User’s Guide

NEC Express Server
Express5800 Series

Express5800/R310e-E4
Express5800/R320e-E4
Express5800/R320e-M4
Express5800/R310f-E4
Express5800/R320f-E4
Express5800/R320f-M4
EXP320R, EXP320S

Chapter 1  General Description
Chapter 2  Preparations
Chapter 3  Setup
Chapter 4  Appendix
## Manuals

Manuals for this product are provided as booklets (📖) and as electronic manuals (💻) in the EXPRESSBUILDER DVD (.cd).

### EXPRESSBUILDER

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   | Overview, names, and functions of the server components                                        |
|                                          | **Chapter 2: Preparations**
   | Installation of additional options, connection of peripheral devices, and suitable location for this server |
|                                          | **Chapter 3: Setup**
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### Installation Guide

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### Other manuals

The detail of NEC ESMPRO, BMC Configuration, and other features.
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Conventions Used in This Document

Signs and symbols for safety

WARNING and CAUTION are used in this guide as following meaning.

**WARNING**
Indicates there is a risk of death or serious personal injury

**CAUTION**
Indicates there is a risk of burns, other personal injury, or property damage

Precautions and notices against hazards are presented with one of the following three symbols. The individual symbols are defined as follows:

<table>
<thead>
<tr>
<th><strong>Symbol</strong></th>
<th><strong>Description</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image" alt="Attention Symbol" /></td>
<td>This symbol indicates the presence of a hazard if the instruction is ignored. An image in the symbol illustrates the hazard type.</td>
</tr>
<tr>
<td><img src="image" alt="Prohibited Action Symbol" /></td>
<td>This symbol indicates prohibited actions. An image in the symbol illustrates a particular prohibited action.</td>
</tr>
<tr>
<td><img src="image" alt="Mandatory Action Symbol" /></td>
<td>This symbol indicates mandatory actions. An image in the symbol illustrates a mandatory action to avoid a particular hazard.</td>
</tr>
</tbody>
</table>

(Example in this guide)

- Use only the specified outlet
  - Use a grounded outlet with the specified voltage. Use of an improper power source may cause a fire or a power leak.

(Example in this guide)

- Use a grounded outlet with the specified voltage.
Notations used in the text

In addition to safety-related symbols urging caution, three other types of notations are used in this document. These notations have the following meanings.

<table>
<thead>
<tr>
<th>Important</th>
<th>Indicates critical items that must be followed when handling hardware or operating software. If the procedures described are not followed, <strong>hardware failure, data loss, and other serious malfunctions could occur.</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Note</td>
<td>Indicates items that must be confirmed when handling hardware or operating software.</td>
</tr>
<tr>
<td>Tips</td>
<td>Indicates information that is helpful to keep in mind when using this server.</td>
</tr>
</tbody>
</table>

Optical disk drive

This server is equipped with one of the following drives. These drives are referred to as **optical disk drive** in this document.

- DVD Super MULTI drive

Hard disk drive

Unless otherwise stated, **hard disk drive** described in this document refers to both of the following.

- Hard disk drive (HDD)
- Solid state drive (SSD)
Abbreviations of Operating Systems (Windows)

Windows Operating Systems are referred to as follows.

<table>
<thead>
<tr>
<th>Notations in this document</th>
<th>Official names of OS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Windows Server 2016</td>
<td>Windows Server 2016 Standard</td>
</tr>
<tr>
<td></td>
<td>Windows Server 2016 Datacenter</td>
</tr>
<tr>
<td>Windows Server 2012 R2</td>
<td>Windows Server 2012 R2 Standard</td>
</tr>
<tr>
<td></td>
<td>Windows Server 2012 R2 Datacenter</td>
</tr>
<tr>
<td>Windows Server 2008 R2</td>
<td>Windows Server 2008 R2 Standard</td>
</tr>
<tr>
<td></td>
<td>Windows Server 2008 R2 Enterprise</td>
</tr>
</tbody>
</table>

Operating Systems which is being supported is different depending on product model. See Chapter 1 (1.2 Supported Windows OS) in Installation Guide (Windows) for detailed information.

Abbreviations of Operating Systems (Linux)

Linux Operating Systems are referred to as follows.

See Chapter 1 (1.1 Supported Linux OS) in Installation Guide (Linux) for detailed information.

<table>
<thead>
<tr>
<th>Notations in this document</th>
<th>Official names of Linux</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHEL7.2</td>
<td>Red Hat Enterprise Linux 7.2(x86_64)</td>
</tr>
</tbody>
</table>

POST

POST described in this document refers to the following.

- Power On Self-Test

BMC

BMC described in this document refers to the following.

- Baseboard Management Controller
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**UEFI NETWORK STACK II and iSCSI**

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The most recent version of the guide, as well as other related documents, is also available for download from the following website.

http://www.nec.com/

Safety notes

To use this server safely, read thoroughly Safety Precautions and Regulatory Notices that comes with your server.
Warning labels

Warning labels are attached on or near the components. This label is either attached or printed on the component. Do not remove or black out this label and keep it clean. If no label is attached or printed on the server, contact your sales representative.

External view

Front view

Rear view
Handling precautions

Be sure to observe the following precautions to ensure that the server functions properly. Ignoring these precautions may cause server malfunction or failure.

Installation site
- Install the server in an appropriate place. See Chapter 2 Preparations (2. Installation and Connection).
- Before connecting or removing the cable to or from a peripheral device that does not support the Plug and Play function, make sure that the power to the server is off and remove the power cord from the outlet.
- Switch off all cell phones in the proximity of the server. Electric waves from these devices can cause the server to malfunction.
- When storing the server for a long time, be sure to satisfy the storage environment conditions (temperature: –10 to 55°C, humidity: 20 to 80%, non-condensing).
- Turn off the server and unplug the power cord before moving it.
- In the following cases, check and adjust the system clock before operation.
  - After transportation
  - After storage
  - After the server is used following a period of disuse, in which the storage conditions did not conform to the conditions that guarantee server operations (temperature 10 to 40°C, humidity 20 to 80%)
- Check the system clock approximately once per month. Use of a time server (NTP server) is recommended if highly accurate timing is required by the system.
- The voltage may drop momentarily, for example, due to a lightning strike. To take measures against this, it is recommended to use an uninterruptible power supply (UPS).

Power supply
- Be sure to use this server within the rated current and voltage.
- Power supply cord is not provided as a standard accessory with this server. Be sure to use power supply cord specified by our company based on the power supply voltage and current depending on the environment for use.
- An uninterruptible power supply (UPS) is used to prevent momentary voltage drops. The server does not support UPS connection through the serial port (RS-232C) or power control by PowerChute Plus.

Power-on/Power-off
- Do not turn on the server after connecting the power cord to the outlet before the Module POWER LED on the front of the device (see Chapter 1 (4.8 LEDs)) blinks in green (70 seconds).
- If an uninterruptible power supply (UPS) is connected, set the schedule to wait for at least 70 seconds before turning on the server.
- Do not power off or reset the server, nor disconnect the power cord before POST completes.
- Make sure that the DISK ACCESS LED or Optical DISK ACCESS LED is off before turning off the power or ejecting media from a hard disk drive or an optical disk.
- Allow 30 seconds or more to elapse when turning ON the power of the unit again after turning it to OFF.
- When disconnecting power cord from the outlet, wait at least 30 seconds before connecting the power cord again.
- For stable operation, it is recommended to restart the OS after the system has been duplexed.
• When the power is supplied to both CPU/IO modules at about the same time, 'CPU/IO module 0' is recognized as a primary module. In order for 'CPU/IO module 1' to be recognized as a primary module, connect the power cord to CPU/IO module 1 first, wait for a certain amount of time (15 seconds at least), and then connect the power cord to CPU/IO module 0.

• If a UPS is connected and you want to make CPU/IO module 1 recognized as a primary module, set the schedule so that the power will be supplied to CPU/IO module 1 first, and then CPU/IO module 0, at least 15 seconds later.

Optional devices
• We do not guarantee reproduction of copy-protected DVDs and CDs using reproduction equipment if such disks do not comply with the relevant standards.

• If this server, internal optional devices, and media used as backup devices (tape cartridges) are moved from a cold place to a warm place in a short period of time, condensation may occur, causing malfunction or failure when these devices are next used. To protect important stored data and assets, make sure to wait for a sufficient period before using the server and components in the operating environment.

Reference: Time effective for avoiding condensation in winter (more than 10°C difference between the room temperature and atmospheric temperature)

- Disk devices: Approximately 2 to 3 hours
- Tape media: Approximately 1 day

• For optional devices, we recommend you use NEC products. Even if they are successfully installed or connected, installation of unsupported devices can cause the server to malfunction or fail. You will be charged to repair failures or damage caused by the use of such products even if it is within the warranty period.
Warnings and Additions to This Product and Document

Using a computer extensively may affect different parts of your body. Here are tips you should follow while working on a computer to minimize strain on your body.

**Keep proper posture**

The basic body position for using a computer is sitting straight with your hands on the keyboard parallel with the floor, and your eyes directed slightly downward toward the monitor. With the proper posture described above, no unnecessary strain is applied on any part of your body, in other words when your muscles are most relaxed.

Working on the computer with bad posture such as hunching over or being too close to the monitor could cause fatigue or deteriorated eyesight.

**Adjust the angle of your display**

Most display units are designed for adjustment of the horizontal and vertical angles. This adjustment is important to prevent the screen from reflecting bright lights and to make the display contents easy to see. Working without adjusting the display to a comfortable angle makes it difficult for you to maintain a proper posture and you will get tired easily. Adjust the viewing angle before use.

**Adjust the brightness and contrast of the display**

Display screens have functions to control brightness and contrast. The most suitable brightness/contrast depends on age, individuals, and environment, so adjust it to suit your preferences. A too bright or too dark display is bad for your eyes.

**Adjust the angle of keyboard**

Some keyboards are ergonomically designed, which allow the angle to be adjusted. Adjusting the angle of the keyboard is effective to reduce tension on your shoulders, arms, and fingers.

**Clean your equipment**

Keeping your equipment clean is important not only for the appearance but also for functional and safety reasons. A dusty monitor makes it difficult to see the display contents, so clean it regularly.

**Take rest breaks**

When you feel tired, take a break. Light exercise is also recommended.
This chapter introduces the features of this server and the name of each part.

1. Preface

2. Accessories
   Describes the server’s accessories.

3. Features
   Describes the server’s features and the system management.

4. Names and Functions of Components
   Describes the name of each part contained in this server.
Welcome to the NEC Express5800 Series product.

This server is a "fault-tolerant (ft)" server focusing on "high reliability" in terms of fault-tolerance, in addition to "high performance", "scalability", and "general versatility" provided by Express5800 series.

In the event of trouble, its dual configuration will allow the system to instantaneously isolate the failed parts to assure non-stop running; operation will be moved smoothly from one module to the other, minimizing damage to it. You can use this server in a mission-critical system where high availability is required. By the use of Windows/Linux operating system or VMware ESXi, it also provides outstanding openness for general-purpose applications, etc.

To make the best use of these features, read this User's Guide thoroughly to understand how to operate the server.
2. Accessories

The carton box contains various accessories which are required for setup or maintenance. Make sure you have them all for future use.

- Front bezel
- Bezel lock key (attached to front bezel)
- Slide rails and screws for rack mount
- Cable tie
- EXPRESSBUILDER
- Software CD/DVD (differs in product models)

Make sure you have all accessories and inspect them. If an accessory is missing or damaged, contact your sales representative.

Important

The chassis serial number plate and maintenance label is located on the server. If the serial number does not match the number on the warranty, you may not be guaranteed against failure even within the warranty period. Contact your sales representative if they do not match.
3. Features

3.1 Features of the Server

The server contains two server modules in one enclosure. Each module has the following features:

High performance
- Intel® Xeon® processor
  - Express5800/R310e-E4, R320e-E4: Intel Xeon processor E5-2630v3 (2.4GHz, 8 cores)
  - Express5800/R320e-M4: Intel Xeon processor E5-2670v3 (2.3GHz, 12 cores)
  - Express5800/R310f-E4, R320f-E4: Intel Xeon processor E5-2630v4 (2.2GHz, 10 cores)
  - Express5800/R320f-M4: Intel Xeon processor E5-2671v4 (2.3GHz, 14 cores)
- Intel hyper threading technology features
- High-speed memory access
  - Express5800/R310e-E4, R320e-E4, R320e-M4: DDR4 supported, Max. operation speed 1866MHz supported.
  - Express5800/R310f-E4, R320f-E4, R320f-M4: DDR4 supported, Max. operation speed 2133MHz supported.
- High-speed disk access (SAS 12Gbps supported)
- High-speed Ethernet
  - Express5800/R310e-E4, R320e-E4, R310f-E4, R320f-E4:
    1000BASE-T/100BASE-TX (2 ports) interface (1Gbps/100Mbps supported)
  - Express5800/R320e-M4, R320f-M4:
    10GBASE-T/100BASE-T/100BASE-TX (2 ports) interface (10Gbps/1Gbps/100Mbps supported)

High reliability
- Memory monitoring feature (error correction/error detection)
- Bus parity error detection
- Temperature detection
- Error detection
- Internal fan monitoring feature
- Internal voltage monitoring feature
- BIOS password feature
- The security lock that comes with Front Bezel

Management Utilities
- NEC ESMPRO
- System BIOS firmware management feature (NEC ExpressUpdate for Windows)
- Remote management feature (EXPRESSSCOPE Engine 3)
- Hard disk drive monitoring
Power saving
- Power monitoring feature
- 80 PLUS® Platinum certified high efficiency power supply
- Fan control appropriate to environment, work load, and configuration

Expandability
- Option slots
  - Express5800/R310e-E4, R320e-E4, R310f-E4, R320f-E4:
    - PCI Express 3.0 (x4 lanes) : 2 slots (Low profile)
  - Express5800/R320e-M4, R320f-M4:
    - PCI Express 3.0 (x4 lanes) : 2 slots (Low profile)
    - PCI Express 3.0 (x8 lanes) : 2 slots (Full Height)
- Large capacity memory of up to 512GB
  - Express5800/R310e-E4, R310f-E4: up to 256GB
  - Express5800/R320e-E4, R320e-M4, Express5800/R320f-E4, R320f-M4: up to 512GB
- Can upgrade to multi-processor system with up to two processors
  - Express5800/R310e-E4, R310f-E4: up to one processor
  - Express5800/R320e-E4, R320e-M4, Express5800/R320f-E4, R320f-M4: up to two processors
- Expansion Bay (for 2.5-inch hard disk drives): 8 slots
- Optical disk drive bay provided as standard
- USB2.0 interface (Front: 1 port, rear: 3 ports)
- USB3.0 interface (Rear: 2 ports, option) *1
- Onboard LAN
  - Express5800/R310e-E4, R320e-E4, R310f-E4, R320f-E4: 2 ports
  - Express5800/R320e-M4, R320f-M4: 4 ports
- Management LAN port (1 port)

Ready to use
- Options are installed by BTO (Build to Order)
- No cable connection is required to install a hard disk drive (hot swap supported).

Many built-in Features
- El Torito Bootable CD-ROM (no emulation mode) format supported
- Software power-off
- Remote power-on feature
- AC-Link feature
- Power switch mask
- Baseboard Management Controller (BMC) conforming to IPMI v2.0

Self-diagnosis
- Power On Self-Test (POST)
- Test and Diagnosis (T&D) utility
Easy setup
- EXPRESSBUilder (setup utility)
- BIOS Setup utility (SETUP)

Maintenance features
- Off-line Tools
- Memory dump feature using DUMP Switch
- Feature to back up and restore BIOS/BMC configuration information

*1. USB3.0 may be unsupported depending on your operating system.
3.2 Fault-Tolerant Features

Hardware modules work while synchronizing and comparing with each other. Even if one hardware module stops, the server can continue its operation as the service with the other hardware module.

Major components are duplexed:
Even if one hardware module stops, the server can continue operation with the other module.
After the failed module is replaced, the new module obtains information from the other and resumes operation.

This server is a highly fault-tolerant server that achieves continuous computing operations, data storage mirror, and continuous network connection. This server is capable of executing applications running on Windows/Linux or a guest operating system supported by VMware ESXi.

This server achieves continuous computing operations for the server and server-based applications with its redundant CPU processing and redundant memory. It assures data redundancy through duplication of server data on an independent storage system. These features eliminate server downtime that is usually caused by network disconnection or trouble with the I/O controller, network adapter or hard disk drive, and support operation of the network and server applications continuously.

This server detects status changes, errors and logs of these events. If you use an alarm notification tool, you can configure this server to notify you when certain events occur.

This server is installed on the system as a server management solution. NEC ESMPRO, a GUI-based management tool, allows you to monitor, view, and configure the server. This tool also supports both local and remote management of the server.
(a) Advantages of this server

- Highly fault-tolerant processing and I/O subsystems
  This server uses redundant hardware and software to assure server operation even if one module suffers trouble with its processor, memory, I/O (including trouble related to the I/O controller), hard disk drive, or network adapter.

- Continuous network connection
  This server maintains continuous network connection by detecting any trouble with the network adapter, connection, etc. If trouble occurs, the standby network connection will take over all network traffic processing and thus securely maintain the network system connection of the server without losing network traffic or client connection.

- Support of multiple network connections
  Since this server can support multiple network connections, you can add network redundant control or network traffic control.

- No need to modify applications
  You can run the each OS-compliant application on this server. Thus, unlike other highly fault-tolerant products, special API or scripts are not necessary.

- Automatic mirroring
  This server automatically maintains data as the current data.

- Transparent migration
  This server constantly monitors events. If trouble occurs on server module of this server, it will transparently use a redundant module of the failed module. This feature maintains data and user access without stopping application service.

- Automatic reconfiguration
  When the failed module restarts after the trouble is corrected, the server will perform reconfiguration automatically, and if necessary, resynchronize the affected modules. Reconfiguration can include CPU processing (e.g., CPU memory), server's operating system (and related applications), and system data stored on the hard disk drive. In most cases, the server automatically restores redundancy of the server modules after recovery.

- Event notification function (Windows)
  When trouble or other events are detected on the server, they will be notified to Log and saved. Therefore, you can view the log items locally or remotely by a usual OS operation. Since an events use unique IDs, they are easy to distinguish. In addition, you can use alert notification software such as Express Report Service or Express Report Service (HTTPS) to manage the server. It is recommended to use such software to cope with system failure quickly. Ask your service representative for details.
• syslog function (Linux /VMware)
  All events and failures detected by the server are saved in syslog. In addition, you can use alarm report software, such as Express Report Service, for management of this server. It is recommended that Express Report Service be used also to cope with system failures quickly. Ask your sales representative for details.
• In-service repairing
  You can repair or replace a failed module even if the server is operating.
### 3.3 Management Features

NEC ESMPRO Agent enables you to collectively manage the state of your systems. You can also monitor the server states from a management PC on network where NEC ESMPRO Manager is installed.

The features available on this server are as shown in the table below.

<table>
<thead>
<tr>
<th>Function</th>
<th>Availability</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td></td>
<td>Shows physical hardware information.</td>
</tr>
<tr>
<td>Memory bank</td>
<td>△</td>
<td>Shows physical memory information.</td>
</tr>
<tr>
<td>Device info</td>
<td>△</td>
<td>Shows information specific to the server.</td>
</tr>
<tr>
<td>CPU</td>
<td>△</td>
<td>Shows physical CPU information.</td>
</tr>
<tr>
<td>System</td>
<td>○</td>
<td>Shows logical CPU information and monitors the load factor. Shows logical memory information and monitors the status.</td>
</tr>
<tr>
<td>I/O device</td>
<td>○</td>
<td>Shows information on I/O devices (serial ports, keyboard, mouse, and video). It may not be displayed depending OS.</td>
</tr>
<tr>
<td>System environment</td>
<td></td>
<td>Monitors temperatures, fans, voltage, power supply, and others.</td>
</tr>
<tr>
<td>Temperature</td>
<td>△</td>
<td>Monitors the temperature inside of the chassis.</td>
</tr>
<tr>
<td>Fan</td>
<td>△</td>
<td>Monitors the fans.</td>
</tr>
<tr>
<td>Voltage</td>
<td>△</td>
<td>Monitors the voltage inside of the chassis.</td>
</tr>
<tr>
<td>Power supply</td>
<td>△</td>
<td>Monitors the power supply unit.</td>
</tr>
<tr>
<td>Cover / Door</td>
<td>X</td>
<td>Monitors Chassis Intrusion (open/close state of chassis cover or door).</td>
</tr>
<tr>
<td>Software</td>
<td>○</td>
<td>Shows service, driver, and OS information.</td>
</tr>
<tr>
<td>Network</td>
<td>○</td>
<td>Shows network (LAN) information and monitors packets.</td>
</tr>
<tr>
<td>BIOS</td>
<td>△</td>
<td>Shows BIOS information.</td>
</tr>
<tr>
<td>Local polling</td>
<td>○</td>
<td>Monitors the values of MIB items obtained by NEC ESMPRO Agent.</td>
</tr>
<tr>
<td>Storage</td>
<td>×</td>
<td>Monitors controllers and storage devices including hard disk drives.</td>
</tr>
<tr>
<td>File system</td>
<td>○</td>
<td>Shows the file system configuration and monitors the free space.</td>
</tr>
<tr>
<td>Others*</td>
<td>×</td>
<td>Monitors OS stall using the Watch Dog Timer.</td>
</tr>
<tr>
<td></td>
<td>△</td>
<td>Performs alert processing after an OS STOP error occurs.</td>
</tr>
</tbody>
</table>

○: Supported. △: Supported on Windows OS and Linux OS. ×: Unsupported.

*: Not displayed on the NEC ESMPRO Manager screen.

**Tips**

NEC ESMPRO Manager and NEC ESMPRO Agent are supplied with the server as standard. For how to install and use each software component, refer to the explanation of the component.
3.4 Firmware and Software Version Management for Windows

Use of NEC ESMPRO Manager and NEC ExpressUpdate Agent can manage or update versions of firmware and software easily.

This feature easily updates the update packages downloaded from NEC ESMPRO Manager.
# 4. Names and Functions of Components

## 4.1 Front View

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) System POWER LED</td>
<td>Goes on green when either of the powers of the CPU/IO modules is on. The LED goes off when both powers of CPU/IO module are off.</td>
</tr>
<tr>
<td>(2) System FAULT LED</td>
<td>Goes on amber if one of the CPU/IO modules fails. You can know the details by checking (14) EXPRESSSCOPE. The LED blinks in amber if the failed CPU/IO module cannot be identified.</td>
</tr>
</tbody>
</table>
| (3) System FT LED   | Displays the device status:  
Green: operating under duplex condition  
Off: not in duplex condition                                                        |
| (4) System ID LED   | Identifies the system to maintain.  
Blue: UID switch was pressed.  
Blinking in blue: The software command was sent from remote terminal. |
### 4.2 Front View (Without Front Bezel)

1. **CPU/I/O module 0**
   - Installs CPU (processor), memory (DIMM), PCI card, cooling fan, and hard disk drive.

2. **Hard disk drive bay**
   - Installs hard disk drives. The last-digit number indicates a slot number.

3. **UID (Unit ID) switch**
   - Turns on/off the Module ID LED on the front and rear of the device. When pressing the switch once, Module ID LED lights and it goes off when pressing it again.

4. **Dump (NMI) switch**
   - Performs the memory dump when pressing the button of primary CPU/I/O module for 4 to 8 seconds.

5. **DISK ACCESS LED**
   - Lights/blinks while accessing the installed hard disk drives.

6. **Optical disk drive**
   - Reads writes from/to a CD/DVD.

7. **System POWER LED**
   - Lights in green when one of the powers of the CPU/I/O modules is on. LED goes off when both powers of CPU/I/O module are off.

8. **System FAULT LED**
   - Goes on amber if one of the CPU/I/O modules fails. You can know the details by checking (14) EXPRESSSCOPE. The LED also goes on amber if the failed CPU/I/O module cannot be identified.

9. **System FT LED**
   - Displays the device status:
     - Green: operating under duplex condition
     - Off: not in duplex condition

10. **System ID LED**
    - Identifies the device to maintain.
      - Blue: UID switch was pressed.
      - Blinking in blue: The software command was sent from remote terminal.

11. **USB connector**
    - Connects to the device supporting USB interface.

12. **Power switch**
    - Turns off/on the power. When pressing it once, the power turns on. When pressing it again, the power turns off. Forced shutdown takes place when pressing it for 4 seconds or longer.

13. **CPU/I/O module 1**
    - Installs CPU (processor), memory (DIMM), PCI card, cooling fan unit, and hard disk drive. The names of each part are the same as CPU/I/O module 0.

14. **EXPRESSSCOPE**
    - Indicates the status of CPU/I/O modules. Lights or flashes green or amber.

15. **Pull-out Tag**
    - Shows the product number and serial number of the server.
4.3 Rear View

R310e-E4, R320e-E4, R310f-E4, R320f-E4 model

R320e-M4, R320f-M4 model
<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) USB connector (3 ports)</td>
<td>Connects to the device supporting USB interface.</td>
</tr>
<tr>
<td>(2) Management LAN connector</td>
<td>Connects to the network connector supporting 100BASE-TX/10BASE-T interface. (2)-3 LINK/ACT LED (2)-2 SPEED LED</td>
</tr>
<tr>
<td>(3) Module ID LED</td>
<td>Identifies the module to maintain. This LED goes on green when UID switch is pressed. This LED blinks green when remote command is received.</td>
</tr>
<tr>
<td>(4) 10G LAN connector (R320e-M4, R320f-M4 model only)</td>
<td>Connects to the network connector supporting 10GBASE-T/100BASE-T/100BASE-TX. (4)-1 LAN1 (4)-1-1 LINK/ACT LED (4)-1-2 SPEED LED (4)-2 LAN2 (4)-2-1 LINK/ACT LED (4)-2-2 SPEED LED</td>
</tr>
<tr>
<td>(5) 1G LAN connector</td>
<td>Connects to the network connector supporting 1000BASE-T/100BASE-TX. (5)-1 LAN1 (5)-1-1 LINK/ACT LED (5)-1-2 SPEED LED (5)-2 LAN2 (5)-2-1 LINK/ACT LED (5)-2-2 SPEED LED</td>
</tr>
<tr>
<td>(6) Power unit</td>
<td>Supplies the power. (6)-1 Stopper Bar to prevent the CPU/I0 module from falling off the server while the power cord is connected. Ensure that the bar is not unset to remove CPU/I0 module. (6)-2 Ejector (6)-3 Power Unit LED (6)-4 AC inlet Socket to connect power code. Slide the stopper to connect the power cable. (6)-5 Handle</td>
</tr>
<tr>
<td>(7) PCI slot</td>
<td>Installs an optional PCI card. (7)-1 Slot 1 (7)-2 Slot 2 (7)-3 Slot 3 (R320e-M4, R320f-M4 model only) (7)-4 Slot 4 (R320e-M4 R320f-M4 model only)</td>
</tr>
<tr>
<td>(8) Serial Port for maintenance (COM)</td>
<td>(8)-1 COM1 not available (8)-2 COM2 not available</td>
</tr>
<tr>
<td>(9) Monitor connector</td>
<td>Connects to a display.</td>
</tr>
<tr>
<td>(10) USB connector (2 ports) (option)</td>
<td>Connects to the device supporting USB interface. Ports to connect backup devices (internal / external RDX) supported by NEC</td>
</tr>
</tbody>
</table>
4.4 External View

(1) Front bezel  The cover to protect devices in the front.
(2) LEDs  For more information, see Chapter 1 (4.8 LEDs).
## 4.5 Optical Disk Drive

<table>
<thead>
<tr>
<th></th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1)</td>
<td>Optical DISK ACCESS LED - Lights while accessing the loaded optical disk.</td>
</tr>
<tr>
<td>(2)</td>
<td>Tray eject button - Ejects the tray.</td>
</tr>
<tr>
<td>(3)</td>
<td>Emergency hole - If the tray eject button fails to eject tray, insert a metal pin into this hole to forcibly eject the tray.</td>
</tr>
</tbody>
</table>
4.6 CPU/IO Module

R310e-E4, R320e-E4, R310f-E4, R320f-E4 model (without top cover)

R320e-M4, R320f-M4 model (without top cover)

PCI riser card
The figure below shows internal view of CPU/IO module without ducts.

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) HDD BP (Backplane)</td>
<td>-</td>
<td>(2) Cooling fan</td>
<td>-</td>
<td>(3) Processor (CPU)</td>
<td>Mounted below the heat sink. Processor #1 is standard installation. Processor #2 is optional.</td>
<td>(4) DIMM</td>
</tr>
<tr>
<td>(5) CPU/IO board</td>
<td>-</td>
<td>(6) PCI Riser card (R320e-M4,R320f-M4 model only)</td>
<td>-</td>
<td>(7) Power unit</td>
<td>-</td>
<td>(8) Internal USB cable</td>
</tr>
</tbody>
</table>
### 4.7 CPU/IO Board

#### CPU/IO board on CPU/IO module

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) Processor (CPU) socket</td>
<td>(1)-1 Processor #1 (CPU#1)  (1)-2 Processor #2 (CPU#2)</td>
</tr>
<tr>
<td>(2) DIMM slot</td>
<td>(2)-1 DIMM1 to DIMM4 from top  (2)-2 DIMM8 to DIMM5 from top</td>
</tr>
<tr>
<td>(3) DIMM slot</td>
<td>(3)-1 DIMM9 to DIMM12 from top  (3)-2 DIMM16 to DIMM13 from top  Available only when Processor #2 (CPU#2) is installed.</td>
</tr>
<tr>
<td>(4) HDD BP connector</td>
<td>-</td>
</tr>
<tr>
<td>(5) Lithium battery</td>
<td>-</td>
</tr>
<tr>
<td>(6) CMOS Clear jumper</td>
<td>See the following for details.  <em>Chapter 1 (10.3 Clearing BIOS Settings (CMOS Memory)) in Maintenance Guide (Windows).</em>  <em>Chapter 1 (9.3 Clearing BIOS Settings (CMOS Memory)) in Maintenance Guide (Linux).</em>  <em>Chapter 1 (9.3 Clearing BIOS Settings (CMOS Memory)) in Maintenance Guide (VMware).</em></td>
</tr>
<tr>
<td>(7) Password Clear jumper</td>
<td>See the following for details.  See <em>Chapter 1 (10.3 Clearing BIOS Settings (CMOS Memory)) in Maintenance Guide (Windows).</em>  <em>Chapter 1 (9.3 Clearing BIOS Settings (CMOS Memory)) in Maintenance Guide (Linux).</em>  <em>Chapter 1 (9.3 Clearing BIOS Settings (CMOS Memory)) in Maintenance Guide (VMware).</em></td>
</tr>
<tr>
<td>(8) Connector for PCIe card</td>
<td>(8)-1 PCI slot #1  (8)-2 PCI slot #2</td>
</tr>
<tr>
<td></td>
<td>Names and Functions of Components</td>
</tr>
<tr>
<td>---</td>
<td>----------------------------------</td>
</tr>
</tbody>
</table>
| (9) 1G LAN connector | (9)-1 LAN1  
(9)-2 LAN2 |
| (10) 10G LAN connector  
(R320e-M4, R320f-M4 model only) | (10)-1 LAN1  
(10)-2 LAN2 |
| (11) Connector for PCI riser card  
(R320e-M4, R320f-M4 model only) | -|
| (12) Management LAN connector | -|
| (13) Internal USB cable connector | Internal USB cable is optional. |
4.8 LEDs

The figures below show the location of LEDs on server.
For details, see Chapter 1 (6.1 Error Messages by LED Indication) in Maintenance Guide.

<Front View>

System POWER LED
System FAULT LED
System FT LED
System ID LED

<Front View Without Front Bezel>

DISK ACCESS LED
Module POWER LED
ID LED
SAFE TO PULL LED
PRIMARY LED
EXPRESSSCOPE

Optical DISK ACCESS LED

<Rear View>

Power unit LED
Management LAN connector
Module ID LED
10G LAN connector (R320e-M4, R320f-M4 model only)
1G LAN connector
SPEED LED
LINK/ACT LED
Preparations

This chapter describes preparations for using this server.

1. **Installing Internal Optional Devices**
   Describes how to install or remove optional devices.

2. **Installation and Connection**
   Describes how to place the server in a suitable location and connect some cables.
1. Installing Internal Optional Devices

See the following sections in the Maintenance Guide for how to install internal optional devices.

Chapter 2 (6. Installing/Replacing Internal Optional Devices) in Maintenance Guide (Windows)
Chapter 2 (5. Installing and Replacing Optional Devices) in Maintenance Guide (Linux)
Chapter 2 (5. Installing/Replacing Internal Optional Devices) in Maintenance Guide (VMware)

You do not need to provide any settings for software.

Important

- We recommend that optional devices be installed by a maintenance service staff from your maintenance service company authorized by NEC.
- Use only the devices and cables provided by NEC. You will be charged to repair damages, malfunctions, and failures caused by the use of any devices or cables not specified for use with this server even within the warranty period.
2. Installation and Connection

This section describes the procedure to install the server and connect to peripheral devices.

2.1 Installing/Removing the front bezel

When you power on/off the server, handle the optical disk drive, or remove/install a hard disk drive or CPU/IO module, remove the front bezel.

Removal

1. Insert the provided bezel lock key into the key slot and turn it to the left while pushing lightly.
2. Hold the right edge of the bezel and pull it forward.
3. Slide the bezel right a little to take the hook off the frame and remove the bezel.

Installation

1. Engage the left hook with the server’s frame.
2. Push the right side of the frame to mount it.
2.2 Rack

This server must be mounted to a rack which conforms to EIA standards.

2.2.1 Installing Rack

Refer to the manual that comes with your rack for how to install the rack, or consult with your sales representative.

WARNING

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, see Safety Precautions and Regulatory Notices.

- Use only in the specified environment.
- Do not connect the ground wire to a gas pipe.

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see Safety Precautions and Regulatory Notices.

- Do not carry or install the server only by a single person.
- Remove the CPU/IO module from the server and 4U chassis before moving the server.
- Do not install the server so that the load may be concentrated on a specific point.
- Do not install any components only by a single person.
- Confirm that hinge pins of the door are completely secured in place.
- Do not pull out the CPU/IO module from the rack when the rack is unstable.
- Do not provide the wiring for the server to exceed the rating of the power supply.
- Do not use the server in the environment where corrosive gas is generated.
Do not install the rack or server under the following environment. Doing so may cause malfunction of the server.

- Narrow space from which devices cannot be pulled out from the rack completely
- Place that cannot bear the total weights of the rack and devices mounted on the rack
- Place where stabilizers cannot be installed or where the rack can be installed only after the practice of proper earthquake-resistant construction
- Place of uneven or slanting floor
- Place of drastic temperature change (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated
- Place where sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, and other corrosive gases exist
- Place where the air (or dust) includes components accelerating corrosion (such as sulfur, sodium chloride) or conductive metals
- Place where chemicals may be accidentally sprayed over
- Place where a carpet not subject to anti-static process is laid
- Place where some objects may be fallen on the rack
- Place near a device generating intense magnetic field (such as TVs, radios, broadcast/communication antennas, power transmission wires, and electromagnetic cranes) is placed
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption
- Place near equipment that generates power noise (such as contact spark at power-on/power-off of commercial power supply through a relay)
- Environment where operation of the server is not guaranteed (such as power supply, ambient temperature, and/or humidity)

**Tips**  
See Appendix (1. Specifications) for details.
2.2.2 Installing the server to the rack

Mount the server to the rack.

**WARNING**

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, see Safety Precautions and Regulatory Notices.

- Do not use any racks out of standards.
- Use only under the specified environment.

**CAUTION**

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see Safety Precautions and Regulatory Notices.

- Do not drop the server.
- 4U chassis weighs about 10 kgs. At least two persons are required to install it.
- CPU/IO module weighs about 18 kgs. At least two persons are required to install it.
- Do not leave the CPU/IO module of the server being pulled out.
- Do not install the CPU/IO module with its cover removed.
- Do not get your fingers caught.

**Important**

Temperature increases and airflow in the rack

If multiple devices are installed, or if the inside of the rack is not sufficiently ventilated, the internal temperature rises due to the heat emitted from each device, which may result in a malfunction. Review airflow in the rack and room and take sufficient measures so that the internal temperature will not exceed the operational temperature during operation.

Air enters the server from the front and exits from the rear.
Mount the server to a rack in the following procedure.

**Checking accessories**

The following are the required accessories. Check if you have them all.

- Bracket: 2
- Plain washer: 4
- Flat head screw: 8
- Pan head screw: 8

Cage nuts (two pieces) are not included. Use the cage nuts provided with the rack.

**Locating**

Locate the square holes of rack to install the server.

Next to the square hole of the rack, an imprinted mark is placed for 1U. This server is as high as 4U (about 176 mm), and install it between the imprinted marks that indicate the height of 4U.

**Note**

To keep balance, install the server as low as you can on the rack.
Installing the chassis

Follow the steps below to set the 4U chassis to the rack.

1. If the rack has front and rear doors, open them.

   Tips Refer to the instruction manual that comes with the rack.

2. Install the brackets from the rear side of the rack.

   Install the brackets with its flat side facing inside. Place them with four pan head screws with washers that come with the server symmetrically. Tighten the screws temporarily.

3. Attach two cage nuts symmetrically into the second square holes from the bottom of chassis.

   Cage nuts Attached to the second holes from the bottom of chassis
Fix a cage nut from inside of the rack. Hook either of the clips of the cage nut to a square hole of the rack, and hook the other clip to a hole by a flat-bladed screwdriver.

**Note**
Make sure that the cage nuts on left and right sides are level.

4. Remove two CPU/I/O modules from the chassis.

**Tips**
Remove the module while lowering the lock lever.

5. Loosen the screw, and remove the DVD drive unit from the chassis.
6. Loosen the screws, and remove the system backplane from the chassis.

7. Insert the chassis from the front side of the rack.

8. Temporarily tighten flat head screws attached to the server to the four places at the top and the bottom on front, and back sides (total: 8) from the rear of the rack.
9. Open the covers and tighten tightly the screws to each two places, right and left from the front.

10. Tighten tightly the four pan head screws on the rear side and the eight flat head screws on the side panels.
11. Mount the System Backplane removed in Step 6, and secure it with screws.

12. Mount the DVD drive unit removed in Step 5, and secure it with screws.
13. Mount the CPU/IO module 0 removed in Step 4.

14. Raise the lock levers on the left and right sides.
15. Fasten the levers on the left and right sides with screws.

16. Mount the CPU/IO module 1 in the same way as described in Steps 13 through 15.
### 2.2.3 Removing the device from the rack

Remove the server from the rack in the following procedure.

**CAUTION**

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see *Safety Precautions and Regulatory Notices.*

- Do not drop the server.
- 4U chassis weighs about 10 kgs. At least two persons are required to install it.
- CPU/IO module weighs about 18 kgs. At least two persons are required to install it.
- Do not leave the CPU/IO module of the server being pulled out.
- Do not get your fingers caught.

Follow the steps below and unmount the server from the rack.

1. Check that the server is powered off, and remove all the power cords and interface cables from the server.
2. Remove the front bezel.
3. Loosen the screws on the left and right sides of the front panel of the CPU/IO module and release the lock by pulling the ejector toward you.
4. Pull out the CPU/IO module carefully from the rack.

**Important**

- When you pull out the device, do not load anything on its top. It is dangerous, since the device becomes unstable and it may fall.
- Do not hold the handle on the front side or the convex part on the back side. To move the device, hold the bottom.
- Since the device is locked and cannot be pulled out, pull it out after releasing the lock by lowering the lock on the side of the CPU/IO module.

5. Hold firmly the server and remove it from the rack.

**Tips**

To remove the mechanical component of the rack, see *Chapter 2 (2.2.2 Installing the server to the rack).*
2.3 Tower Conversion Kit

By using the tower conversion kit, you can install the server without using the dedicated rack.

2.3.1 Installing the Tower Conversion Kit

**WARNING**

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause death or serious injury. For details, see *Safety Precautions and Regulatory Notices*.

- Use only under the specified environment.
- Do not connect the ground wire to a gas pipe.

**CAUTION**

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see *Safety Precautions and Regulatory Notices*.

- Do not carry or install the server only by a single person.
- Remove the CPU/IO module from the server before moving the server.
- Do not install the server so that the load may be concentrated on a specific point.
- Do not install any components only by a single person.
- Do not pull out the CPU/IO module from the rack when the tower conversion kit is unstable.
- Do not leave the CPU/IO module of the server being pulled out from tower conversion kit.
- Do not provide the wiring for the server to exceed the rating of the power supply.
- Do not use the server in the environment where corrosive gas is generated.
Do not install the tower conversion kit in such places as listed below. Otherwise, the server may malfunction.

- Narrow space from which devices cannot be pulled out from the tower conversion kit completely
- Place that cannot bear the total weights of the devices mounted on tower conversion kit
- Place where stabilizers cannot be installed or where the tower conversion kit can be installed only after the practice of proper earthquake-resistant construction
- Place of uneven or slanting floor
- Place where temperatures change widely (near a heater, air conditioner, or refrigerator)
- Place where intense vibration may be generated
- Place where sulfur dioxide, hydrogen sulfide, nitrogen dioxide, chlorine, ammonia, ozone, and other corrosive gases exist
- Place where chemicals may be accidentally sprayed over
- Place whose floor is covered with non-antistatic carpet
- Place that may be subject to falling objects
- Place that is close to some equipment that generates intense magnetic field (such as TV set, radio, broadcasting/communications antenna, power transmission wire, and electromagnetic crane)
- Place where the power cord of the server must be connected to an AC outlet that shares the outlet of another device with large power consumption
- Place that is close to some equipment that causes power noises (such as sparks caused by power-on/off using a relay)
- Environment where operation of the server is not guaranteed

When you have selected a site, carry the tower conversion kit to the site, then place it slowly and gently.

**Important** Do not hold the tower conversion kit by its front door to lift it. The front door may be disengaged and damage the device.

After placing the tower conversion kit, lock its two rear wheels out of four.
2. Installation and Connection

Chapter 2  Preparations

2.3.2 Installing the Rack-mount Model to the Tower Conversion Kit

Follow the procedure below to install the devices to the tower conversion kit.

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see Safety Precautions and Regulatory Notices.

- Do not drop the server.
- 4U chassis weighs about 10 kgs. At least two persons are required to install it.
- CPU/I/O module weighs about 18 kgs. At least two persons are required to install it.
- Do not leave the CPU/I/O module of the server being pulled out.
- Do not install the CPU/I/O module with its cover removed.
- Do not get your fingers caught.

1. Open the front door of the tower conversion kit.

Note: If the door is locked, use the provided security key to unlock.
2. Confirm the location of four cage nuts on the front of the kit.

See the figure below for locations of the core nuts (two on the front top and two on the front bottom.)

**Note**

Four cage nuts have been installed on the chassis of the kit at shipment.

3. Remove one screw from the AC lock bracket on the rear of the tower conversion kit.

4. Remove the AC lock bracket.
2. Installation and Connection

5. Remove two CPU/I/O modules from the chassis.

6. Remove the DVD drive unit from the chassis.

7. Remove the rack mount bracket (handle) from the front of chassis.

**Important**

You cannot close the door with the handle being mounted. Keep the removed handle and screws for future use.
8. Insert the chassis from the front side of the tower conversion kit.

**Note** Push the chassis to the end of tower conversion kit.

9. Fix the chassis to the tower conversion kit with the provided four pan head screws (two for the top side and two for the bottom side).
10. Fix the chassis to the tower conversion kit with four flat head screws.

11. Mount the AC lock bracket and secure it with one screw.

12. Insert the DVD drive unit to the chassis and secure it with a screw.
13. Slowly and carefully insert the CPU/I/O module 0 into the chassis.

14. Close the levers on the top and the bottom, and then secure the CPU/I/O module with screws.

15. Install the CPU/I/O module 1 to the chassis with the same procedures.
2.4 Connection

Connect peripheral devices to the server.

Connectors that allow a variety of peripheral devices to be connected are provided at the front and rear of the server. Figures on the next page show the peripheral devices that can be connected as standard and connector positions.

WARNING

Be sure to observe the following precautions to use the server safety. Failure to observe the precautions may cause death or serious injury. For details, see Safety Precautions and Regulatory Notices.

- Do not hold the power plug with wet hands
- Do not connect the ground wire to a gas pipe

CAUTION

Be sure to observe the following precautions to use the server safely. Failure to observe the precautions may cause burns, injury, and property damage. For details, see Safety Precautions and Regulatory Notices.

- Use only the specified outlet to insert.
- Do not connect the power cord to an outlet that has an illegal number of connections.
- Insert the power plug into the outlet as far as it goes.
- Use only the specified power cord.
- Do not connect or disconnect the interface cable while the power cord is plugged in the outlet.
- Use only the specified interface cable
1. Connect the power cord to a circuit breaker of 15 A or less.

Note the following precautions to connect cables.

- If connecting any peripheral device and its interface cable made by other companies (a third party), contact your sales representative to check if they can be used with the server beforehand.
- USB devices supported by the server are Flash FDD, keyboard (including a mouse), and Server Switch Unit (SSU) designated by NEC. Connecting USB devices other than the above will cause malfunctions and failures.
- Power off the server before connecting peripheral devices, with the exception of peripherals with USB interface. Connecting a powered peripheral device to the powered server will cause malfunctions and failures.
- If you purchase the Internal USB cable and expand USB ports, the port supports a USB device that is the backup device (internal / external RDX) designated by NEC.
- If you purchase the Internal USB cable and both USB ports are installed on both CPU/IO modules, backup devices connected to these ports are not configured for duplication by using hardware.
- In the case of standard configuration, you need to complete setup of the operating system before installing external file backup device.
- The serial port connectors are reserved for maintenance.
When the device is not Plug and Play device, turn off the server and devices to be connected before connecting.

- Fix the power cord or interface cable with cable ties.
- Make sure that no pressure is applied on the plug of power cord.

### 2.4.1 Connecting to a uninterruptible power supply (UPS)

To connect the power cord of the server to the uninterruptible power supply (UPS), use the connector output on the rear of the UPS. For details, refer to the manual supplied with the UPS.

If you want to control the power of server with the output of UPS, change the following BIOS settings.

- **[Server]- [Power Control Configuration]-[AC-LINK]**
- Select **Power On** to perform automatic operations by using the UPS.

See the following for details.

- *Chapter 3 (2. BIOS Setup Utility (SETUP)).*
- *Chapter 3 (1. System BIOS) in Maintenance Guide (Windows)*
- *Chapter 3 (1. System BIOS) in Maintenance Guide (Linux)*
- *Chapter 3 (1. System BIOS) in Maintenance Guide (VMware)*
This chapter describes how to set up the server.

1. **Turning on the Server**  
   Describes how to turn on the server.

2. **BIOS Setup Utility (SETUP)**  
   Describes how to start BIOS Setup Utility.

3. **EXPRESSSCOPE Engine 3**  
   Describes how to use EXPRESSSCOPE Engine 3.

4. **EXPRESSIONBUILDER**  
   Describes how to use EXPRESSIONBUILDER.

5. **Installing Software Components**  
   Describes how to install an operating system and bundled software.

6. **Turning off the Server**  
   Describes how to turn off the server.
1. Turning on the Server

Follow the steps below to turn on the power.

1. Connect the power cord to this server and wait until the Module POWER LED on CPU/IO modules 0 and 1 start blinking green.

   **Tips**
   - It takes about one minute for LEDs on the front side of the server to turn on or start blinking after the power cord is connected to the server.
   - If you power off the server, wait at least 30 seconds before turning it on again.

2. Power on the display unit and other peripherals connected to the server.

   **Note**
   - If the power code is connected to a power controller (such as UPS), ensure that the controller is powered on.

3. Remove the front bezel.
4. Open the acrylic cover, and press the POWER switch. The System POWER LED goes on green. After a while, the "NEC" logo will appear on the screen.

Important
- Do not connect or disconnect USB device while POST is running.
- Do not power off the server while POST is running.

While the "NEC" logo is displayed on the screen, the server runs a power-on self test (POST) to check hardware. For details, see Chapter 3 (1.1 POST).
1. Turning on the Server


Chapter 3  Setup

1. POST

Power-On Self Test (POST) is a self-test feature stored on the motherboard of the server. When you power on the server, POST will start automatically to check the CPU/I0 board, DIMM, processor (CPU), and other devices. POST also displays startup messages for various utilities.

Usually, you do not need to check the POST message, but you should check messages when:

- You install a new server.
- You suspect a failure.
- An error message appears.

1.1 POST process

1. When you power on the server, it starts from the primary CPU/I0 module. Then, POST begins, and messages are displayed on the display to notify of initialization of the memory, PCI device, and so on. After the initialization messages, the logo appears on the display.

   **Note**
   - Keyboard becomes operable after the logo appears.
   - While the initialization messages are appearing, they may disappear on the screen (black screen) a moment but there is no problem.
   - Depending on the setting of BIOS setup utility (SETUP), the logo or initialization message does not appear.

   If Enabled is specified for Password On Boot in Security menu of SETUP, you will be prompted to enter password after the logo is displayed. If you enter the incorrect password three times consecutively, POST is stopped. In this case, power off the server, and power it on.

   **Important**
   Do not set a password before installing an OS.

2. Press the Esc key to clear the log. Then, the contents of POST are displayed. It includes messages to notify of the installed CPU, the memory capacity, and others.

   **Tips**
   If you set "Quiet Boot" to [Disabled] in the "Boot" menu in the BIOS setup utility (SETUP), the contents of logo will be shown without the logo itself.

3. After a while, the following message appears on the screen. (* The on-screen message depends on your system environment.)

   Press <F2> SETUP, <F4> ROM Utility, <F12> Network

   You can run the various functions by pressing the following function key:

   - <F2> key: Runs BIOS Setup Utility (SETUP). For details, see Chapter 3 (2. BIOS Setup Utility (SETUP)) on this guide.


   - <F12> key: Starts from network.

4. The OS starts when POST is completed.
1. Turning on the Server

1.1.2 POST Error Messages

If POST detects an error, an error message appears on the screen. For descriptions of error messages, causes, and countermeasures, see Chapter 1 (6.2. POST Error Messages) in Maintenance Guide (Windows), Maintenance Guide (Linux) or in Maintenance Guide (VMware).

1.1.3 Switching of boot pair

The CPU/IO module 0 or 1 is started depending on the primary/secondary status of modules when the server was shut down the last time. At the first startup after AC OFF, the CPU/IO module (0 or 1) powered on first is managed as primary, and the module powered on later is managed as secondary.

If POST or OS startup does not complete normally, the server will automatically restart. In this case, the other CPU/IO module (secondary) is determined as primary module, and POST or OS runs on that module (switching of boot pair).

If POST does not complete normally on both CPU/IO modules, the server will stop with the state of DC OFF or POST halts with an error message displayed.

The following devices are connected to the primary CPU/IO module. When one CPU/IO module is disconnected because of a failure, the other module is selected automatically to continue operating.

- VGA (display)
- USB device (keyboard, mouse, server switch unit, Flash FDD, optical disk drive)

**Note**

- If the Flash FDD is connected to a Windows model, the drive letter may change from A to B by switching CPU/IO modules. Changing of the drive letter does not affect the operation of the server. If the drive letter is changed, access the Flash FDD with the changed drive letter.
- For Windows models, the drive letter of the optical disk drive is re-assigned automatically. The unused letter is assigned to the drive in the order of D to Z. If you want to set the fixed drive letter to the optical disk drive, specify the letter which is not assigned in the order of D to Z after setting the hard disk drive letter.
2. BIOS Setup Utility (SETUP)

This section describes how to configure basic input/output system (BIOS). Make sure that you understand the descriptions in this chapter to configure BIOS properly.

2.1 Overview

BIOS Setup Utility (SETUP) is a utility to set basic hardware settings. This utility is installed in a flash memory on the server as standard.

Factory settings of BIOS are set with optimal values. Usually, you do not need to run SETUP. **Modify the settings only at the cases described in Chapter 3 (2.4 Cases that Require Changes).**

2.2 Starting and Exiting SETUP

2.2.1 Starting SETUP

Run POST following Chapter 3 (1.1.1 POST process).

After a while, the following message will be displayed on the lower left of the screen. The on-screen message depends on your system environment.

Press <F2> SETUP, <F4> ROM Utility, <F12> Network

If you press <F2> key, SETUP starts upon completion of POST, and the Main menu appears.

If you have set a password, the following message appears and prompts you to enter the password.

Enter Password [                          ]

If you enter incorrect password consecutively three times, the operation stops and you cannot proceed. No more operations can be done. Turn off the power.

2.2.2 Exiting SETUP

To exit SETUP after saving changes, choose Save & Exit → Save Changes and Exit.

To exit SETUP without saving changes, choose Save & Exit → Discard Changes and Exit.

Tips

- To restore the default value, choose Save & Exit → Load Setup Defaults.
- Some values are different from the factory settings.
- Values of ISCSI Configuration submenu of Advanced menu and UEFI Driver Configuration submenu do not return to default values.
### 2.3 Usage of SETUP

Use the following keys to operate SETUP.

- **Cursor keys (\(<\uparrow>, <\downarrow>\)**
  Chooses an item displayed on the screen. If characters of an item are highlighted, that means the item is currently chosen.

- **Cursor keys (\(<\leftarrow>, <\rightarrow>\)**
  Chooses Main, Advanced, Security, Server, Boot, or Save & Exit from the top menu.

- **\(<\rightarrow>\) key/\(<\leftrightarrow>\) key**
  Changes the value (parameter) of the chosen item. You cannot use this key when a menu which has ▶ on the left is chosen.

- **\(<\text{Enter}>\) key**
  Determines the chosen parameter by pressing this key.

- **\(<\text{Esc}>\) key**
  Cancels pop-up window. On the submenu, pressing this key takes you to the previous screen. On the top menu, the following window appears. If you choose Yes, SETUP closes without saving the changes.

<table>
<thead>
<tr>
<th>Quit without saving?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
</tr>
<tr>
<td>No</td>
</tr>
</tbody>
</table>

- **\(<F1>\) key**
  Displays help information. Press <Esc> key to go back to the original screen.
2. BIOS Setup Utility (SETUP)

- **<F2> key**
  Displays the following window. If you choose Yes, the previous parameter(s) are restored. If the value has been saved with **Save & Changes**, the stored values are restored.

<table>
<thead>
<tr>
<th>Load Previous Values?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Yes] No</td>
</tr>
</tbody>
</table>

- **<F3> key**
  Displays the following window. If you choose Yes, restore the parameters of the currently selected item to the default setting. **Some default parameters are different from the factory settings.**

<table>
<thead>
<tr>
<th>Load Setup Defaults?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Yes] No</td>
</tr>
</tbody>
</table>

  **Note**
  Values of **ISCSI Configuration** submenu of **Advanced** menu and **UEFI Driver Configuration** submenu do not return to default values.

- **<F4> key**
  Displays the following window. If you choose Yes, the changes are saved and SETUP closes. After closing, the server restarts automatically.

<table>
<thead>
<tr>
<th>Save configuration and exit?</th>
</tr>
</thead>
<tbody>
<tr>
<td>[Yes] No</td>
</tr>
</tbody>
</table>
### 2.4 Cases that Require Changes

Use SETUP to change a parameter in the following cases. Other than cases described below, do not change the settings. A list of SETUP parameters and factory settings are described in Chapter 3 (1. System BIOS) in "Maintenance Guide (Windows)”, Maintenance Guide (Linux) or "Maintenance Guide (VMware)".

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>To be changed</th>
<th>Remark</th>
</tr>
</thead>
</table>
| **Basic**       | Change date and time                             | **Main** → **System Date**  
**Main** → **System Time** | Configurable on OS                                                         |
|                 | On/Off NumLock at power ON                       | **Boot** → **Bootup Numlock State** → **ON**                                |                                                                       |
|                 | Hide the logo during POST                        | **Boot** → **Quite Boot** → **Disabled**                                      | Pressing <Esc> key hides the logo tentatively.                        |
| **Option board**| Enable Option ROM Scan of installed option board | **Advanced** → **PCI Configuration** → **PCI Device Controller and Option ROM**  
**Settings** → **PCI Slot Option ROM** → **Enabled** | X is PCI slot number of the option board                                  |
| **Boot**        | According to OS, set a UEFI mode as a boot mode.  | **Boot** → **Boot Mode** → **UEFI** *1**  
Applied OS:  
- Windows Server 2016  
- Windows Server 2012 R2  
- RHEL7.2 | Perform the settings according to Chapter 1 (Installing Operating System in "Installation Guide (Windows)", Installation Guide (Linux)). For physical formatting, see Chapter 3 (3.3 Physical Formatting of the Hard Disk Drive in "Maintenance Guide (Windows)", or Maintenance Guide (Linux)). |
|                 | To perform physical formatting, set a Legacy BIOS mode temporarily and reset. | **Boot** → **Boot Mode** → **Legacy** *1**  
Applied OS:  
- Windows Server 2008 R2  
- VMware ESXi | Perform the settings according to Chapter 1 (Installing Operating System in "Installation Guide (Windows)" or "Installation Guide (VMware)"). For physical formatting, see Chapter 3 (3.3 Physical Formatting of the Hard Disk Drive in "Maintenance Guide (Windows)", or "Maintenance Guide (Linux)". |
|                 | According to OS, set a Legacy BIOS mode as a boot mode. | **Boot** → **Boot Mode** → **Legacy** *1**  
Applied OS:  
- Windows Server 2008 R2  
- VMware ESXi | Perform the settings according to Chapter 1 (Installing Operating System in "Installation Guide (Windows)" or "Installation Guide (VMware)"). For physical formatting, see Chapter 3 (3.3 Physical Formatting of the Hard Disk Drive in "Maintenance Guide (Windows)", or "Maintenance Guide (Linux)". |
|                 | After loading BIOS Setting to default value (perform "Load Setup Defaults" in BIOS SETUP Utility), set Legacy BIOS mode as a boot mode. | **Boot** → **Boot Mode** → **Legacy** *1**  
Applied OS:  
- Windows Server 2016  
- Windows Server 2012 R2  
- RHEL7.2 | Perform the settings according to Chapter 1 (Installing Operating System in "Installation Guide (Windows)" or "Installation Guide (VMware)"). For physical formatting, see Chapter 3 (3.3 Physical Formatting of the Hard Disk Drive in "Maintenance Guide (Windows)", or "Maintenance Guide (Linux)". |
|                 | To perform physical formatting, set a Legacy BIOS mode temporarily. | **Boot** → **Boot Mode** → **Legacy** *1**  
Applied OS:  
- Windows Server 2016  
- Windows Server 2012 R2  
- RHEL7.2 | For physical formatting, see Chapter 3 (3.3 Physical Formatting of the Hard Disk Drive in "Maintenance Guide (Windows)", or "Maintenance Guide (Linux)". |
|                 | Set the XHCI mode to [Auto] according to your OS. | **Advanced** → **USB Configuration** → **XHCI Mode** → **Auto** *1**  
Applied OS:  
- Windows Server 2016  
- Windows Server 2012 R2  
- VMware ESX  
- RHEL7.2 | |
<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
<th>To be changed</th>
<th>Remark</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boot</td>
<td>Set the XHCI mode to [Disabled] according to your OS.</td>
<td>Advanced → USB Configuration → XHCI Mode → Disabled *1</td>
<td>When you use EXPRESSBUILD, set the highest priority to CD/DVD.</td>
</tr>
<tr>
<td></td>
<td>Change the boot order of devices</td>
<td>Boot → Boot Option Priorities → Change the boot priority</td>
<td></td>
</tr>
<tr>
<td>Security</td>
<td>Set a password</td>
<td>Security → Administrator Password → Set a password</td>
<td>If password is set, a message requesting password is displayed at the next SETUP execution.</td>
</tr>
<tr>
<td></td>
<td>Restrict bootup by entering password</td>
<td>Security → User Password → Set a password</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Security → Password on Boot → Enabled</td>
<td>Can be selected when password is set.</td>
</tr>
<tr>
<td>UPS</td>
<td>When the server is supplied with power from UPS, always turn on the power.</td>
<td>Server → Power Control Configuration → AC-LINK → Power ON</td>
<td></td>
</tr>
<tr>
<td>Power link</td>
<td>If the server is turned off by using POWER switch, leave it OFF even when UPS supplies power.</td>
<td>Server → Power Control Configuration → AC-LINK → Last State</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Keep the power OFF even when UPS supplies power.</td>
<td>Server → Power Control Configuration → AC-LINK → Stay off</td>
<td></td>
</tr>
</tbody>
</table>

*1. The factory setting is preset to the proper setting.
3. EXPRESSSCOPE Engine 3

3.1 Overview

EXPRESSSCOPE Engine 3 provides a variety of features using Baseboard Management Controller (BMC).

For details, see EXPRESSSCOPE Engine 3 User's Guide in EXPRESSBUILDER.

EXPRESSSCOPE Engine 3 monitors the power unit, fans, temperature, and voltage of the server. Connecting the management LAN connector (see Chapter 1 (4.3 Rear View) in User's Guide) to your network enables you to do the following from a remote site through a web browser and SSH client:

- Manage the server
- Remotely control the keyboard, video, and mouse (KVM)
- Remotely access a CD/DVD/floppy disk/ISO image/USB memory(*).

* To actualize these functions, virtual USB mass storage (Remote FD, Remote CD/DVD, Remote USB Memory, or Virtual Flash) is always connected as USB mass storage.

Tips

Use Offline Tools of the server to reset BMC.

Note

EXPRESSSCOPE Engine 3 is implemented on both CPU/IO modules (module 0 and 1) and configuration is required on both modules. (Namely, different IP addresses for CPU/IO module 0 and 1 need to be set.)

3.2 EXPRESSSCOPE ENGINE 3 Network configuration

Below is an example of the configuration procedure which enables EXPRESSSCOPE Engine 3 to be used via a web browser.

1. Run POST according to Chapter 3 (1.1.1 POST process). After a while, the following message appears on the lower left of the screen. (* The on-screen message depends on your system environment.)

   Press <F2> SETUP, <F4> ROM Utility, <F12> Network

2. Press the <F4> key to launch Off-line TOOL while the message is displayed.
   You can also press the <F4> key while the message is being displayed to open the Off-line TOOL MENU screen.

3. Select your keyboard type on keyboard selection screen.
4. When the Off-line TOOL MENU appears, select **BMC Configuration**, **BMC Configuration**, **Network**: **CPU/I0 module 0/1**, and then **IPv4 Property** or **IPv6 Property**.

5. Configure IPv4 or IPv6 network settings.

![Figure of IPv4 Property](image1)

**Figure of IPv4 Property**

![Figure of IPv6 Property](image2)

**Figure of IPv6 Property**
6. Connect the LAN cable to the management LAN connector in order to connect to the network. Access EXPRESSSCOPE Engine 3 by using a web browser of management PC according to the settings in Step 5.
4. EXPRESSBUILDER

EXPRESSBUILDER helps you to install Windows or maintain the server.

4.1 Features of EXPRESSBUILDER

EXPRESSBUILDER provides the following features.

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Setup (Windows reinstallation)</td>
<td>Installs Windows on your server. Easily completes the process to installation of applications. To use this feature, choose <strong>OS installation</strong> in Boot Selection Menu.</td>
</tr>
<tr>
<td>Bundled software</td>
<td>Stores NEC ESMPRO, BMC Configuration, and other bundled software.</td>
</tr>
<tr>
<td>Maintenance</td>
<td>Diagnoses the server. To use this feature, choose <strong>Tool menu</strong> in Boot Selection Menu.</td>
</tr>
<tr>
<td>Manuals</td>
<td>Stores manuals, including this User’s Guide.</td>
</tr>
</tbody>
</table>

4.2 Usage of EXPRESSBUILDER

To install the Windows OS or diagnose the system, you can use EXPRESSBUILDER, which comes with the server.

Start EXPRESSBUILDER in either of the following procedure.

- Insert the DVD into the server, and then restart it.
- Insert the DVD into a computer running Windows. Autorun menu appears automatically. If the menu does not appear automatically, run the following file.
  \autorun\dispatcher_x64.exe.

For details, see **Chapter 3 (5. Details of EXPRESSBUILDER) in Maintenance Guide.**
5. Installing Software Components

Continue to install software components such as OS.

See the instructions below.

- To install Windows: *Installation Guide (Windows)*
- To install Linux: *Installation Guide (Linux)*
- To install VMware: *Installation Guide (VMware)*
6. Turning off the Server

Follow the steps below to turn off the power. If the server is connected to a UPS, refer to manuals provided with the UPS or the application that controls the UPS.

1. Shut down the OS.
2. The server automatically turns off after the OS shuts down.
   The Module POWER LED on each CPU/IO module will be blinking while AC power is supplied.
3. Power off all peripheral devices.

Tips

Hibernate feature of Windows Server cannot be used. Do not set Hibernate at Windows shutdown.
Appendix

1. **Specifications**
   Describes specifications of the server.

2. **Glossary**
   Describes glossaries of this document.

3. **Revision Record**
   Describes revision history of this document.
## 1. Specifications

<table>
<thead>
<tr>
<th>Model</th>
<th>N8800-201F</th>
<th>N8800-202F</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU</strong></td>
<td>Intel Xeon Processor (*1)</td>
<td>Intel Xeon Processor (*1)</td>
</tr>
<tr>
<td>Type</td>
<td>E5-2630v3</td>
<td>E5-2670v3</td>
</tr>
<tr>
<td>Clock speed</td>
<td>2.40 GHz</td>
<td>2.30 GHz</td>
</tr>
<tr>
<td>Standard / Maximum</td>
<td>1/2 (per one module)</td>
<td>1/2 (per one module)</td>
</tr>
<tr>
<td>Number of cores (C) / Number of threads (T) (1CPU)</td>
<td>8C/16T</td>
<td>12C/24T</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel C612 Chipset (*2) / GeminiEngine™</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Memory</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Capacity Standard / Maximum</td>
</tr>
<tr>
<td>Memory module</td>
</tr>
<tr>
<td>Maximum clock speed</td>
</tr>
<tr>
<td>Error check, correction</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Storage</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard disk drive</td>
</tr>
<tr>
<td>Maximum</td>
</tr>
<tr>
<td>The user area is reduced to a half of the physical capacity due to duplication.</td>
</tr>
<tr>
<td>Hot swap</td>
</tr>
<tr>
<td>Interface</td>
</tr>
<tr>
<td>Optical disk drive</td>
</tr>
<tr>
<td>FDD</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Graphics</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip / Video RAM</td>
</tr>
<tr>
<td>Graphic display / resolution</td>
</tr>
<tr>
<td>&lt;Windows Server 2008 R2&gt; 16,770,000 colors, 800x600, 1,024x768, 1,280x1,024,</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Interface</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>4xUSB 2.0 (1x Front, 3x Rear) (Option, 2xUSB 3.0 per CPU/O module)</td>
</tr>
<tr>
<td>(2x Rear, for backup devices) (*3) (*4) 1x Analog RGB (Mini D-sub 15 pin, 1x Rear) 2x1000BASE-T LAN connector (1000BASE-T/100BASE-TX, RJ45, 2x Rear) 1x Management LAN connector (1000BASE-T/100BASE-TX, RJ45, 1x Rear)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Power supply</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>800 W 80 Plus Platinum compliant (bipolar grounded outlet)</td>
</tr>
<tr>
<td>100-127 / 200-240 VAC ±10%, 50/60 Hz ± 3 Hz</td>
</tr>
<tr>
<td>Power consumption (100V at maximum configuration)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Environmental requirements</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Temperature/Humidity</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Accessories</strong></th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th><strong>Installed OS</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Microsoft Windows Server 2012R2 Standard</td>
</tr>
<tr>
<td>Microsoft Windows Server 2012R2 Datacenter</td>
</tr>
<tr>
<td>Microsoft Windows Server 2008R2 Enterprise SP1</td>
</tr>
<tr>
<td>VMware ESXi 6.0 Update1b</td>
</tr>
<tr>
<td>Unsupported functions:</td>
</tr>
<tr>
<td>VMware Fault Tolerance (FT)</td>
</tr>
<tr>
<td>VMware Distributed Power Management (DPM)</td>
</tr>
<tr>
<td>Fibre Channel N-Port ID Virtualization (NPV)</td>
</tr>
<tr>
<td>Modifying the DVSwitch Configuration</td>
</tr>
<tr>
<td>RAW Device Mapping (RDM) (only for internal HDD)</td>
</tr>
<tr>
<td>VMDirectPath</td>
</tr>
<tr>
<td>Single-Root I/O Virtualization</td>
</tr>
<tr>
<td>VMware vSphere Flash Read Cache</td>
</tr>
<tr>
<td>vCenter Server lockdown mode</td>
</tr>
<tr>
<td>LACP</td>
</tr>
<tr>
<td>Red Hat Enterprise Linux 7.2(x86_64)</td>
</tr>
<tr>
<td>Unsupported functions:</td>
</tr>
<tr>
<td>Virtualization technology(KVM, LXC, etc.)</td>
</tr>
</tbody>
</table>

*1 This server does not support the following features: |
- Intel(R) Secure Key (RDRAND) |
- Intel(R) Turbo Boost Technology |
- Intel(R) Virtualization Technology (VT-d) |
- Enhanced Intel(R) SpeedStep Technology |
- Intel(R) Demand Based Switching |
- Intel(R) I/O Acceleration Technology |
- Thermal Monitoring Technologies |
- Intel(R) AVX (Advanced Vector Extensions) |
- Intel(R) AVX2 (Advanced Vector Extensions 2) |

*2 This server does not support the following features: |
- Intel(R) Node Manager |

*3 The USB bus operates in USB 2.0 mode when the system is running with Windows Server 2008 R2 operating system. |

*4 Not supported in VMware
## Specifications

### CPU

<table>
<thead>
<tr>
<th>Type</th>
<th>Intel Xeon Processor (*1)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clock speed</td>
<td>2.40 GHz</td>
</tr>
<tr>
<td>Standard / Maximum</td>
<td>1/1 (per one module)</td>
</tr>
<tr>
<td>Tertiary cache</td>
<td>20 MB</td>
</tr>
<tr>
<td>Number of cores (C) / number of threads (T) (1CPU)</td>
<td>8C/16T</td>
</tr>
</tbody>
</table>

### Chipset

<table>
<thead>
<tr>
<th>Capacity Standard / Maximum</th>
<th>Not pre-installed / 256 GB (8x 32 GB) (per module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory module</td>
<td>DDR4-2133 8 GB/16 GB RDIMM, 32 GB LRDIMM RDIMM and LRDIMM cannot be mixed.</td>
</tr>
<tr>
<td>Maximum clock speed</td>
<td>1866 MHz</td>
</tr>
<tr>
<td>Error check, correction</td>
<td>ECC, x4 SDDC</td>
</tr>
</tbody>
</table>

### Memory

<table>
<thead>
<tr>
<th>Capacity Standard / Maximum</th>
<th>Not pre-installed / 256 GB (8x 32 GB) (per module)</th>
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<tr>
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<td>Error check, correction</td>
<td>ECC, x4 SDDC</td>
</tr>
</tbody>
</table>

### Hard disk drive

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>2.5-inch HDD: SAS 19.2TB (16x 1.2TB) The user area is reduced to a half of the physical capacity due to duplication.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td>Supported</td>
</tr>
</tbody>
</table>

### Interface

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>Not pre-installed / 256 GB (8x 32 GB) (per module)</th>
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<tbody>
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### Storage

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### Graphics

<table>
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</table>

### Chipset

<table>
<thead>
<tr>
<th>Type</th>
<th>Intel C612 Chipset (<em>2) / GeminiEngine</em></th>
</tr>
</thead>
</table>

### Expansion slots

<table>
<thead>
<tr>
<th>Supported slot</th>
<th>2x PCI EXPRESS 3.0 (x4 lane, x8 slot) (Low profile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chip / Video RAM</td>
<td>Management controller chip / 32 MB</td>
</tr>
</tbody>
</table>

### Graphics

<table>
<thead>
<tr>
<th>Graphic display / resolution</th>
<th>&lt;Windows Server 2012 R2&gt; 16,770,000 colors: 800x600, 1,024x768, 1,280x1,024, 1,600x1,200</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>&lt;Windows Server 2008 R2&gt; 16,770,000 colors: 800x600, 1,024x768, 1,280x1,024, 1,600x1,200</td>
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### Interface

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### Power supply

<table>
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<td>ECC, x4 SDDC</td>
</tr>
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</table>

### External dimensions

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>2.5-inch HDD: SAS 19.2TB (16x 1.2TB) The user area is reduced to a half of the physical capacity due to duplication.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td>Supported</td>
</tr>
</tbody>
</table>

### Power consumption

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>2.5-inch HDD: SAS 19.2TB (16x 1.2TB) The user area is reduced to a half of the physical capacity due to duplication.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td>Supported</td>
</tr>
</tbody>
</table>

### Weight (Standard / Max.)

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>2.5-inch HDD: SAS 19.2TB (16x 1.2TB) The user area is reduced to a half of the physical capacity due to duplication.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td>Supported</td>
</tr>
</tbody>
</table>

### Environmental requirements

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>2.5-inch HDD: SAS 19.2TB (16x 1.2TB) The user area is reduced to a half of the physical capacity due to duplication.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td>Supported</td>
</tr>
</tbody>
</table>

### Installed OS

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>2.5-inch HDD: SAS 19.2TB (16x 1.2TB) The user area is reduced to a half of the physical capacity due to duplication.</th>
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<tbody>
<tr>
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<td>Supported</td>
</tr>
</tbody>
</table>

### Supported OS

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>2.5-inch HDD: SAS 19.2TB (16x 1.2TB) The user area is reduced to a half of the physical capacity due to duplication.</th>
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</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td>Supported</td>
</tr>
</tbody>
</table>

---

*1 This server does not support the following features:
- Intel(R) Secure Key (RDRAND)
- Intel(R) Turbo Boost Technology
- Intel(R) Virtualization Technology (VT-d)
- Enhanced Intel(R) SpeedStep Technology
- Intel(R) Demand Based Switching
- Intel(R) I/O Acceleration Technology
- Thermal Monitoring Technologies
- Intel(R) AVX (Advanced Vector Extensions)
- Intel(R) AVX2 (Advanced Vector Extensions 2)
- XCR0_MASTER_YMM_H
- TXT (Trusted Execution Technology)

*2 This server does not support the following features:
- Intel(R) Node Manager

*3 The USB bus operates in USB 2.0 mode when the system is running with Windows Server 2008 R2 operating system.
## 1. Specifications

### CPU

<table>
<thead>
<tr>
<th>Type</th>
<th>N8800-218F</th>
<th>N8800-219F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type</td>
<td>Intel Xeon Processor (*1)</td>
<td>Intel Xeon Processor (*1)</td>
</tr>
<tr>
<td>E5-2630v4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>E5-2671v4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clock speed</td>
<td>2.20 GHz</td>
<td>2.30 GHz</td>
</tr>
<tr>
<td>Standard / Maximum</td>
<td>1/2 (per one module)</td>
<td>1/2 (per one module)</td>
</tr>
<tr>
<td>Tertiary cache</td>
<td>25 MB</td>
<td>35 MB</td>
</tr>
<tr>
<td>Number of cores (C) / Number of threads (T) (1CPU)</td>
<td>10C/20T</td>
<td>14C/28T</td>
</tr>
</tbody>
</table>

### Chipset

<table>
<thead>
<tr>
<th>Capacity Standard / Maximum</th>
<th>Not pre-installed / 512 GB (16x 32 GB)</th>
<th>(per module)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Memory module</td>
<td>DDR4-2400 8 GB/16 GB RDIMM, 32 GB RDIMM</td>
<td></td>
</tr>
<tr>
<td>RDIMM and LRDIMM cannot be mixed.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Memory

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>Not pre-installed / 512 GB (16x 32 GB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>DDR4-2400 8 GB/16 GB RDIMM, 32 GB RDIMM</td>
<td></td>
</tr>
<tr>
<td>RDIMM and LRDIMM cannot be mixed.</td>
<td></td>
</tr>
</tbody>
</table>

### Hard disk drive

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>2.5-inch HDD: SAS 19.2TB (16x 1.2TB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td>Supported</td>
</tr>
<tr>
<td>Maximum</td>
<td></td>
</tr>
</tbody>
</table>

### Interface

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>4xUSB 2.0 (1x Front, 3x Rear)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td>Supported</td>
</tr>
<tr>
<td>Optical disk drive</td>
<td>Built-in</td>
</tr>
</tbody>
</table>

### Expansion slots

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>2x PCI EXPRESS 3.0 (x4 lane, x8 slot) (Low profile)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td>Supported</td>
</tr>
<tr>
<td>Maximum</td>
<td></td>
</tr>
</tbody>
</table>

### Graphics

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>Management controller chip / 32 MB</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td></td>
</tr>
<tr>
<td>Optical disk drive</td>
<td></td>
</tr>
</tbody>
</table>

### Interface

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>4xUSB 2.0 (1x Front, 3x Rear)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td>Supported</td>
</tr>
<tr>
<td>Optical disk drive</td>
<td>Built-in</td>
</tr>
</tbody>
</table>

### Power supply

800 W 80 Plus Platinum compliant (bipolar grounded outlet)

### External dimensions (width × depth × height)

<table>
<thead>
<tr>
<th>Standard / Maximum</th>
<th>483 mm (width) × 734 mm (depth) × 176 mm (height)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hot swap</td>
<td></td>
</tr>
</tbody>
</table>

### Weight (Standard/ Max.)

45 kg / 51 kg

### Power consumption

1430 VA/1420 W

### Environmental requirements

#### Temperature/Humidity

- Operating: 10 to 40°C / 20 to 80%.
- Storage: -10 to 55°C / 20 to 80% (No condensation either when operating or when stored)

### Environmental requirements

#### Temperature/Humidity

- Operating: 10 to 30°C / 20 to 80%.
- Storage: -10 to 55°C / 20 to 80% (No condensation either when operating or when stored)

### Accessories


### Installed OS

- Microsoft Windows Server 2016 Standard
- Microsoft Windows Server 2016 Datacenter

---

*1 This server does not support the following features:
- Intel(R) Secure Key (RDRAND/ RDSEED)
- Intel(R) Turbo Boost Technology
- Intel(R) Virtualization Technology (VT-d)
- Enhanced Intel(R) SpeedStep Technology
- Intel(R) Demand Based Switching
- Intel(R) I/O Acceleration Technology
- Thermal Monitoring Technologies
- Intel(R) AVX (Advanced Vector Extensions)
- Intel(R) AVX2 (Advanced Vector Extensions 2)
- XCR0, MASTER, YMM, H
- TXT (Trusted Execution Technology)

*2 This server does not support the following features:
- Intel(R) Node Manager
## Chapter 4  Appendix

### Model N8800-226F

<table>
<thead>
<tr>
<th>Model</th>
<th>N8800-226F</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU Type</td>
<td>Intel Xeon Processor (*1)</td>
</tr>
<tr>
<td>Clock speed</td>
<td>2.20 GHz</td>
</tr>
<tr>
<td>Standard / Maximum</td>
<td>1/1 (per one module)</td>
</tr>
<tr>
<td>Tertiary cache</td>
<td>25 MB</td>
</tr>
<tr>
<td>Number of cores (C) / Number of threads (T) (1CPU)</td>
<td>10C/20T</td>
</tr>
<tr>
<td>Chipset</td>
<td>Intel C612 Chipset (“2) / GeminiEngine™</td>
</tr>
<tr>
<td>Memory Capacity Standard / Maximum</td>
<td>Not pre-installed / 256 GB (8x 32 GB) (per module)</td>
</tr>
<tr>
<td>Memory module</td>
<td>DDR4-2400 8 GB/16 GB RDIMM, 32 GB RDIMM</td>
</tr>
<tr>
<td>Maximum clock speed</td>
<td>2133 MHz</td>
</tr>
<tr>
<td>Error check, correction</td>
<td>ECC, x4 SDDC</td>
</tr>
<tr>
<td>Hard disk drive Standard</td>
<td>2.5-inch HDD: SAS 19.2TB (16x 1.2TB)</td>
</tr>
<tr>
<td>Maximum</td>
<td>The user area is reduced to a half of the physical capacity due to duplication.</td>
</tr>
<tr>
<td>Interface</td>
<td>SAS 12 Gb/s</td>
</tr>
<tr>
<td>Optical disk drive</td>
<td>Built-in</td>
</tr>
<tr>
<td>FDD</td>
<td>Option: Flash FDD (1.44 MB)</td>
</tr>
<tr>
<td>Supported slot</td>
<td>2x PCI EXPRESS 3.0 (x4 lane, x8 slot) (Low profile)</td>
</tr>
<tr>
<td>Chip / Video RAM</td>
<td>Management controller chip / 32 MB</td>
</tr>
<tr>
<td>Interface 4xUSB 2.0 (1x Front, 3x Rear)</td>
<td>(Option, 2xUSB 3.0 per CPU/I0 module (2x Rear, for backup devices)</td>
</tr>
<tr>
<td>1x Analog RGB (Mini-D-sub 15 pin, 1x Rear) 2x1000BASE-T LAN connector (1000BASE-T/100BASE-TX, RJ45, 2x Rear)</td>
<td>1x Management LAN connector (100BASE-TX/10BASE-T, RJ45, 1x Rear)</td>
</tr>
<tr>
<td>Power supply</td>
<td>800 W 80 Plus Platinum compliant (bipolar grounded outlet)</td>
</tr>
<tr>
<td>External dimensions (width × depth × height)</td>
<td>483 mm (width) × 734 mm (depth)× 176 mm (height) (Front bezel included)</td>
</tr>
<tr>
<td>Weight (Standard/ Max.)</td>
<td>45 kg / 51 kg</td>
</tr>
<tr>
<td>Power consumption (100V at maximum configuration)</td>
<td>1430 VA/1420 W</td>
</tr>
<tr>
<td>Environmental requirements Operational: 10 to 40°C / 20 to 80%, Storage: –10 to 55°C / 20 to 80% (No condensation either when operating or when stored)</td>
<td></td>
</tr>
<tr>
<td>Installed OS</td>
<td>-</td>
</tr>
<tr>
<td>Supported OS</td>
<td>Microsoft Windows Server 2016 Standard</td>
</tr>
</tbody>
</table>

* *1 This server does not support the following features: |
  - Intel(R) Secure Key (RDRAND/ RDSEED) |
  - Intel(R) Turbo Boost Technology |
  - Intel(R) Virtualization Technology (VT-d) |
  - Enhanced Intel(R) SpeedStep Technology |
  - Intel(R) Demand Based Switching |
  - Intel(R) I/O Acceleration Technology |
  - Thermal Monitoring Technologies |
  - Intel(R) AVX (Advanced Vector Extensions) |
  - Intel(R) AVX2 (Advanced Vector Extensions 2) |
  - XCR0_MASTER_YMM_H |
  - TXT(Trusted Execution Technology) |

* *2 This server does not support the following features: |
  - Intel(R) Node Manager |
### Glossary

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIOS Setup Utility (SETUP)</td>
<td>Software for setting BIOS. You can run this software by pressing &lt;F2&gt; key during POST.</td>
</tr>
<tr>
<td>BMC</td>
<td>Baseboard Management Controller (BMC) is a built-in controller that supports the IPMI version 2.0 protocol. BMC can manage the server hardware.</td>
</tr>
<tr>
<td>BMC Configuration Utility</td>
<td>Software for setting BIOS and BMC. You can use as Windows application or run this software when pressing &lt;F4&gt; key during POST.</td>
</tr>
<tr>
<td>CPU/IO module</td>
<td>A module that includes CPUs (processors), memory, PCI boards, a cooling fan, hard disk drives and power supply units.</td>
</tr>
<tr>
<td>DUMP Switch</td>
<td>A switch that is used for collecting the memory dump if an error occurs. You can specify the destination of the dump by using the OS function.</td>
</tr>
<tr>
<td>EXPRESSBUILDER</td>
<td>Standard software with a feature that makes it easier to install Windows OS in Windows model. This also includes several useful applications and instruction manuals. (When installing OS other than Windows in ft server, the feature that helps easy OS installation is not available.)</td>
</tr>
<tr>
<td>EXPRESSSCOPE ENGINE 3</td>
<td>A name of BMC for NEC Express5800 series.</td>
</tr>
<tr>
<td>Express Report Service</td>
<td>Software that can report the server failure to the contact center by E-mail or modem. This software is installed with NEC ESMPRO Agent to the server.</td>
</tr>
<tr>
<td>Express Report Service (HTTPS)</td>
<td>Software that can report the server failure to the contact center by HTTPS.</td>
</tr>
<tr>
<td>ExpressUpdate</td>
<td>A feature for updating BIOS, firmware, driver, and software of the server. This feature is available when NEC ESMPRO Manager cooperates with EXPRESSSCOPE ENGINE 3 and ExpressUpdate Agent.</td>
</tr>
<tr>
<td>ExpressUpdate Agent</td>
<td>Software for performing ExpressUpdate. This is installed to the server.</td>
</tr>
<tr>
<td>Flash FDD</td>
<td>An optional USB device that can use as a floppy disk drive.</td>
</tr>
<tr>
<td>NEC ESMPRO</td>
<td>Standard software for the server management. This consists of several applications for managing or monitoring.</td>
</tr>
<tr>
<td>NEC ESMPRO Agent</td>
<td>Software for monitoring the server. This works with NEC ESMPRO Manager and resides as the OS service.</td>
</tr>
<tr>
<td>NEC ESMPRO Agent Extension</td>
<td>Software for performing the scheduled operations. This works with NEC ESMPRO Manager.</td>
</tr>
<tr>
<td>NEC ESMPRO Manager</td>
<td>Software for managing a number of servers on network.</td>
</tr>
<tr>
<td>OEM driver</td>
<td>A Windows driver for the mass storage device.</td>
</tr>
<tr>
<td>OS standard installer</td>
<td>An installer that stored in Windows installation disc. Use this installer if you want to install the OS manually.</td>
</tr>
<tr>
<td>Offline tools</td>
<td>Software that can read and change SEL, SDR, FRU and other IPMI data. You can start Offline tools when pressing &lt;F4&gt; key during POST.</td>
</tr>
<tr>
<td>PC for Management</td>
<td>A computer for managing the server on network. A general Windows/Linux computer can be used as &quot;PC for Management&quot;.</td>
</tr>
<tr>
<td>PCI module</td>
<td>An I/O subsystem logically configured in a CPU/IO module. It includes hard disk drives, PCI cards, BMC and 1G/10G LAN.</td>
</tr>
<tr>
<td>Product Info Collection Utility</td>
<td>Software for collecting several hardware/software statuses and event logs. You can easily collect the data for the server maintenance by using this software.</td>
</tr>
<tr>
<td>Starter Pack</td>
<td>Software package for the server. This software includes the customized drivers for Windows. This must be installed before using Windows on the server.</td>
</tr>
<tr>
<td>Windows OS parameter file</td>
<td>A file that saved settings for installing Windows. You can install with the saved settings in this file when installing Windows with EXPRESSBUILDER.</td>
</tr>
</tbody>
</table>
## 3. Revision Record

<table>
<thead>
<tr>
<th>Document Number</th>
<th>Date Issued</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>30.102.01-101.01</td>
<td>2015</td>
<td>Newly created</td>
</tr>
<tr>
<td>30.102.01-101.02</td>
<td>2015</td>
<td>Added the description about Windows Server 2008 R2</td>
</tr>
<tr>
<td>30.102.01-101.03</td>
<td>June 2016</td>
<td>Added the description about VMware</td>
</tr>
<tr>
<td>30.102.01-101.04</td>
<td>August 2016</td>
<td>Added the description about Red Hat Enterprise Linux 7.2</td>
</tr>
<tr>
<td>30.103.01-101.02</td>
<td>July 2017</td>
<td>Added the description about Express5800/R310f-E4, R320f-E4, R320f-M4, and Windows Server 2016</td>
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