Installation Guide
(Windows Server 2019)

NEC Express Server
Express5800 Series

Express5800/R120h-1M,R120h-2M
Express5800/R120h-1E,R120h-2E
Express5800/T120h
Express5800/R110j-1

Chapter 1   Installing Windows

Chapter 2   Maintenance

Chapter 3   Appendix

Contents

Introduction

Thank you for purchasing our product.

When using the **EXPRESSBUILDER E8.10-006.01 (3.30.213)**, see this manual before installing Windows.

Please read carefully the instructions and keep this document for your future reference.

Conventions Used in This Document

Notations used in the text

The symbols used in this document include the following:

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

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-ROM drive**
- **DVD Super MULTI drive**

Hard disk drive

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

- **Hard disk drive (HDD)**
- **Solid state drive (SSD)**

Removal Media

Unless otherwise stated, *removal media* described in this document refer to both of the following.

- **USB Memory**
- **Flash FDD**

Abbreviations of Operating Systems

Windows Operating Systems are referred to as follows.

> See *Chapter 1 (1.2 Supported Windows OS)* for detailed information.

Notations in this document	Official names of Windows
Windows Server 2019	Windows Server 2019 Standard
	Windows Server 2019 Datacenter

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  zlib.h -- interface of the 'zlib' general purpose compression library
  version 1.2.2, October 3rd, 2004

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NEC Express5800 Series
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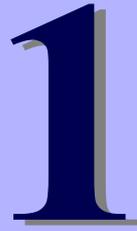
Installing Windows

This manual explains the setup procedure for a physical environment.

Read through this chapter to set up the Windows correctly.

1. **Information of Windows Installation**

   Describes Supported Windows OS and mass storage controllers which is supported by EXPRESSBUILDER/Starter Pack.

2. **Flow of Windows Installation**

   Describes the flow chart of Windows installation.

3. **Installing Windows Server 2019**

   Describes how to install Windows Server 2019.

4. **Setting up for Maintenance**

   Describes the features that should be set up for maintenance in advance.
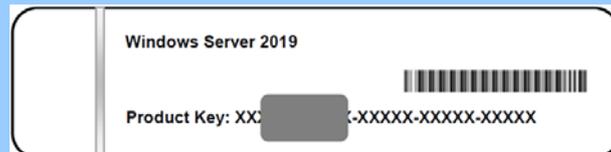
5. **Backup of system information**

   Describes how to back up the setting information of the system in advance of troubles.

1. Information of Windows Installation

This section describes the points of using EXPRESSBUILDER/Starter Pack to install Windows operating system.

Important

> **The product key on the Certificate of Authenticity (COA) label is necessary information when authenticate the license. Scrape off with a coin or the like lightly the scratch that covers a part of the product key. When you scrape, be careful not to break the part that the product key is printed on.**
>
> Windows Server 2019
>
> Product Key: XX[   ]X-XXXXX-XXXXX-XXXXX
>
> **The label cannot be reissued if it is lost or stained. It is recommended to write down the product key and keep it with other accessories.**

Refer to the following for the installation of virtual OS.

If your virtualization infrastructure is Hyper-V:

Refer to the following web site for the Hyper-V setting and the installation procedure of the guest OS and so on.

http://www.58support.nec.co.jp/global/download/w2019/hyper-v/hyper-v-ws2019.html

If your virtualization infrastructure is not Hyper-V:

Refer to the manual provided by virtualization infrastructure vendor to prepare the virtual environment.

Prepare a media or an ISO image of the OS to install.

1. Start the virtual machine from a media or an ISO image of the OS to install.
2. Follow the on-screen instruction to complete the OS installation.
3. Refer to the manual provided by virtualization infrastructure vendor to install the necessary services and applications.

1.1   Starting EXPRESSBUILDER

Use EXPRESSBUILDER to reconfigure RAID arrays.

For details, see *Chapter 2* (*3. Details of EXPRESSBUILDER*) in *Maintenance Guide*.

This document installs Windows Server 2019 without EXPRESSBUILDER.

Usage

Remove a CD/DVD and removable media from the server, restart the server and press <F10> key (EXPRESSBUILDER) during POST.

1.2 Supported Windows OS

You can install the following editions of Windows operating system.

OS : Install using **Manual** option

Name of Windows OS		Boot mode		Installtion method
		UEFI	Legacy	**OS**
Windows Server 2019 *	Standard	✓	N/A	✓
	Datacenter	✓	N/A	✓

✓ : Supported

*   "Nano Server" is not supported.

1.3 Supported Mass Storage Controllers

The table below lists the controllers for this server, supported by EXPRESSBUILDER/Starter Pack.

If a controller not mentioned below is connected, set it up while referring to the instructions supplied with the controller.

【**Express5800/R120h-1M,R120h-2M**】

	R120h-1M	R120h-2M
RAID controller supporting the installation of OS at EXPRESSBUILDER		
Onboard RAID Controller	✓	✓
N8103-189 RAID Controller (RAID 0/1)	✓	✓
N8103-190 RAID Controller (2GB, RAID 0/1/5/6)	✓	✓
N8103-191 RAID Controller (4GB, RAID 0/1/5/6)	✓	✓
N8103-192 RAID Controller (RAID 0/1)	✓	N/A
N8103-193 RAID Controller (2GB, RAID 0/1/5/6)	✓	N/A
N8103-194 RAID Controller (4GB, RAID 0/1/5/6)	✓	N/A
N8103-195 RAID Controller (RAID 0/1)	✓	✓
N8103-201 RAID Controller (2GB, RAID 0/1/5/6)	✓	✓
Other options		
N8103-196 RAID Controller (2GB, RAID 0/1/5/6)	✓	✓
N8103-184/E184 SAS Controller	✓	✓
N8103-197 SAS Controller	✓	✓
N8190-163 Fibre Channel Controller (1ch)	✓	✓
N8190-164 Fibre Channel Controller (2ch)	✓	✓
N8190-165 Fibre Channel Controller (1ch)	✓	✓
N8190-166 Fibre Channel Controller (2ch)	✓	✓
N8190-171 Fibre Channel Controller (1ch)	✓	✓
N8190-172 Fibre Channel Controller (2ch)	✓	✓

✓ : Supported

【**Express5800/R120h-1E, R120h-2E**】

	R120h-1E	R120h-2E
RAID controller supporting the installation of OS at EXPRESSBUILDER		
Onboard RAID Controller	✓	✓
N8103-189　RAID Controller (RAID 0/1)	N/A	✓
N8103-190　RAID Controller (2GB, RAID 0/1/5/6)	N/A	✓
N8103-192　RAID Controller (RAID 0/1)	✓	N/A
N8103-193　RAID Controller (2GB, RAID 0/1/5/6)	✓	N/A
N8103-195　RAID Controller (RAID 0/1)	✓	✓
N8103-201　RAID Controller (2GB, RAID 0/1/5/6)	✓	✓
Other options		
N8103-196　RAID Controller (2GB, RAID 0/1/5/6)	✓	✓
N8103-184/E184　SAS Controller	✓	✓
N8103-197　SAS Controller	✓	✓
N8190-163　Fibre Channel Controller (1ch)	✓	✓
N8190-164　Fibre Channel Controller (2ch)	✓	✓
N8190-165　Fibre Channel Controller (1ch)	✓	✓
N8190-166　Fibre Channel Controller (2ch)	✓	✓
N8190-171　Fibre Channel Controller (1ch)	✓	✓
N8190-172　Fibre Channel Controller (2ch)	✓	✓

✓ : Supported

【**Express5800/T120h**】

	T120h
RAID controller supporting the installation of OS at EXPRESSBUILDER	
Onboard RAID Controller	✓
N8103-189　RAID Controller (RAID 0/1)	✓
N8103-190　RAID Controller (2GB, RAID 0/1/5/6)	✓
N8103-191　RAID Controller (4GB, RAID 0/1/5/6)	✓
N8103-195　RAID Controller (RAID 0/1)	✓
N8103-201　RAID Controller (2GB, RAID 0/1/5/6)	✓

Other options	
N8103-196 RAID Controller (2GB, RAID 0/1/5/6)	✓
N8103-184/E184 SAS Controller	✓
N8103-197 SAS Controller	✓
N8190-163 Fibre Channel Controller (1ch)	✓
N8190-164 Fibre Channel Controller (2ch)	✓
N8190-165 Fibre Channel Controller (1ch)	✓
N8190-166 Fibre Channel Controller (2ch)	✓
N8190-171 Fibre Channel Controller (1ch)	✓
N8190-172 Fibre Channel Controller (2ch)	✓

✓ : Supported

【Express5800/R110j-1】

	R110j-1
RAID controller supporting the installation of OS at EXPRESSBUILDER	
Onboard RAID Controller	✓
N8103-192 RAID Controller (RAID 0/1)	✓
N8103-193 RAID Controller (2GB, RAID 0/1/5/6)	✓
Other options	
N8103-196 RAID Controller (2GB, RAID 0/1/5/6)	✓
N8103-184/E184 SAS Controller	✓
N8103-197 SAS Controller	✓
N8190-163 Fibre Channel Controller (1ch)	✓
N8190-164 Fibre Channel Controller (2ch)	✓
N8190-165 Fibre Channel Controller (1ch)	✓
N8190-166 Fibre Channel Controller (2ch)	✓
N8190-171 Fibre Channel Controller (1ch)	✓
N8190-172 Fibre Channel Controller (2ch)	✓

✓ : Supported

1.4 Supported Optional LAN board

The table below lists the optional LAN boards for this server, supported by Starter Pack.

【Express5800/R120h-1M,R120h-2M】

	R120h-1M	R120h-2M
N8104-171 Quad Port 1000BASE-T LOM Card	✓	✓
N8104-172 Quad Port 1000BASE-T LOM Card	✓	✓
N8104-173 Dual Port 10GBASE-T LOM Card	✓	✓
N8104-175 Dual Port 10GBASE-T LOM Card	✓	✓
N8104-176 Dual Port 10GBASE SFP+ LOM Card	✓	✓
N8104-177 Dual Port 25GBASE SFP+ LOM Card	✓	✓
N8104-178 Dual Port 1000BASE-T Adapter	✓	✓
N8104-179 Quad Port 1000BASE-T Adapter	✓	✓
N8104-180 Dual Port 1000BASE-T Adapter	✓	✓
N8104-181 Quad Port 1000BASE-T Adapter	✓	✓
N8104-182 Dual Port 10GBASE-T Adapter	✓	✓
N8104-183 Dual Port 10GBASE-T Adapter	✓	✓
N8104-184 Dual Port 10GBASE-T Adapter	✓	✓
N8104-185 Dual Port 10GBASE SFP+ Adapter	✓	✓
N8104-186 Dual Port 10GBASE SFP+ Adapter	✓	✓
N8104-187 Dual Port 25GBASE SFP28 Adapter	✓	✓

✓ : Supported

【Express5800/R120h-1E, R120h-2E】

	R120h-1E	R120h-2E
N8104-171 Quad Port 1000BASE-T LOM Card	✓	✓
N8104-172 Quad Port 1000BASE-T LOM Card	✓	✓
N8104-173 Dual Port 10GBASE-T LOM Card	✓	✓
N8104-175 Dual Port 10GBASE-T LOM Card	✓	✓
N8104-176 Dual Port 10GBASE SFP+ LOM Card	✓	✓

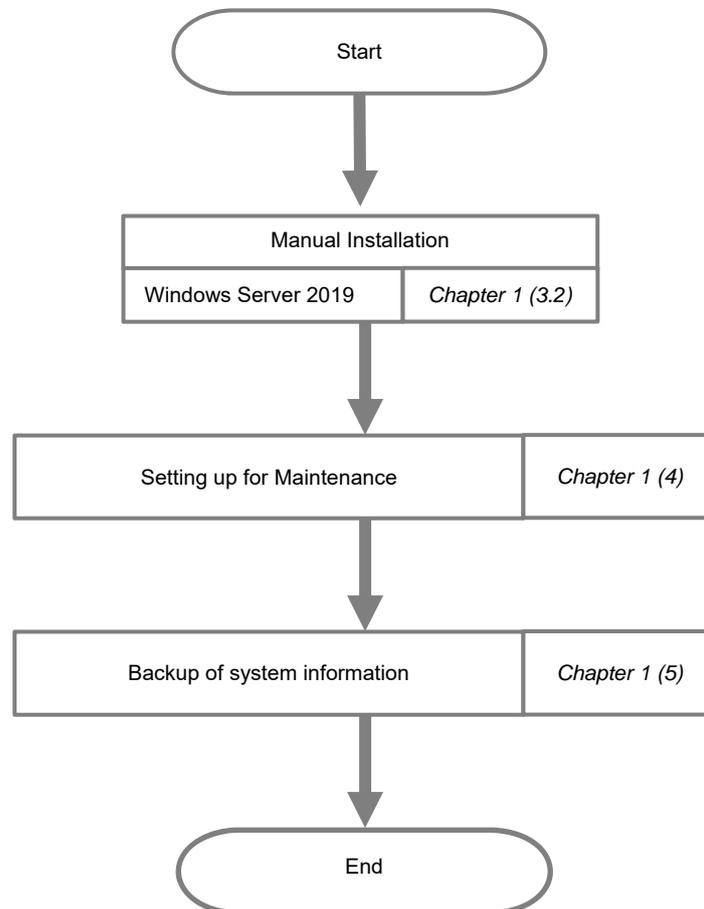|		
N8104-177 Dual Port 25GBASE SFP+ LOM Card	✓	✓
N8104-178 Dual Port 1000BASE-T Adapter	✓	✓
N8104-179 Quad Port 1000BASE-T Adapter	✓	✓
N8104-180 Dual Port 1000BASE-T Adapter	✓	✓
N8104-181 Quad Port 1000BASE-T Adapter	✓	✓
N8104-182 Dual Port 10GBASE-T Adapter	✓	✓
N8104-183 Dual Port 10GBASE-T Adapter	✓	✓
N8104-184 Dual Port 10GBASE-T Adapter	✓	✓
N8104-185 Dual Port 10GBASE SFP+ Adapter	✓	✓
N8104-186 Dual Port 10GBASE SFP+ Adapter	✓	✓
N8104-187 Dual Port 25GBASE SFP28 Adapter	✓	✓
N8104-193 Dual Port 1000BASE-T LOM Card	✓	✓
N8104-194 Dual Port 10GBASE-SR LOM Card	✓	✓
N8104-195 Dual Port 10GBASE-T LOM Card	✓	✓

✓ : Supported

【Express5800/T120h】

	T120h
N8104-178 Dual Port 1000BASE-T Adapter	✓
N8104-179 Quad Port 1000BASE-T Adapter	✓
N8104-180 Dual Port 1000BASE-T Adapter	✓
N8104-181 Quad Port 1000BASE-T Adapter	✓
N8104-182 Dual Port 10GBASE-T Adapter	✓
N8104-183 Dual Port 10GBASE-T Adapter	✓
N8104-184 Dual Port 10GBASE-T Adapter	✓
N8104-185 Dual Port 10GBASE SFP+ Adapter	✓
N8104-186 Dual Port 10GBASE SFP+ Adapter	✓
N8104-187 Dual Port 25GBASE SFP28 Adapter	✓

✓ : Supported

【**Express5800/R110j-1**】

	R110j-1
N8104-171 Quad Port 1000BASE-T LOM Card	✓
N8104-172 Quad Port 1000BASE-T LOM Card	✓
N8104-173 Dual Port 10GBASE-T LOM Card	✓
N8104-178 Dual Port 1000BASE-T Adapter	✓
N8104-179 Quad Port 1000BASE-T Adapter	✓
N8104-180 Dual Port 1000BASE-T Adapter	✓
N8104-181 Quad Port 1000BASE-T Adapter	✓
N8104-182 Dual Port 10GBASE-T Adapter	✓
N8104-185 Dual Port 10GBASE SFP+ Adapter	✓

✓ : Supported

𝟤. Flow of Windows Installation

Read a proper section to install Windows according to the following figure.

Start

Manual Installation	
Windows Server 2019	*Chapter 1 (3.2)*

Setting up for Maintenance	*Chapter 1 (4)*

Backup of system information	*Chapter 1 (5)*

End

Important	**After building environment, back up the setting information of the system in advance of any troubles.**

3. Installing Windows Server 2019

3.1 Precautions of Windows Server 2019 Installation

Read the precautions explained this section before installing.

OS : Manual Installation

BIOS setting			
—	—	OS	Change **Boot Mode** to **UEFI Mode**. For details, see *Chapter 2 (1. System Utilities)* in *Maintenance Guide.* **System Configuration > BIOS/Platform Configuration (RBSU) > Boot Options > Boot Mode > UEFI Mode**
—	—	OS	Select **Enabled** for X2APIC feature of processor. For details, see *Chapter 2 (1. System Utilities)* in *Maintenance Guide.* **System Configuration > BIOS/Platform Configuration (RBSU) > Processor Options > Processor x2APIC Support > Enabled**
—	—	OS	**R120h-1M,R120h-2M,R120h-1E,R120h-2E,T120h** Change **time zone** to the **Unspecified Time Zone**. For details, see *Chapter 2 (1. System Utilities)* in *Maintenance Guide.* **System Configuration > BIOS/Platform Configuration (RBSU) > Date and time > Time Zone : Unspecified Time Zone**
—	—	OS	**R120h-1M,R120h-2M,R120h-1E,R120h-2E,T120h** Change **time format** to the **Local Time**. For details, see *Chapter 2 (1. System Utilities)* in *Maintenance Guide.* **System Configuration > BIOS/Platform Configuration (RBSU) > Date and time > Time Format : Local Time**
Hardware configuration			
			The following hardware configurations require special procedures.
—	—	OS	**Using RAID controller** Before you install Windows Server 2019, if using a RAID controller, build the RAID system in advance according to the *User's Guide.*
—	—	OS	**Installation When Multiple Logical Drives Exist** If you select wrong hard disk drive in Windows Server 2019 installation, the setup may erase existing data unexpectedly. Refer to displayed disk capacity or partition size to find target hard disk drive.
—	—	OS	**Reinstalling to a mirrored volume** When you install Windows Server 2019 in an environment with a mirrored volume created using Windows, disable mirroring before installing the operating system and enable it again after the installation. Use [Computer Management] – [Disk Management] to create, disable, or remove the mirrored volume.

—	—	OS	**Peripherals such as RDX/MO** Remove an MO device before installing. Some peripherals need to be halted before installation. Refer to the manual provided with the peripherals for how to set a device appropriate to installation.
—	—	OS	**DAT, LTO, and similar media** Do not set media that is unnecessary to installation during setup.
—	—	OS	**Reinstalling to dynamic disks** If the hard disk drive has been upgraded to a dynamic disk, the Windows cannot be reinstalled to it with the existing partitions. Install Windows with Manual Installation.

Setup when mass memory is installed

If mass memory is installed in your system, the large size of paging file is required at installation, and the partition size for storing debug information (dump file) cannot be allocated.

If you fail to create the partition, allocate the required size to multiple disks according to the following steps.

1. Set the system partition size to a size sufficient to install the OS and paging file.
2. Specify another disk as the destination to save the debug information (required dump file size) according to *Chapter 1 (4. Setting up for Maintenance).*

If the hard disk drive does not have enough free area to write the debug information, set the partition size to a size sufficient to install the OS and paging file, and then add another hard disk drive for the dump file.

> **Note**   If the partition size for installing Windows is smaller than the recommended size, expand the partition size or add another hard disk drive.

If sufficient free area cannot be allocated for the paging file, perform either of the following after install Windows.

– **Specify a hard disk drive other than the system drive as the location to store the paging file for collecting memory dump**

Create a paging file of "installed memory size + 400 MB (installed memory size + 1,100 MB when the size is 4 TB or more)" or more in a drive other than the system drive.

The paging file that exists in the first drive (in the order of drive letter C, D, E, ...) is used as the temporary memory dump location.
Therefore, make sure that the size of the paging file that exists in the first drive is at least "installed memory size + 400 MB (installed memory size + 1,100 MB when the installed physical memory is 4 TB or more)".
Paging files in dynamic volumes are not used for dumping memory. The setting is applied after restarting the system.

Example of correct setting

C : No paging file exists
D : Paging file whose size is "installed memory size + 400 MB* " or more

→ The paging file in drive D can be used for collecting memory dump because its size satisfies the requirement.

Example of incorrect setting 1

C : Paging file whose size is smaller than the installed memory size
D : Paging file whose size is "installed memory size + 400 MB* " or more

→ The paging file in drive C is used for collecting memory dump, but collection may fail because the size of the paging file is smaller than the installed memory size.

Example of incorrect setting 2

C : Paging file whose size is "installed memory size x 0.5"
D : Paging file whose size is "installed memory size x 0.5
E : Paging file whose size is 400 MB*

→ The total paging file size in all drives is "installed memory size + 400 MB* ", but collection may fail because only the paging file in drive C is used for collecting memory dump.

Example of incorrect setting 3

C : No paging file exists
D : Paging file whose size is "installed memory size + 400 MB* " or more (in dynamic volume)

→ Paging files in a dynamic volume cannot be used for collecting memory dump. Thus, collecting memory dump fails.

* This value is installed memory size +1,100 MB when the installed memory size is 4 TB or more

– **Specify a drive other than the system drive for "Dedicated Dump File".**

Create the registry shown below by using the Registry Editor and specify the name of Dedicated Dump File.

<For example: "dedicateddumpfile.sys" in drive D>

Key	:	HKEY_LOCAL_MACHINE\SYSTEM \CurrentControlSet\Control\CrashControl
Name	:	DedicatedDumpFile
Type	:	REG_SZ
Data	:	D:\dedicateddumpfile.sys

Note the following when specifying Dedicated Dump File:

- The setting is applied after restarting the system.
- Specify a drive that has free space of "installed memory size + 400MB (installed memory size + 1,100 MB when the installed memory size is 4 TB or more)" or more.
- Dedicated Dump File cannot be placed in dynamic volumes.
- Dedicated Dump File is only used for collecting memory dump, and is not used as memory. Specify the paging file size so that sufficient virtual memory can be allocated in the entire system.

System partition size

OS

The system partition size can be calculated by using the following formula.

Size required to install the OS + paging file size + dump file size + application size

Desktop Experience

Size required to install the OS	=	12,400 MB
Paging file size (recommended)	=	installed memory size + 400MB
Dump file size	=	installed memory size + 400MB (installed memory size is 4 TB or less)
	=	installed memory size + 1,100MB (installed memory size is exceeding 4 TB)
Application size	=	as required by the application

Server Core

Size required to install the OS	=	8,600MB
Paging file size (recommended)	=	installed memory size + 400MB
Dump file size	=	installed memory size + 400MB (installed memory size is 4 TB or less)
	=	installed memory size + 1,100MB (installed memory size is exceeding 4 TB)
Application size	=	as required by the application

For example, if the installed memory size is 2 GB (2,048 MB), and application size is 100 MB, the partition size is calculated as follows:

12,400MB + (2,048MB + 400MB) + 2,048MB + 400MB + 100MB
= 17,396MB

The above mentioned partition size is the minimum partition size required for system installation. Ensure that the partition size is sufficient for system operations.

The following partition sizes are recommended.

Desktop Experience	:	**32,768MB(32GB) or more**
Server Core	:	**32,768MB(32GB) or more**

＊1GB = 1,024MB

Note

- The above paging file sizes are recommended for collecting debug information (dump file). The initial size of the Windows partition paging file must be large enough to store dump files.
  Make sure you set a sufficient paging file size. If the paging file is insufficient, there will be a virtual memory shortage that may result in an inability to collect correct debug information.
- Regardless of the sizes of internal memory and write debug information, the maximum size of the dump file is "installed memory size + 400 MB (installed memory size + 1,100 MB when installed memory size is 4 TB or more)".
- When installing other applications or other items, add the amount of space needed by the application to the partition.

If the partition size for installing Windows is smaller than the recommended size, expand the partition size or add another hard disk drive.

● **When installing using Manual Installation**

Tips

When creating a partition, Windows OS creates the following partitions at the top of hard disk drive

- Recovery Partition   : 499MB
- EFI System Partition (ESP)   : 100MB *1
- Microsoft Reserved Partition (MSR)   : 16MB *2

615MB is allocated for these three partitions out of the specified partition size. For example, when 61,440MB is specified for partition size, the area available free area is calculated as follows:

$$61,440MB - (499MB + 100MB + 16MB) = 60,825MB$$

Free area

System Partition

Recovery Partition
(499MB)

Microsoft Reserved Partition (MSR)[*2]
(16MB)

EFI System Partition (ESP)[*1]
(100MB)
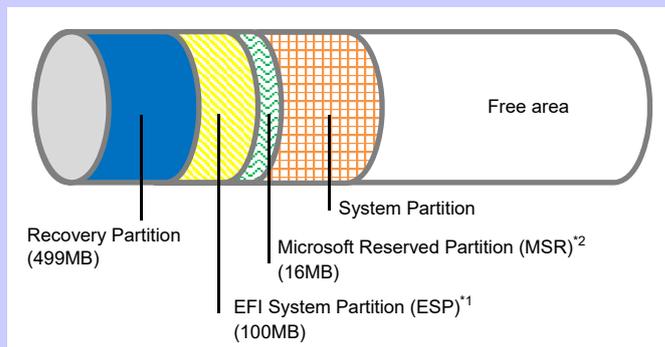
*1   May be 300MB in size depending on hard disk drive type.

*2   MSR is not displayed on **Disk Management**.

Windows Server 2019 Hyper-V support

— — OS

Refer to the following web site for information related to Windows Server 2019 Hyper-V.
http://www.58support.nec.co.jp/global/download/w2019/hyper-v/hyper-v-ws2019.html

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Using BitLocker

— — OS

If using BitLocker, note the following.
● Be sure to keep the recovery password secure. Do not keep it near a server running BitLocker.

Important

If the recovery password is not entered, the OS cannot be started, and the content of the partition encrypted by BitLocker cannot be referenced any more. The recovery password might be required at startup of the OS after the following:

- **Replacement of motherboard**
- **Change of BIOS setting**
- **Initialization of trusted platform module (TPM) ***
  *** Depending on your system, it may not be supported.
  Refer to the Instruction Manuals about hardware.**

● To reinstall the operating system into a partition that is encrypted with BitLocker, delete the BitLocker-encrypted partition prior to reinstallation.

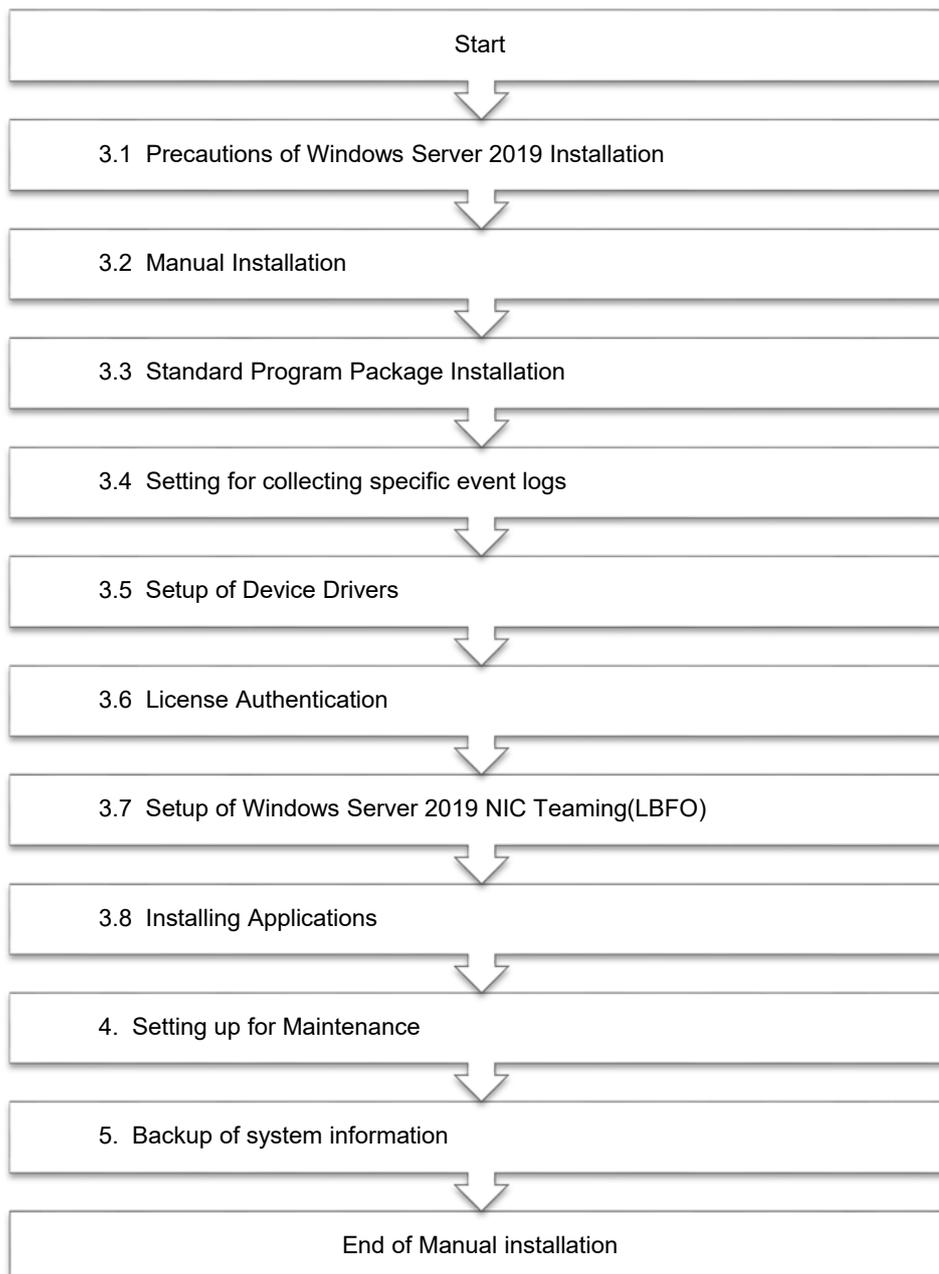| Support for NIC teaming in Windows Server 2019			
—	—	OS	The NIC teaming feature, which used to be provided by network interface card (NIC) vendors, is built into Windows Server 2019. In Windows Server 2019, this feature is also called "load balancing and failover (LBFO)". Refer to *Chapter 1 (3.7 Setup of Windows Server 2019 NIC Teaming (LBFO)* and specify any required settings.

3.2   **Manual Installation**

This section describes how to install Windows Server 2019 with Manual option.

Note	"Manual Installation" installs OS without EXPRESSBUILDER.

3.2.1 **Setup flow**

```
                        Start

        3.1  Precautions of Windows Server 2019 Installation

        3.2  Manual Installation

        3.3  Standard Program Package Installation

        3.4  Setting for collecting specific event logs

        3.5  Setup of Device Drivers

        3.6  License Authentication

        3.7  Setup of Windows Server 2019 NIC Teaming(LBFO)

        3.8  Installing Applications

        4.  Setting up for Maintenance

        5.  Backup of system information

                   End of Manual installation
```

3.2.2 Requirements for Setup

Prepare the following media and instruction manuals before starting setup.

➢ Either of the following OS installation media

- **NEC operating system installation media** (hereafter referred to as *Backup DVD-ROM*)

- **Microsoft operating system installation media** (hereafter referred to as *Windows Server 2019 DVD-ROM*)

➢ Starter Pack

- **Starter Pack DVD** (Optional or downloading from our website)

  → The Starter Pack which supports Windows Server 2019 is "S8.10-006.01" or later.
     Download it from Web site.

➢ **Installation Guide**

- **Windows Server 2019 Installation Guide** (This document)

Note	If using the onboard RAID controller and the internal optical disk drive, the driver is loaded from a removable media device. Copy and prepare the following files onto a removable media in advance. *<Starter Pack>:***software\006\drivers\sw_raid1_driver**

3.2.3 Installation procedure

Note	Read the precautions in *Chapter 1 (3.1 Precautions of Windows Server 2019 Installation)* in advance.

1. Turn on peripherals (such as a display), and then turn on the server.

   Insert OS installation media into the drive.

2. To run EXPRESSBUILDER, press <F10> key during POST.

   On the **One-Time Boot Menu**, select the optical disk drive in which the OS installation media was inserted.

3. The system starts from the OS installation media

   he message "Press any key to boot from CD or DVD…" is displayed on the upper of the screen.

   Press the <Enter> key to start from the media.

Note	If the Windows Setup screen (the screen in the next step) does not display, the <Enter> key was not properly pressed. Turn the system power on again, and then start again.

4.   Click **Next**.
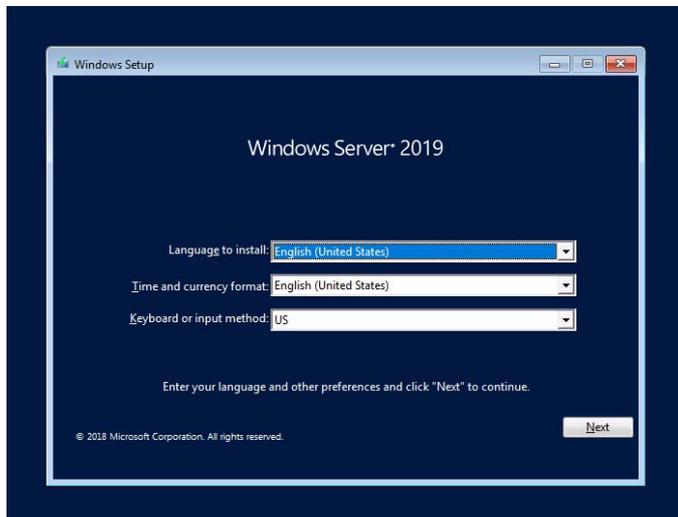
5.   Click **Install now**.
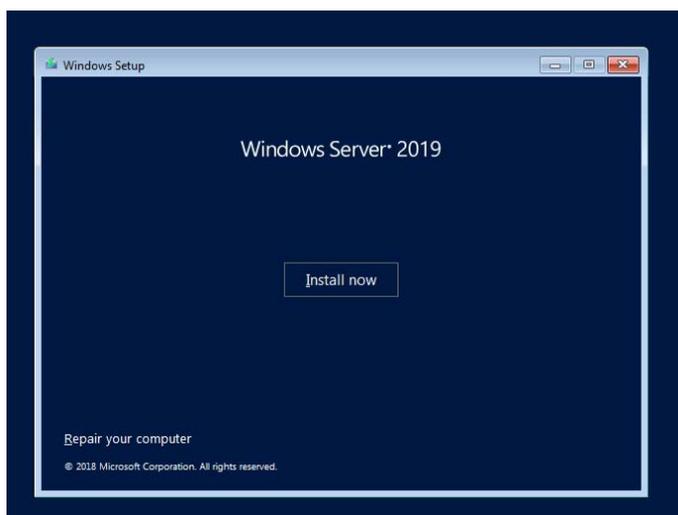
If the following message is displayed: Go to Step 6.

If the following message is not displayed: Go to Step 8.

6.   After connecting the removable media where the onboard RAID controller driver was copied, specify the path and click **OK**.

<Removable media>:**\sw_raid1_driver**

7.   Select the following driver from the displayed list of drivers, and click **Next**.

HPE Smart Array S100i SR Gen10 SW RAID

8.   Type the product key, and then click **Next**.
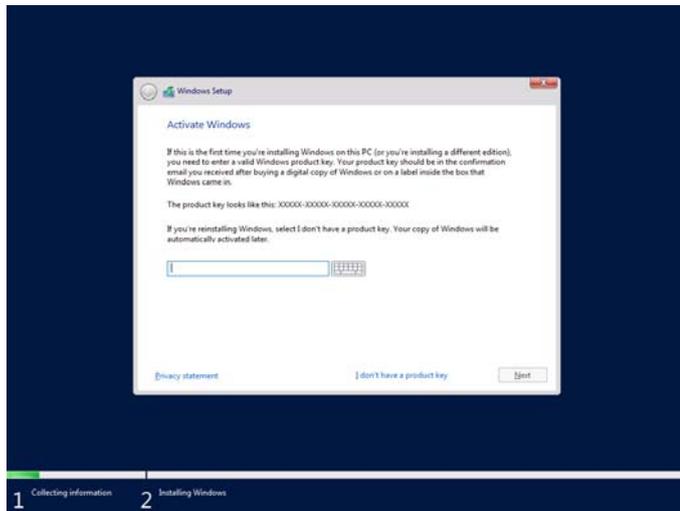
Tips	If you are using Backup DVD-ROM, this screen does not appear.

9.   Choose an operating system you want to install and click **Next**.
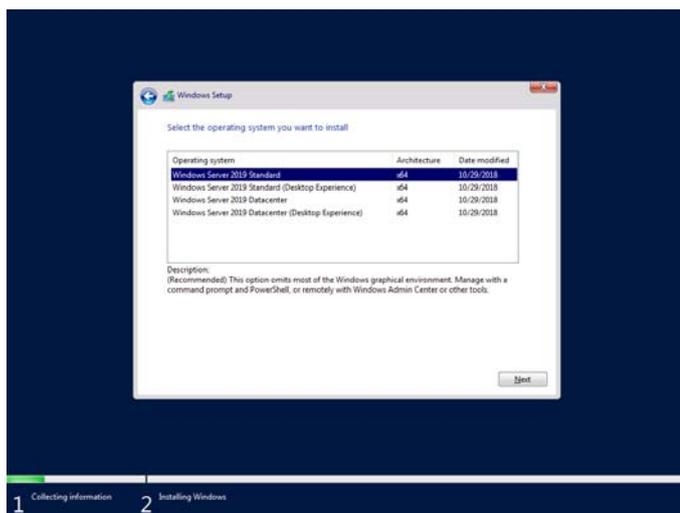
Options are displayed depending on the installation media you are using.

Tips	Read the message of the screen, and then choose an installation option.
	• Windows Server 2019 Standard or Windows Server 2019 Datacenter
	→ Described as "Server Core" by this manual
	• Windows Server 2019 Standard (Desktop Experience) or Windows Server 2019 Datacenter (Desktop Experience)
	→ Described as "Desktop Experience" by this manual

10. Read the license terms carefully.

If you agree, check **I accept the license terms** and click **Next**.
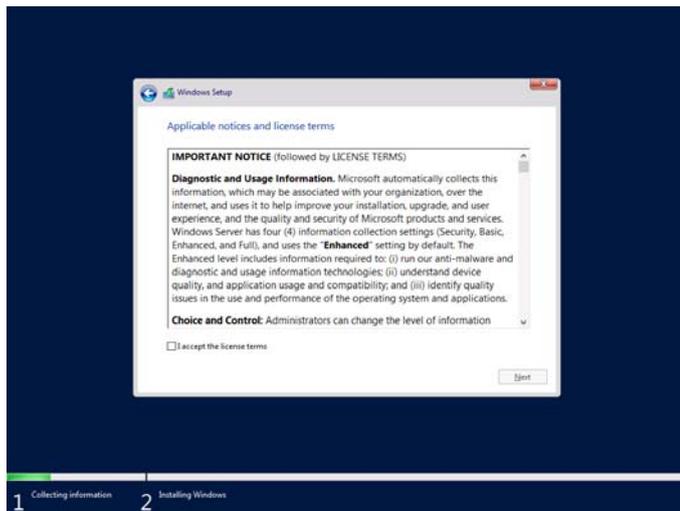
11. Select **Custom: Install Windows only (advanced)**.
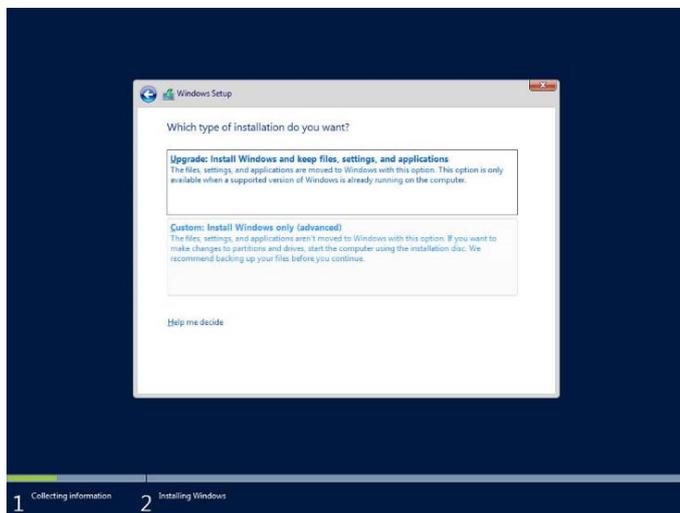
12. The "Select Windows installation location" screen is displayed.

If the driver was loaded in steps 6 and 7, or if the onboard RAID controller is not in use, proceed to step 15.

If you select **Load driver** here, the following screen will be displayed.

13. After setting the Starter Pack DVD in the UBS-DVD drive, assign a file directory, and click **OK**.

-   Onboard RAID Controller

*<Starter Pack DVD>:***\software\006\drivers\sw_raid1_driver**

14. Select the following driver from the displayed list of drivers, and click **Next**.

-   Onboard RAID Controller   : **HPE Smart Array S100i SR Gen10 SW RAID**

15.   Click **New**.

If the partition is already created, proceed to step 18.
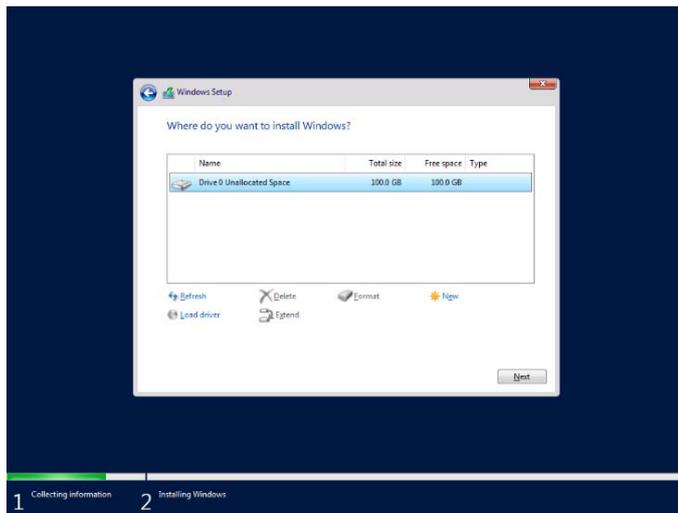
Tips	If **New** is not displayed on the screen, click **Drive options (advanced)**.

16.   Specify the partition size in the text box, and the click **Apply**.
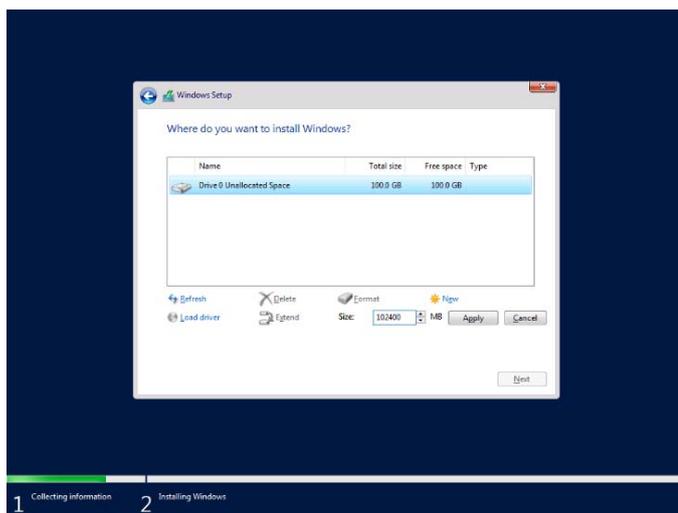
When the following window appears, click **OK**.
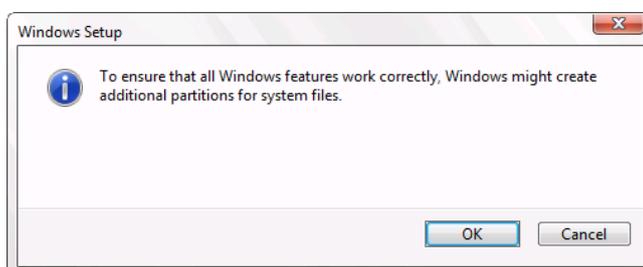
Tips	When creating a partition, the OS creates the following partitions at top of the hard disk drive.
	   – Recovery Partition
	   – EFI System Partition (ESP)
	   – Microsoft Reserved Partition (MSR)

17.   Select the partition created in step 16, and then click **Format**.

Important	When the following screen appears, read the message and click [OK]. Carefully select the partition to be formatted because data in the partition will be erased.
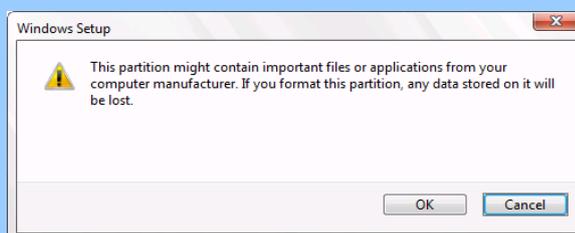
18.   Select the created partition, and then click **Next**.
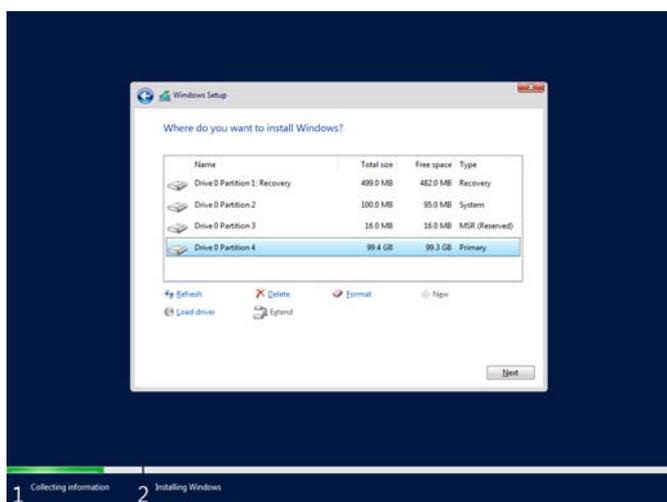
Tips	The number of partitions displayed differs depending on the hardware configuration.

If Starter Pack DVD is in the drive, change it to the OS disk, and then click **Refresh**.

When the following message appears, Windows installation starts automatically.
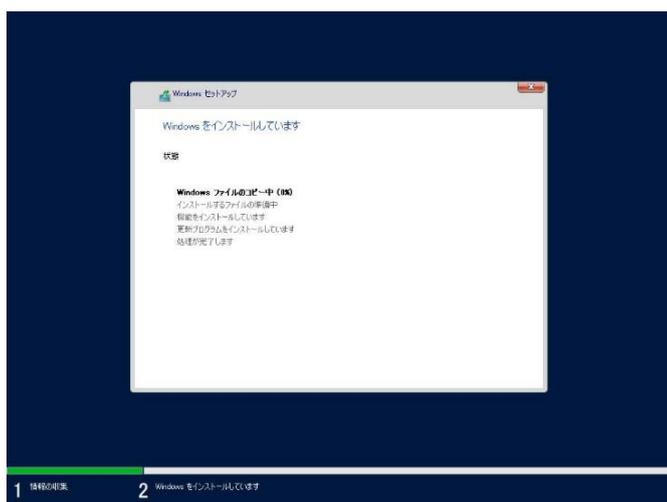
The server will automatically restart after Windows Server 2019 is installed.

You will proceed to Windows setup after restart.

19. Set user settings according to operating system chosen in step 9.

Desktop Experience
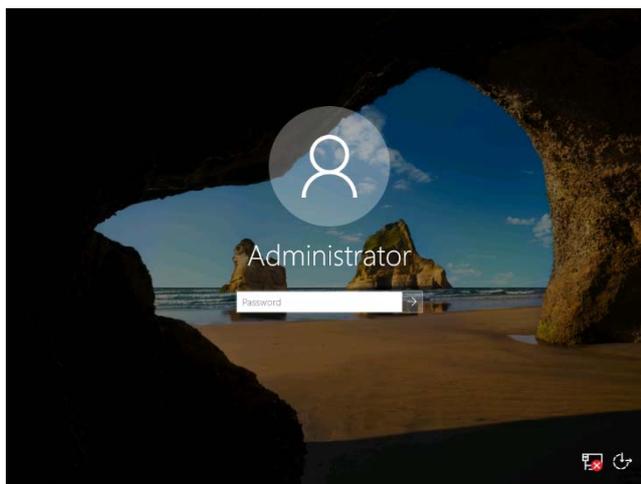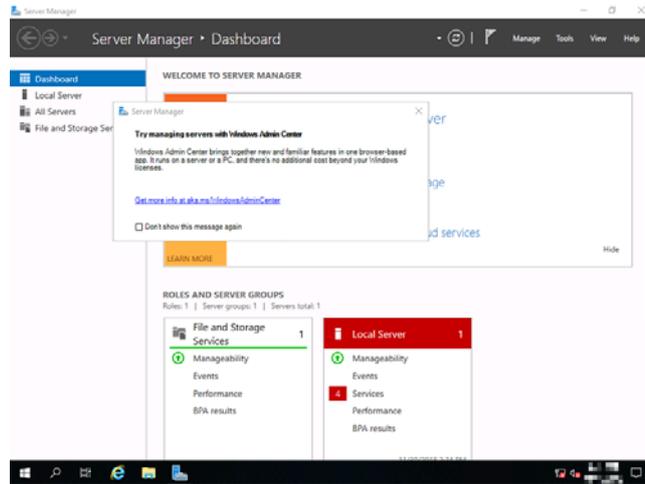
Type a password and click **Finish**.
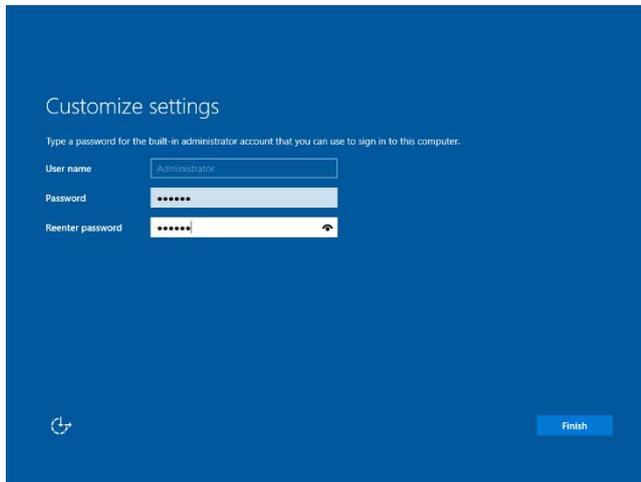
Press <Ctrl> + <Alt> + <Delete> keys to unlock.
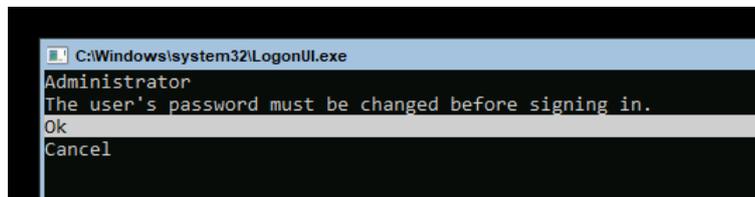

Enter the password and press <Enter> key.

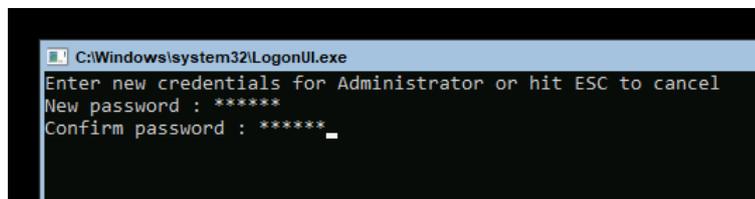Windows Server 2019 starts.

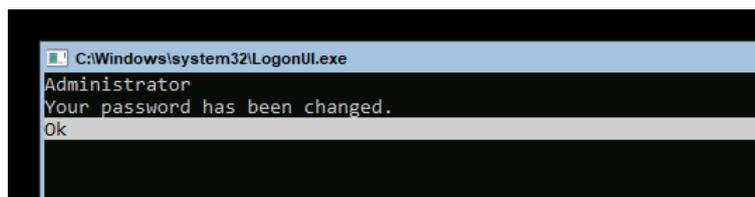
Server Core

The password is needed to change. Choose **OK** and press <Enter> key.
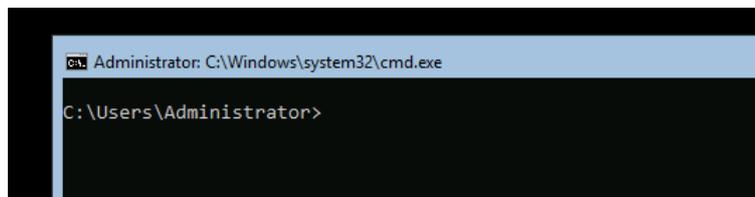

Enter a new password and press <Enter> key.

Choose **OK** and press <Enter> key after the following message is displayed.

Windows Server 2019 starts.

20.   See *Chapter 1 (3.3. Standard Program Package Installation)* to install SPP.

21.   See *Chapter 1 (3.4 Setting for collecting specific event logs)* to set it.

22.   Install drivers and specify detailed settings according to *Chapter 1 (3.5 Setup of Device Drivers).*

23.   Confirm if Windows is activated according to *Chapter 1 (3.6 License Authentication).*

24.   See *Chapter 1 (3.7 Setup of Windows Server 2019 NIC Teaming (LBFO))* to setup a team as needed*.*

25.   Install the applications as needed according to *Chapter 1 (3.8 Installing Applications).*

26.   Set the other OS settings according to *Chapter 1 (4. Setting up for Maintenance).*

27.   See *Chapter 1 (5. Backup of system information)* to back up the system.

The Windows installation with Manual Installation is now complete.

3.3 Standard Program Package Installation

Standard Program Package (SPP) contains drivers customized for this server.

Make sure to install SPP before running the server system.

| Important	After attaching the internal option, application of Standard Program Package may be required. For details, see *Chapter 1 (3.5 Setup of Device Drivers)*.

3.3.1 Installing Standard Program Package on Desktop Experience

1.   Sign-in to the Windows with an Administrators privilege.

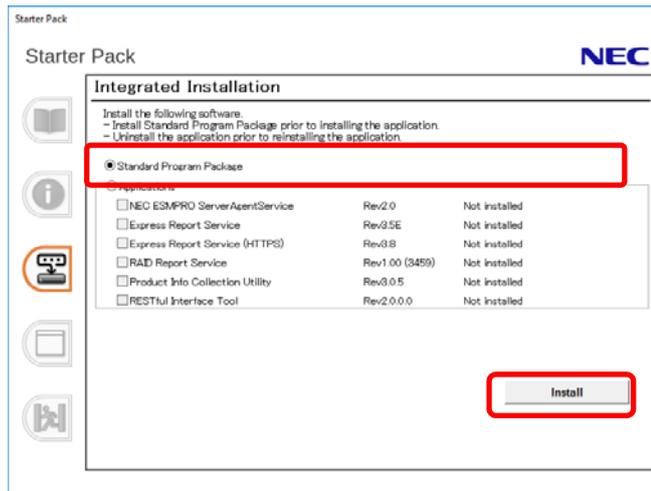2.   Set the Starter Pack DVD to the drive.

Note	● When the N8104-173/182/185 is installed to the server, run **\packages\cp036669.exe** on the DVD. After that, restart the server. ● When N8103-189/190/191/192/193/194/195/196/197/201 is installed to the server, **\packages\cp037197.exe** on the DVD to install the driver. After that, restart the server.

3.   Run the **start_up.bat** under the root folder on DVD.

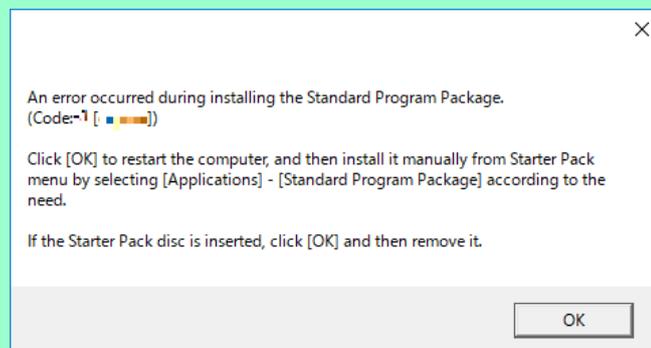4.   Click **Integrated Installation** on the menu.
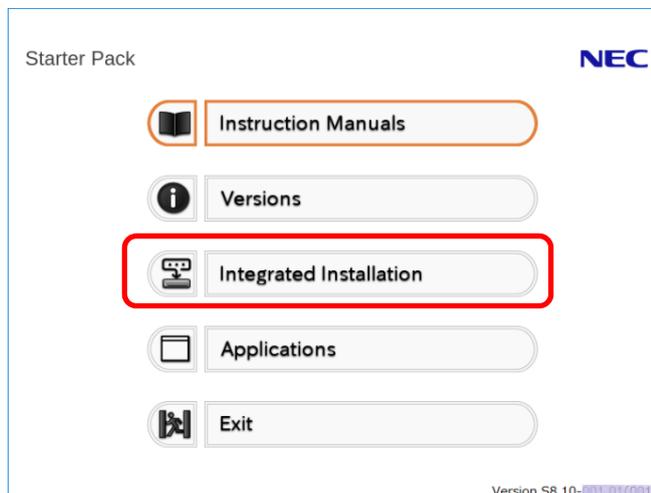
5.   Choose **Standard Program Package** on the following screen, and then click **Install**.

Wait until installation completes (about 5 to 15 minutes).

Note   If the following message displayed during installing the Standard Program Package, reboot the system and retry Step1-5.

SPP installation is now complete.

3.3.2 Installing Standard Program Package on Server Core

1.   Sign-in to the Windows with an Administrators privilege.

2.   Set the Starter Pack DVD to the drive.

Note	● When the N8104-173/182/185 is installed to the server, run **\packages\cp036669.exe** on the DVD. After that, restart the server. ● When N8103-189/190/191/192/193/194/195/196/197/201 is installed to the server, **\packages\cp037197.exe** on the DVD to install the driver. After that, restart the server.

3.   From the command prompt, type the following command.

In the example below, the optical disk drive is the D drive.

cd /d D:\software\006\win\seamless

```
C:\Users\administrator>cd /d D:\software\006\win\seamless
```

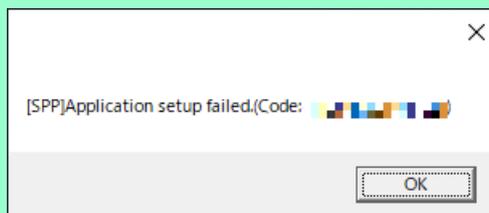4.   Type the following command, and then press <Enter> key.

instcmd.vbs spp /s

```
D:\software\006\win\seamless >instcmd.vbs spp /s
```

Wait until installation completes (about 5 to 15 minutes).

Note	If the following message displayed during installing the Standard Program Package, reboot the system and retry Step1-4.

SPP installation is now complete.

3.4 Setting for collecting specific event logs

(1) Desktop Experience

Sign-in to the account with an Administrators privilege for following settings.

1.   Press <Windows logo> + <R> key to start **Run**.

2.   Type "gpedit.msc", and then press <Enter> key. Local Group Policy Editor is displayed.

3.   Click **Computer Configuration** > **Administrative Templates** > **System** on the left pane.

4.   Right-click **Enable Persistent Time Stamp** on the right pane, and then click **Edit**.

5.   Check **Enable** on Enable Persistent Time Stamp screen.

6.   Click **Apply**, and then confirm the contents and click **OK**.

The setting is now complete. Close Local Group Policy Editor.

(2) Server Core

Sign-in with the built-in Administrators privilege to Windows Server system which can recognize the Server Core Environment that have applied SPP by above procedure, for the following settings.

1.   Press <Windows logo> + <R> key to start **Run**.

2.   Type "mmc.exe", and then press <Enter> key. Console window is displayed.

3.   Click **Add/Remove Snap-in …** of **File**.

4.   Select **Group Policy Object Editor**, and click **Add**.

5.   Click **Browse...** of Select Group Policy Object window, and select **Another Computer**.

6.   Input IP address or computer name, and click **OK**.

7.   Click **OK** on Add or Remove Snap-ins window.

8.   Click *<Server Core Environment>* **Policy** > **Computer Configuration** > **Administrative Templates** > **System** on the left pane of Console window.

9.   Right-click **Enable Persistent Time Stamp** on the right pane, and then click **Edit**.

10.   Check **Enabled** on Enable Persistent Time Stamp screen.

11.   Click **Apply**, and then confirm the contents and click **OK**.

The setting is now complete.
Save settings as needed, and close Console window.

3.5   Setup of Device Drivers

Install and set up device drivers provided for the standard configuration of the server.

For details regarding the installation and setup of a driver for an optional device, refer to the manual supplied with the optional device.

3.5.1 Installing the LAN drivers

(1) LAN drivers

The drivers are installed by Standard Program Package.

Important	**Wake On LAN (WOL) is supported by onboard network adapters and N8104-171/172/173/175/176/177/193/194/195 only. Wake On LAN is available after installing the LAN driver.** **For Wake On LAN of R120h-1E/2E/T120h onboard network adapters and N8104-172/175/176/193/194/195, when using Wake On LAN see *Chapter 1 (3.5.2 Setting up LAN drivers - (2) Setting up Wake on LAN).*** **BIOS settings, check Maintenance Guide.**
Note	• To change the LAN driver settings, sign in to the system from a local console using an administrator's account. Remotely changing the settings by using the operating system's remote desktop feature is not supported. • Choose the **Internet Protocol (TCP/IP)** check box when specifying an IP address.

(2) Optional LAN board

This server supports the following optional LAN boards.

R120h-1M/R120h-2M

N8104-171/172/173/175/176/177/178/179/180/181/182/183/184/185/186/187

R120h-1E/R120h-2E

N8104-171/172/173/175/176/177/178/179/180/181/182/183/184/185/186/187/193/194/195

T120h

N8104-178/179/180/181/182/183/184/185/186/187

R110j-1

N8104-171/172/173/178/179/180/181/182/185

If you install the LAN boards after installing Standard Program Package, install Standard Program Package again according to *Chapter 1 (3.3 Standard Program Package Installation)*.

(3) Network adapter name

After installing the LAN drivers, the following network adapter names will be displayed on the Device Manager.

- **Network adapters for the standard configuration**

    R120h-1M/R120h-2M

    HPE Ethernet 1Gb 4-port 331i Adapter #xx(*1)

    R120h-1E/R120h-2E

    HPE Ethernet 1Gb 2-port 368i Adapter #xx(*1)

    T120h

    HPE Ethernet 1Gb 4-port 369i Adapter #xx(*1)

    R110j-1

    HPE Ethernet 1Gb 2-port 332i Adapter #xx(*1)

- **If connecting with an optional LAN board**:

N8104-171	HPE Ethernet 1Gb 4-port 331FLR Adapter #xx(*1)
N8104-172	HP Ethernet 1Gb 4-port 366FLR Adapter #xx(*1)
N8104-173	HPE FlexFabric 10Gb 2-port 533FLR-T Adapter #xx(*1)
N8104-175	HPE Ethernet 10Gb 2-port 562FLR-T Adapter #xx(*1)
N8104-176	Port1：HPE Ethernet 10Gb 2-port 562FLR-SFP+ Adapter #xx(*1)
	Port2：HPE Ethernet 10Gb 562SFP+ Adapter #xx(*1)
N8104-177	HPE Ethernet 10/25Gb 2-port 622FLR-SFP28 Converged Network Adapter #xx(*1)
N8104-178	HPE Ethernet 1Gb 2-port 332T Adapter #xx(*1)
N8104-179	HPE Ethernet 1Gb 4-port 331T Adapter #xx(*1)
N8104-180	HP Ethernet 1Gb 2-port 361T Adapter #xx(*1)
N8104-181	HP Ethernet 1Gb 4-port 366T Adapter #xx(*1)
N8104-182	HPE Ethernet 10Gb 2-port 530T Adapter #xx(*1)
N8104-183	HPE Ethernet 10Gb 2-port 521T Adapter #xx(*1)
N8104-184	HPE Ethernet 10Gb 2-port 562T Adapter #xx(*1)
N8104-185	HPE Ethernet 10Gb 2-port 530SFP+ Adapter #xx(*1)
N8104-186	Port1：HPE Ethernet 10Gb 2-port 562SFP+ Adapter #xx(*1)
	Port2：HPE Ethernet 10Gb 562SFP+ Adapter #xx(*1)
N8104-187	HPE Ethernet 10/25Gb 2-port 621SFP28 Adapter #xx(*1)
N8104-193	HPE Ethernet 1Gb 2-port 368FLR-MMT Adapter #xx(*1)
N8104-194	HPE Ethernet 10Gb 2-port 568FLR-MMSFP+ Adapter #xx(*1)
N8104-195	HPE Ethernet 10Gb 2-port 568FLR-MMT Adapter #xx(*1)

    *1: If there are adapters with the same name, a different identification number will be assigned to *xx*.

Tips	The ID for N8104-173/177/182/183/185/187 might be a number of two or more digits.This is due to the LAN driver specifications and not an error. This number cannot be changed.

Tips	The network adapter name displayed in the device manager may be different from the one listed above. In this case, the correct network adapter name can be displayed by following the procedure below. 1. Start **Device Manager**. 2. Open **Network Adapters**, right click on the relevant adapter, and select **Uninstall Device**. Do not check the **Delete the driver software of this device** checkbox. 3. Select **Scan hardware change** from **Control**.

3.5.2 Setting up LAN drivers

(1) Setting link speed

The transfer rate and duplex mode of the network adapter must be the same as those of the switching hub. Follow the procedure below to specify the transfer rate and duplex mode.

Tips	If you are using a network adapter for N8104-185/187, the network adapter settings can be set to "10 Gbps Full Duplex" or "25 Gbps Full Duplex", and the connected switching hub settings can be set to "Auto Negotiation".

1. Open the **Device Manager**.
2. Expand **Network Adapters**, and then double-click the name of the network adapter you want to configure.
    The properties of the network adapter will be displayed.
3. On the **Advanced** tab, set the **Speed & Duplex** values to the same as those of the switching hub.
4. Click **OK** in the **Network Adapter Properties** dialog box.
5. Restart the system.

   The link speed setting is now complete.

(2) Setting up Wake on LAN

When using R120h-1E/2E/T120h onboard network adapters and N8104-172/175/176/193/194/195 with

the server, follow the procedure below to set it.

1. Open the **Device Manager**.
2. Expand **Network Adapters**, and then double-click the name of the network adapter you want to configure.
    The properties of the network adapter will be displayed.
3. Open **Advanced** tab, click **Enable PME** to show Value.
4. Change the value to **Enabled** by the down-arrow button.
5. Click **OK**, and then restart the system.

Setup is now complete.

3.5.3 Using Graphics Accelerator

The drivers are installed by Standard Program Package.

3.5.4 Using SAS Controller (N8103-184/E184)

The driver for SAS controller N8103-184/E184 is automatically installed by Windows Plug-and-Play.

3.5.5 Using SAS Controller (N8103-197)

The drivers are installed by Standard Program Package.

If you install the SAS controller (N8103-197) after installing Standard Program Package, install Standard Program Package again according to *Chapter 1 (3.3 Standard Program Package Installation)*.

3.5.6 Using RAID Controller (N8103-189/190/191/192/193/194/195/196/201)

The drivers are installed by Standard Program Package.

If you install the RAID controller (N8103-189/190/191/192/193/194/195/196/201) after installing

Standard Program Package, install Standard Program Package again according to *Chapter 1 (3.3 Standard Program Package Installation)*.

3.5.7 Using Fibre Channel Controller (N8190-163/164/165/166/171/172)

The drivers are installed by Standard Program Package.

If you install the Fibre Channel controller (N8190-163/164/165/166/171/172) after installing Standard Program Package, install Standard Program Package again according to *Chapter 1 (3.3 Standard Program Package Installation)*.

3.6 License Authentication

To use Windows Server 2019, you need finish the license authentication procedure.

Confirm if the license is authenticated or not in the next step.
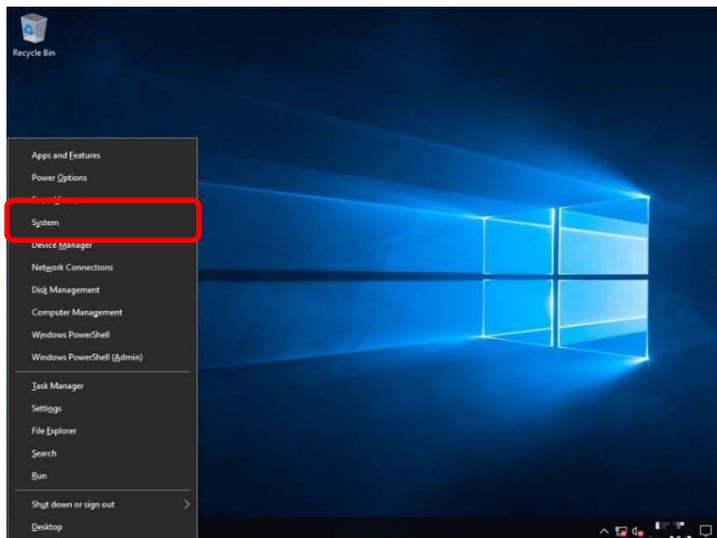
Note

To activate Windows Server 2019, enter the Product Key written on the COA (Certificate of Authenticity) label. The COA label of Windows Server 2019 is attached to the operating system media package.
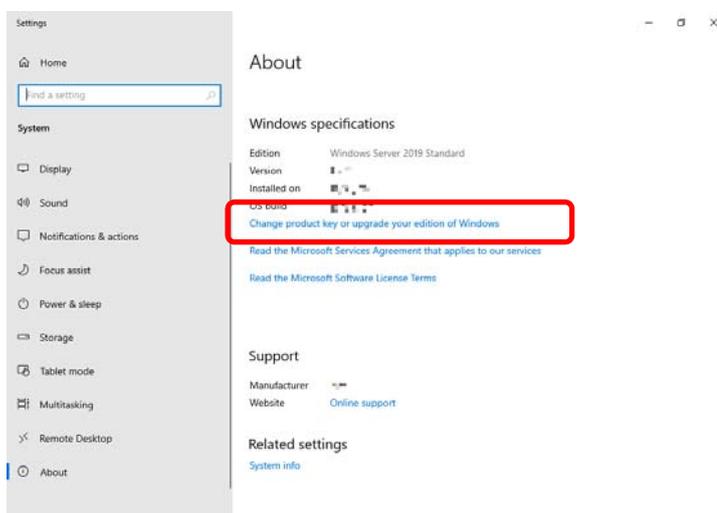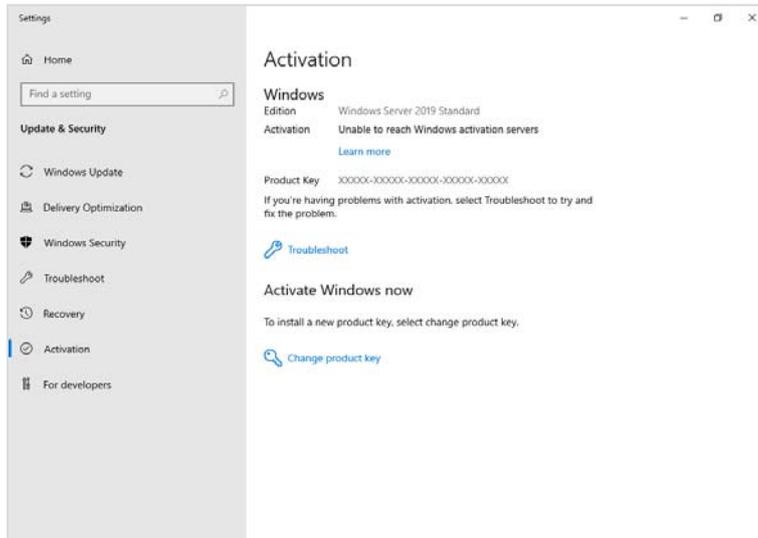

3.6.1 Desktop Experience

1.   Right-click the lower left of the screen, and click **System** from the menu displayed.

2.   Click **Change product key or upgrade your edition of Windows**.

3.   Perform license authentication.

When connected to the Internet:

Click **Change product key**.

Complete license authentication process according to the message.

When not connected to the Internet:

Go to Step 4.
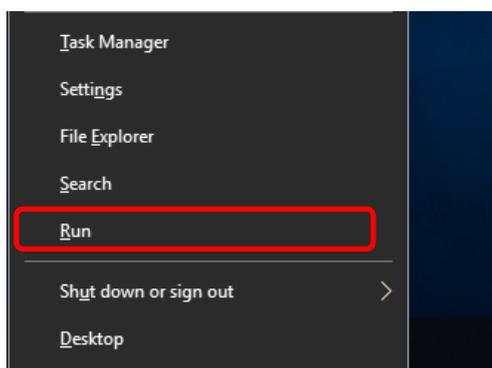
4.   Perform the license authentication by phone.

Go to the appropriate step according to OS installation media you are using.

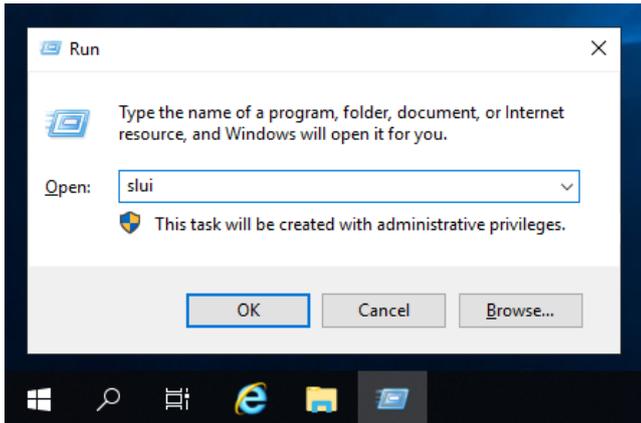**Backup DVD-ROM:**   Go to Step 5.

Windows Server 2019 DVD-ROM:

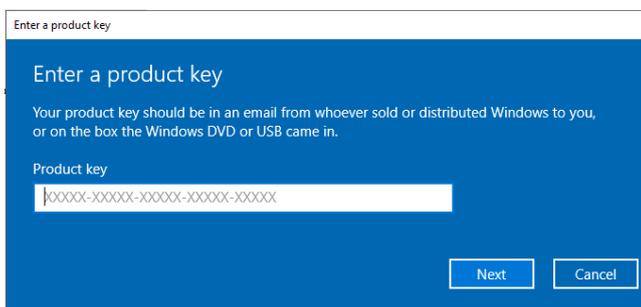Product key is <u>already entered</u>:   Go to Step 8.

Product key is <u>not entered</u>:   Go to Step 5.

5.   Right-click the lower left of the screen, and click **Run** from the menu displayed.
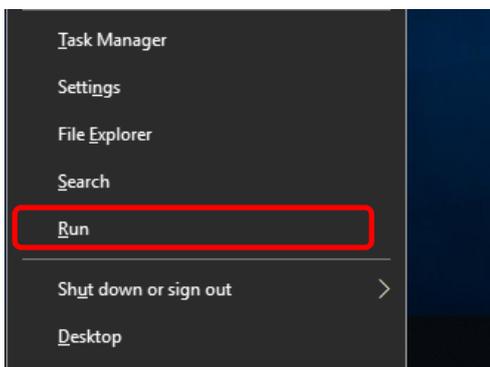
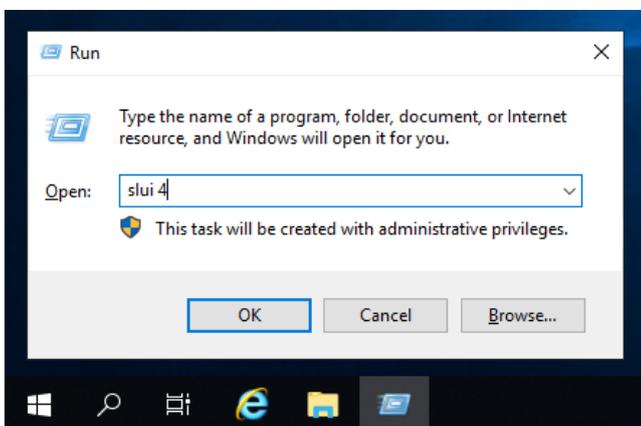6.   Type "slui", and then press <Enter> key.

7.   Change the product key. On the next screen, type the product key.

8.   Right-click the lower left of the screen, and click **Run** from the menu displayed.
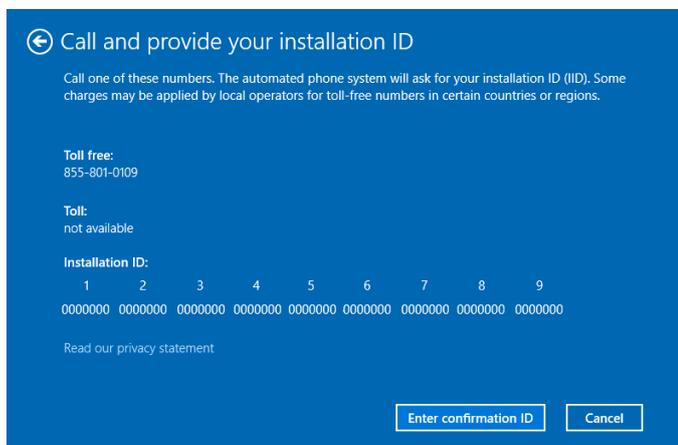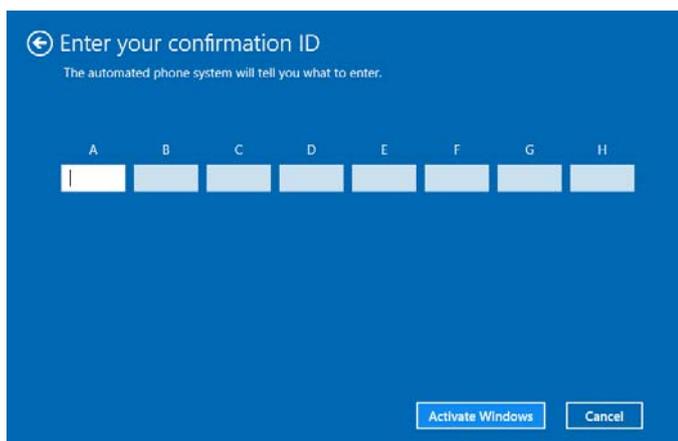

9.   Type "slui 4", and then press <Enter> key.

10. On the next screen, choose your country, and then click **Next**.
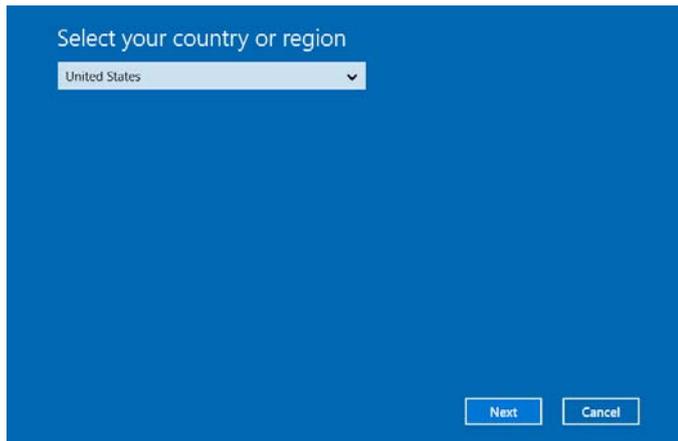
Get the installation ID required for license activation.

11. Call the Microsoft license activation hotline and then tell your installation ID.

Type the confirmation ID, and then click Activate Windows.

The authentication is now complete.

3.6.2 **Server Core**

1.   Confirm if your license is activated.

At the command prompt, type the following command, and then press <Enter> key.

```
C:¥Users¥administrator>slmgr –dli
```

When license authentication is required, go to the next step.

When your license is already authenticated, you can skip the next and the subsequent steps.

2.   Change the product key.

Using Backup DVD-ROM:

Type the following command, and then press <Enter> key.

```
C:¥Users¥administrator>slmgr -ipk <Product key on COA label>
```

Using Windows Server 2019 DVD-ROM:

You do not need to change the product key.

Go to the next step

3.   Perform license authentication.

The server connects to the Internet:

License authentication is performed via the Internet.

Type the following command, and then press <Enter> key.

```
C:¥Users¥administrator>slmgr –ato
```

This completes authentication.

The server does not connect to the Internet:

Use telephone for license authentication.

Type the following command to get an Install ID for authentication, and then press <Enter> key.

```
C:\Users\administrator>slmgr -dti
```

Acquire the installation ID required for license activation.

Refer to the file %systemroot%\system32\sppui\phone.inf to confirm the telephone number of Microsoft Licensing Center.

Call Microsoft Licensing Center and tell them your Install ID.

Type the confirmation ID you have received in the following command line, and then press <Enter> key.

```
C:\Users\administrator>slmgr -atp <Confirmation ID>
```

The authentication is now complete.

3.7 Setup of Windows Server 2019 NIC Teaming (LBFO)

Set up the network adapter teaming feature as shown below.

3.7.1 Launching the NIC teaming setup tool

1.   Launch **Server Manager**.

2.   Select **Local Server**.

3.   In the **Properties** window, click **Enable** or **Disable** for **NIC teaming**.

       The NIC teaming setup tool will launch.

Tips	The NIC teaming setup tool can also be launched by opening the **Run** dialog box, typing "`lbfoadmin /server .`", and then pressing <Enter> key.

3.7.2 Creating a team

Create a team by using the NIC teaming setup tool.

1.   In the **Servers** section, select the name of the server to set up.

       If there is only one server connected, the name of the server is selected automatically.

2.   In the **Teams** section, under **Tasks**, select **New Team**. The **New Team** wizard then starts.

3.   Type the name of the team to create, and then select the network adapter to include in the team from the **Member adapters** list.

4.   Click **Additional properties**.

5.   Specify the required settings, and then click **OK**.

Teaming mode

Static Teaming	Configures static aggregation between the NIC and switches.
Switch Independent	Configures teaming on the NIC side without depending on the switch settings.
LACP	Configures dynamic aggregation between the NIC and switches.

Load balancing mode

Address Hash	Distributes the load based on IP addresses and port numbers.
Hyper-V Port	Distributes the load to each of the virtual switch ports used by the virtual machines.
Dynamic	• Distributes the load based on IP addresses and port numbers in sending. • Distributes the load same to "Hyper-V Port" in receiving.

Standby adapter

       Select one adapter to be set to standby mode from the adapters in the team.

       Setting all adapters to active mode is also possible.

Primary team interface

       Any VLAN ID can be specified for the primary team interface.

3.7.3 Removing a team

Remove a team by using the NIC teaming setup tool.

1. In the **Servers** section, select the name of the server to set up.

    If there is only one server connected, the name of the server is selected automatically.

2. In the Teams section, select the team to remove**.**

3. In the Teams section, under **Tasks**, select **Delete**.

4. The message box to confirm appears, then click Delete team.

3.7.4 Notes and restrictions

- NIC teaming on a guest OS is not supported.

- Teaming of virtual NICs on the host OS is not supported in the Hyper-V environment.

- When STP (Spanning Tree Protocol) is enabled on network switch ports to which network adapters of the team are connected, network communications may be disrupted. Disable STP, or configure "PortFast" or "EdgePort" to the ports.

    * About setting the network switch of the connection destination, see the manual of the network switch.

- All NICs in the team must be connected to the same subnet.

- Teaming of different speed NICs is not supported.

- Teaming of different vendor's NICs is not supported.

- When teaming is configured in a Network Load Balancing (NLB) environment, you should select multicast mode on the NLB cluster.

- When a team is removed, the following error message may be logged in the system event log.

    You can safely ignore this error message.

Level	Error
Source	Microsoft-Windows-NDIS
Event ID	10317
Task Category	PnP
Message	Miniport Microsoft Network Adapter Multiplexor Driver, {xxxxxxxx-xxxx-xxxx-xxxx-xxxxxxxxxxxx}, had event Network Interface deleted while PNP Device still exists. Note that this event is provided for informational purpose and might not be an error always (Eg: In case of vSwitch which was recently un-installed or a LBFO team was removed)

- In a Windows Server Failover Cluster environment, heartbeat interruption or failover may occur if you configure Active-Standby teaming. To avoid this, you should configure multiple NICs in Active Mode in a team so that all the NICs do not fail simultaneously.

- In a Hyper-V environment, the following warning message may appear when a teaming adapter is bound to a virtual switch. There is no problem for the operation unless this message is output multiple times at one time.

Level	Warning
Source	Microsoft-Windows-MsLbfoSysEvtProvider
Event ID	16945
Message	MAC conflict: A port on the virtual switch has the same MAC as one of the underlying team members on Team Nic Microsoft Network Adapter Multiplexor Driver

Refer to the following website for the latest information.

http://www.58support.nec.co.jp/global/download/w2019/index.html

- [Technical Information] - [NIC Teaming (LBFO)]

3.8 Installing Applications

Some applications included in Starter Pack can be installed easily by performing the procedures described below. When installing these applications individually, see *the manual of each applications*. This feature is **only available on Desktop Experience**.

Tips	This function supports clean installation of applications only. If you re-install installed application, refer to *the manual of each applications*.

1. Sign-in to the Windows with an Administrators privilege.

2. Insert the Starter Pack DVD into the optical disk drive.

3. Run the **start_up.bat** under the root folder on DVD.

4. Click **Integrated Installation** on the menu.
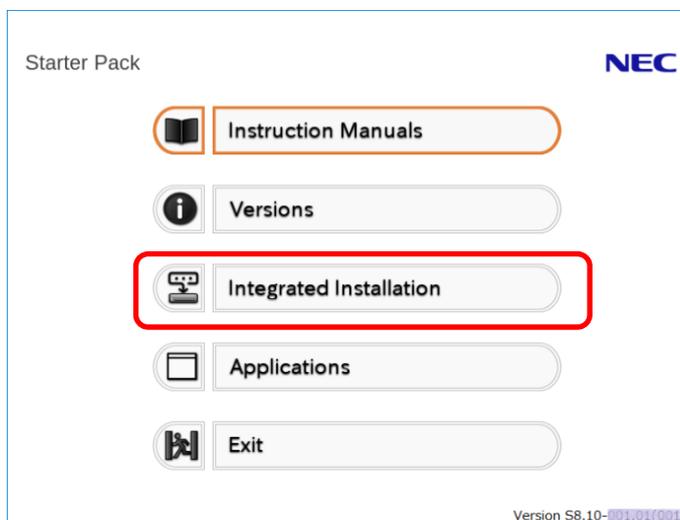
5. On the following screen, choose the check boxes corresponding to the applications you want to install, and then click **Install**. The chosen applications are automatically installed.
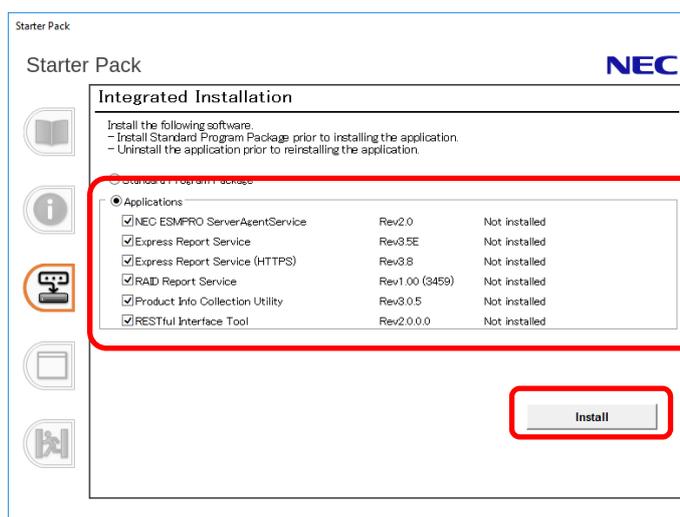
Note	• Applications available for installation are chosen by default. • If your system environment does not satisfy the prerequisite for an application, you cannot install it. For details, see the on-screen information and *the manual of each applications.*

- To collect product information using a device information collection utility, RESTful interface tool needs to be installed. If it is not installed, some logs required for the maintenance may not be gathered.

6.   When a message indicating restart appears, click **OK** to restart the server.

7.   See *the manual of each applications* to install the bundled software or confirm that the software is appropriate to your operating environment.

Now installation of applications is complete.

4. Setting up for Maintenance

We recommend setting up the following features for maintenance.

4.1 Specifying Memory Dump Settings (Debug Information)

This section explains the procedures for collecting a memory dump (debug information) in the server.

Important	When you restart the system to save the memory dump, a message informing you that the system is short of virtual memory might appear. Ignore this message and proceed with the restart. If you reset or restart the system again, the memory dump might not be saved normally.

1.   Right-click the left bottom of screen, and click **System** from the menu displayed.
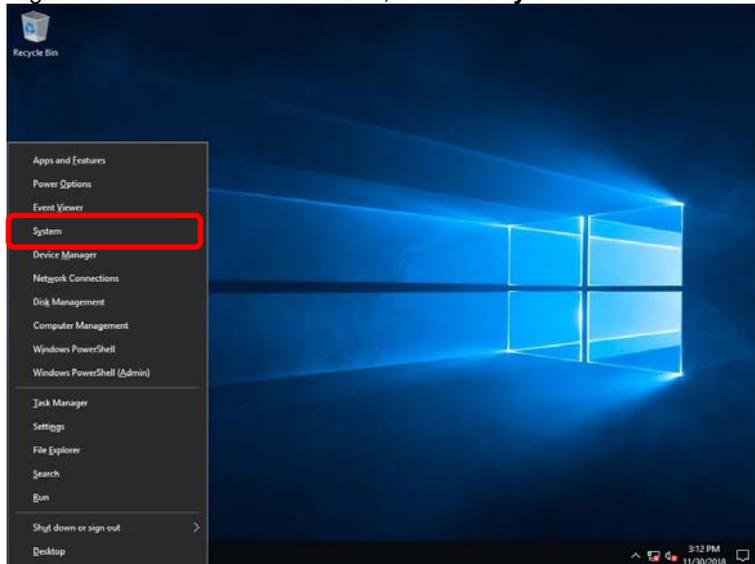
2.   Click **System info**.
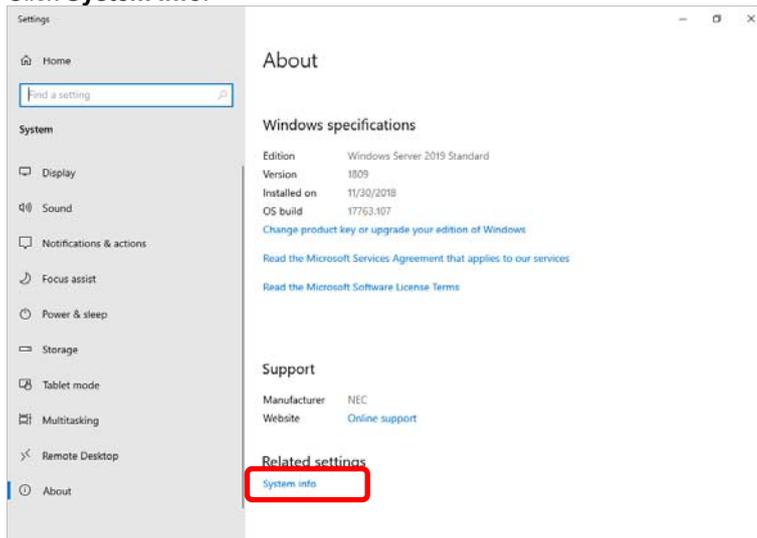
3.   Click **Advanced system settings**.
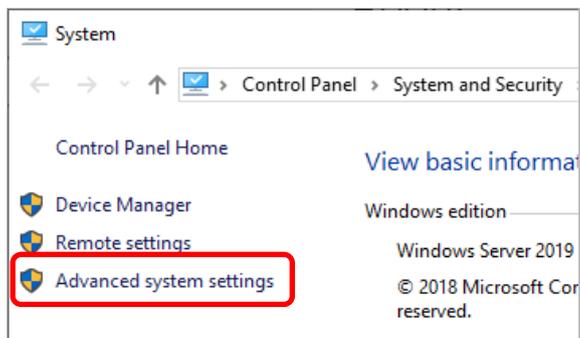
4.   In **Startup and Recovery**, click **Settings…**.
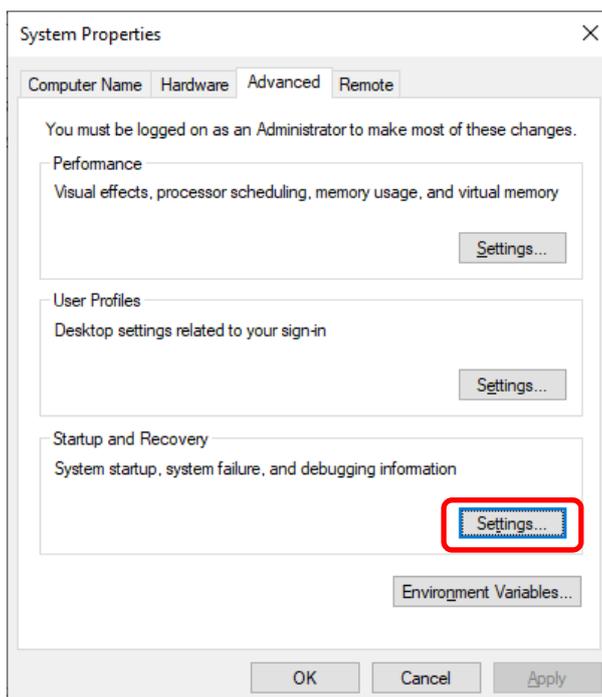
5.   Type a file name to store the debug information in the **Dump file** text box, and then click **OK**.
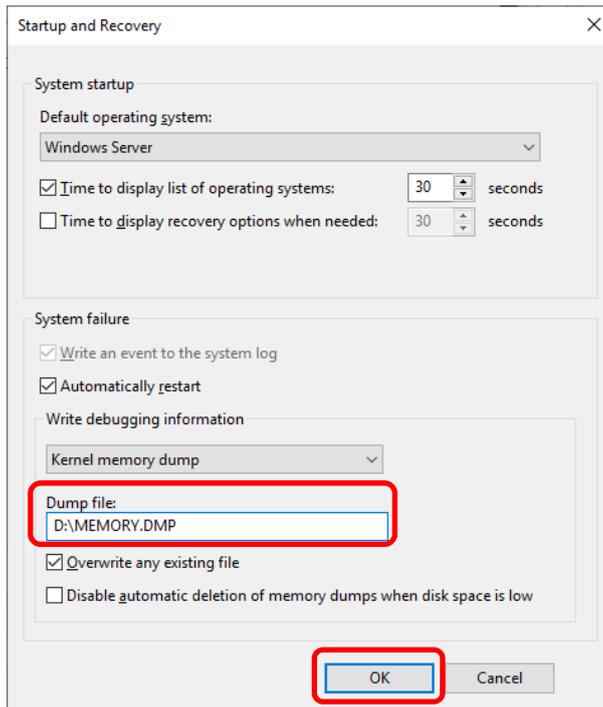
Note the following when specifying a dump file:

- We recommend specifying Kernel memory dump for Write debugging information.
- Specify a drive that has a free space of at least "the memory capacity mounted on the server 400 MB".
- The size of the debug information (memory dump) changes if DIMM is added. Make sure that the free space of the drive to store the debug information (memory dump) is sufficient.

6.   In **Performance**, click **Settings**.
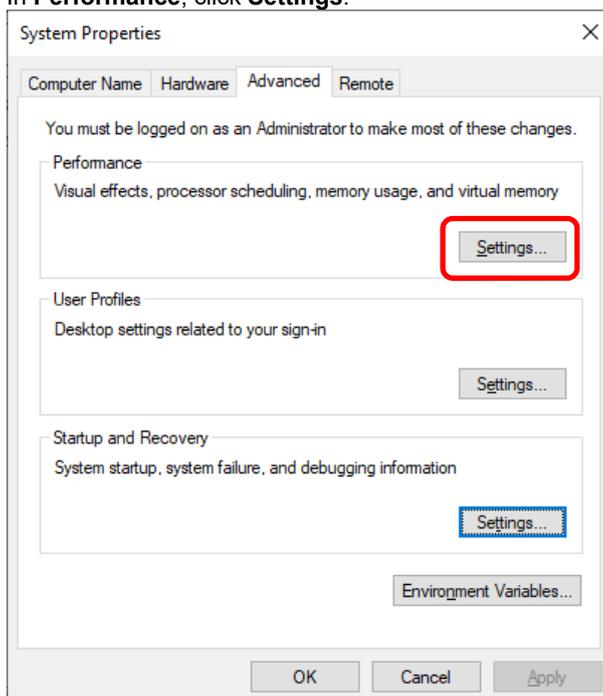
7.   Click the **Advanced** tab on the **Performance Options** window.
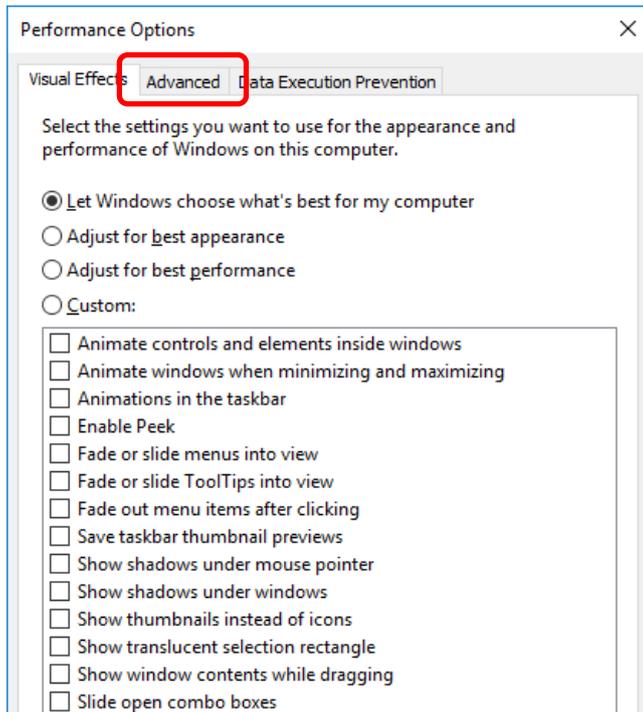
8.   In **Virtual memory**, click **Change…**.
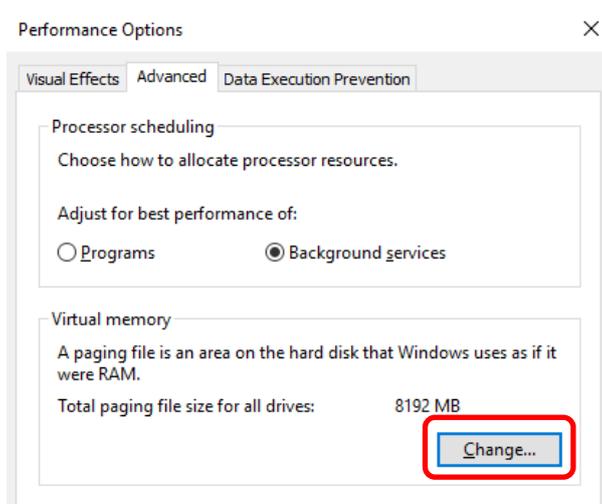
9. Clear the **Automatically manage paging file size for all drives** check box, and then click **Custom size**.
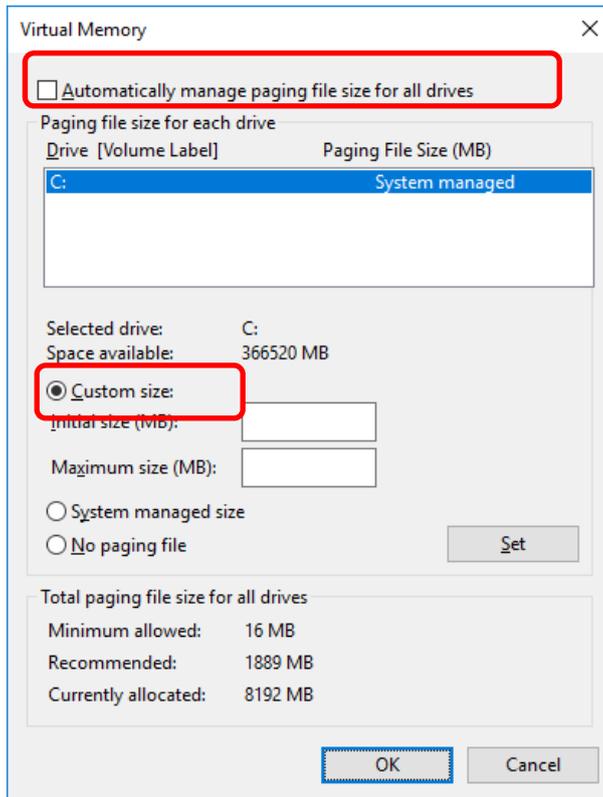
10. In **Paging file size for each drive**, enter the value equal or larger than the recommended value for

    Initial size, and the value larger than **Initial size** for **Maximum size**, and then click **Set**.
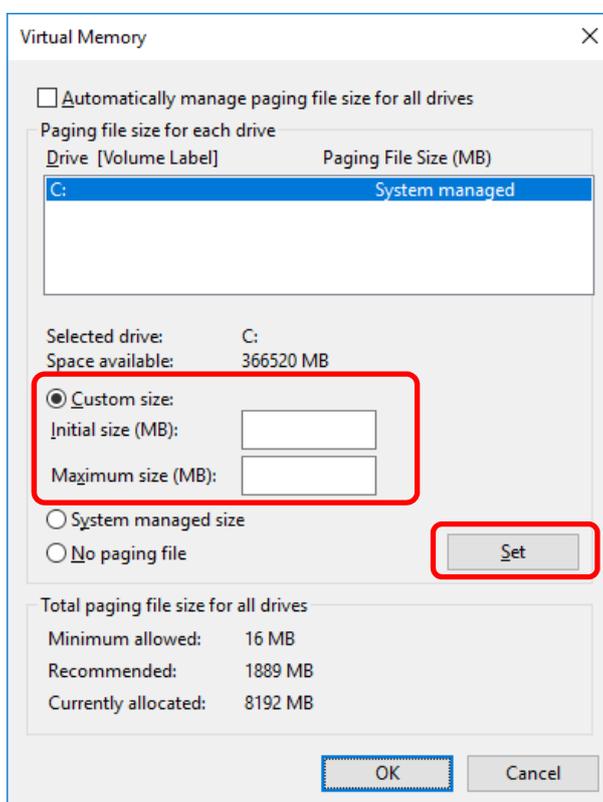
Note the following when specifying a paging file size:

- The paging file is used to collect debug information (dump file). The boot volume must have a paging file of its initial size ("total size of physical memory" + 400 MB (total size of physical memory + 1,100MB when the total size is 4 TB or more) is enough to store the dump file. Make sure to specify a sufficient paging file size.

- See "System Partition Size" in Chapter 1 (3.1 Precautions of Windows Server 2019 Installation) for recommended value.

- When DIMM is added, re-specify the paging file according to the increased memory size.

- If an error occurs in setting the paging file to a drive exceeding 2TB, close [Virtual memory] and [Performance Options], and then set in the following way.

  ex. Setting the paging file in drive C with 4096 MB as Initial size, 8192MB as Maximum size.

    1. Start command prompt as Administrator and execute the following command.

       ```
       wmic computersystem set AutomaticManagedPagefile=false
       wmic pagefileset delete
       ```

    2. Restart the Windows system.

    3. Start command prompt as Administrator and execute the following command.

       ```
       wmic pagefileset create name="C:\pagefile.sys"
       wmic pagefileset set InitialSize=4096, MaximumSize=8192
       ```

    4. Restart the Windows system.

11. Click **OK**.

    If a message to restart Windows appears, restart the system according to on-screen message.

    Specification of the memory dump settings is now complete.

4.2 How to Create a User-mode Process Dump File

The user-mode process dump file records information when an application error occurs.

If an application error occurs, get user-mode process dump information using the following procedures without closing the pop-up window that reported the error:

1. Right-click an empty area of the taskbar and then click **Task Manager** or press <Ctrl> + <Shift> + <Esc> keys to start Task Manager.
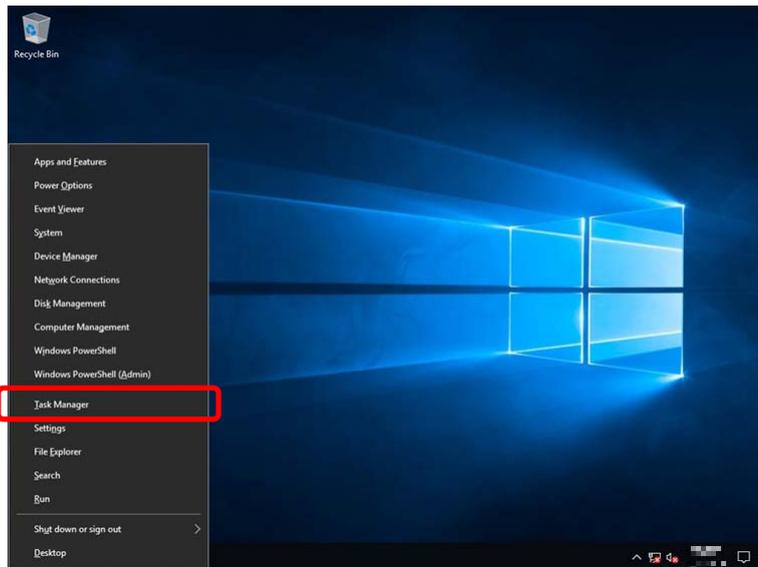
2. Click **More details**.
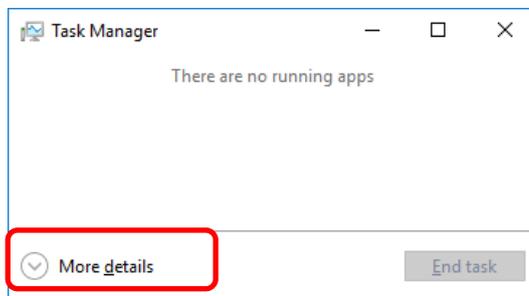
3. Click the **Processes** tab.

4. Right-click the name of the process that you want to get dump information for, and then click **Create Dump File**.

5. A dump file for the process is created in the following folder:

    C:\Users\(user name)\AppData\Local\Temp

    Tips   If the folder is not displayed, open Explorer, select **Hidden items** in the **View** tab.
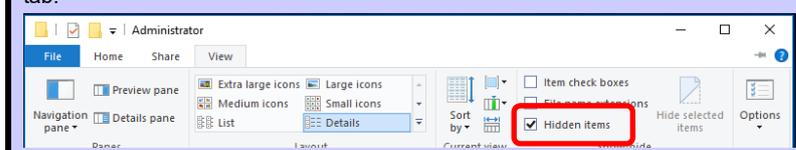
    Get the user-mode process dump file from the folder shown in step 5.

5. Backup of system information

After environment building, back up the setting information of the system in advance of any troubles.

- Back up system settings contained in system utility.

  See *User's Guide (2. Description on System Utility)* for details of system utility.

- Back up detail information of iLO 5.

  See *" iLO 5 User's Guide"* for details of procedure.

2

Maintenance

NEC Express5800 Series
Express5800/R120h-1M,R120h-2M
Express5800/R120h-1E,R120h-2E
Express5800/T120h
Express5800/R110j-1

This chapter explains maintenance of server, and what actions are to be taken in case of trouble when operating this server.

1. **Failure Information**

   Describes how to collect the failure information. See this section in case of a failure.

2. **Troubleshooting**

   Describes how to troubleshoot the server. See this section if you suspect a failure.

3. **Windows System Recovery**

   Describes Windows recovery setup. See this section if the Windows is corrupt.

1. Failure Information

If the server does not work normally, you can collect failure information by using the following way.

The failure information to be described is to be collected only at the request of your sales representative.

Important	**Do not reset during dumping memory or restarting the server even if the message of virtual memory shortage appears.**

1.1   Collecting Event Logs

To collect the various event logs of the server, follow the steps below.

Tips	If a STOP error, system error, or stall occurs, restart the system and then follow the steps below.

1.   Right-click the left bottom of screen, and click **Event Viewer** from the menu displayed.
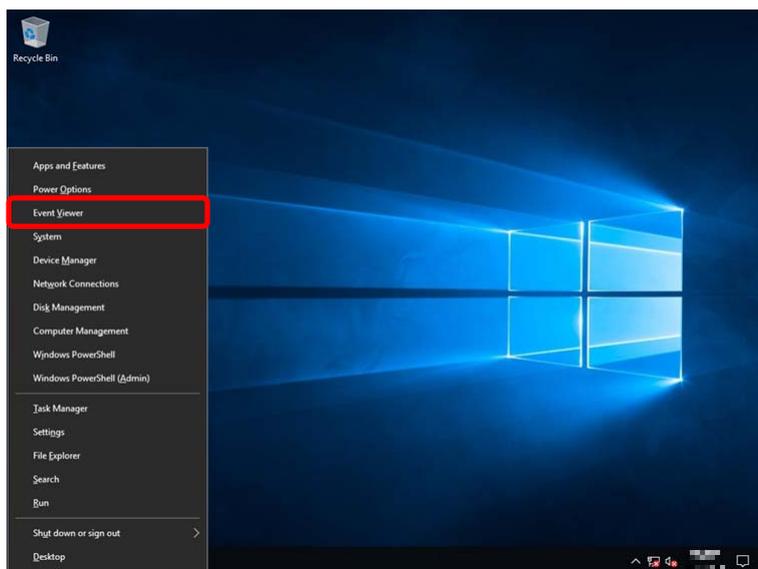
2.   Select the type of log in **Windows Logs**.

Application records events related to running applications.

Security records events related to security.

System records events that occur in Windows system components.
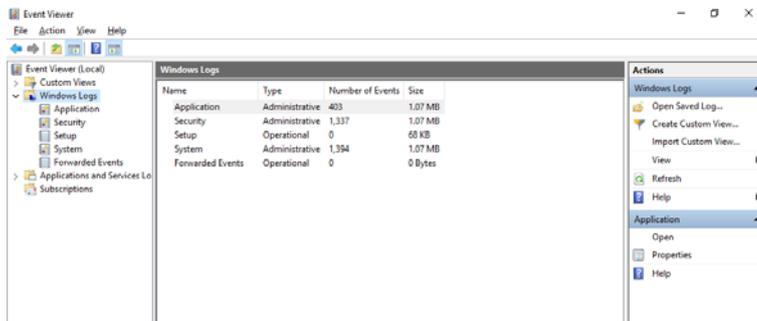
3.   Click **Save All Events As...** from **Action** menu
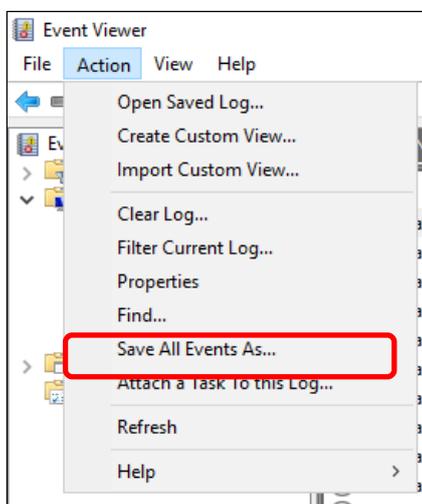
4.   Type the file name of the archived log in **File name**.

5.   Select the type of the log file you want to save in **Save as type**, and then click **Save**.

1.2 Collecting Configuration Information

This section describes how to collect hardware information or configuration.

Tips	If a STOP error, system error, or stall occurs, restart the system and then follow the steps below.

1. Right-click the left bottom of screen, and click **Run** from the menu displayed.
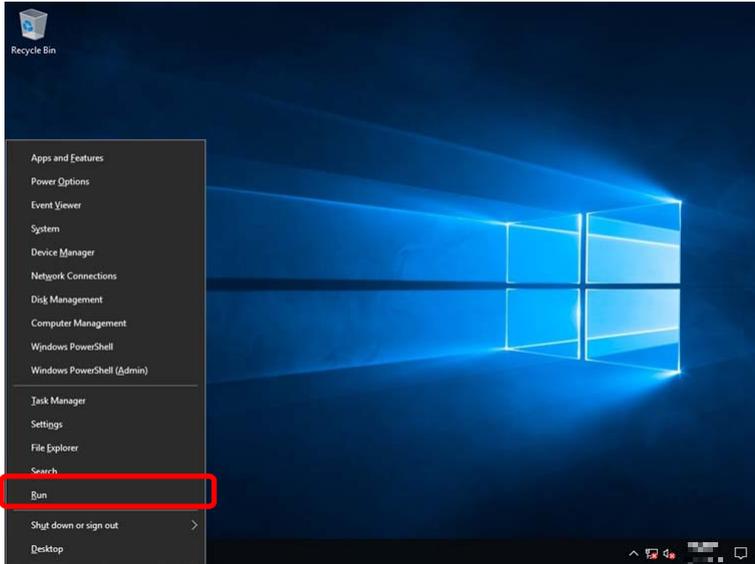
2. Type `msinfo32.exe`, and then press <Enter> key.
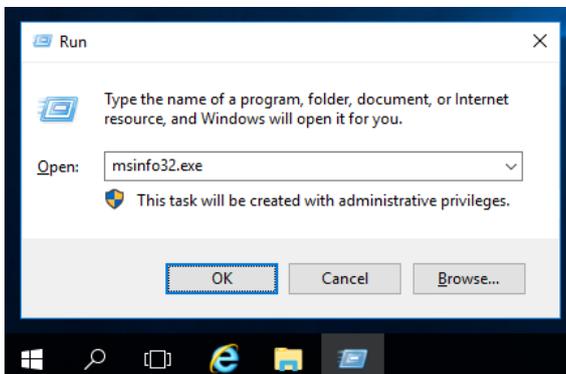
    System Information starts.

3. Click **Export** from **File** menu.

4. Type a file name to save in **File Name**, and then Click **Save**.

1.3 **Collecting User-Mode Process Dump**

The user-mode process dump is the failure information related to application errors.

For details, see *Chapter 1 (4.2 How to Create a User-Mode Process Dump File).*

1.4 **Collecting Memory Dump**

If an error occurs, the dump file will be saved to get necessary information. You can specify any location for saving the diagnostic information. For details, see *Chapter 1 (4.1 Specifying Memory Dump Settings (Debug Information)).*

Consult with your sales representative before dumping the memory. Dumping the memory while the server is in operating normally will affect the system operation.

| Important	**Do not reset during dumping memory or resetting the server even if the message of virtual memory shortage appears.**

2. Troubleshooting

If this system does not operate as intended, check it according to the contents of your document before sending it for repair. If an item in the checklist corresponds with a problem you are experiencing, follow the processing instructions.

The other contents check Maintenance Guide.

2.1 Problem of Using Internal Devices and Other Hardware

[?] **Flow Control of LAN controller**

→ When the Flow Control is set as **Auto Negotiation**, **Rx & Tx Enabled**, **Tx Enabled or Transmit Enabled**, **Receive & Transmit Enabled** in case that the packet processing of the operating system stops due to some factors, such as a system hang, with a high transmission load, pause frames may be sent continuously.

In this case, the buffer in the switch runs out because a large amount of packets is stored in the switch, which may affect all the telecommunication devices connected to the server. To avoid this, set the Flow Control as **Disabled**.

3. Windows System Recovery

Recover the Windows system by using the following instructions if the system does not work normally.

Note	• After recovering Windows, install drivers and the Starter Pack referring to *Chapter 1 (3.5 Setup of Device Drivers)* and Chapter1 *(3.3 Standard Program Package Installation).* • If the Windows system cannot find hard disk drives, you cannot recover the Windows system.

3.1 Recovery of Windows Server 2019

If the Windows does not start normally, you can recover it using the feature of the Windows installation disc. To run this feature, start the installation disc, and then choose **Repair your computer** in the setup wizard. We recommend that this option is performed by the system administrator.

If the RAID controller driver is required, take the following steps:

Note	When the server configures an on-board RAID controller and an internal optical disc drive, load the driver from a removable media. Copy the following folder from Starter Pack DVD to a removable media in advance. **\software\006\drivers\sw_raid1_driver**

1. After turning on the server or restarting the server, insert the OS installation disc into the server.

2. Press <F11> key during POST to start Boot Menu.

3. In **One-Time Boot Menu**, select the optical disc drive to which OS installation disc is set by Step 1, and then exit the menu.

4. When the message "Press any key to boot from CD or DVD..." appears on the upper of the screen, press <Enter> key to boot from the disc.

    While boot-up proceeds, the message "Loading files..." appears.

5. Choose **Repair your computer** in the setup wizard.

6. Click **Troubleshoot**.

7. Click **Command Prompt**.

8. After setting Starter Pack DVD to the drive, run the following command to load the driver:

    ("D:" means a drive name of DVD and this name depends on your system)

    For on-board RAID controller:

    ```
    drvload D:\software\006\drivers\sw_raid1_driver\SmartDQ.inf
    ```

Tips	● When the server configures an on-board RAID controller and an internal optical disc drive, load the driver from a removable media. ("E:" means a drive name of removable media and this name depends on your system) drvload E:\sw_raid1_driver\SmartDQ.inf

- The volume label for each drive can be checked from the display result of the dir command.

  Example: **dir C:**

9.   Exit the command prompt.

The driver installation is completed.

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3

Appendix

1. **List of Windows Event Logs**

   Shows a list of Windows event logs.

1. List of Windows Event Logs

OS

Event Log

ID	Source	Level	Message (Description)
	Timing when an event is logged		Action

All Windows OS

System Log

ID	Source	Level	Message (Description)
1	VDS Basic Provider	Error	Unexpected failure. Error code : 32@01000004
	At the time of a USB Device connection		When it's at the time of a USB Device connection, it's no problem.
51	Cdrom	Warning	Error detected on the device \Device\CdRom0 during the paging operation.
	When installing an OS		This event may be registered in the event viewer, but this does not affect system operation.
56	Application Popup	Error	The description for Event ID 56 from source Application Popup cannot be found. Either the component that raises this event is not installed on your local computer or the installation is corrupted. You can install or repair the component on the local computer. If the event originated on another computer, the display information had to be saved with the event. The following information was included with the event: PCI XXXXXXXXXXXXXXXXXX The message resource is present but the message was not found in the message table * A different number replaces X depending on the connection status of the LAN board.
	When installing an OS, starting system, or applying Starter Pack		When multiple N8104-157 are loaded it is registered, but does not affect system operation.
129	SmartDQa	Warning	Reset was issued to the device \Device\RaidPort(x). (x is any number)
	While the system is running		If this message has been registered as a log during heavy I/O, there is no problem since the OS has succeeded in retry. Continue using.
129	SmartPqi	Warning	Reset was issued to the device \Device\RaidPort(x). (x is any number)
	While the system is running		Even if the message is registered in the log, there is no problem because the OS has successfully completed the retry. You don't need any changes.
157	Disk	Warning	Disk x is suddenly removed.
	When creating a RAID		If you create new RAID on Windows, this event can be registered, but this does not affect the system operation.

Windows Server 2019

System Log

4	l2nd	Warning	HPE Ethernet 10Gb 2-port 530SFP+ Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
4	l2nd	Warning	HPE Ethernet 10Gb 2-port 530T Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
4	l2nd	Warning	HPE FlexFabric 10Gb 2-port 533FLR-T Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
4	l2nd	Warning	QLogic BCM57810 10 Gigabit Ethernet (NDIS VBD Client) #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS		This event does not affect system operation.
4	l2nd2	Warning	HPE Ethernet 10/25Gb 2-port 622FLR-SFP28 Converged Network Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
4	l2nd2	Warning	HPE Ethernet 10Gb 2-port 521T Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
4	l2nd2	Warning	HPE Ethernet 10/25Gb 2-port 621SFP28 Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
4	q57nd60a	Warning	HPE Ethernet 1Gb 2-port 332i Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
4	q57nd60a	Warning	HPE Ethernet 1Gb 4-port 331i Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
4	q57nd60a	Warning	HPE Ethernet 1Gb 4-port 331T Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
4	q57nd60a	Warning	HPE Ethernet 1Gb 4-port 331FLR Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.

4	q57nd60a	Warning	HPE Ethernet 1Gb 2-port 332T Adapter #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
4	b57nd60a	Warning	Broadcom NetXtreme Gigabit Ethernet #xx: The network link is down. Check to make sure the network cable is properly connected.
	When installing an OS		This event does not affect system operation.
9	qefcoe	Warning	The SAN link is down for port WWN XX:XX:XX:XX:XX:XX:XX:XX. Check to make sure the network cable is properly connected. (X is any number)
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
11	Elxfc	Error	The driver detected a controller error on Device\RaidPortX. (X is any number)
	When applying Standard Program Package		This event does not affect system operation.
27	e1rexpress	Warning	HP Ethernet 1Gb 2-port 361T Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	e1rexpress	Warning	HP Ethernet 1Gb 4-port 366T Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	e1rexpress	Warning	HP Ethernet 1Gb 4-port 366FLR Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	e1iexpress	Warning	Intel(R) I350 Gigabit Network Connection #xx Network link is disconnected.
	When installing an OS		This event does not affect system operation.
27	i40eb	Warning	HPE Ethernet 1Gb 2-port 368i Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	i40eb	Warning	HPE Ethernet 1Gb 4-port 369i Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	i40eb	Warning	HPE Ethernet 1Gb 2-port 368FLR-MMT Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	i40eb	Warning	HPE Ethernet 10Gb 2-port 568FLR-MMSFP+ Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	i40eb	Warning	HPE Ethernet 10Gb 2-port 568FLR-MMT Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.

27	ixgbs	Warning	HPE Ethernet 10Gb 2-port 562FLR-T Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	ixgbs	Warning	HPE Ethernet 10Gb 2-port 562T Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	ixgbi	Warning	HPE Ethernet 10Gb 2-port 562FLR-T Adapter #xx Network link is disconnected.
	When installing an OS		This event does not affect system operation.
27	ixgbi	Warning	HPE Ethernet 10Gb 2-port 562T Adapter #xx Network link is disconnected.
	When installing an OS		This event does not affect system operation.
27	i40ea	Warning	HPE Ethernet 10Gb 2-port 562SFP+ Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	i40ea	Warning	HPE Ethernet 10Gb 562SFP+ Adapter #xx Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	i40ea	Warning	HP Ethernet 10Gb 2-port 562FLR-SFP+ Adapter Network link is disconnected.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
27	i40ei65	Warning	The description for Event ID 27 from source i40ei65 cannot be found. Either the component that raises this event is not installed on your local computer or the installation is corrupted. You can install or repair the component on the local computer.
	When installing an OS		This event does not affect system operation.
56	qebdrv	Warning	NTPNP_PCIxxxx: RDMA has been implicitly disabled due to RDMA interface incompatibility between NDIS Miniport (ver x.xx.xx.x) and VBD (ver x.xx.x.x) drivers. VBD driver upgrade is required. * "x" depends on the system environment.
	When applying Standard Program Package		This event does not affect system operation.
69	i40eb	Warning	HPE Ethernet xGb x-port xxxx Adapter The driver for the device detected a newer version of the NVM image than expected. Please install the most recent version of the network driver. * "x" depends on the system environment.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.
69	i40ei65	Warning	The description for Event ID 69 from source "i40ei65" cannot be found. Either the component that raises this event is not installed on your local computer or the installation is corrupted. You can install or repair the component on the local computer.
	When installing an OS, starting system, or applying Standard Program Package		This event does not affect system operation.

129	SmartDQa	Warning	Reset was issued to the device \Device\RaidPort(x). (x is any number)
	While the system is running		If this message has been registered as a log during heavy I/O, there is no problem since the OS has succeeded in retry. Continue using.
129	SmartPqi	Warning	Reset was issued to the device \Device\RaidPort(x). (x is any number)
	While the system is running		Even if the message is registered in the log, there is no problem because the OS has successfully completed the retry. You don't need any changes.
134	Microsoft-Windows-Time-Service	Warning	NtpClient was unable to set a manual peer to use as a time source because of DNS resolution error on 'time.windows.com,0x1'. NtpClient will try again in 15 minutes and double the reattempt interval thereafter. The error was: No such host is known. (0x80072AF9)
	While the system is running		This event does not affect system operation if it is not recorded after connecting to the internet.
157	Disk	Warning	Disk x is suddenly removed.
	When creating a RAID		If you create new RAID on Windows, this event can be registered, but this does not affect the system operation.

225	Kernel-PnP	Warning	The application YYY with process id XXX stopped the removal or ejection for the device ZZZ.
			
			* ZZZ : Instance name of the device
			     YYY : Name of the process that was using the device
			       XXX : ID of the process that was using the device

	When applying Standard Program Package		This event does not affect system operation.
7023	Service Control Manager	Error	"xxxxxxxx service terminated with the following error: A device attached to the system is not functioning."
	When running an OS for the first time		This event does not affect system operation if it is recorded only on the first startup and not recorded repeatedly.
7023	Service Control Manager	Error	The Spooler service terminated with the following error: Ran out of memory

	When installing an OS		There is no problem when it occurs at following conditions.
			  1. Occurs once during OS installation, and it does not register continuously.
			  2. After sign-in to the system, the service started normally.

7030	Service Control Manager	Error	The Printer Extensions and Notifications service is marked as an interactive service. However, the system is configured to not allow interactive services. This service may not function properly.
	When running an OS for the first time		This event does not affect system operation if it is recorded only on the first startup and not recorded repeatedly.
10010	Microsoft-Windows-DistributedCOM	Error	The server {XXXXXXXX-XXXX-XXXX-XXXX-XXXXXXXXXXXX} did not register with DCOM within the required timeout.
	While the system is running		This event does not affect system operation.
10149	Microsoft-Windows-WinRM	Warning	The WinRM service is not listening for WS-Management requests.
	When restarting an OS		There is no problem to ignore it when WinRM event 10148 (The WinRM service is not listening for WS-Management requests.) is registered after soon.

Application Event Log

1015	Microsoft-Windows-Security-SPP	Error	Detailed HRESULT. Returned hr=0xC004F022, Original hr=0x********
	When restarting an OS		This event does not affect system operation if it is not recorded repeatedly after activating the Windows.
3007	EvntAgnt	Warning	Error opening event log file Parameters. Log will not be processed. Return code from OpenEventLog is 87.
	When SNMP is effective		Every restarting it's registered, it's no problem.
3007	EvntAgnt	Warning	Error opening event log file State. Log will not be processed. Return code from OpenEventLog is 87.
	When SNMP is effective		Every restarting it's registered, it's no problem.
8198	Microsoft-Windows-Security-SPP	Error	License Activation (slui.exe) failed with the following error code: hr=0x******** Command-line arguments: RuleId=*****************************
	When restarting an OS		This event does not affect system operation if it is not recorded repeatedly after activating the Windows.

Applications and Services Logs

1	Microsoft-Windows-SMBWitnessClient	Error	Witness Client initialization failed with error (The system cannot find the file specified.)
	When installing an OS		This event does not affect system operation if it is recorded only on the first startup and not recorded repeatedly.
69	Microsoft-Windows-AppModel-Runtime	Error	Failed with 0x490 modifying AppModel Runtime status for package ************************* for user ********* (current status = 0x0, desired status = 0x20).
	When running an OS for the first time		This event does not affect system operation if it is recorded only on the first startup and not recorded repeatedly.
200	Microsoft-Windows-DeviceSetupManager	Warning	A connection to the Windows Update service could not be established.
	While the system is running		This event does not affect system operation if it is not recorded after connecting to the internet.
201	Microsoft-Windows-DeviceSetupManager	Warning	A connection to the Windows Metadata and Internet Services (WMIS) could not be established.
	While the system is running		This event does not affect system operation if it is not recorded after connecting to the internet.
202	Microsoft-Windows-DeviceSetupManager	Warning	The Network List Manager reports no connectivity to the internet.
	While the system is running		This event does not affect system operation if it is not recorded after connecting to the internet.
215	AppReadiness	Error	'ART:UserFirstLogon' failed for <user>. Error:'Illegal operation attempted on a registry key that has been marked for deletion.' (0 seconds)
	When installing an OS		This event does not affect system operation if it is not recorded repeatedly.

| 360 | Microsoft-Windows-User Device Registration | Warning | Windows Hello for Business provisioning will not be launched.
Device is AAD joined (AADJ or DJ++): Not Tested
User has logged on with AAD credentials: No
Windows Hello for Business policy is enabled: Not Tested
Windows Hello for Business post-logon provisioning is enabled: Not Tested
Local computer meets Windows hello for business hardware requirements: Not Tested
User is not connected to the machine via Remote Desktop: Yes
User certificate for on premise auth policy is enabled: Not Tested
Machine is governed by none policy. |
| | When restarting an OS | | There is no problem when it occurs at the environment that is not registered to Microsoft Azure AD. |

Revision Record

Document Number	Date	Notes
CBZ-002473-148-00	April 2019	The first edition