardware Configuration Information Collection (*16)	○	○	○	○	○
	Control from Web Browser(*2)(*20)	-	○	○	○(*22)	○(*22)
	Operations from Command Line Interface (*2)(*23)	-	○	○	○	○
	Remote Batch(*2)	-	○	○	○	○
	Scheduled Running	-	○	○	○	○

		(*4)(*16)					
		Shows RAID info	-	-	-	-	-
		Shows LOM info	-	-	-	○(*24)	○(*24)
		Power Management	-	○	○	○	○
		Power Control	-	○(*19)	○(*19)	○(*20)	○(*20)
		ExpressUpdate (*11)(*16)	○	○	○	○(*18)	○(*18)
		Remote BIOS Settings (a part of settings only)	-	-	-	○	○
	Connected via:	LAN	○	○	○	○	○
		COM Port (via Modem)	-	○	○	○	○
Integrated Server Management		Multi-Server Remote Control	-	○	○	○	-
		Multi-Server Monitoring	-	○	○	○	○
		Multi-Server Remote Batch	-	○	○	○	○
		Multi-Server Scheduled Running(*4)(*16)	-	○	○	○	○
		Multi-Server Power Management	-	○	○	○	○
		Multi-Server ExpressUpdate (*11)(*16)	○	○	○	○	○
Maintenance/ Installation Assistance Functions		Off-Line Maintenance Utility	-	-	-	○	○
		Remote Boot (PXE Boot)	○	○(*17)	○(*17)	○(*17)	○(*17)
		EXPRESSSCOPE Profile Key	-	-	-	○	○
Remote Wake Up		Wake On LAN(*5)	○	○	○	○	○
		Wake On Ring	○	○(*17)	○(*17)	○(*17)	○(*17)
LDAP/Active Directory Authentication			-	-	-	○	○
Dedicated RAS Processor Mounted (Independent Operation)			-	○	○	○	○
IPMI Support			-	Ver. 2.0	Ver. 2.0	Ver. 2.0	Ver. 2.0

(*1) This function requires the NEC ESMPRO Agent.

(*2) This function is available regardless of the state of the OS running on the NEC Express5800 Server Series (ex. regardless of whether the OS is absent, running or malfunctioning).

(*3) This function is supported only by the Windows OS (Windows Server 2003 and later) and Linux OS. For the Windows OS, this function can be achieved by using the SAC. For the Linux OS, this function can be achieved by using the serial console.

(*4) This function requires the NEC ESMPRO Agent Extension. This function is not supported by GT110b and GT110b-S.

(*5) For the Windows OS that supports the ACPI, the OS can wake up from the sleep mode by remote PC operation (via LAN). For some models, the wake on LAN function is restricted immediately after turning ON the AC power.

(*7) The e-mail reporting is available only for the Express Report Service.

(*8) To use this function, commonly used terminal software (Tera Term, Hyper Terminal, etc.) is required. The function may be restricted depending on the utility. For example, some of the characters may be garbled.

(*9) The GUI (OS console) and remote media (CD/DVD/FD) are not available via COM port.

(*10) To use the NEC Express5800 Server Series in a virtualized environment, using a mouse by the remote KVM console functions and remote media functions are not available.

(*11) This function requires the NEC ExpressUpdate Agent.

(*12) This item should be noted when the NEC Remote KVM and Media License Key, N8115-03 (for EXPRESSSCOPE Engine 2) or N8115-04 (for EXPRESSSCOPE Engine 3), is installed.

(*13) The monitoring can be performed for T110b, R120a-1, R120a-2, R120b-1, R120b-2, T120a-E, T120a-M, T120b-E, T120b-M and R140b-4 with redundant power configuration, and for R110b-1, E110b-1, iR120a-1E and E120b-1.

(*14) When using this function, the COM2 port, which is mounted in the managed server as standard, is not available. To connect a device such as UPS to the COM1 port, "RS-232C Connector Kit" is required.

(*15) The monitoring can be performed only with redundant power configuration.

(*16) This function is not supported by E110b-M.

(*17) This function is supported by the standard LAN port mounted in the NEC Express5800 Server Series.

(*18) Update of the system BIOS and BMC firmware is available (via Out-Of-Band) without the NEC ExpressUpdate Agent.

(*19) This function is supported by some models only.

(*20) This function is enhanced in comparison with that of the supported NEC Express5800 Server Series with the EXPRESSSCOPE Engine 2 mounted.

(*21)Supports HTTPS

(*22) *4 users can login to EXPRESSSCOPE Engine at the same time (R120f-1M, R120f-2M, E120f-M, R120f-1E, R120f-2E, T120f)

* 3 users can login at the same time (Other machine with EXPRESSSCOPE Engine 3).

(*23)Supports SSH with AES.

(*24)This function shows LAN on Mother information on EXPRESSSCOPE Engine 3 Web Console. (R110f-1E, R110g-1E, R120d-1M, R120d-2M, R120e-1M, R120e-2M, T120d, T120e, R120d-1E, R120d-2E, R120e-1E , R120e-2E, E120d-M, E120e-M, E120d-1

● Table A-3: Main Functions for Server Management (with NEC ESMPRO Manager Ver. 6)

○: Supported

‑ : Not supported

Category	Function	R120f-1M, R120f-2M, E120f-M, R120f-1E, R120f-2E, T120f, R110h-1, T110h, T110h-S, E120g-M, R120g-1M, R120g-2M, R120g-2E, T120g, R120g-1E, T110i-S, T110i, R110i-1	
		EXPRESSSCOPE Engine 3 Standard	**EXPRESSSCOPE Engine 3 Extended(*7)**
Functions	Power Unit Monitoring	○	○
	Temperature Monitoring	○	○
	Voltage Monitoring	○	○
	Fan Monitoring	○	○
	Chassis Cover Monitoring	○	○
	Water Cooling Unit Monitoring	‑	‑
	CPU/Memory/Bus Monitoring	○(*8)	○(*8)
	Hardware Configuration Information Collection	○	○
	Hardware Log Information Collection	○	○
	HDD Health Monitoring	○	○
	Power Monitoring	○	○
	CPU/Memory/File/LAN Utilization/State Monitoring (*1)	○	○
	Hardware Configuration Information Collection	○	○
	Hardware Log Information Collection	○	○
Stall Monitoring/Auto-Reboot Functions	BIOS/POST Stall Monitoring	○	○
	Boot Monitoring	○	○
	OS Stall Monitoring	○	○
	Shutdown Monitoring	○	○
Reporting Functions(*2)	Hardware Failure	○	○
	Boot Failure	○	○
	Kernel Panic	○	○
Connected via:	LAN	○(SNMP/E-Mail)	○(SNMP/E-Mail)
	COM Port (via Modem)	‑	‑
Remote Console Functions/ Remote Media Functions (*2)	POST/BIOS Setup	○(*9)	○
	DOS-Based Utilities	○(*9)	○
	Boot Screen, Panic Screen	○(*3)(*9)	○
	CUI (OS Console) (*3)	○(*3)(*9)	○(*10)
	GUI (OS Console)	‑	○(*10)
	Remote Media (CD/DVD/FD)	‑	○(*10)
	Remote Media (Flash Memory)	‑	○(*10)
Connected via:	LAN	○	○
	COM Port (via Modem)	○(*11)	○(*11)
Remote Control Functions/ Remote Diagnosis Functions (*2)	System Reset(*2)	○	○
	Power ON/Forced Power OFF(*2)	○	○
	OS Shutdown	○	○
	DUMP Switch(*2)	○	○
	UID Switch(*2)	○	○
	STATUS LED State Information Collection(*2)	○	○
	Virtual LCD Information Collection(*2)	○	○
	BIOS Information/Hardware Configuration Information Collection	○	○
	Control from Web Browser(*2)(*14)	○	○
	Operations from Command Line Interface(*2)(*15)	○	○
	Remote Batch(*2)	○	○
	Scheduled Running(*4)	○	○
	Shows RAID info	○	○
	Shows LOM info	○	○
	Power Management	○	○
	Power Control	○	○
	ExpressUpdate(*5)	○(*12)	○(*12)
	Remote BIOS Settings	○	○
Connected via:	LAN	○	○
	COM Port (via Modem)	○	○
Integrated Server Management	Multi-Server Remote Control	○	○
	Multi-Server Monitoring	○	○
	Multi-Server Remote Batch	○	○
	Multi-Server Scheduled Running(*4)	○	○
	Multi-Server Power Management	○	○
	Multi-Server ExpressUpdate(*5)	○	○
Maintenance/Installation Assistance Functions	Offline Maintenance Utility	○	○
	Remote Boot (PXE Boot)	○(*13)	○(*13)
	EXPRESSSCOPE Profile Key	○	○
Remote Wake Up	Wake On LAN(*6)	○	○
LDAP / Active Directory Authentication		○	○
Dedicated RAS Processor Mounted (Independent Operation)		○	○
IPMI Support		Ver. 2.0	Ver. 2.0

(*1) This function requires the NEC ESMPRO ServerAgentService. The server needs to be installed in service mode.

(*2) This function is available regardless of the state of the OS running on the NEC Express5800 Server Series (ex. regardless of whether the OS is absent, running or malfunctioning).

(*3) This function is supported only by the Windows OS (Windows Server 2008 or later) and Linux OS. For the Windows OS (Windows Server 2003 or later), this function can be achieved by using the SAC (Special Administration Console). For the Linux OS, this function can be achieved by using the serial console.

(*4) This function requires the NEC ESMPRO Agent Extension.

(*5) This function requires the NEC Express Update Agent.

(*6) For the Windows OS that supports the ACPI, the OS can wake up from the sleep mode by remote PC operation (via LAN). For some models, the wake on LAN function is restricted immediately after turning ON the AC power.

(*7) This item should be noted when the NEC Remote KVM and Media License Key (N8115-04) of EXPRESSSCOPE Engine 3 is installed.

(*8) Display of logical information and status monitoring of memory are not available.

(*9) When using this function, the COM2 port, which is mounted in the managed server as standard, is not available. To connect a device such as UPS to the COM1 port, "RS-232C Connector Kit" is required.

(*10) To use the NEC Express5800 Server Series in a virtualized environment, using a mouse by the remote KVM console functions and remote media functions are not available.

(*11) The GUI (OS console) and remote media (CD/DVD/FD) are not available via COM port.

(*12) Update of the system BIOS and BMC firmware is available (via Out-Of-Band) without the NEC Express Update Agent.

(*13) This function is supported by the standard LAN port mounted in the NEC Express5800 Server Series.

(*14) *4 users can login to EXPRESSSCOPE Engine at the same time.

(*15)Supports SSH with AES.

(*16)This function shows RAID information on EXPRESSSCOPE Engine 3 Web Console.

(*17)This function shows LAN on Mother information on EXPRESSSCOPE Engine 3 Web Console.

● **Table A-4: Main Management Functions of the Consolidated Power Supply Unit**

The NEC Remote KVM and Media License Key (N8115-03) is not supported by the EXPRESSSCOPE Engine 2 mounted in the Consolidated Power Supply Unit.

○: Supported − : Not supported		Consolidated Power Supply Unit	
		EXPRESSSCOPE Engine 2 Standard	EXPRESSSCOPE® Engine 2 Standard + NEC ESMPRO Manager Ver. 5
Consolidated Power Supply Unit Monitoring Functions	Power Unit Monitoring	○	○
	Temperature Monitoring	○	○
	Voltage Monitoring	○	○
	Power Monitoring	○	○
	Hardware Log Information Collection	○	○
Stall Monitoring /Auto-Reboot Functions	BIOS/POST Stall Monitoring	○	○
Reporting Functions	Hardware Failure	○	○
	Boot Failure	○	○
Connected via:	LAN	○(SNMP/E-Mail)	○(SNMP/E-Mail)
	COM Port (via Modem)	○(PPP)	○(PPP)
Remote Console Functions/ Remote Media Functions	POST/BIOS Setup(*1)	○(*2)	○(*2)
	DOS-Based Utilities(*1)	○(*2)	○(*2)
	Boot Screen(*1)	○(*2)	○(*2)
Connected via:	LAN	○	○
	COM Port (via Modem)	○	○
Remote Control Functions/ Remote Diagnosis Functions	System Reset(*1)	○(*3)	○(*3)
	Power ON/Forced Power OFF(*1)	○(*3)	○(*3)
	UID Switch	○	○
	STATUS LED State Information Collection	○	○
	Virtual LCD Information Collection	○	○
	Control from Web Browser	○	○
	Operations from Command Line Interface	○	○
	Remote Batch	−	○
	Scheduled Running	−	−
	Power Management	○	○
Connected via:	LAN	○	○
	COM Port (via Modem)	−	−
Integrated Server Management	Multi-Server Remote Control	−	○
	Multi-Server Monitoring	−	○
	Multi-Server Remote Batch	−	○
	Multi-Server Scheduled Running	−	−
	Multi-Server Power Management	−	○
Dedicated RAS Processor Mounted (Independent Operation)		○	○
IPMI Support		Ver. 2.0	Ver. 2.0

(*1) This function is also available via serial port.
(*2) The remote console functions are supported for the Maintenance Card mounted in the Consolidated Power Supply Unit.
(*3) The power control function is supported for the Maintenance Card mounted in the Consolidated Power Supply Unit. Usually, the power of the Maintenance Card does not need to be turned ON.
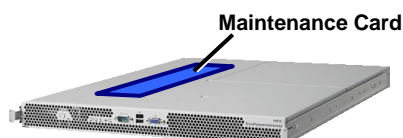
Maintenance Card

● **About the Maintenance Card:**
   • The Maintenance Card is mounted in the Consolidated Power Supply Unit as standard to remotely monitor the power, etc.
   • The power of the Maintenance Card is usually turned OFF, however, the functions listed above are available.
   • The power of the Maintenance Card requires to be turned ON for initial configuration and maintenance of the Consolidated Power Supply Unit.

● Table A-5: Main Functions for the Express5800/E120b-M Server Management

The Express5800/E120b-M is the energy saving server for data centers (ECO CENTER) with a dedicated BMC mounted. For definitions of each function, refer to the descriptions on the EXPRESSSCOPE Engine 2 in this guide.

○: Supported − : Not supported		E120b-M Dedicated BMC	E120b-M Dedicated BMC + NEC ESMPRO Manager Ver. 5 and Ver. 6
Server Monitoring Functions	Power Unit Monitoring	−	−
	Temperature Monitoring	○	○
	Voltage Monitoring	○	○
	Fan Monitoring	○	○
	Chassis Cover Monitoring	−	−
	Water Cooling Unit Monitoring	−	−
	CPU/Memory/Bus Monitoring	○(*5)	○(*5)
	HDD Health Monitoring	−	○
	Power Monitoring	○	○
	CPU/Memory/File/LAN Utilization/State Monitoring	−	○
	Hardware Configuration Information Collection	○	○
	Hardware Log Information Collection	○	○
Stall Monitoring/ Auto-Reboot Functions	BIOS/POST Stall Monitoring	−	−
	Boot Monitoring	−	−
	OS Stall Monitoring	−	○
	Shutdown Monitoring	−	○
Reporting Functions(*1)	Hardware Failure	○	○
	Boot Failure	○	○
	Kernel Panic	○	○
Connected via:	LAN	○(SNMP /E-mail)	○(SNMP /E-mail)
	−	−	−
Remote Console Functions/ Remote Media Functions(*1)	POST/BIOS Setup	○	○
	DOS-Based Utilities	○	○
	Boot Screen, Panic Screen	○	○(*2)
	CUI (OS Console)(*2)	○(*6)	○(*2)
	GUI (OS Console)	○(*6)	○
	Remote Media (CD/DVD/FD)	○(*6)	○
	Remote Media (Flash Memory)	−	−
Connected via:	LAN	○	○
	COM Port (via MODEM)	−	−
Remote Control Functions/ Remote Diagnosis Functions	System Reset(*1)	○	○
	Power ON/Forced Power OFF(*1)	○	○
	OS Shutdown	○	○
	DUMP Switch(*1)	○	○
	UID Switch(*1)	○	○
	STATUS LED State Information Collection (*1)	○	○
	Virtual LCD Information Collection(*1)	−	−
	BIOS Information/Hardware Configuration Information Collection	−	○
	Control from Web Browser(*1)	○	○
	Operations from Command Line Interface (*1)	○	○
	Remote Batch(*1)	−	○
	Scheduled Running	−	−
	Power Management	○	○
	ExpressUpdate	−	−
Connected via:	LAN	○	○
	COM Port (via Modem)	−	−
Integrated Server Management	Multi-Server Remote Control	−	○
	Multi-Server Monitoring	−	○
	Multi-Server Remote Batch	−	○
	Multi-Server Scheduled Running	−	−
	Multi-Server Power Management	−	○
	Multi-Server ExpressUpdate	−	−

Maintenance/ Installation Assistance Functions	Maintenance Partition Boot	-	-
	Remote Boot (PXE Boot)	○	○
Remote Wake Up	Wake On LAN(*3)	○	○
	Wake On Ring	-	-
EXPRESSSCOPE Monitor(*4)		-	-
Dedicated RAS Processor Mounted (Independent Operation)		○	○
IPMI Support		Ver. 2.0	Ver. 2.0

(*1) This function is available regardless of the state of the OS running on the NEC Express5800 Server Series (ex. regardless of whether the operating system is absent, running or malfunctioning).

(*2) This function can be achieved only on the Linux OS by using the serial console.

(*3) For the Windows OS that supports the ACPI, the OS can wake up from the sleep mode by remote PC operation (via LAN).

(*4) The LEDs on the front of the NEC Express5800 Server Series allow the abnormality in the CPU temperature and fan failure to be detected.

(*5) The supported function is the memory monitoring only.

(*6) To use the NEC Express5800 Server Series in a virtualized environment, using a mouse by the remote KVM console functions and remote media functions are not available.

● Table A-6: Main Functions for the Express5800/HR120a-1, HR120b-1 Server Management

The Express5800/HR120a-1 and HR120b-1 are the many-core servers with a dedicated BMC, which allow the real-time processing of vast amounts of data with MIC architecture. For definitions of each function below, refer to the descriptions on the EXPRESSSCOPE Engine 2 in this guide.

		HR120a-1, HR120b-1 Dedicated BMC	HR120a-1, HR120b-1 Dedicated BMC + NEC ESMPRO Manager Ver. 5 and Ver. 6
Server Monitoring Functions	Power Unit Monitoring	○	○
	Temperature Monitoring	○	○
	Voltage Monitoring	○	○
	Fan Monitoring	○	○
	Chassis Cover Monitoring	-	○
	Water Cooling Unit Monitoring	-	-
	CPU/Memory/Bus Monitoring	○(*3)	○(*3)
	HDD Health Monitoring	-	○
	Power Monitoring	○	○
	CPU/Memory/File/LAN Utilization/State Monitoring	-	○
	Hardware Configuration Information Collection	○	○
	Hardware Log Information Collection	○	○
Stall Monitoring/ Auto-Reboot Functions	BIOS/POST Stall Monitoring	-	-
	Boot Monitoring	-	-
	OS Stall Monitoring	-	○
	Shutdown Monitoring	-	○
Reporting Functions(*1)	Hardware Failure	○	○
	Boot Failure	-	-
	Kernel Panic	-	-
Connected via:	LAN	-	○(SNMP /E-mail)
	-	-	-
Remote Console Functions/ Remote Media Functions(*1)	POST/BIOS Setup	○	○
	DOS-Based Utilities	○	○
	Boot Screen, Panic Screen	○	○(*2)
	CUI (OS Console)(*2)	○	○(*2)
	GUI (OS Console)	○	○
	Remote Media (CD/DVD/FD)	○	○
	Remote Media (Flash Memory)	-	-
Connected via:	LAN	○	○
	COM Port (via MODEM)	-	-
Remote Control Functions/ Remote Diagnosis Functions	System Reset(*1)	○	○
	Power ON/Forced Power OFF(*1)	○	○
	OS Shutdown	○	○
	DUMP Switch(*1)	○	○
	UID Switch(*1)	○	○
	STATUS LED State Information Collection (*1) (*4)	○	○
	Virtual LCD Information Collection(*1)	-	-
	BIOS Information/Hardware Configuration Information Collection	-	○
	Control from Web Browser(*1)	○	○
	Operations from Command Line Interface (*1)	○	○
	Remote Batch(*1)	-	○
	Scheduled Running	-	-
	Power Management	○	○
	ExpressUpdate	-	-
Connected via:	LAN	○	○
	COM Port (via Modem)	-	-
Integrated Server Management	Multi-Server Remote Control	-	○
	Multi-Server Monitoring	-	○
	Multi-Server Remote Batch	-	○
	Multi-Server Scheduled Running	-	-
	Multi-Server Power Management	-	○

○: Supported
-: Not supported

	Multi-Server ExpressUpdate	-	-
Maintenance/ Installation Assistance Functions	Maintenance Partition Boot	-	-
	Remote Boot (PXE Boot)	○	○
Remote Wake Up	Wake On LAN(*3)	-	-
	Wake On Ring	-	-
EXPRESSSCOPE Monitor(*4)		-	-
Dedicated RAS Processor Mounted (Independent Operation)		○	○
IPMI Support		Ver. 2.0	Ver. 2.0

(*1) This function is available regardless of the state of the OS running on the NEC Express5800 Server
      Series (ex. regardless of whether the operating system is absent, running or malfunctioning).

(*2) This function can be achieved only on the Linux OS by using the serial console.

(*3) The supported function is the memory monitoring only.

(*4) This is the virtual STATUS LED which is displayed on WebUI by BMC.

● Table A-7: Main Functions for the Express5800/D120h Server(with no management software)

		D120h	
○ : Supported		BMC Standard	BMC Extended(*8)
— : Not supported			
Server Monitoring Functions	Power Unit Monitoring	○(Only CMC)	○(Only CMC)
	Temperature Monitoring	○	○
	Voltage Monitoring	○	○
	Fan Monitoring	○(Only CMC)	○(Only CMC)
	Chassis Cover Monitoring	—	—
	Water Cooling Unit Monitoring	—	—
	CPU/Memory/Bus Monitoring	○	○
	HDD Health Monitoring	○(Only CMC)	○(Only CMC)
	Power Monitoring	○	○
	CPU/Memory/File/LAN Utilization/State Monitoring	—	—
	Hardware Configuration Information Collection	—	—
	Hardware Log Information Collection	○	○
Stall Monitoring/ Auto-Reboot Functions	BIOS / POST Stall Monitoring	○	○
	Boot Monitoring	—	—
	OS Stall Monitoring	—	—
	Shutdown Monitoring	—	—
Reporting Functions(*1)	Hardware Failure	○	○
	Boot Failure	—	—
	Kernel Panic	○	○
Connected Via	LAN	○(SNMP/E-Mail)	○(SNMP/E-Mail)
	COMPort(via Modem)	—	—
Remote Console Functions/ Remote Media Functions (*1)	POST / BIOS Setup	○(SOL)(*5)	○
	DOS-Based Utilities	—(Not DOS)	—(Not DOS)
	Boot Screen, Panic Screen	○(SOL)(*2)(*5)	○
	CUI(OS Console)(*2)	○(SOL)(*2)(*5)	○(*4)
	GUI(OS Console)	—	○(*4)
	Remote Media(CD/DVD/FD)	—	○(*4)
	Remote Media (Flash Memory)	—	○(*4)
Connected via	LAN	○	○
	COM Port(via Modem)	—	—
Remote Control Functions/ Remote Diagnosis Functions	System Reset(*1)	○	○
	Power ON/ Forced Power OFF(*1)	○	○
	OS Shutdown	○	○
	DUMP Switch(*1)	○ (BMC WebCon/ SMASH CLP)	○ (BMC WebCon/ SMASH CLP)
	UID Switch(*1)	○(Only Node)	○(Only Node)
	STATUS LED State Information Collection(*1)	—	—
	Virtual LCD Information Collection(*1)	—	—
	BIOS Information/ Hardware Configuration Information Collection	—	—
	Control from Web Browser (*1)(*6)	○	○
	Operations from Command Line Interface(*1)(*7)	○	○
	Remote Batch(*1)	—	—
	Scheduled Running	—	—
	Shows RAID info	—	—
	Shows LOM info	△(Only Info)	△(Only Info)
	Power Management	○	○
	Power Control	○	○
	ExpressUpdate	—	—
	Remote BIOS Settings（a part of settings only）	—	—
Connected	LAN	○	○

via	COM Port (via Modem)	–	–
Integrated Server Management	Multi-Server Remote Control	–	–
	Multi-Server Monitoring	–	–
	Multi-Server Remote Batch	–	–
	Multi-Server Scheduled Running	–	–
	Multi-Server Power Management	–	–
	Multi-Server ExpressUpdate	–	–
Maintenance/Installation Assistance Function	Off-Line Maintenance Utility	○(DVD)	○(DVD)
	Remote Boot(PXE Boot)	○	○
	EXPRESSSCOPE Profile key	–	–
Remote Wake Up	Wake On LAN (*3)	○	○
	Wake On Ring	–	–
LDAP/Active Directory Authentication		○	○
Dedicated RAS Processor Mounted (Independent Operation)		○	○
IPMI Support		Ver.2.0	Ver.2.0

(*1) This function is available regardless of the state of the OS running on the NEC Express5800 Server Series (ex. regardless of whether the OS is absent, running or malfunctioning).

(*2) This function is supported by the Windows OS (Windows Server 2003 and later) and Linux OS only. For the Windows OS, this function can be supported by using the Special Administration Console (SAC). For the Linux OS, this function can be supported by using the serial console.

(*3) For the Windows OS that supports the ACPI, the OS can wake up from the sleep mode by remote PC operation (via LAN). For some models, the wake on LAN function is restricted immediately after turning ON the AC power.

(*4) To use the NEC Express5800 Server Series in a virtualized environment, using a mouse by the remote KVM console functions and remote media functions are not available.

(*5) When using this function, the COM2 port, which is mounted in the managed server as standard, is not available. To connect a device such as UPS to the COM1 port, "RS-232C Connector Kit" is required.

(*6)Supports HTTPS.

(*7)Supports SSH.

(*8)This item should be noted when the NEC Remote KVM and Media License Key N8115-32 is installed.

● Table A-8: Main Functions for the Express5800/D120h(with NEC ESMPRO Manager Ver.6)

			D120h	
			BMC Standard	BMC Extended(*9)
○ : Supported — : Not supported				
Server Monitoring Functions		Power Unit Monitoring	○(Only CMC)	○(Only CMC)
		Temperature Monitoring	○	○
		Voltage Monitoring	○	○
		Fan Monitoring	○(Only CMC)	○(Only CMC)
		Chassis Cover Monitoring	—	—
		Water Cooling Unit Monitoring	—	—
		CPU/Memory/Bus Monitoring	○	○
		HDD Health Monitoring	○(Only CMC)	○(Only CMC)
		Power Monitoring	○	○
		CPU/Memory/File/LAN Utilization/State Monitoring(*1)	○	○
		Hardware Configuration Information Collection	○(ESMPRO/SAS is needed)	○(ESMPRO/SAS is needed)
		Hardware Log Information Collection	○	○
Stall Monitoring/ Auto-Reboot Functions		BIOS / POST Stall Monitoring	○	○
		Boot Monitoring	—	—
		OS Stall Monitoring	—	—
		Shutdown Monitoring	—	—
Reporting Functions(*2)		Hardware Failure	○	○
		Boot Failure	—	—
		Kernel Panic	○	○
	Connected via	LAN	○(SNMP/E-Mail)	○(SNMP/E-Mail)
		COM Port(via Modem)	—	—
Remote Console Functions/ Remote Media Functions(*2)		POST / BIOS Setup	○(*6)	○
		DOS-Based Utilities	—(Not DOS)	—(Not DOS)
		Boot Screen, Panic Screen	○(*3)(*6)	○
		CUI(OS Console)(*3)	○(*3)(*6)	○(*7)
		GUI(OS Console)	—	○(*7)
		Remote Media(CD/DVD/FD)	—	○(*7)
		Remote Media (Flash memory)	—	○(*7)
	Connected via	LAN	○	○
		COM Port(via Modem)	—	—
Remote Control Functions/ Remote Diagnosis Functions		System Reset(*2)	○	○
		Power ON/ Forced Power OFF(*2)	○	○
		OS Shutdown	○	○
		DUMP Switch(*2)	○ (BMC WebCon/ SMASH CLP)	○ (BMC WebCon/ SMASH CLP)
		UID Switch(*2)	○(Only Node)	○(Only Node)
		STATUS LED State Information Collection(*2)	○	○
		Virtual LCD Information Collection(*2)	—	—
		BIOS Information/ HW Configuration Information Collection	○ (ESMPRO/SAS is needed)	○ (ESMPRO/SAS is needed)
		Control from Web Browser(*2)	○	○
		Operations from Command Line Interface(*2)(*8)	○	○
		Remote Batch(*2)	○	○
		Scheduled Running	—	—
		Shows RAID info	—	—
		Shows LOM Info	△(Only Info)	△(Only Info)
		Power Management	○	○
		Power Control	○	○
		ExpressUpdate(*4)	○ (ExpressUpdate Agent is needed、 via OOB is not supported)	○ (ExpressUpdate Agent is needed、 via OOB is not supported)

		Remote BIOS Settings（a part of settings only）	－	－
	Connected via	LAN	○	○
		COM Port(via Modem)	－	－
Integrated Server Management		Multi-Server Remote Control	○	○
		Multi-Server Monitoring	○	○
		Multi-Server Remote Batch	○	○
		Multi-Server Scheduled Running	－	－
		Multi-Server Power Management	○	○
		Multi-Server ExpressUpdate(*4)	○(Only SW)	○(Only SW)
Maintenance/ Installation Assistance Function		Off-Line Maintenance Utility	○(DVD)	○(DVD)
		Remote Boot(PXE Boot)	○	○
		EXPRESSSCOPE Profile key	－	－
Remote Wake Up		Wake On LAN (*5)	○	○
LDAP/Active Directory Authentication			○	○
Dedicated RAS Processor Mounted (Independent Operation)			○	○
IPMI Support			Ver.2.0	Ver.2.0

(*1) This function requires the NEC ESMPRO ServerAgentService. The server needs to be installed in service mode.

(*2) This function is available regardless of the state of the OS running on the NEC Express5800 Server Series (ex. regardless of whether the OS is absent, running or malfunctioning).

(*3) This function is supported only by the Windows OS (Windows Server 2008 or later) and Linux OS. For the Windows OS (Windows Server 2003 or later), this function can be achieved by using the SAC (Special Administration Console). For the Linux OS, this function can be achieved by using the serial console.

(*4) This function requires the NEC Express Update Agent.

(*5) For the Windows OS that supports the ACPI, the OS can wake up from the sleep mode by remote PC operation (via LAN). For some models, the wake on LAN function is restricted immediately after turning ON the AC power.

(*6) When using this function, the COM2 port, which is mounted in the managed server as standard, is not available. To connect a device such as UPS to the COM1 port, "RS-232C Connector Kit" is required.

(*7) To use the NEC Express5800 Server Series in a virtualized environment, using a mouse by the remote KVM console functions and remote media functions are not available.

(*8) Supports SSH

(*9) This item should be noted when the NEC Remote KVM and Media License Key N8115-32 is installed.

Appendix B. Main Functions for Server Management (Descriptions)

This appendix describes each of the main functions for server management.

● Server Monitoring Functions

These functions monitor the state of the server. There are two types of monitoring; hardware monitoring by the EXPRESSSCOPE Engine 2, EXPRESSSCOPE Engine 3, BIOS, etc. and software monitoring by the NECESMPRO Agent and NEC ESMPRO ServerAgentService.

A server that comes with NEC ESMPRO Agent is capable of providing centralized management of the hardware monitoring items and software monitoring items while the OS is running. Information on the states of these monitored items can be viewed by the NEC ESMPRO Manager Ver. 5 or 6 communicating with NEC ESMPRO Agent.

A server that comes with NEC ESMPRO ServerAgentService is capable of providing centralized management of the software monitoring items while the OS is running. Information of the states of the monitored items can be viewed by the NEC ESMPRO Manager Ver. 6 communicating with NEC ESMPRO ServerAgentService. In order to manage the hardware monitoring items, NEC ESMPRO Manager needs to communicate with EXPRESSSCOPE Engine 3.

Even if the DC power of the NEC Express5800 Server Series is turned OFF or NEC ESMRO Agent/ NEC ESMPRO ServerAgentService is not available, the information on the states of the hardware monitoring items can be viewed by the NEC ESMPRO Manager Ver. 5 or 6 communicating with the BMC(*).

Information on the states of the hardware monitoring items can also be viewed by the Web console of the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3.

(*) Information browsing is available only for the NEC Express5800 Server Series mounted with EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3.

(When using the NEC ESMPRO Manager Ver. 5, 6)
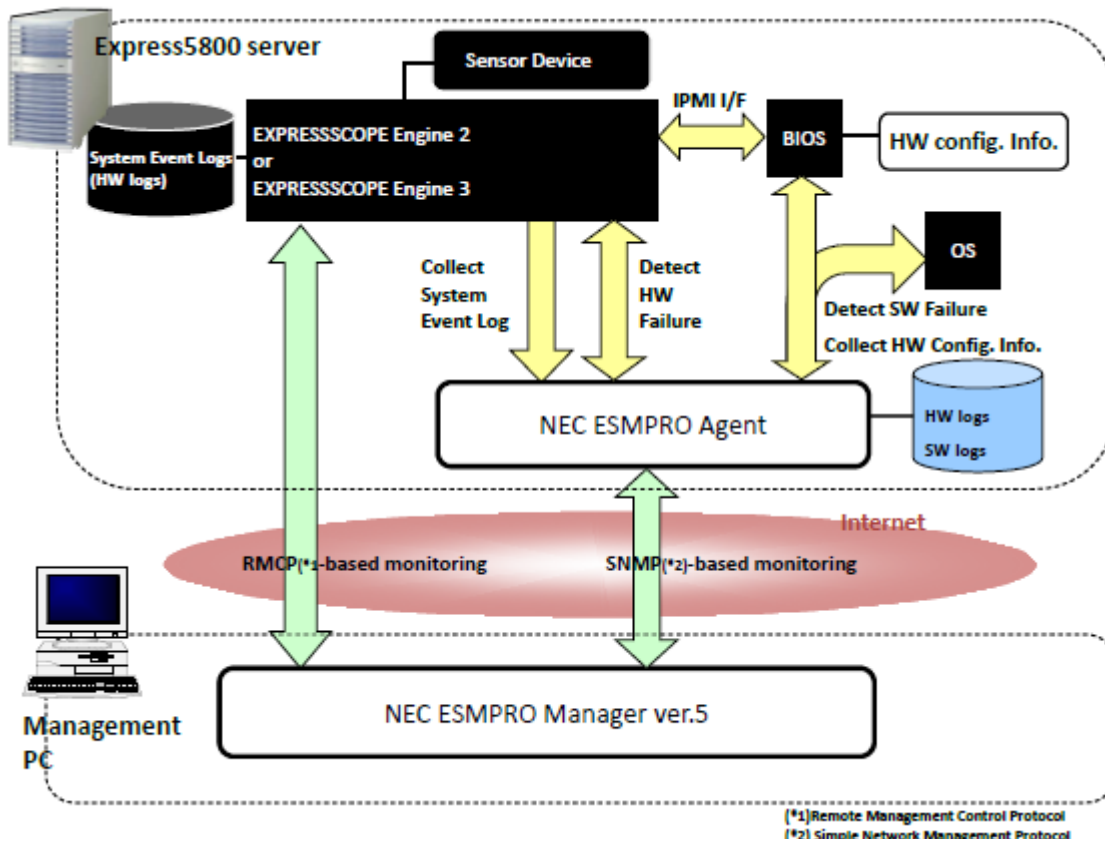
Server Monitoring Paths Overview (ESMPRO Manager ver. 5)
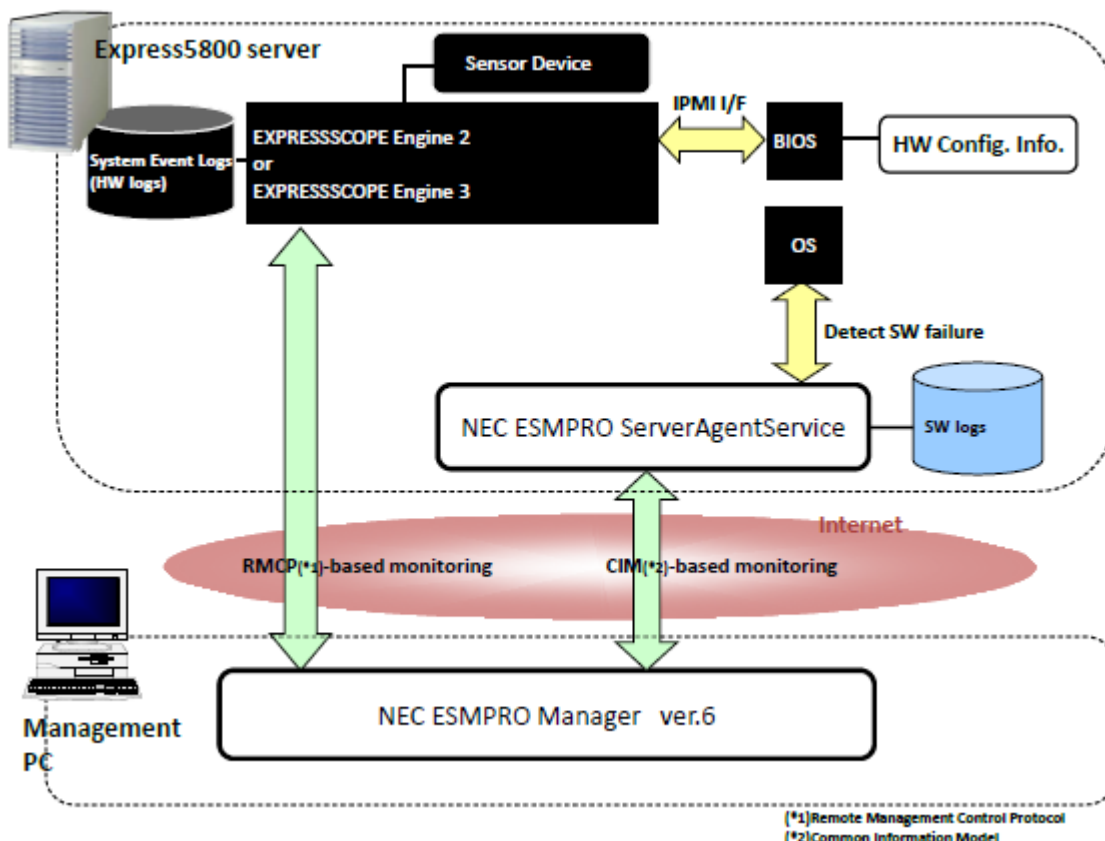
Server Monitoring Paths Overview (ESMPRO Manager ver. 6)

■ Power Unit Monitoring

This function is to monitor the state of the power unit and detect the failures.

■ Temperature Monitoring

This function is to monitor the temperatures inside the server. The mainly monitored temperatures are as follows.

Ambient temperature

Server inlet temperature

CPU temperature

■ Voltage Monitoring

This function is to monitor each type of voltage used in the NEC Express5800 Server Series.

■ Fan Monitoring

This function is to monitor the state of the fan and to detect the failures and loss of redundancy.

■ Chassis Cover Monitoring

This function is to monitor the opening and closing of the covers including the front cover and side cover.

■ Water Cooling Unit Monitoring

This function is to monitor the state of water pressure within the pump of the Water Cooling Unit and to detect leaks of the water cooling liquid.

■ CPU/Memory/Bus Monitoring

This function is to detect the CPU failures (ex. internal errors that can be detected by the CPU), memory bit-flip and errors in each bus.

■ HDD Health Monitoring

This function is to monitor the state of each disk by using the S.M.A.R.T. functions, RAID monitoring functions, etc. This function is provided by the NEC ESMPRO Manager Ver. 5, Ver. 6, EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3.

The NEC ESMPRO Manager Ver. 5 and 6 monitors the state of each disk by using the S.M.A.R.T. functions, RAID monitoring functions, etc.

The EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3 monitor the state of each disk by communicating with the LSI chip mounted in the NEC Express5800 Server Series.

■ Power Monitoring

This function is to monitor the amount of power consumed in the NEC Express5800 Server Series.

■ CPU/Memory/File/LAN Utilization and State Monitoring
　This function is to monitor the CPU, memory, file utilization and LAN utilization of the NEC
　Express5800 Server Series.
　To use this function, the NEC ESMPRO Agent or NEC ESMPRO ServerAgentService is required.

■ Hardware Configuration Information Collection
　This function is to collect and view the hardware configuration information (configuration of CPU,
　memory, board mounted in PCI slot, disk, etc.). To view the information, NEC ESMPRO Agent or
　NEC ESMPRO ServerAgentService is required.

■ Hardware Log Information Collection
　This function is to collect the hardware event logs. The System Event Logs (SELs) collected by the
　EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3 are temporarily stored in the
　nonvolatile memory. And then, SELs in the nonvolatile memory and event logs that can be detected
　only by the software managed by the NEC ESMPRO Agent are merged and saved when the NEC
　ESMPRO Agent boots.

● **Stall Monitoring/Auto-Reboot Functions**

These functions are to monitor various types of stalls that occur during the time from the server startup
to the shutdown process, including the time while the OS is running, and to reboot the system
automatically if the system cannot be recovered within a certain period of time after detecting a stall.
These functions can be achieved by a module, which is running on the CPU of the NEC Express5800
Server Series to update the timer (*1) called Watchdog Timer (WDT) within a certain period of time. To
perform the boot monitoring/OS stall monitoring, the system management driver, which is used with
the NEC ESMPRO Agent or Server Configuration Utility, is required.

(*1) A timer that is mounted in the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3, and
　　　independent from the CPU.

■ BIOS/POST Stall Monitoring
　This function is to monitor stalls while executing the POST. If a stall is detected, the system will be
　reset forcibly. The WDT is updated by the BIOS.

■ Boot Monitoring
　This function is to monitor stalls during the time from the completion of the POST to the completion of
　the OS boot. If a stall is detected, the system will be reset forcibly, and then rebooted. For the
　multi-CPU NEC Express5800 Server Series, the booted CPU will be switched before rebooting the
　system. The BIOS allows the monitoring to be started at the beginning of the OS boot and the
　completion of the OS boot will be notified by the system management driver.

■ OS Stall Monitoring
　This function is to monitor stalls of the OS. If an OS stall is detected, an NMI will be generated. For

the Windows OS, a system memory dump can be created by generating the NMI. If the stall persists after generating the NMI, the system will be rebooted automatically. The WDT is updated by the system management driver.

■ Shutdown Monitoring
This function is to monitor stalls during the time from the start of the shutdown to turning OFF the DC power of the system. If a stall is detected, the DC power of the system will be turned OFF forcibly. The system management driver allows the monitoring to be started at the beginning of the shutdown, and the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3 detect the completion of the shutdown.

NOTE: The detailed operating mode (timeout interval of the WDT, action taken when timeout occurs, etc.) for the OS stall monitoring and shutdown monitoring can be configured by the NEC ESMPRO Agent or Server Configuration Utility.

● Reporting Functions

These functions are to notify the remote management server when a failure is detected on the NEC Express5800 Server Series.
The NEC ESMPRO Manager Ver. 5, 6 receives the notification. The modules that can send the reporting are the NEC ESMPRO Agent, NEC ESMPRO ServerAgentService, EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3, and there are two reporting paths; a reporting via LAN and a reporting via modem.

To perform this function via LAN, NEC ESMPRO Agent supports SNMP trap reporting defined in the NEC-MIB, NEC ESMPRO ServerAgentService supports CIM Indication and SNMP trap reporting, and EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3 support e-mail reporting as well as the SNMP trap reporting according to the Platform Event Trap (PET) format. To perform these functions via modem, the server is accessed and the SNMP trap reporting will be sent via PPP.

* For the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 3 mounted, the reporting functions via modem are not supported.

(When using the NEC ESMPRO Manager Ver. 5, 6)
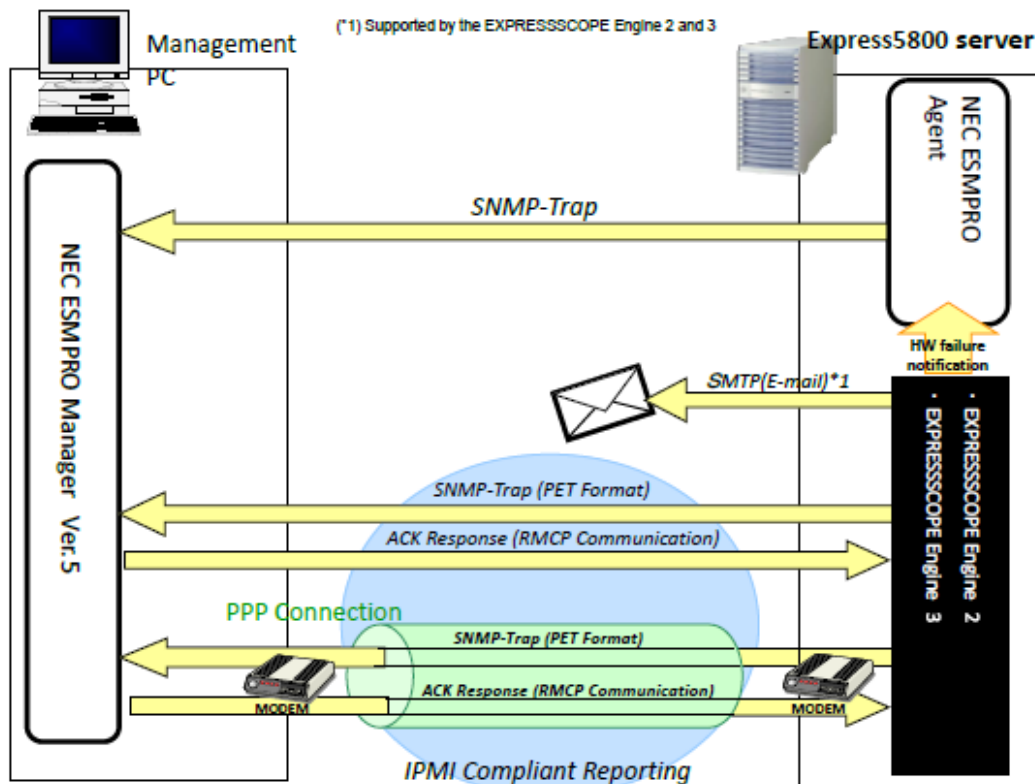
Failure Reporting Paths Overview (ESMPRO Manager ver. 5)
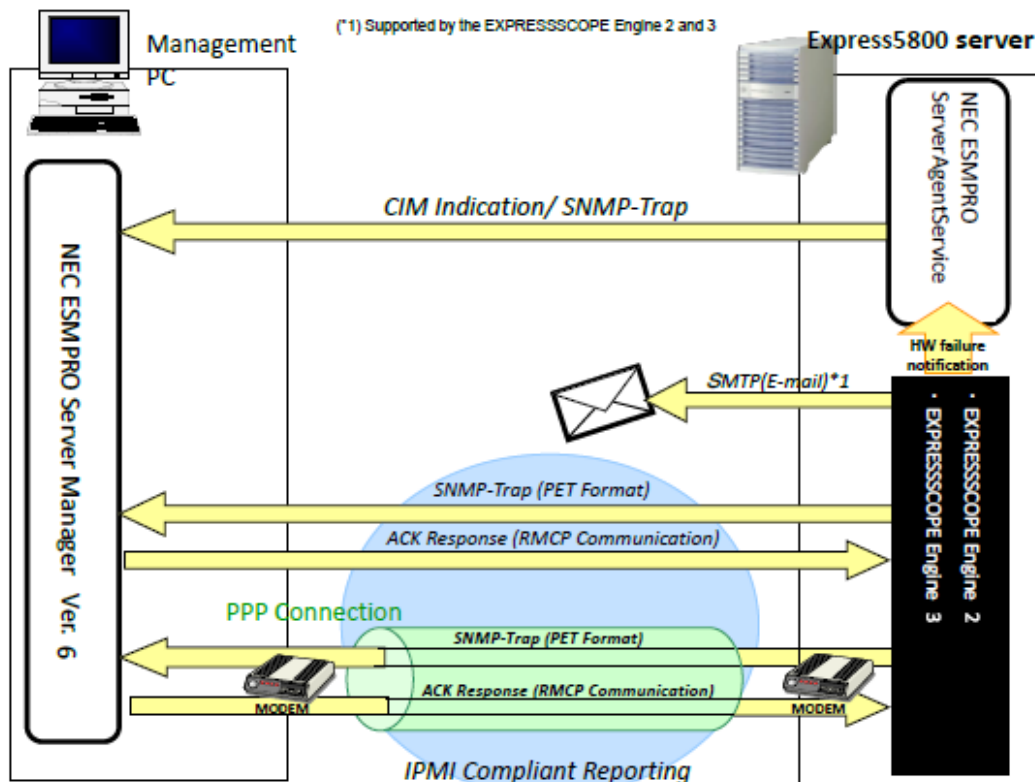
Failure Reporting Paths Overview (ESMPRO Manager ver. 6)

■ Hardware Failure

The reporting is sent if a failure is detected for the monitoring items of the "Server Monitoring Functions."

■ Boot Failure

The reporting is sent if a boot failure, such as OS boot failure, is detected.

■ Kernel Panic

The reporting is sent if a kernel panic occurs on the OS.

● Remote Console Functions

These functions allow the local console display output to be viewed remotely. These functions can be divided into two types; functions provided as standard by a combination of the IPMI Serial Over LAN (SOL) (*1) using the NEC ESMPRO Manager Ver. 5 or Ver. 6 and NEC ESMPRO Agent Extension, and remote KVM console functions (*2) that allow the hardware-based display output to be viewed remotely by capturing it by the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3.
A BIOS standard function allows the output to be directed to the serial port while the POST process or BIOS setup is in progress, and the output can be viewed via modem by using commonly used terminal software (such as HyperTerminal).

(*1) Technology that redirects the input/output to/from COM2 port to the input/output to/from LAN. This technology is standardized in the IPMI Ver. 2.0.
(*2) For the EXPRESSSCOPE Engine 2, the optional NEC Remote KVM and Media License Key (N8115-03) is required.
For the EXPRESSSCOPE Engine 3, the optional NEC Remote KVM and Media License Key (N8115-04) is required.

To use the NEC Express5800 Server Series in a VMware® Infrastructure 3 environment, using a mouse by the remote KVM console functions is not available.

■ POST/BIOS Setup

The POST/BIOS setup screen can be viewed and operated remotely.

■ DOS-Based Utilities

The DOS-based utilities (various types of utilities provided by the NEC EXPRESSBUILDER, etc.) can be viewed and operated remotely. Note that the utilities that require switching to a particular display mode may not be available.

■ Boot Screen/Panic Screen

The screen that appears during the OS boot process and the screen that appears when a kernel panic occurs can be viewed remotely.

■ CUI (OS Console)

The Linux terminal console and Special Administrator Console (SAC) of EMS supported by the Windows OS (Windows Server 2003 and Windows Server 2008), can be viewed remotely. For the Linux terminal console, the output destination of the OS should be set to COM.

■ GUI (OS Console)

The OS GUI can be viewed remotely. There are two types of functions; functions provided as standard by using the NEC ESMPRO Agent Extension (*) and the optional remote KVM console functions. The supported OSes are only those supported by the NEC Express5800 Server Series. For details, refer to the "User's Guide" provided with the NEC Express5800 Server Series, as the installation of a specific driver provided with the NEC EXPRESSBUILDER is required depending on the OS.

(*) For GUI on the Windows OS, the display output that can be viewed is the same as that of local console. For GUI on the Linux OS, the display output can be viewed in a separate window by X Window System, however, the appearance differs from that of local console.

The below shows the details of support matrix for each of the remote console functions performed via LAN and via serial port (modem).

The availability differs depending on the use of the NEC ESMPRO Manager Ver. 5 or Ver. 6, use of the remote KVM console functions, use or non-use of the NEC ESMPRO Agent Extension, and whether the optional license is installed.

○ The remote KVM console functions are supported.
● The remote console functions of the NEC ESMPRO Manager Ver. 5 and Ver. 6 are supported.
− Not supported.

EE2: EXPRESSSCOPE Engine 2, EE3: EXPRESSSCOPE Engine 3

Remote Console Functions via LAN

NEC ESMPRO Ver. 5	Manager(*1)	Use				Non-Use	
or Ver. 6	Agent(*2)	Use		Non-Use		Non-Use	
EE2 or EE3	OPT(*3)	Installed	Not Installed	Installed	Not Installed	Installed	Not Installed
POST/BIOS Setup		○	○	○	○	○	○
DOS-Based Utilities		○	○	○	○	○	○
Boot Screen/Panic Screen		○	●(*4)	○	●(*4)	○	—
CUI (OS Console)		○	○	○	○	○	○
GUI (OS Console)		○	●(*5)	○	—	○	—

(*1) NEC ESMPRO Manager Ver. 5 or Ver. 6
(*2) NEC ESMPRO Agent Extension
(*3) NEC Remote KVM and Media License Key (N8115-03 or N8115-04)
(*4) The boot screen and panic screen are viewable only on the Windows OS (Windows Server 2003 and Windows Server 2008).
(*5) For the Linux OS, GUI is available only in a specific window by the X Window System.

Remote Console Functions via Serial Port (Modem)

NEC ESMPRO Ver. 5	Manager(˚1)	Use		Non-Use
or Ver. 6	Agent(˚2)	Use	Non-Use	Non-Use
EE2 or EE3	OPT(˚3)	—	—	—
POST/BIOS Setup		●	●	●
DOS-Based Utilities		●	●	—
Boot Screen/Panic Screen		●(*4)	●(*4)	●(*4)
CUI (OS Console)		●(*5)	●(*5)	●(*5)
GUI (OS Console)		—	—	—

(*1) NEC ESMPRO Manager Ver. 5 or Ver. 6
(*2) NEC ESMPRO Agent Extension
(*3) There is no difference in the remote console functions depending on whether the NEC Remote KVM and Media License Key (N8115-03 or N8115-04) is installed.
(*4) The boot screen and panic screen are viewable only on the Windows OS (Windows Server 2003 and Windows Server 2008).
(*5) For the Linux OS, the output destination of the console should be set to COM before establishing the connection.

● Remote Media Functions

These functions are available only for the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 mounted (*1). To use these functions, the NEC Remote KVM and Media License Key (N8115-03 or N8115-04) is required.

A CD/DVD/FD/USB flash drive, which is connected to a remote management PC where the Web console of the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 is displayed, can be recognized as a drive of the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 mounted, by sending the input and output to/from the CD/DVD/FD/USB flash drive (writing to a DVD is not supported) to the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 via LAN.

The drive can be used for OS installation or such, as the drive is recognized as a local USB drive.

(*1) To use the NEC Express5800 Server Series in a VMware® Infrastructure 3 environment, the remote media functions are not available.

● Remote Control Functions/Remote Diagnosis Functions

These functions are to remotely check the operations performed on the NEC Express5800 Server Series and the state of the NEC Express5800 Server Series.

For the interface of these functions, there is a method using the NEC ESMPRO Manager Ver. 5 or Ver. 6 and a method using the Web console provided by the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3.

To use the NEC ESMPRO Manager Ver. 5 or Ver. 6, the remote control functions and remote diagnosis functions can be performed by connecting to the NEC Express5800 Server Series via serial port (modem).

■ System Reset
This function is to remotely reset the system of the NEC Express5800 Server Series. The system can be reset regardless of the state of the OS.

■ Power ON/Forced Power OFF
This function is to remotely turn ON/OFF the power of the NEC Express5800 Server Series. The power can be turned ON/OFF regardless of the state of the OS.

■ OS Shutdown
This function is to shut down the OS. To shut down the OS via the NEC ESMPRO Manager Ver. 5 or Ver. 6, software shutdown is performed by using the NEC ESMPRO Agent Extension. If this function is performed in an environment that does not use the NEC ESMPRO Agent Extension or this function is performed from the Web console of the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3, the system can be shut down depending on the settings on the OS, as this function emulates pressing the power switch of the NEC Express5800 Server Series.

■ DUMP Switch
This function is to generate Non-Maskable Interrupts (NMIs) to the CPU. For the Windows OS, a blue screen appears, and a system memory dump can be created depending on the settings.

■ UID Switch
For the NEC Express5800 Server Series with a UID LED (in blue) mounted, the LED light can blink remotely. This function can be used to identify the NEC Express5800 Server Series under maintenance, etc.

■ STATUS LED State Information Collection
This function is to remotely view the state of the STATUS LED, which is mounted on the front of the NEC Express5800 Server Series. For the LED colors and the corresponding states, refer to the "User's Guide" of each model.

■ Virtual LCD Information Collection
For the NEC Express5800 Server Series with the LCD mounted, the displayed information can be viewed virtually and remotely.
Even for the NEC Express5800 Server Series with no LCD mounted, the displayed information can be viewed virtually. For the displayed information, refer to the "User's Guide" of each model.

■ BIOS Information/Hardware Configuration Information Collection
This function is to remotely view the BIOS information and hardware configuration information. To use this function, the NEC ESMPRO Agent is required on the server-side, and the information can be viewed remotely by the NEC ESMPRO Manager Ver. 5. This function is available only while the OS is running, as this function uses the NEC ESMPRO Agent.

■ Control from Web Browser
This function is to operate the NEC Express5800 Server Series through the Web browser-based GUI.
The operations are available via the NEC ESMPRO Manager Ver. 5 or Ver. 6 (Tomcat) from the Web browser.
In addition, the NEC Express5800 Server Series can be operated from the Web browser even in an environment where the NEC ESMPRO Manager Ver. 5 or Ver. 6 is not available, as the NEC Express5800 Server Series incorporate a Web server.

■ Operations from Command Line Interface
This function is to operate the NEC Express5800 Server Series from the Command Line Interface. By using the NEC ESMPRO Manager Ver. 5 or Ver. 6, the tasks requested to the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 can be performed from the DOS prompt shell on the NEC Express5800 Server Series where the NEC ESMPRO Manager Ver. 5 or Ver. 6 is running.

The NEC Express5800 Server Series can be remotely operated from the Command Line Interface by setting up a Telnet/SSH server or such on the NEC Express5800 Server Series where the NEC ESMPRO Manager Ver. 5 or Ver. 6 is running.

For the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3, the NEC Express5800 Server Series can be operated from the Command Line Interface even in an environment without the NEC ESMPRO Manager Ver. 5 or Ver. 6, as the Telnet/SSH functions are supported by the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3.

The Command Line Interface of the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3 is compliant with the Command Line Protocol (CLP) defined by an industry standards development organization, DMTF.

■ Remote Batch
This function is to send requests to the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 from the NEC ESMPRO Manager Ver. 5 or Ver. 6 to turn the DC power ON/OFF, shut down the OS(*1), collect the hardware log information and hardware configuration information at the specified time according to the set schedule. These requests can be performed regardless of the state of the OS, except shutting down the OS.

The network between the NEC Express5800 Server Series and a device where the NEC ESMPRO Manager Ver. 5 or Ver. 6 is installed must always be connected, as the requests are sent via LAN.

(*1) To use the shutdown function, the NEC ESMPRO Agent Extension is required.

■ Scheduled Running
This function is to shut down the OS and to turn the DC power ON at the time specified by creating the schedule on the NEC ESMPRO Manager Ver. 5 or Ver. 6 and by sending the schedule data to the NEC ESMPRO Agent Extension.

Turning the DC power ON can be achieved by the NEC ESMPRO Agent Extension specifying the time when the DC power will be turned ON next time for the EXPRESSSCOPE Engine 2 or EXPRESSSCOPE Engine 3 before shutting down the OS.

Once the NEC ESMPRO Manager Ver. 5 or Ver. 6 has sent the schedule data to the NEC ESMPRO Agent Extension, the NEC Express5800 Server Series can be managed according to the schedule data, even if the network is not available.

■ Power Management
This function is to measure the amount of power consumed by the NEC Express5800 Server Series from the NEC ESMPRO Manager Ver. 5 or Ver. 6.

The measured maximum/minimum/average power consumption value and the current value can be displayed.
The values can be measured for 24 hours at intervals of 5 to 60 seconds and there are two types of measurement methods; measuring the value newly and measuring the value with keeping the previous value. The measurement results can be downloaded in CSV format.

The current power consumption can be viewed from the Web browser of the EXPRESSSCOPE Engine 2 and EXPRESSSCOPE Engine 3.
This function can be performed only for the NEC Express5800 Server Series that support power management function.

■ Power Control
This function is to control the amount of power consumed by the NEC Express5800 Server Series. Previously, this function was supported by some models of the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 2 mounted, but currently, it is also supported by the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 3 mounted, and the power control function is enhanced for the NEC Express5800 Server Series that supports this function. For the NEC Express5800 Server Series that supports the enhanced function, the power consumption control and requests for reporting and OS shutdown have become available by the CPU throttling

function, etc., in the event that the power consumption exceeds the pre-specified threshold, as well as displaying the power control state on the graphs in real-time by using the NEC ESMPRO Manager Ver. 5 or Ver. 6.

■ NEC ExpressUpdate
These functions are to remotely update the system BIOS and BMC firmware on the NEC Express5800 Server Series.

The NEC ExpressUpdate functions allow the update packages to be downloaded from the update package server and to be installed manually or at a specified time.
The managed servers require the NEC ExpressUpdate Agent.
This function is available in the NEC ESMPRO Manager Ver. 5.1 and later.
For the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 3 mounted, the system BIOS and BMC firmware can be updated (via Out-Of-Band) without installing the NEC ExpressUpdate Agent on the managed server.

The support matrix for the remote control functions and remote diagnosis functions that are available via LAN and via serial port (modem) when using the NEC ESMPRO Manager Ver. 5 or Ver. 6 is provided below, respectively.

The available functions differ depending on the use or non-use of the NEC ESMPRO Agent Extension.

(When using the NEC ESMPRO Manager Ver. 5 and Ver. 6)

○ Supported and available from the Web console
● Supported and available from the Web console of the NEC ESMPRO Manager Ver. 5 and Ver. 6
─ Not supported

EE2: EXPRESSSCOPE Engine 2, EE3: EXPRESSSCOPE Engine 3

Remote Control Functions/Remote Diagnosis Functions via LAN

NEC ESMPRO Manager Ver. 5 or Ver. 6	Use		Non-Use
NEC ESMPRO Agent Extension	Use	Non-Use	Non-Use
EE2 or EE3 OPT(˙1)	─	─	─
System Reset	○	○	○
Power ON/Forced Power OFF	○	○	○
OS Shutdown	○(*2)	○(*2)	○(*2)
DUMP Switch	○	○	○
UID Switch	○	○	○
STATUS LED State Information Collection	○	○	○
Virtual LCD Information Collection	○	○	○
BIOS Information/Hardware Configuration Information Collection	●(*3)	●(*3)	●(*3)
Control from Web Browser	○	○	○
Operations from Command Line Interface	○	○	○

Remote Batch	●	●	—
Scheduled Running	●	—	—
Power Management	○	○	○
Power Control	○(*5)	○(*5)	○(*5)
BMC and System BIOS Update	●(*4)	●(*4)	○(*5)

(*1) There is no difference in the functions depending on whether the NEC Remote KVM and Media
    License Key (N8115-03 or N8115-04) is installed.
(*2) This function can be performed by the same operation as pressing the power switch.
(*3) The NEC ESMPRO Agent is required.
(*4) The NEC ExpressUpdate Agent is required. This function is not required for the NEC Express5800
    Server Series with the EXPRESSSCOPE Engine 3 mounted.
(*5) This function is supported only by the NEC Express5800 Server Series with the EXPRESSSCOPE
    Engine 3 mounted.

Remote Control Functions/Remote Diagnosis Functions via Serial Port (Modem)

NEC ESMPRO Manager Ver. 5 or Ver. 6	Use		Non-Use
NEC ESMPRO Agent Extension	Use	Non-Use	Non-Use
EE2 OPT(*1)(*6)	—	—	—
System Reset	●	●	—
Power ON/Forced Power OFF	●	●	—
OS Shutdown	●(*3)	●(*2)	—
DUMP Switch	●	●	—
UID Switch	●	●	—
STATUS LED State Information Collection	●	●	—
Virtual LCD Information Collection	●	●	—
BIOS Information/Hardware Configuration Information Collection	—	—	—
Control from Web Browser	●(*4)	●(*4)	—
Operations from Command Line Interface	●(*5)	●(*5)	—
Remote Batch	—	—	—
Scheduled Running	—	—	—
Power Management	●	●	—
Power Control	—	—	—
ExpressUpdate	—	—	—

(*1) There is no difference in the functions depending on whether the NEC Remote KVM and Media License Key (N8115-03 or N8115-04) is installed.
(*2) This function can be performed by the same operation as pressing the power switch.
(*3) If the OS shutdown did not work by the NEC ESMPRO Agent or NEC ESMPRO Agent Extension, the same operation as pressing the power switch will be performed after confirmation.
(*4) The NEC ESMPRO Manager Ver. 5 and Ver. 6 can be accessed via LAN.
(*5) This function can be performed from the DOS prompt shell on the NEC Express5800 Server Series where the NEC ESMPRO Manager Ver. 5 or Ver. 6 is running. The connection between the NEC Express5800 Server Series and the NEC ESMPRO Manager Ver. 5 or Ver. 6 must be established before using this function.
(*6) For the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 3 mounted, the remote control functions and remote diagnosis functions are not available via serial port (modem).

● Integrated Server Management Functions

The remote control functions can be performed for multiple servers at once by organizing the servers into groups and by specifying a group.

■ Multi-Server Remote Control Function
  This function is to perform remote control functions for a group of multiple servers.

■ Multi-Server Monitoring Function
  This function is to display the states of multiple servers that belong to the same group in a list. The states of the all servers that belong to the same group can be viewed.

■ Multi-Server Remote Batch Function
  This function is to perform the remote batch function for a group of multiple servers.

■ Multi-Server Scheduled Running Function
  This function is to perform the scheduled running function for a group of multiple servers.

■ Multi-Server Power Management Function
  This function is to perform the power management function for a group of multiple servers.

■ Multi-Server ExpressUpdate Function
  This function is to perform the ExpressUpdate function for a group of multiple servers.

● Maintenance/Installation Assistance Functions

These functions are used for maintenance and installation.

■ Off-Line Maintenance Utility
  This utility is to perform preventive maintenance and failure analysis for the NEC Express5800 Server Series.
  In the event of a failure, such that the NEC EMSPRO cannot boot, the cause of the failure can be identified by using this utility. For details, refer to the "Maintenance Guide" of each model.

■ Remote Boot (PXE Boot)
  If the Preboot eXecution Environment (PXE) is supported, the operations including remotely installing a server are available by remotely sending a boot image to a server via TFTP. To use this function, a PXE server and a DHCP server are required.

■ EXPRESSSCOPE Profile Key
  The EXPRESSSCOPE Profile Key is a removable flash memory mounted in the motherboard and various settings on the BMC firmware or such can be saved in it. At the replacement of the motherboard, the settings values can be retained by replacing the EXPRESSSCOPE Profile Key into the new motherboard. For details, refer to the "User's Guide" of each model.

● Other Functions

■ Wake On LAN
  This function is to turn the DC power of the system ON by receiving MagicPacket™.
  This function can be set to enable/disable in the BIOS setup menu.

■ Wake On Ring
  This function is to turn the DC power of the system ON by ringing (sending a signal for a phone call) when connecting to the modem. This function can be set to enable/disable in the BIOS setup menu.
  (*)This function is not supported for R120f-1M, R120f-2M, E120f-M.

■ LDAP/Active Directory Authentication
  For the account management of the EXPRESSSCOPE Engine, synchronization with LDAP/Active Directory is available. This function is supported by the EXPRESSSCOPE Engine 3 and later.

■ EXPRESSSCOPE Monitor
  This function allows LEDs (or an LCD) mounted on the front of the NEC Express5800 Server Series to display the state of the NEC Express5800 Server Series.

■ Dedicated RAS Processor Mounted (independent operation)
  This function provides a dedicated processor for server management depending on the model.

■ IPMI Support
  This function provides support for the IPMI specification, which is an industry standard for server management. The latest version of IPMI is 2.0.

Appendix C. Express5800 Scalable HA Server Management Functions

Supported Models:

· Express5800 Scalable HA Servers: A1080a-E, A1080a-D, A1080a-S (EXPRESSSCOPE Engine SP2 (*)
 adopted)

This appendix describes the main functions for server management that are available with combination of
the hardware functions and management software on the supported models.

Table C-1: About the main functions for server management that are available when using none of the
management software for each model.

Table C-2: About the main functions for server management that are available when using the NEC
ESMPRO Manager Ver. 5 and Ver. 6 (management software).

Table C-3: About the main functions for server management that are enhanced by "EXPRESSSCOPE
Engine SP2" adopted in A1080a-E, A1080a-D and A1080a-S.

For definitions of each item in Table C-1 and Table C-2, refer to the descriptions on the EXPRESSSCOPE
Engine 2 in this guide. The differences in the functions between the EXPRESSSCOPE Engine 2 and
EXPRESSSCOPE Engine SP2 are described in Table C-3.

(*) EXPRESSSCOPE Engine SP2 is a BMC for high-end servers.

● Table C-1: Express5800 Scalable HA Server Management Functions (with no management software)

○: Supported - : Not supported			A1080a-S, A1080a-D, A1080a-E EXPRESSSCOPE Engine SP2
Server Monitoring Functions	Power Unit Monitoring		○
	Temperature Monitoring		○
	Voltage Monitoring		○
	Fan Monitoring		○
	Chassis Cover Monitoring		-
	Water Cooling Unit Monitoring		-
	CPU/Memory/Bus Monitoring		○
	HDD Health Monitoring		○(*8)
	Power Monitoring		○
	CPU/Memory/File/LAN Utilization/State Monitoring		-
	Hardware Configuration Information Collection		○
	Hardware Log Information Collection		○(*15)
Stall Monitoring/ Auto-Reboot Functions	BIOS/POST Stall Monitoring		○
	Boot Monitoring		-
	OS Stall Monitoring		-
	Shutdown Monitoring		-
Reporting Functions(*1)	Hardware Failure		○(*15)
	Boot Failure		○
	Kernel Panic		○
	Connected via:	LAN	○(SNMP/E-Mail)
		COM Port (via Modem)	-
Remote Console Functions/ Remote Media Functions(*1)	POST/BIOS Setup		○
	DOS-Based Utilities		-
	Boot Screen, Panic Screen		○
	CUI (OS Console)(*2)		○(*7)
	GUI (OS Console)		○(*7)
	Remote Media (CD/DVD/FD)		○(*7)
	Remote Media (Flash Memory)		-

	Conne cted via:	LAN	○
		COM Port (via Modem)	-
Remote Control Functions/ Remote Diagnosis Functions		System Reset(*1)	○
		Power ON/Forced Power OFF(*1)	○
		OS Shutdown	○
		DUMP Switch(*1)	○
		UID Switch(*1)	○
		STATUS LED State Information Collection (*1)	○
		Virtual LCD Information Collection(*1)	○
		BIOS Information/Hardware Configuration Information Collection	-
		Control from Web Browser(*1)	○
		Operations from Command Line Interface(*1)	○
		Remote Batch(*1)	-
		Scheduled Running	-
		Power Management	○
		ExpressUpdate	-
	Conne cted via:	LAN	○
		COM Port (via Modem)	-
Integrated Server Management		Multi-Server Remote Control	-
		Multi-Server Monitoring	-
		Multi-Server Remote Batch	-
		Multi-Server Scheduled Running	-
		Multi-Server Power Management	-
		Multi-Server ExpressUpdate	-
Maintenance/Installation Assistance Functions		Maintenance Partition Boot	-
		Remote Boot (PXE Boot)	○
Remote Wake Up		Wake On LAN(*3)	○
		Wake On Ring	-
EXPRESSSCOPE Monitor			○(*14)(*15)
Dedicated RAS Processor Mounted (Independent Operation)			○
IPMI Support			Ver. 2.0

(*1) This function is available regardless of the state of the OS running on the NEC Express5800 Server Series (ex. regardless of whether the OS is absent, running or malfunctioning).

(*2) This function is supported by the Windows OS (Windows Server 2008 and later) and Linux OS only. For the Windows OS, this function can be supported by using the Special Administration Console (SAC). For the Linux OS, this function can be supported by using the serial console.

(*3) For the Windows OS that supports the ACPI, the OS can wake up from the sleep mode by remote PC operation (via LAN).

(*4) In the case of using the Express5800 Scalable HA Servers in a virtualized environment, using the mouse function with the remote KVM console function or remote media function is not available.

(*5) This function is supported in configuration that supports HDD hot-swapping.

(*6) The LCD panel on the front of the Express5800 Scalable HA Servers allows you to turn ON/OFF the power of the system, check the information and state of the system, set each network, etc.

(*7) This function is enhanced in comparison with that of the supported Express5800 Scalable HA Servers with the EXPRESSSCOPE Engine 2 mounted.

● Table C-2: Express5800 Scalable HA Server Management Functions (with NEC ESMPRO Manager Ver. 5 and Ver. 6)

○: Supported
- : Not supported

			A1080a-S, A1080a-D, A1080a-E EXPRESSSCOPE Engine SP2
Server Monitoring Functions		Power Unit Monitoring	○
		Temperature Monitoring	○
		Voltage Monitoring	○
		Fan Monitoring	○
		Chassis Cover Monitoring	-
		Water Cooling Unit Monitoring	-
		CPU/Memory/Bus Monitoring	○
		HDD Health Monitoring	○
		Power Monitoring	○
		CPU/Memory/File/LAN Utilization/State Monitoring(*1)	○
		Hardware Configuration Information Collection	○
		Hardware Log Information Collection	○(*16)
Stall Monitoring/ Auto-Reboot Functions		BIOS/POST Stall Monitoring	○
		Boot Monitoring	○
		OS Stall Monitoring	○
		Shutdown Monitoring	○
Reporting Functions(*2)		Hardware Failure	○(*16)
		Boot Failure	○
		Kernel Panic	○
	Connected via:	LAN	○ (SNMP /E-Mail)
		COM Port (via Modem)	-
Remote Console Functions/Remote Media Functions(*2)		POST/BIOS Setup	○
		DOS-Based Utilities	-
		Boot Screen, Panic Screen	○(*3)
		CUI (OS Console)(*3)	○(*3)(*10)
		GUI (OS Console)	○(*10)
		Remote Media (CD/DVD/FD)	○(*10)
		Remote Media (Flash Memory)	-
	Connected via:	LAN	○
		COM Port (via Modem)	-
Remote Control Functions/ Remote Diagnosis Functions		System Reset(*2)	○
		Power ON/Forced Power OFF(*2)	○
		OS Shutdown	○
		DUMP Switch(*2)	○
		UID Switch(*2)	○
		STATUS LED State Information Collection (*2)	○
		Virtual LCD Information Collection(*2)	○
		BIOS Information/Hardware Configuration Information Collection(*2)	○
		Control from Web Browser(*2)	○
		Operations from Command Line Interface(*2)	○
		Remote Batch(*2)	○
		Scheduled Running(*4)	○
		Power Management	○
		ExpressUpdate(*11)	○
	Connected via:	LAN	○
		COM Port (via Modem)	-
Integrated Server Management		Multi-Server Remote Control	○
		Multi-Server Monitoring	○
		Multi-Server Remote Batch	○
		Multi-Server Scheduled Running(*4)	○
		Multi-Server Power Management	○
		Multi-Server ExpressUpdate(*11)	○
Maintenance/ Installation Assistance Functions		Maintenance Partition Boot	-
		Remote Boot (PXE Boot)	○
Remote Wake Up		Wake On LAN	○
		Wake On Ring	-
EXPRESSSCOPE Monitor(*6)			○(*16)
Dedicated RAS Processor Mounted (Independent Operation)			○
IPMI Support			Ver. 2.0

(*1) This function requires the NEC ESMPRO Agent.

(*2) This function is available regardless of the state of the OS running on the NEC Express5800 Server Series (ex. regardless of whether the OS is absent, running or malfunctioning).

(*3) This function is supported by the Windows OS (Windows Server 2008 and later) and Linux OS only. For the Windows OS, this function can be supported by using the Special Administration Console (SAC). For the Linux OS, this function can be supported by using the serial console.

(*4) This function requires the NEC ESMPRO Agent Extension.

(*5) For the Windows OS that supports the ACPI, the OS can wake up from the sleep mode by remote PC operation (via LAN).

(*6) The LCD panel on the front of the Express5800 Scalable HA Servers allows you to turn ON/OFF the power of the system, check the information and state of the system, set each network, etc.

(*7) In the case of using the Express5800 Scalable HA Servers in a virtualized environment, using the mouse function with the remote KVM console function or remote media function is not available.

(*8) This function requires the NEC ExpressUpdate Agent.

(*9) This function is enhanced in comparison with that of the supported Express5800 Scalable HA Servers with the EXPRESSSCOPE Engine 2 mounted.
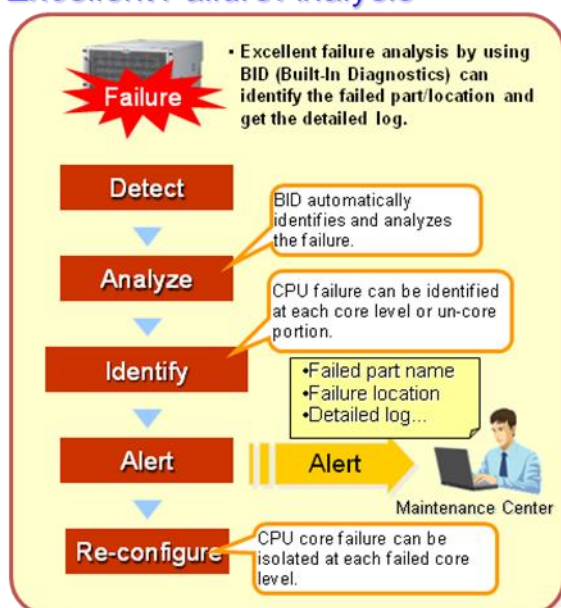
● Table C-3 Enhancement in the Monitoring and Management Efficiency that is Supported by "EXPRESSSCOPE Engine SP2"

The Express5800 Scalable HA Server A1080a-S, A1080a-D and A1080a-E have the "EXPRESSSCOPE Engine SP2" to enhance the monitoring and management efficiency even further than the standard IA servers, and achieve the functions below.
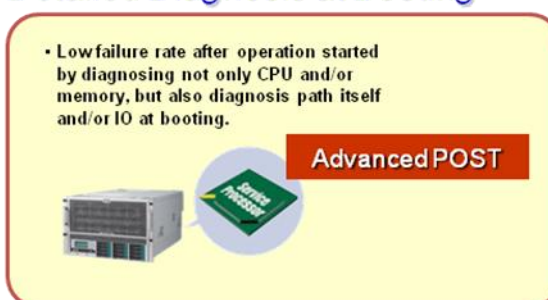
Server Monitoring Function	Advanced diagnosis function which achieves high availability and operability	The function reduces the failure rate while the system is in operation by performing the advanced POST for modules including CPU, memory and PCI at the initial boot. In the event of an error, various types of logs are collected to identify the failed part by the information acquired.
Reporting Function	Detailed log reporting	In the event of a failure, information required to identify the cause of the failure, such as information on the suspicious part, hardware log or trace log is reported from the BMC by e-mail in a timely manner. Being informed of the state of the failure in an early stage allows you to minimize the system downtime.
EXPRESSSCOPE Monitor (LCD)	Multi-functional LCD panel is mounted	The EXPRESSSCOPE Monitor allows you to turn ON/OFF the power of the system, check the information and state of the system, set each network, etc. In addition to the LEDs, the state of the server can be displayed on the LCD. In addition to the improved visibility, it reduces your time and effort on the system management, as the state can be visually checked in more detail.
Remote Console Function	BIOS and firmware can be updated with the EXPRESSSCOPE Engine SP2	As the BIOS and firmware can be updated from the EXPRESSSCOPE Engine SP2 mounted in the hardware, they can be remotely updated even in any of the Linux OS or virtual environment, regardless of the OS state.
	BIOS and firmware configuration information can be saved and recovered with the EXPRESSSCOPE Engine SP2	As the BIOS and firmware configuration information can be saved and recovered with the EXPRESSSCOPE Engine SP2 mounted in the hardware, the configuration information can be saved and recovered without booting the OS (DOS-based tool, etc.).

(Features of the monitoring and management functions of A1080a-S, A1080a-D and A1080a-E)

Appendix D. Main Functions for the Express5800/A2040b/c/d, A2020b/c/d, A2010b/c/d, A1040b/c/d Server Management

Supported Models:

- Express5800: A2040b, A2020b, A2010b, A1040b, A2040c, A2020c, A2010c, A1040c, A2040d, A2020d, A2010d, A1040d

This appendix describes the main functions for server management that are available with combination of the hardware functions and management software on the supported models above.

Table D-1: About the management software supported by Express5and the models mentioned in the Supported Models above.

Table D-2: About the server management functions that are available without the use of the management software.

Table D-3: About the main functions for server management that are available when using the NEC ESMPRO Manager Ver. 5 (management software).

Table D-4: About the main functions for server management that has been enhanced by the EXPRESSSCOPE Engine SP3.

For definition of each item in Table D-1, Table D-2, and Table D-3, refer to the descriptions on the EXPRESSSOPE Engine 3 in this guide. The difference in the functions between the EXPRESSSCOPE Engine 3 and EXPRESSSCOPE Engine SP3 will be described in Table D-4.

Table D-1: Management Software supported by the Express5800/A2040b/c/d, A2020b/c/d, A2010b/c/d, and A1040b/c/d.
(Refer to "Chapter 2: NEC Express5800 Server Series Server Management Product" for the description of management software.)

Express5800/A2040b, A2020b, A2010b and A1040b support the server management software listed below.
(⊙ Supported as standard)

Model	Managed Server				Management PC	
	EXPRESS SCOPE Engine SP3	**NEC ESMPRO ServerAgentService**	**NEC ESMPRO Agent Ver.**	**NEC ESMPRO Agent Extension**	**NEC ESMPRO Manager Ver.6**	**NEC ESMPRO Manager Ver.5**
EXPRESS5800/ A2040d, A2020d, A2010d, A1040d	⊙	⊙	-	⊙	⊙	-
EXPRESS5800/ A2040c, A2020c, A2010c, A1040c	⊙	(*1)	(*1)	⊙	⊙	-
EXPRESS5800/ A2040b, A2020b, A2010b, A1040b	⊙	-	4.x	⊙	⊙	⊙

(*1) The NEC ESMPRO ServerAgentService should be used for Windows OS; and NEC ESMPRO Agent Ver. 4 for Linux OS.

Table D-2: Main Functions for Server Management (with no management software)

		EXPRESS5800/ A2040b, A2020b, A2010b, A1040b, A2040c, A2020c, A2010c, A1040c, A2040d, A2020d, A2010d, A1040d	For comparison: Express5800/R120e-2M
○: Supported - : Not supported		EXPRESSSCOPE Engine SP3	EXPRESSSCOPE Engine 3 Extended
Server Monitoring Functions	Power Unit Monitoring	○	○
	Temperature Monitoring	○	○
	Voltage Monitoring	○	○
	Fan Monitoring	○	○
	Chassis Cover Monitoring	-	-
	Water Cooling Unit Monitoring	-	-
	CPU/Memory/Bus Monitoring	○	○
	HDD Health Monitoring	-	○
	Power Monitoring	○	○
	CPU/Memory/File/LAN Utilization/State Monitoring	-	-
	Hardware Configuration Information Collection	○	○
	Hardware Log Information Collection	○	○
Stall Monitoring/ Auto-Reboot Functions	BIOS/POST Stall Monitoring	○	○
	Boot Monitoring	-	-
	OS Stall Monitoring	-	-
	Shutdown Monitoring	-	-
Reporting Functions(*1)	Hardware Failure	○	○
	Boot Failure	○	○
	Kernel Panic	○	○
Connected via:	LAN	○(SNMP /E-mail)	○(SNMP /E-mail)
	COM Port (via Modem)	-	-
Remote Console Functions/ Remote Media Functions(*1)	POST/BIOS Setup	○	○
	DOS-Based Utilities	-	○
	Boot Screen, Panic Screen	○	○
	CUI (OS Console)(*2)	○(*5)	○(*5)
	GUI (OS Console)	○(*5)	○(*5)
	Remote Media (CD/DVD/FD)	○(*5)	○(*5)
	Remote Media (Flash Memory)	○(*5)	○(*5)
Connected via:	LAN	○	○
	COM Port (via Modem)	-	○(*6)(*7)
Remote Control Functions/ Remote Diagnosis Functions	System Reset(*1)	○	○
	Power ON/Forced Power OFF(*1)	○	○
	OS Shutdown	○	○
	DUMP Switch(*1)	○	○
	UID Switch(*1)	○	○
	STATUS LED State Information Collection (*1)	○	○
	Virtual LCD Information Collection(*1)	○	○
	BIOS Information/Hardware Configuration Information Collection	-	-
	Control from Web Browser(*1)	○	○
	Operations from Command Line Interface (*1)	○	○
	Remote Batch(*1)	-	-
	Scheduled Running	-	-
	Power Management	○	○
	Power Control	○	○(*8)
	ExpressUpdate	○(*9)	○(*9)
	Remote BIOS Settings (a part of settings only)	○	○
Connected via	LAN	○	○
	COM Port (via Modem)	-	-
Integrated Server Management	Multi-Server Remote Control	-	-
	Multi-Server Monitoring	-	-
	Multi-Server Remote Batch	-	-
	Multi-Server Scheduled Running	-	-
	Multi-Server Power Management	-	-
	Multi-Server ExpressUpdate	-	-
Maintenance/ Installation Assistance Functions	Offline Maintenance Utility	-	○
	Remote Boot (PXE Boot)	○(*10)	○(*11)
	EXPRESSSCOPE Profile Key	○	○

Remote Wake Up	Wake On LAN(*3)	○	○
	Wake On Ring	-	○(*11)
LDAP/Active Directory Authentication		○	○
EXPRESSSCOPE Monitor (*4)		○	-
Dedicated RAS Processor Mounted (Independent Operation)		○	○
IPMI Support		Ver. 2.0	Ver. 2.0
Advanced POST		○(*12)	-
BMC Mail Alert Function (with Detailed Log)		○(*12)	-
SOL Console Logging Function		○(*12)	-
IPv6 Support		○(*13)	-

(*1) This function is available regardless of the state of the OS running on the NEC Express5800 Server Series (ex. regardless of whether the operating system is absent, running or malfunctioning).

(*2) This function is supported by the Windows OS (Windows Server 2008 and later) and Linux OS only. For the Windows OS, this function can be supported by using the Special Administration Console (SAC). For the Linux OS, this function can be supported by using the serial console.

(*3) For the Windows OS that supports the ACPI, the OS can wake up from the sleep mode by remote PC operation (via LAN). For some models, the Wake On LAN function is restricted immediately after turning ON the AC power.

(*4) The LEDs or LCD on the front of the NEC Express5800 Server Series allow easy identification of failed parts in the event of a failure.

(*5) To use the NEC Express5800 Server Series in a virtualized environment, using a mouse by the remote KVM console functions and remote media functions are not available.

(*6) To use this function, commonly used terminal software (Tera Term, Hyper Terminal, etc.) and a connection using the COM port (via modem) are required. The function may be restricted depending on the utility. For example, some of the characters may be garbled.

(*7) The GUI (OS console) and remote media (CD/DVD/FD) are not available via COM port.

(*8) This function has been enhanced compared to the supported products with the EXPRESSSCOPE Engine 2 mounted.

(*9) For the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 3 mounted, the system BIOS and BMC firmware can be updated (via Out-Of-Band).

(*10) Remote Boot (PXE Boot) is supported via external LAN card.

(*11) This function is supported by the standard LAN port mounted in the NEC Express5800 Server Series.

(*12) This function has been enhanced compared to the supported products with the EXPRESSSCOPE Engine SP2 mounted.

(*13) Only web console functions, SMASH-CLP functions, and e-mail alert functions are supported.

Table D-3: Server Management Functions (with NEC ESMPRO Manager Ver.5, Ver. 6)

		EXPRESS5800/ A2040b, A2020b, A2010b, A1040b, A2040c, A2020c, A2010c, A1040c, A2040d, A2020d, A2010d, A1040d	For comparison: Express5800/R120e-2M
○: Supported − : Not supported		EXPRESSSCOPE Engine SP3	EXPRESSSCOPE Engine 3 Extended
Server Monitoring Functions	Power Unit Monitoring	○	○
	Temperature Monitoring	○	○
	Voltage Monitoring	○	○
	Fan Monitoring	○	○
	Chassis Cover Monitoring	−	−
	Water Cooling Unit Monitoring	−	−
	CPU/Memory/Bus Monitoring	○	○
	HDD Health Monitoring	○	○
	Power Monitoring	○	○
	CPU/Memory/File/LAN Utilization/State Monitoring(*1)	○	○
	Hardware Configuration Information Collection	○	○
	Hardware Log Information Collection	○	○
Stall Monitoring/ Auto-Reboot Functions	BIOS/POST Stall Monitoring	○	○
	Boot Monitoring	○	○
	OS Stall Monitoring	○	○
	Shutdown Monitoring	○	○
Reporting Functions(*1)	Hardware Failure	○	○
	Boot Failure	○	○
	Kernel Panic	○	○
Connected via:	LAN	○(SNMP /E-mail)	○(SNMP /E-mail)
	COM Port (via Modem)	−	−
Remote Console Functions/ Remote Media Functions(*1)	POST/BIOS Setup	○	○
	DOS-Based Utilities	−	○
	Boot Screen, Panic Screen	○	○
	CUI (OS Console)(*3)	○(*7)	○(*7)
	GUI (OS Console)	○(*7)	○(*7)
	Remote Media (CD/DVD/FD)	○(*7)	○(*7)
	Remote Media (Flash Memory)	○(*7)	○(*7)
Connected via:	LAN	○	○
	COM Port (via Modem)	−	○(*8)
Remote Control Functions/ Remote Diagnosis Functions	System Reset(*2)	○	○
	Power ON/Forced Power OFF(*2)	○	○
	OS Shutdown	○	○
	DUMP Switch(*2)	○	○
	UID Switch(*2)	○	○
	STATUS LED State Information Collection (*2)	○	○
	Virtual LCD Information Collection(*2)	○	○
	BIOS Information/Hardware Configuration Information Collection	○	○
	Control from Web Browser(*2)	○	○
	Operations from Command Line Interface (*2)	○	○
	Remote Batch(*2)	○	○
	Scheduled Running	○	○
	Power Management	○	○
	Power Control	○	○(*9)
	ExpressUpdate(*4)	○(*10)	○(*10)
	Remote BIOS Settings (a part of settings only)	○	○
LAN COM Port (via Modem)	LAN	○	○
	COM Port	○	○
Integrated Server Management	Multi-Server Remote Control	○	○
	Multi-Server Monitoring	○	○
	Multi-Server Remote Batch	○	○
	Multi-Server Scheduled Running	○	○
	Multi-Server Power Management	−	○
	Multi-Server ExpressUpdate(*4)	○	○
Maintenance/ Installation	Offline Maintenance Utility	−	○
	Remote Boot (PXE Boot)	○(*11)	○(*12)

Assistance Functions	EXPRESSSCOPE Profile Key	○	○
Remote Wake Up	Wake On LAN(*5)	○	○
	Wake On Ring	-	○(*12)
LDAP/Active Directory Authentication		○	○
EXPRESSSCOPE Monitor(*6)		○	-
Dedicated RAS Processor Mounted (Independent Operation)		○	○
IPMI Support		Ver. 2.0	Ver. 2.0
Advanced POST		○(*13)	-
BMC Mail Alert Function (with Detailed Log)		○(*13)	-
SOL Console Logging Function		○(*13)	-
Ipv6 Support		○(*14)	-

(*1) This function requires the NEC ESMPRO Agent.

(*2) This function is available regardless of the state of the OS running on the NEC Express5800 Server Series (ex. regardless of whether the OS is absent, running or malfunctioning).

(*3) This function is supported only by the Windows OS (Windows Server 2008 and later) and Linux OS. For the Windows OS, this function can be achieved by using the SAC. For the Linux OS, this function can be achieved by using the serial console.

(*4) This function requires the NEC ExpressUpdate Agent.

(*5) For the Windows OS that supports the ACPI, the OS can wake up from the sleep mode by remote PC operation (via LAN). For some models, the wake on LAN function is restricted immediately after turning ON the AC power.

(*6) The LEDs or LCD on the front of the NEC Express5800 Server Series allow easy identification of failed parts in the event of a failure.

(*7) To use the NEC Express5800 Server Series in a virtualized environment, using a mouse by the remote KVM console functions and remote media functions are not available.

(*8) The GUI (OS console) and remote media (CD/DVD/FD) are not available via COM port.

(*9) This function has been enhanced compared to the supported products with the EXPRESSSCOPE Engine 2 mounted.

(*10) For the NEC Express5800 Server Series with the EXPRESSSCOPE Engine 3 mounted, the system BIOS and BMC firmware can be updated (via Out-Of-Band).

(*11) Remote Boot (PXE Boot) is supported via external LAN card.

(*12) This function is supported by the standard LAN port mounted in the NEC Express5800 Server Series.

(*13) This function has been enhanced compared to the supported products with the EXPRESSSCOPE Engine SP2 mounted.

(*14) Only web console functions, SMASH-CLP functions, and e-mail alert function are supported.

Table D-4: Enhancement in the Monitoring and Management Efficiency that is supported by "EXPRESSSCOPE Engine SP3

The Express5800/ A2040b, A2020b, A2010b, A1040b, A2040c, A2020c, A2010c, A1040c, A2040d, A2020d, A2010d, A1040d has the "EXPRESSSCOPE Engine SP3" to enhance the monitoring and management efficiency even further than the standard IA servers, and achieve the functions below.

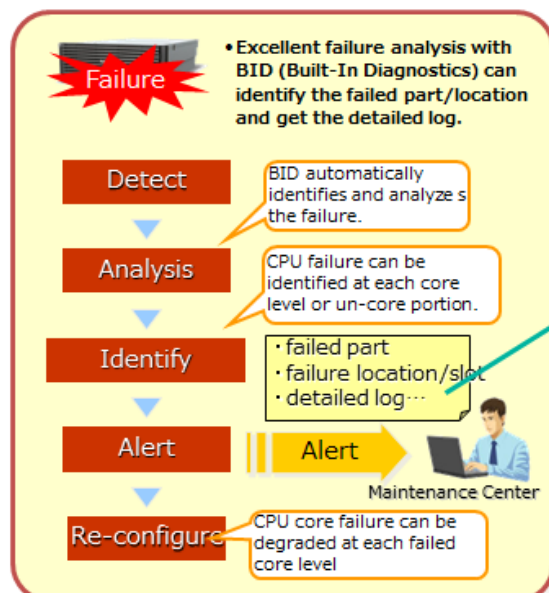| Functions	Description
Advanced POST: Delivers diagnostic features with high accuracy based on availability and operability (*1)	By performing a detailed diagnosis of each module such as CPU, memory, and PCI at the time of server startup, it can reduce the chance of server failure during operation. When an error occurred, identify the possible defective parts based on the collected log. Refer to "Excellent Failure Analysis and Detailed Diagnosis at Booting" on the following page.
BMC e-mail alert function(w/ Detailed Logs) (*1)	In the event of server failure, e-mail alert and notification necessary to solve problems, such as possible defective parts, chipset log, condition of each module, and trace-log to solve the problem, are released from BMC in a timely manner. By understanding the failure situation at an early stage, system downtime can be minimized. Refer to "Excellent Failure Analysis and Detailed Diagnosis at Booting" on the following page.
SOL(Serial Over LAN) Console Logging Function	When using Linux OS, automatic logging of the SOL (Serial Over LAN) console log to the internal flash memory without the use of console software. This log is effective when analyzing the server failure (1MB x 3 generations). Log collected by executing SMASH-CLP command can be displayed.
IPv6 Support	IPv6 IP address can be used as IP address of BMC: Web console functions, SMASH-CLP functions, and e-mail alert functions are supported.

*1: Functions listed above are supported by the Express5800 Scalable HA Servers with the EXPRESSSCOPE Engine SP2 or later described in Appendix C. Functions and features such as identification of possible defective parts as well as the capacity of collected log have been enhanced.

Features of the server monitoring and management functions for the Express5800/A2040b, A2020b, A2010b, A1040b, A2040c, A2020c, A2010c, A1040c, A2040d, A2020d, A2010d, A1040d

1) The Express5800/A2040b, A2020b, A2010b, A1040b, A2040c, A2020c, A2010c, A1040c, A2040d, A2020d, A2010d, A1040d is equipped with dedicated RAS processor - Hardware diagnosis functions supported by the EXPRESSSCOPE Engine SP3 which facilitate an easy identification of failed parts in the event of a failure. This in-depth diagnosis delivers a much quicker restoration/solution compared to the standard IA server.

The hardware failure analysis functions and hardware diagnosis functions of the Express5800/A2040b, A2020b, A2010b, and A1040b in particular, have been enhanced significantly. For example, the Express5800/A2040b, A2020b, A2010b, and A1040b offer a better capability to identify the issues and determine CPU failure situations in detail at core level while standard IA servers only analyze and identify the issues at socket level. Also detailed diagnosis can be performed at the time of server startup so as to reduce the chance of server failure after operation has started.

Excellent Failure Analysis

- Excellent failure analysis with BID (Built-In Diagnostics) can identify the failed part/location and get the detailed log.

Failure

Detect — BID automatically identifies and analyzes the failure.

Analysis — CPU failure can be identified at each core level or un-core portion.

Identify
- failed part
- failure location/slot
- detailed log…

Alert — Alert → Maintenance Center

Re-configure — CPU core failure can be degraded at each failed core level

Detailed Diagnostic at Booting

Advanced POST (Power On Self Test)
Test at reboot not only CPU and Memory but also IO and diagnostics path itself to reduce a failure occurring after operation started.

Message example (CPU core failure)

Identify FRU

BID : ********** Analysis Result **
BID : ——— Fault Analysis Result (FRU/CRU) —————————
No. 1 CPU   [CPU2   ] 98%
No. 2 BM   [BM   ] 2%
BID : ——— Fault Analysis Result (Component) —————
No. 1 CORE   [CPU2/CORE4   ] 96%
No. 2 CPU   [CPU2   ] 2%
No. 3 MB   [BM/MB   ] 2%
BID : ——— Error Information —————————
CPU:Internal Error was detected[L1 I-Cache].
BID : ——— Register Dump —————————
CPU2 MC0 3 a200000000000000
ERRCOD 00000000

FRU: CPU2

Failed : Core 4
Identify failed part

System Configuration
Core
MB   CPU1   CPU2
MEM [ ][ ] [ ][ ] MEM
     [ ][ ] [ ][ ]
IO IO   IO IO Failure at Core 4