Windows Server 2016
Installation Guide

NEC Express Server
Express5800 Series

Express5800/T110g-S, T110g-E, R110g-1E

Chapter 1 Installing Windows

Chapter 2 Maintenance

Chapter 3 Appendix

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Notations 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 refers to the following.

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

Removable media

Unless otherwise stated, *removable media* described in this document refers to the following.

- USB flash drive
- 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 2016	Windows Server 2016 Standard
	Windows Server 2016 Datacenter
	Windows Server 2016 Essentials
Windows Server 2012 R2	Windows Server 2012 R2 Standard
	Windows Server 2012 R2 Datacenter
Windows Server 2012	Windows Server 2012 Standard
	Windows Server 2012 Datacenter

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Keep this document for future reference.

Latest editions

This document was created based on the information available at the time of its creation. The screen images, messages and procedures are subject to change without notice. Substitute as appropriate when content has been modified.

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

http://www.nec.com/

NEC Express5800 Series
Express5800/ T110g-S, T110g-E, R110g-1E

1

Installing Windows

This chapter describes how to install Windows. Read through this chapter to set up the Windows correctly.

1. **Before Starting Setup**
   Describes applicable server models, installable Windows operating systems and supported upgrade methods.

2. **Installing Windows Server 2016**
   Describes how to install Windows Server 2016.

3. **Applying Starter Pack**
   Describes how to apply Starter Pack.

4. **Setting Up Device Drivers**
   Describes how to install and set up Device Drivers.

5. **License Authentication**
   Describes how to Activating Windows to continue to use the system.

6. **Setup of Windows Server 2016 NIC Teaming (LBFO)**
   Describes how to Setup of Windows Server 2016 NIC Teaming (LBFO).

7. **Setting Up for Solving Problems**
   Describes the features that must be set up in advance so that the server can recover from any trouble early and precisely.

1. Before Starting Setup

This section lists the confirmation items for setting up the Windows operating system.

1.1 Supported Models

The following models are supported by this document.

Model Names	**Express5800/T110g-S, T110g-E, R110g-1E**

1.2 Supported Windows OS

You can install the following editions of Windows operating system. Windows Server 2016 is 64-bit(x64) only.

Windows OS		**Boot mode**	
		UEFI	**Legacy**
Windows Server 2016	Standard	N/A	✓
	Datacenter	N/A	✓
	Essentials	N/A	N/A

✓: supported

1.3 Install Options

In this guide, the installation options of Windows Server 2016 are written as below.

- GUI-based installation option

  Witten as “Desktop Experience” in this guide.

- CUI-based installation option

  Witten as “Server Core” in this guide.

Important **“Nano Server” is not supported on Express 5800 series servers.**

1.4 Supported Mass Storage Controllers

The Starter Pack supports the following mass storage controllers.

	T110g-S	T110g-E	R110g-1E
Controllers supported on an operating system by applying the Starter Pack			
Onboard RAID Controller (LSI Embedded MegaRAID)	✓	✓	✓
N8103-168 RAID Controller (1GB, RAID 0/1/5/6)	✓	✓	✓
N8103-171 RAID Controller (0MB, RAID0/1)	✓	✓	✓
N8103-172 RAID Controller (512MB, RAID 0/1)	✓	✓	✓
N8103-173 RAID Controller (512MB, RAID 0/1/5/6)	✓	✓	✓
N8103-174 RAID Controller (1GB, RAID 0/1/5/6)	✓	✓	✓
Other Options			
N8103-142 SAS Controller	✓	✓	✓
N8103-161 RAID Controller (1GB, RAID 0/1/5/6)	N/A	N/A	✓
N8190-153 Fibre Channel Controller (1ch)(8Gbps/Optical)	N/A	N/A	✓
N8190-154 Fibre Channel Controller (2ch)(8Gbps/Optical)	N/A	N/A	✓

✓: supported

1.5 Supported Optional LAN boards

The Starter Pack supports the following LAN boards.

	T110g-S	T110g-E	R110g-1E
LAN boards supported on an operating system by applying the Starter Pack			
N/A	N/A	N/A	N/A
Other Options			
N8104-132 Dual Port 1000BASE-T Adapter	○	○	○
N8104-133 Quad Port 1000BASE-T Adapter	○	○	○
N8104-138 1000BASE-T Adapter	○	○	○
N8104-153 Dual Port 10GBASE-T Adapter	N/A	N/A	○

✓: supported

1.6 In-place Upgrade to Windows Server 2016

Performing an in-place upgrade from Windows Server 2012 R2 or Windows Server 2012 to Windows Server 2016 is not recommended because this may adversely affect files and the registry.

If you want to use Windows Server 2016, please read this document (Chapter1 “2. Installing Windows Server 2016”) and back-up necessary user files prior to installation.

Tips

- An In-place Upgrade refers to upgrading the operating system to Windows Server 2016 by overwriting the existing operating system, Windows Server 2012 R2 or Windows Server 2012, on the same server hardware.
- Performing upgrade from evaluation version to release version is not recommended since this may unexpectedly affect to system or applications.

1.7 Downloads

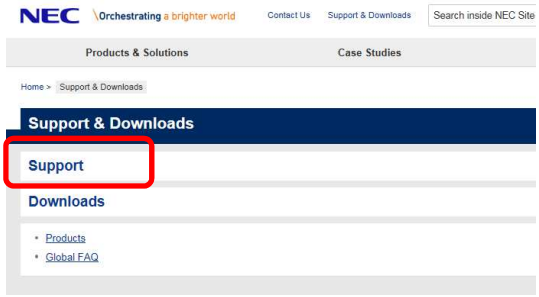
First of all, download the Starter Pack for the applicable model.

1. Downloading the Starter Pack.

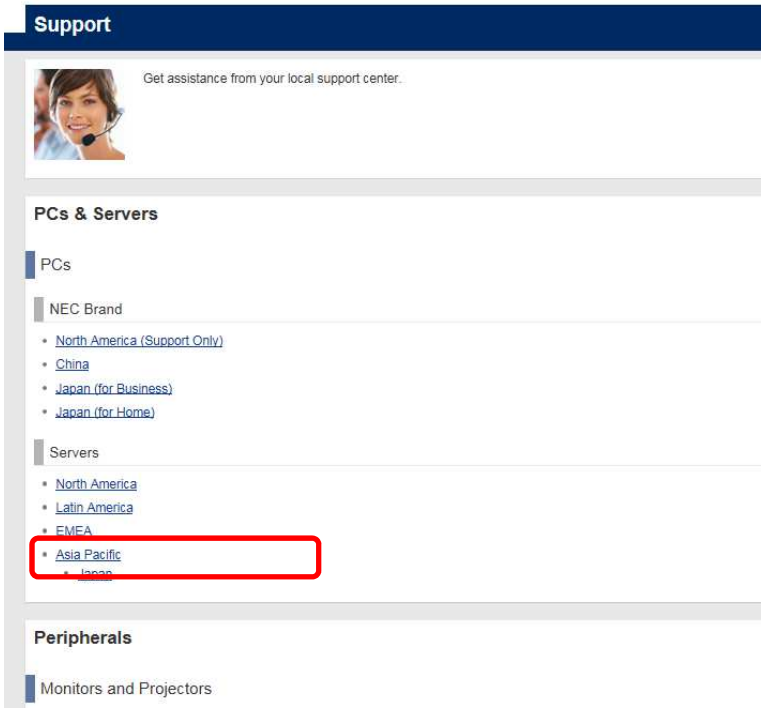
(1) Go to NEC Corporation Web site at http://www.nec.com/.

Click **Support & Downloads**.

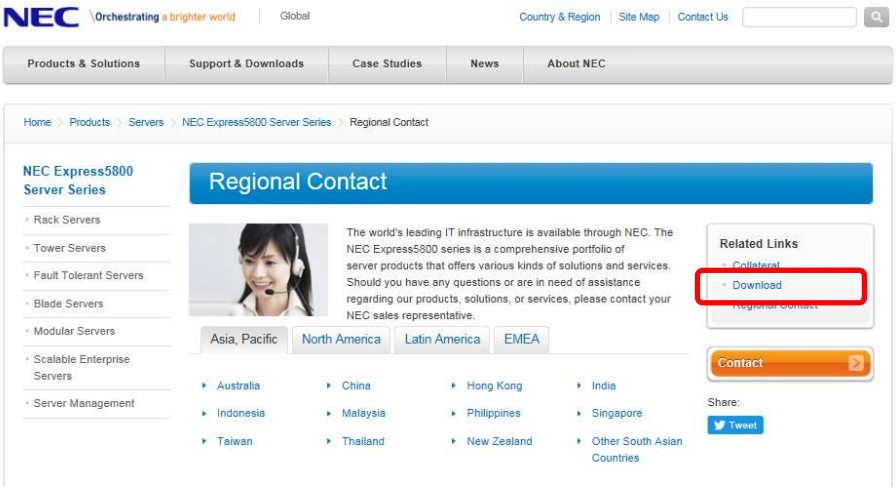
(2) Click **Support**.



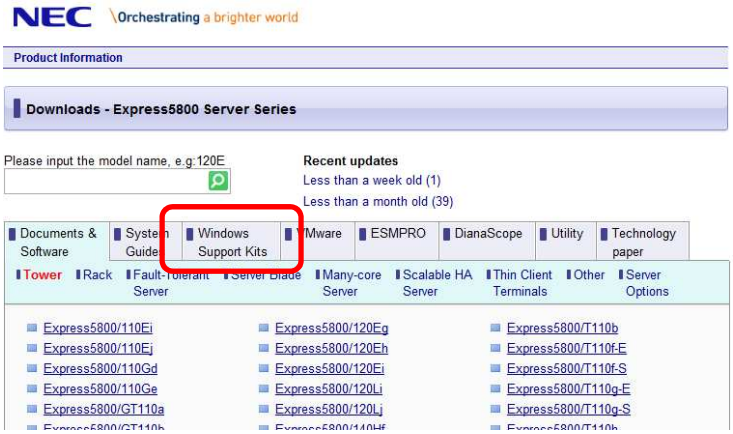
(3) Under “PCs & Servers”, find “Servers” and click **Asia Pacific**.



(4) On “Regional Contact” page, and “Related Links” and click **Download**.



(5) On “Downloads - Express5800 Server Series” page, click Windows Support Kits tab.



(6) On “NEC Express5800 Server Series Microsoft® Windows Server® 2016 Support Kit” page, select the appropriate model name on the list of supported models.

(7) Scroll down to Windows Server 2016 Support Kit section and download the module.

2. After downloading the Starter Pack, unzip the file in any folder (e.g. C:¥TEMP) on the hardware.
Folders which include double-byte characters or spaces in their names cannot be specified.

Tips If folder hierarchy is too deep, extraction of setup programs may not be performed correctly.

If you copy the Starter Pack to an optical disk such as a DVD, copy all the files and folders without changing the structure.

Tips If you use a DVD, write the data in a format compatible with Windows operating system.

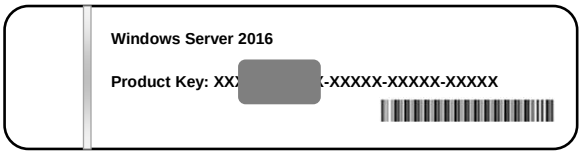
3. After copying the modules, delete all the files and unzipped folders on the hardware.

Download is now complete.

2. Installing Windows Server 2016

2.1 Before Starting Setup

Before you install Windows Server 2016, read this chapter carefully.

COA label
Scrape off with a coin or the like lightly the scratch that covers a part of the product key on the Certificate of Authenticity (COA) label. When you scrape, be careful not to break the part that the product key is printed on. 
Windows Activation
To activate Windows Server 2016, enter the Product Key written on the COA label. The COA label of Windows Server 2016 is attached to the operating system media package or the server. See *Chapter 1(5. License Authentication)*, for details.
Starter Pack Application
Starter Pack installs necessary drivers to Express5800 series servers. Be sure to apply the Starter Pack.
BIOS Update
A BIOS update may be required to install Windows Server 2016. To know if a BIOS update is required, check if there are applicable modules; go to [Windows Server 2016 Support kits] (shown in [1.7 Downloads]). For the update procedure, refer to “Readme.txt” included in the downloaded data or instructions shown on the above web site when downloading the module.
BMC Firmware/SDR Updates
BMC Firmware/SDR updates may be required to install Windows Server 2012 R2. To know if BMC Firmware/SDR updates are required, check if there are applicable modules; go to [Windows Server 2016 Support Kits] (shown in [1.7 Downloads]). For the update procedures, refer to “Readme.txt” included in the downloaded data or instructions shown on the above web site shown when downloading the modules.

BIOS setting

Change **Boot Mode** to **Legacy Mode**. See *Chapter 2 (1. System BIOS)* in *Maintenance Guide* for details.

Boot → **Boot Mode** → **Legacy**

Select IDE Mode for SATA Mode when installing the OS. The initial setting is IDE Mode.

1. While NEC's logo is being displayed on the screen, press F2 key to enter the system BIOS.
2. When the BIOS SETUP UTILITY appears, confirm if the SATA drive setting is set to IDE Mode.

   [Advanced] - [SATA Configuration] - [SATA Mode] : IDE Mode

Hardware configuration

The following hardware configurations require special procedures.

Setup when there are multiple logical drives

When installing Windows Server 2016, disk order and numbers displayed on the screen to create partitions may not be the same as those of physical slots. The installation destination must be judged from the capacity of the hard disk drive or the partition size. If you choose a wrong hard disk drive, existing data may be deleted accidentally.

Important **Refer to the following website for the details.**
http://support.microsoft.com/kb/937251/

Reinstalling to a mirrored volume

Remove an MO device before installing an OS. Some peripheral devices need to be halted before installation. Refer to the manual provided with the peripheral devices for how to set a device appropriate to installation.

Peripheral devices such as RDX/MO

Remove an MO device before installing an OS. Some peripheral devices need to be halted before installation. Refer to the manual provided with the peripheral devices for how to set a device appropriate to installation.

DAT, LTO, and similar media

Do not set media that is unnecessary to installation during setup.

Setup when mass memory is installed

If mass memory is installed in your system, the large size of paging file is required at installation. Thus, the partition size for storing debug information (dump file) may not be secured.
If you fail to secure the dump file size, allocate the required file space to multiple disks by performing 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 store the debug information (required dump file size) by referring to *Chapter 1 (7. Setup for Solving Problems)*.

If the hard disk drive does not have enough space 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 space cannot be secured for the paging file, perform either of the following after installing 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 the installed memory size + 400 MB 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, the size of the paging file must be "installed memory size + 400 MB" 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 × 0.5" **D: Paging file whose size is "installed memory size × 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.

— **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.

<When specifying the file named "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:

- Pay strict attention to edit the registry.
- The setting is applied after restarting the system.
- Specify a drive that has free space of "installed memory size + 400 MB" 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 virtual memory. Specify the paging file size so that sufficient virtual memory can be allocated in the entire system.

System partition size

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	= 15,200MB
Paging file size (recommended)	= installed memory size × 1.5
Dump file size	= installed memory size + 400MB
Application size	= as required by the application

Server Core

Size required to install the OS	= 10,300MB
Paging file size (recommended)	= installed memory size × 1.5
Dump file size	= installed memory size + 400MB
Application size	= as required by the application

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

15,200MB ＋ (2,048MB × 1.5) ＋ 2,048MB ＋ 400MB ＋ 100MB

＝ 20,820 MB

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

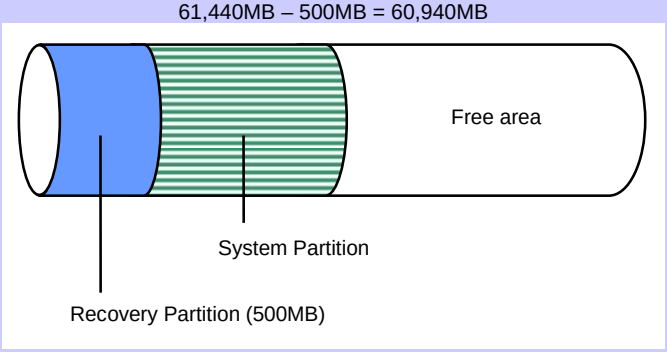
- The above paging file sizes are recommended for collecting debug information (dump file). The initial size of the Windows partition paging file must be large enough to store dump files.
  Make sure you set a sufficient paging file size. If the paging file is insufficient, there will be a virtual memory 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 "size of internal memory + 400 MB".
- 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.

Tips

When creating a partition, Windows OS creates the Recovery Partition (500MB) at the top of hard disk drive.
For example, when 61,440MB is specified for partition size, the area available free area is calculated as follows:

61,440MB – 500MB = 60,940MB



Windows Server 2016 Hyper-V support

Refer to the following web site for information related to Windows Server 2016 Hyper-V.
http://www.58support.nec.co.jp/global/download/w2016/hyper-v/hyper-v-ws2016.html

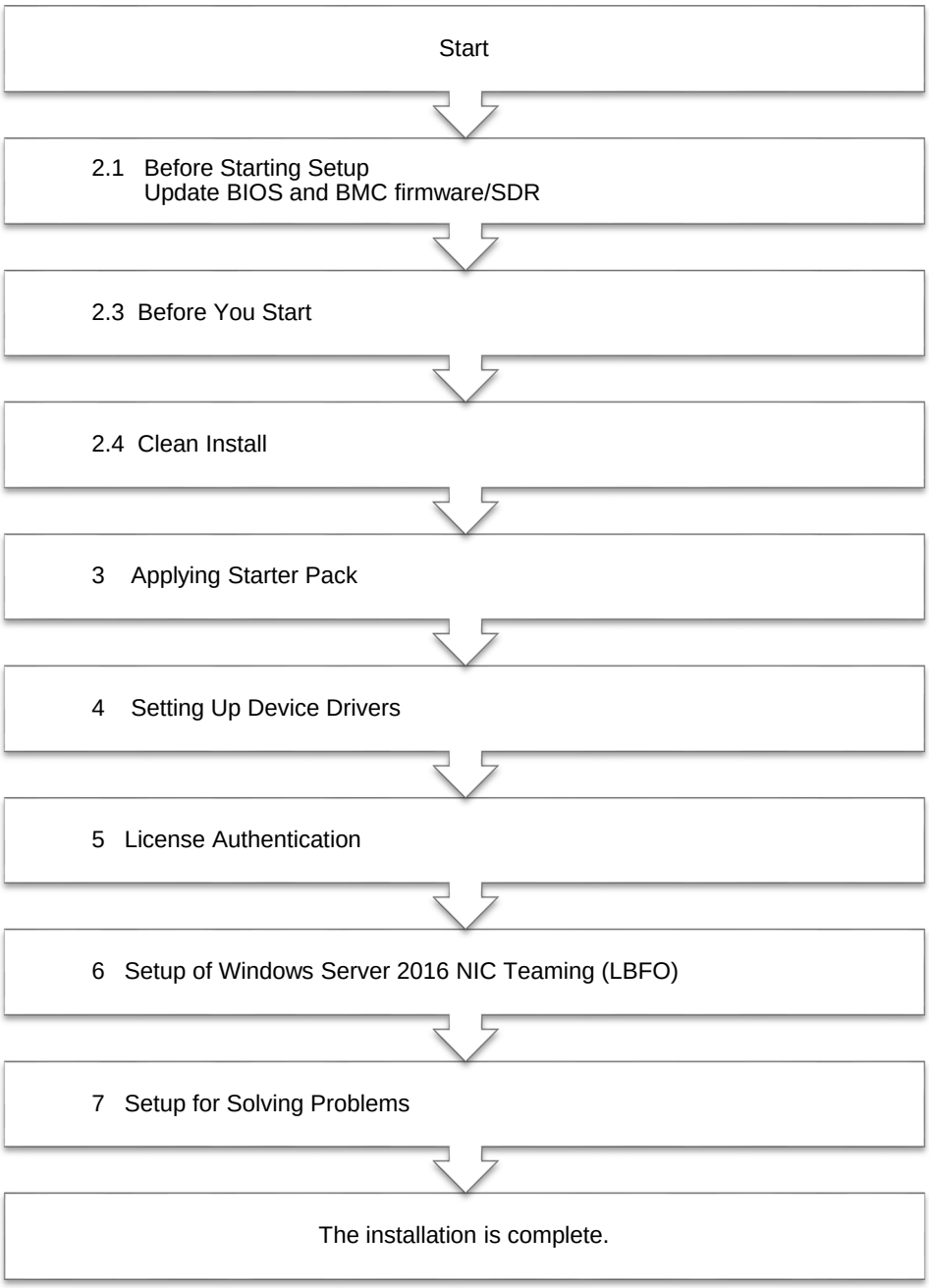
Support for NIC teaming in Windows Server 2016

The NIC teaming feature, which used to be provided by network interface card (NIC) vendors, is built into Windows Server 2016. In Windows Server 2016, this feature is also called "load balancing and failover (LBFO)".
Refer to *Chapter 1 (6. Setup of Windows Server 2016 NIC Teaming (LBFO))* and specify any required settings.

Device Guard feature and Credential Guard feature

Device Guard feature and Credential Guard feature are not available for Express Server.

2.2 Setting Up the Operating System



If you need to install applications after installing the operating system, refer to the application installation guides.

2.3 Before You Start

Before you install Windows Server 2016, check the BIOS settings and hard disk environment (disk array configuration, etc.) of your server referring to a product manual (users' guide, etc.). The latest product manuals are available on NEC's corporate website (http://www.nec.com/).

2.3.1 Preparation for Operating System Installation

Prepare the following media and instruction manuals before starting setup.

Items to necessary to prepare

- ☐ **OS installation media** *need to purchase one of the following.
  - **Microsoft operating system installation media** (hereafter referred to as *Windows Server 2016 DVD-ROM*)
  - **NEC operating system installation media** (hereafter referred to as *Backup DVD-ROM*)
- ☐ **Starter Pack for Windows Server 2016**

Module Name	**WS2016.10-004.01.zip**
Supported Models	Express5800/T110g-S, T110g-E, R110g-1E

Tips For the details about the Starter Pack, see Chapter 1(*1.7 Downloads*) section. For copying the Starter Pack, prepare an optical disk.

Important **After installing Windows Server 2016, do not apply EXPRESSBUILDER or Starter Packs for Windows Server 2012 and Windows Server 2012 R2 that we provide on our website.**
Starter Pack for Windows Server 2012 R2 is not available on Windows Server 2016. Be sure to apply Starter Pack for Windows Server 2016 that suitable to purchased system.

- ☐ **Windows Server 2016 Installation Guide** (this document)

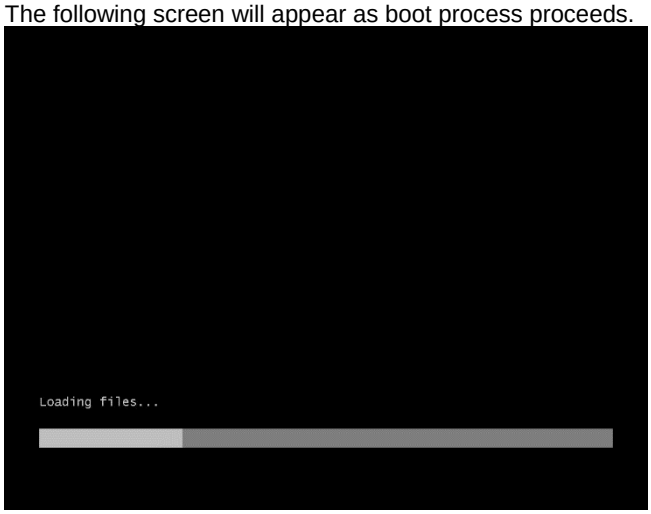
2.4 Clean Install

This section shows the steps to clean install Windows Server 2016.
Note that existing old version of Windows will be deleted.

1. Turn on your display and server in that order.

Important **Update the BIOS as needed referring to "BIOS Update" in "*Chapter 1 (2.1 Before Starting Setup)*.**

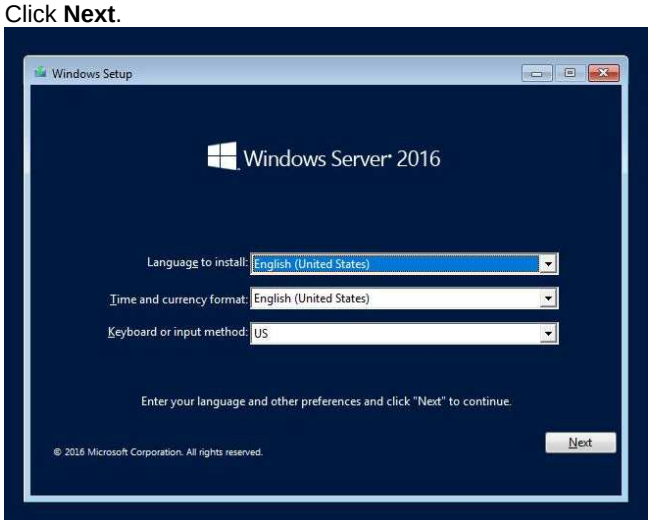
2. Boot from a backup DVD or Windows Server 2016 DVD-ROM.
   The message "Press any key to boot from CD or DVD…" is displayed on the top of the screen.
   Press <Enter> key to start the system from the installation media.
   The following screen will appear as boot process proceeds.



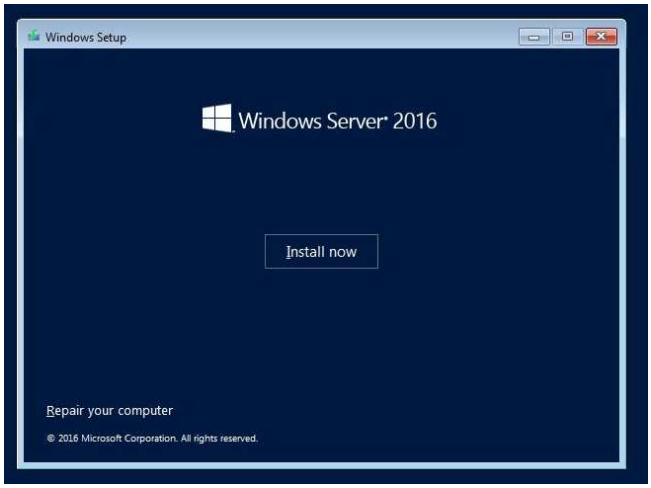
3. If you are using a backup DVD, the following screen will appear. Choose the Language you use.

In case that "Windows Setup" window does not appear, <Enter> key was not pressed correctly in Step 2.
Reboot the server and go back to Step 2.

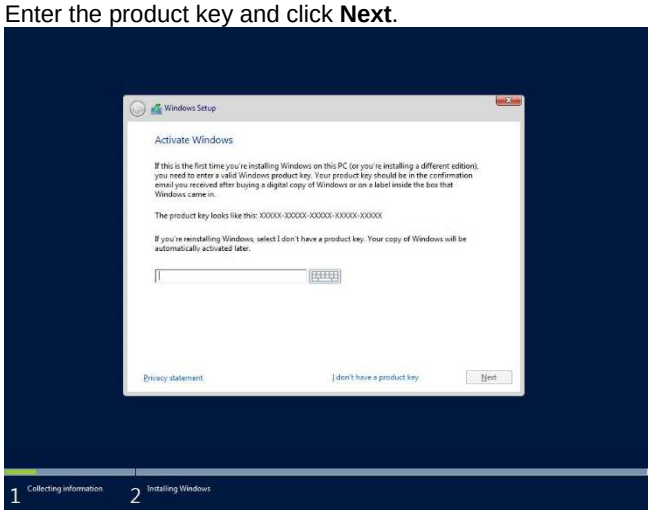
4. Click **Next**.



5. Click **Install now**.

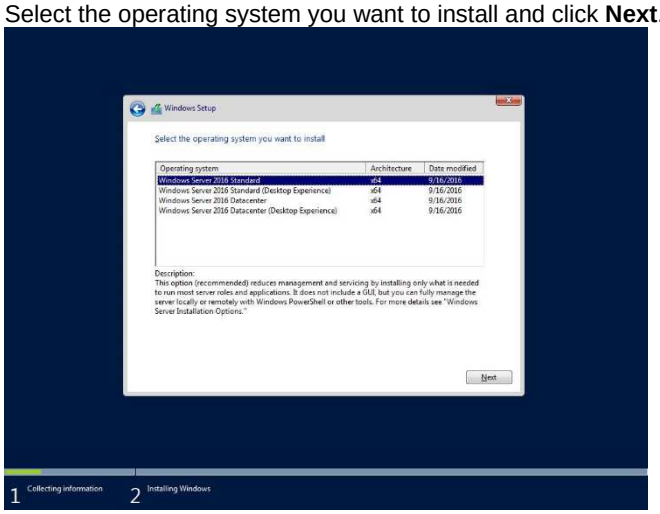


6. Enter the product key and click **Next**.



Tips If you are using a backup DVD-ROM, this screen does not appear.

7. Select the operating system you want to install and click **Next**.



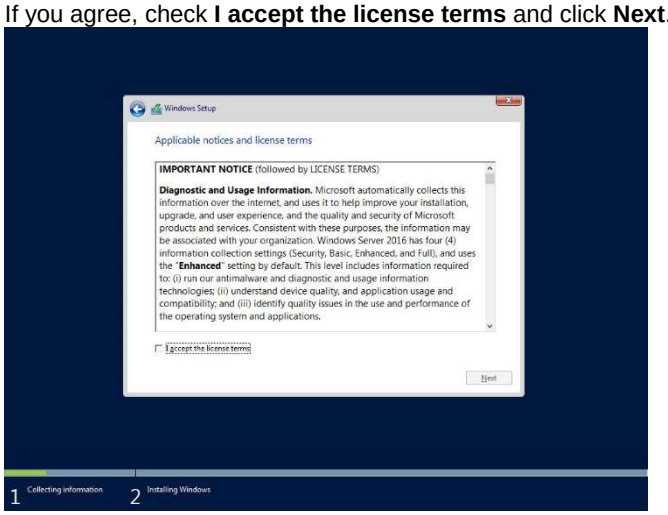
The options listed on the screen vary depending on the installation media you are using.

Tips

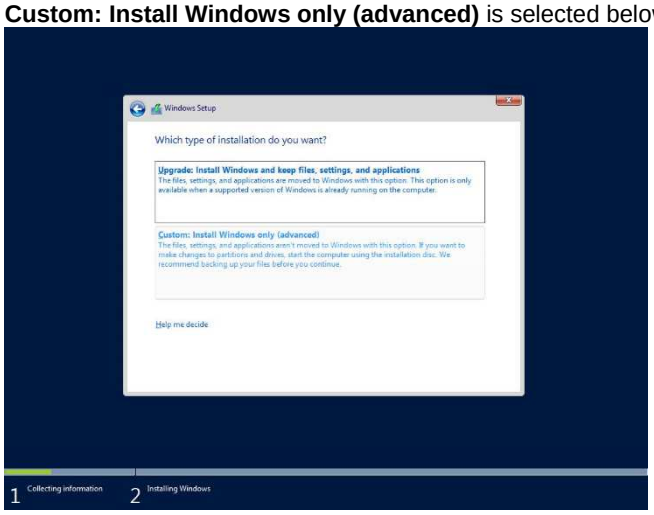
Read the description on the screen and choose an installation option.

- Windows Server 2016 Standard or Windows Server 2016 Datacenter
  → correspond to “Server Core” in this guide
- Windows Server 2016 Standard (Desktop Experience) or Windows Server 2016 Datacenter (Desktop Experience)
  → correspond to “Desktop Experience” in this guide.

8. Read the license terms carefully.
   If you agree, check **I accept the license terms** and click **Next**.

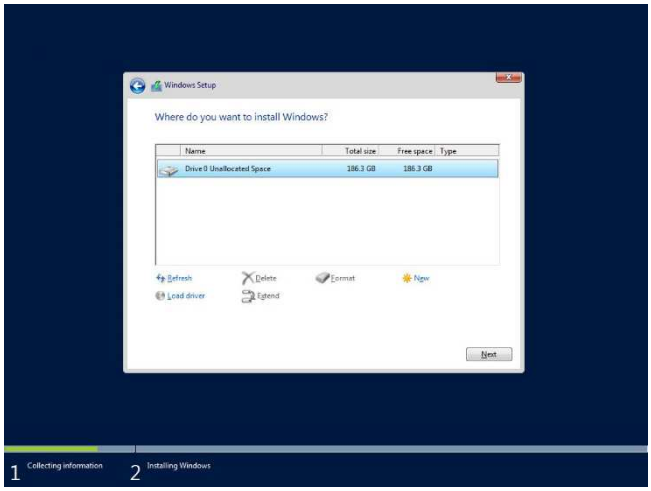


9. Select the type of installation you want.
   Custom: Install Windows only (advanced) is selected below.



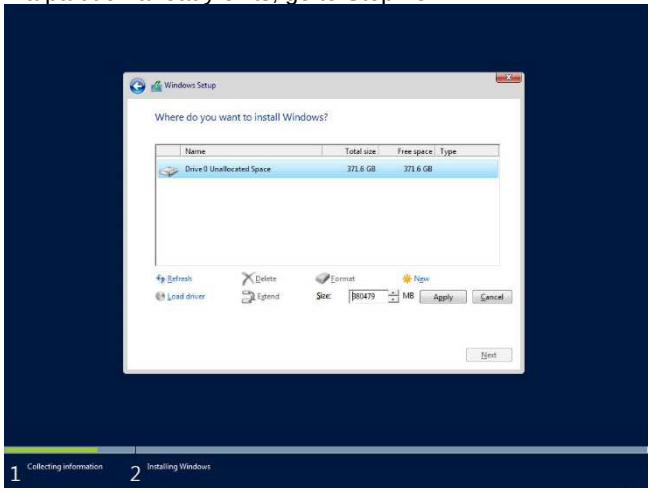
10. "Where do you want to install Windows?" window appears.

11. Click **New**.



Tips It **NEW** is not displayed on the screen, click **Drive Options (advanced)**.

12. Specify the partition size in the text box, and the click **Apply**.
    If a partition already exits, go to Step 13.

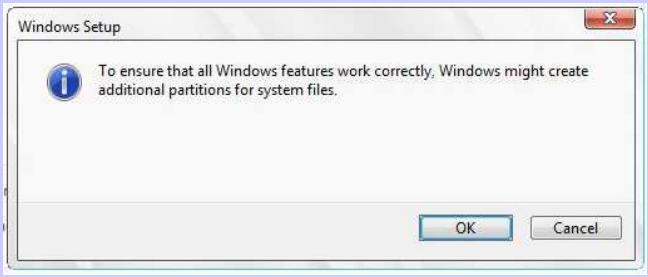


Note

The partition size can only be set to 2TB (2,097,152 MB) or less.

Tips

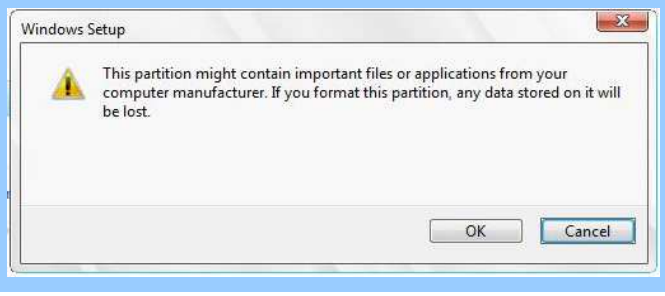
When creating a new partition and installing the OS, a 500 MB boot partition is created. When the following window appears, click **OK**.



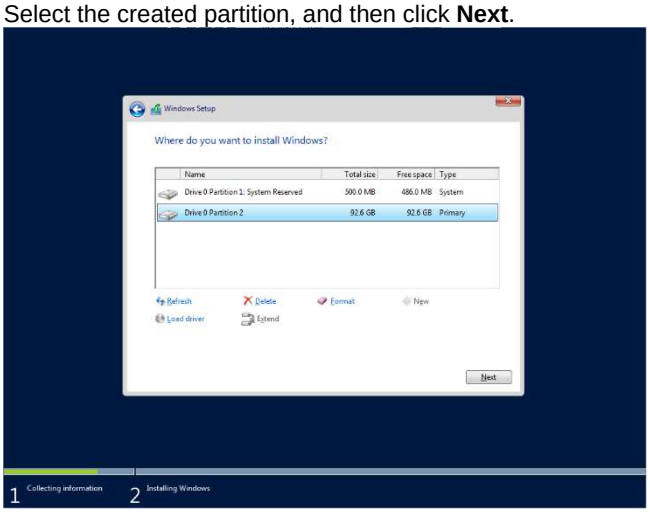
13. Select the partition created in step 12, and then click **Format**.

Important

If the following window appears, read the message carefully and click [OK]. Be careful to choose a partition to format because the data stored on the partition will be cleared.



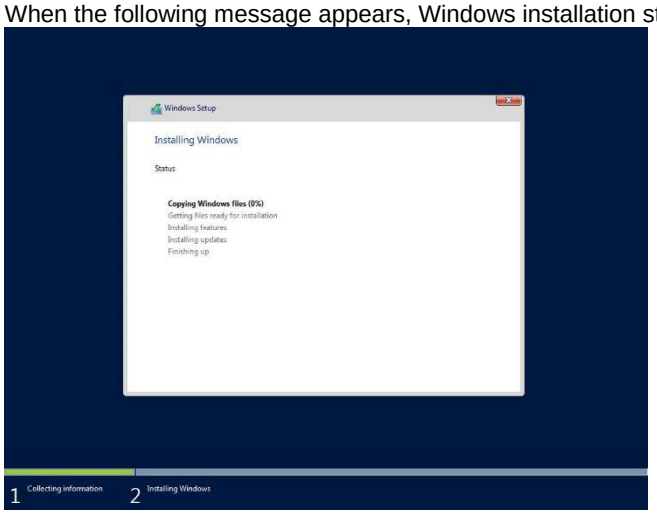
14. Select the created partition, and then click **Next**.



Tips

The number of partitions displayed differs depending on the hardware configuration.

When the following message appears, Windows installation starts automatically.



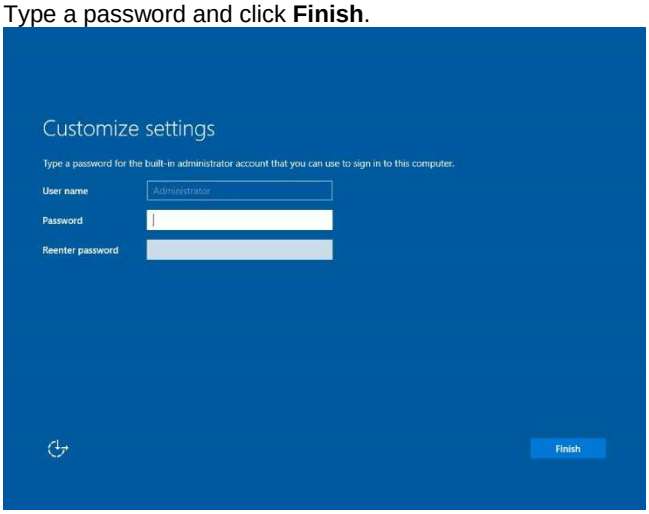
When the installation is done, the system will automatically restart.

After the system restart, continued the Windows Setup.

15. Set according to operating system selected in Step 9.

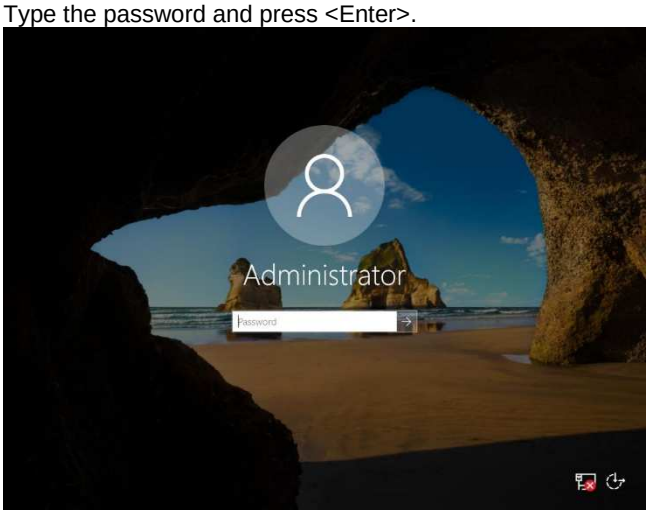
Desktop Experience

Type a password and click **Finish**.

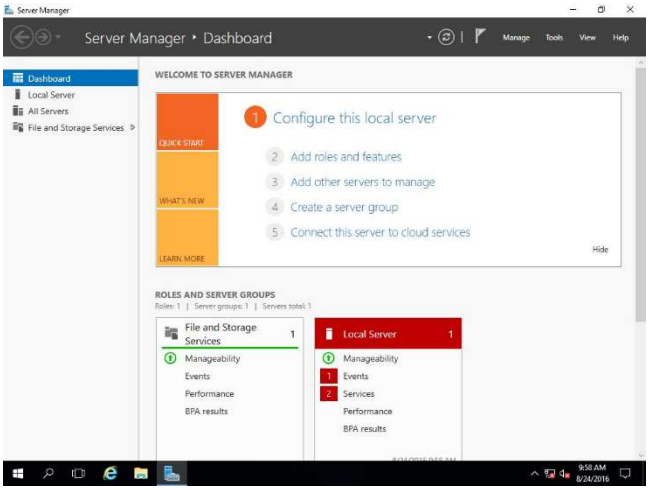


Press <Ctrl> + <Alt> + <Delete> to unlock.

Type the password and press <Enter>.

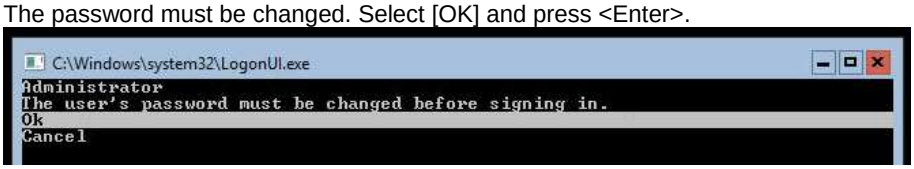


Windows Server 2016 starts.

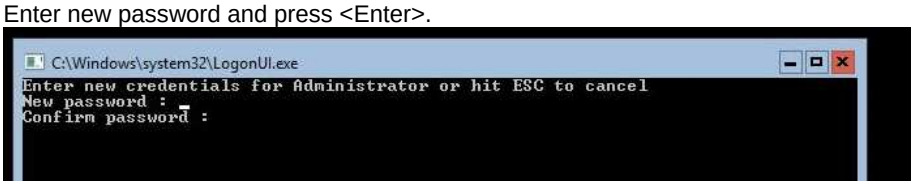


Server Core

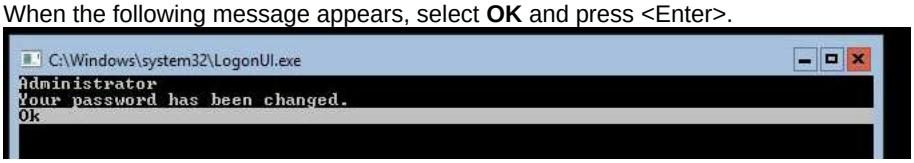
The password must be changed. Select [OK] and press <Enter>.



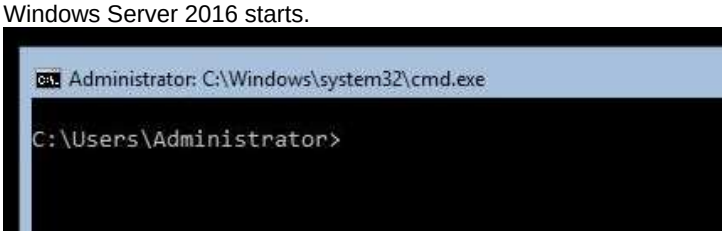
Enter new password and press <Enter>.



When the following message appears, select **OK** and press <Enter>.



Windows Server 2016 starts.



Tips

Refer to Microsoft Website for more details.

Configure and Manage Server Core Installations

http://technet.microsoft.com/us-en/library/jj574091.aspx

16. Apply the Starter Pack referring to *Chapter 1 (3. Applying Starter Pack)*.
17. Install and set up the drivers referring to *Chapter 1 (4. Setting Up Device Drivers)*.
18. Confirm if the Windows is activated referring to *Chapter 1 (5. License Authentication)*.
19. Set up the NIC Teaming as needed referring to *Chapter 1 (6. Setup of Windows Server 2016 NIC Teaming (LBFO))*.
20. Set up features referring to *Chapter 1 (7. Setup for Solving Problems)*.

After the OS installation is completed, install applications as needed referring to the installation guide of each product.

Setup is now completed.

3. Applying Starter Pack

The Starter Pack contains drivers customized for the Express5800 Series.
Before starting to use the system, apply the necessary modules for Windows Server 2016 (Starter Pack) dedicated for the model of your server. A Starter Pack for other server models cannot be used.
If you have not downloaded the Starter Pack, go to *Chapter 1(1.7 Downloads).*

Important

Also install Starter Pack in the following cases.

- **The motherboard of the server has been replaced**
  (If a dialog box prompting you to reboot the system is displayed, reboot the system according to the on-screen instructions, and then apply the Starter Pack.)
- **If the system was restored using a restore process**
- **If a system has been restored using the backup tool**

Note

"Device Guard: virtualization-based security" is disabled by using this setup.
Do not enable Device Guard feature because this feature is not available for this server.

1. Sign-in to Windows installed to the system using an account with administrative rights.
   If you use the Starter Pack copied on a DVD, place the media into the disk drive.
2. Click “Run,” or type the following path in the command prompt and press <Enter>.
   Wail for a while (1 to 3 minutes) until the screen in Step3 appears.

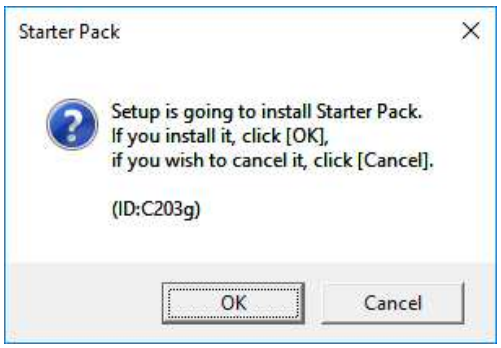
   *<drive letter>:****¥<destination folder>¥winnt¥bin¥pkgsetup.vbs***

Tips

A path which includes double-byte characters or the space character cannot be used here.
For example, if the Starter Pack is placed in *temp* folder in *D* drive, type the following path and press <Enter>.

*D:****¥temp¥winnt¥bin¥pkgsetup.vbs***

3. The following screen appears.

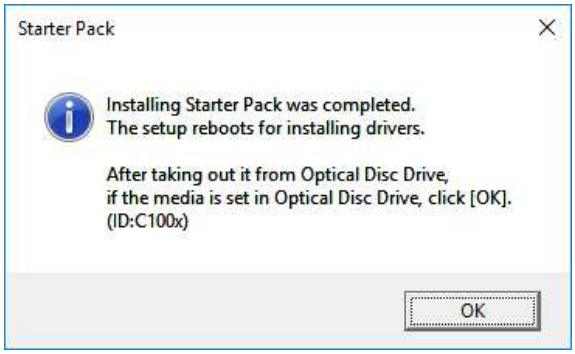


Wait until the installation of the Starter Pack is complete. (About 2 to 5 minutes)

Note

The screen may black out instantaneously or resolution may change while Starter Pack is installed, but it is not a failure.

4. Click **OK** to restart the system.



Installation of Starter Pack is now complete.

4. Setting Up Device Drivers

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

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

4.1 Installing the LAN drivers

4.1.1 LAN drivers

LAN drivers are installed by applying the Starter Pack.

Important

Wake On LAN (WOL) is supported by the standard network adapters only. If you are using other network adapters, you can use Wake On LAN after installing the LAN drivers. For BIOS settings, check the "User's 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.
- Be sure to select the Internet Protocol (TCP/IP) check box when specifying an IP address.

4.1.2 Optional LAN board

This server supports the following optional LAN boards.

N8104-132/133/138/153

When you additionally attach N8104-132/133/138 to the target server, the corresponding LAN driver is automatically installed by Windows Plug-and-Play feature if you have attached the same controller in advance.

When you additionally attach N8104-153 to the target server, the corresponding LAN driver is automatically installed by Windows Plug-and-Play feature if you have attached the same controller in advance.

If not, the driver is not installed.

In that case, please install the driver by the following steps.

N8104-153

Note When **Intel(R) Network Connections xx.xx.xx.xx** is shown to **Programs and Features**, this step is unnecessary.

1. Open command prompt, and execute the following file.
   <drive letter>:¥*<destination folder>*¥winnt¥drivers¥02_network¥1_ag_04¥install_ws2016.bat
2. When the following message appears, restart the system.

   Intel Driver Installation Completed!

3. When LAN board is new addition, setting each LAN board by referring to *Chapter 1(4.2 Setting up LAN drivers)*.

Setup is now completed.

4.1.3 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

Broadcom NetXtreme Gigabit Ethernet #xx *

If connecting with an optional LAN board:

[N8104-132/133/138] Broadcom NetXtreme Gigabit Ethernet #xx *

[N8104-153] Intel(R) Ethernet Controller X540-AT2 #xx *

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

4.2 Setting up LAN drivers

4.2.1 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.

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**.
5. Restart the system.

Setup is now completed.

4.2.2 Configuring Flow Control

Flow Control is a feature to stop transmitting frames temporarily by sending a pause frame to the destination device when the receive buffer is about to run out. When it receives a pause frame, it regulates the transmission. Configure the Flow Control following the procedure below.

Tips

The settings of Transmit/Receive of the network adapter should match those of the destination device. For example, if Flow Control in the destination device is set as Receive only, that in the server should be set as Transmit only.

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 and click **Flow Control** to show **Value**.
4. The **Value** can be configures by the down-arrow button.
5. Click **OK**.
6. Restart the system.

Setup is now completed.

4.2.3 When using N8104-132/133/138

When using N8104-132/133/138 with the server, follow the procedure below to set it.

Note This procedure can be used when you replace a motherboard.

1. Execute the following file.

   <drive letter>:¥*<destination folder>*¥winnt¥drivers¥02_network¥1_ah_03¥pgdyavd_disable.vbs

2. When the following message appears, click OK.

   ```
   Configuration Completed
   [Option:PopUp RLV Disabled(Action:Done)]
   Reboot the system
   ```

   Tips The message “Action:Non” indicates that the LAN driver is already set.

3. Restart the system.

Setup is now completed.

4.3 Graphics accelerator driver

Standard graphics accelerator driver is installed automatically at the time of OS installation.

Note The resolution of the screen is established automatically according to the connected monitor, and it can't be changed.

4.4 When using a SAS controller (N8103-142)

The driver for SAS controller N8103-142 is automatically installed by Windows Plug-and-Play.

4.5 When using a RAID Controller (N8103-161/168/171/172/173/174)

The driver for RAID Controller N8103-161/168/171/172/173/174 is automatically installed by Windows Plug-and-Play.

Driver customized for the Express5800 Series is installed by applying the Starter Pack.

4.6 When using a Fibre Channel controller (N8190-153/154)

The driver for Fibre Channel controller N8190-153/154 is automatically installed by Windows Plug-and-Play. Driver customized for the Express5800 Series is installed by applying the Starter Pack.
However, if you additionally equip a Fibre Channel controller (N8190-153/154), right click on **cli_inst.bat** in the Starter Pack (shown below), and select **Run as Administrator**.

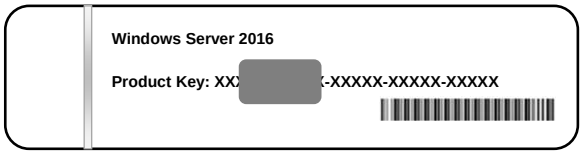
<*drive letter*>:**¥<*destination folder*>¥winnt¥drivers¥01_storage¥1_ao_04¥utl¥cli_inst.bat**

5. License Authentication

You need to activate Windows Server 2016 to use it. Follow the steps below to check if your operating system has been activated and perform the activation as needed.

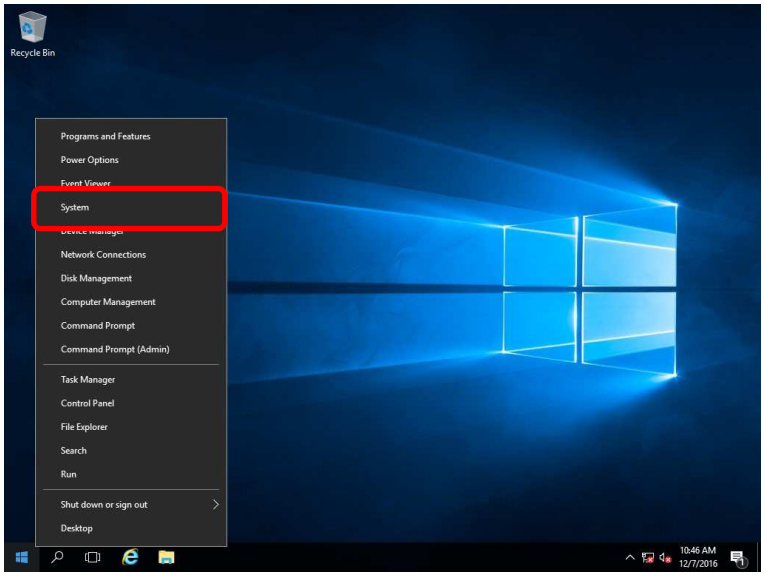
Note

To activate Windows Server 2016, enter the Product Key written on the COA (Certificate of Authenticity) label. The COA label of Windows Server 2012 R2 is attached to the operating system media package.



5.1 Desktop Experience

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



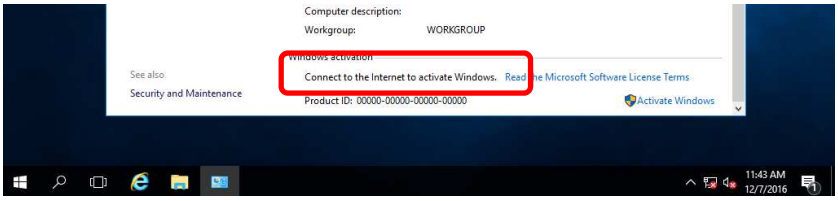
2. Check Windows license authentication.

☐ If "Windows is activated." is displayed:

You do not need to perform this procedure.

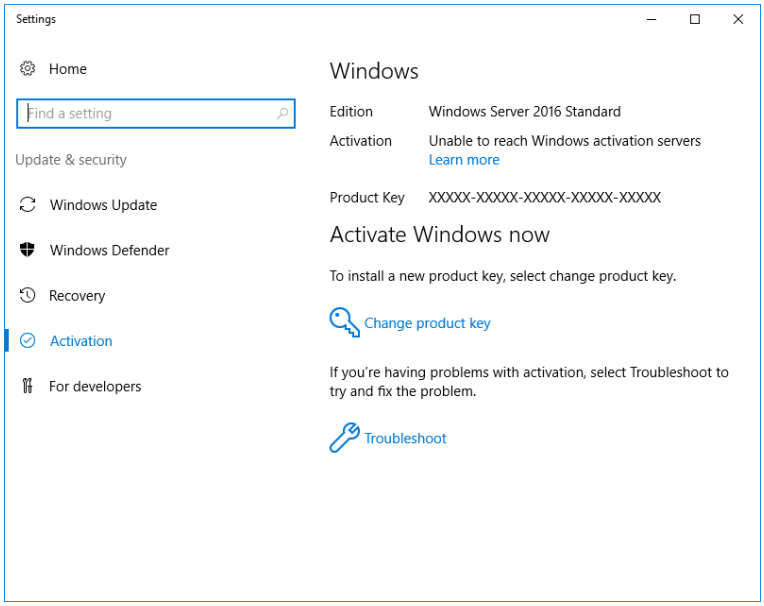
☐ If "Connect to the internet to activate windows." is displayed:

Go to Step 3.



3. Click **Activate Windows**.

4. Perform license authentication.



☐ When connected to Internet:

Click **Change product key**.

Complete license authentication process according to the message.

☐ When not connected to the Internet:

Go to Step 5.

5. Perform License Authentication via telephone.

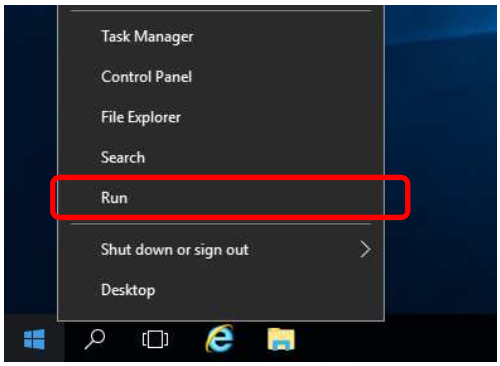
Go to the next step, which differs depending on the installation media you used.

☐ Backup DVD-ROM : Go to Step 6.

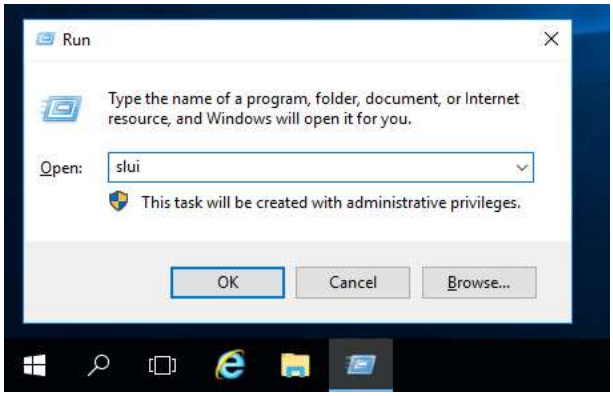
☐ Windows Server 2016 DVD-ROM

- Product key has been input : Go to Step 9.
- Product key has not been input : Go to Step 6.

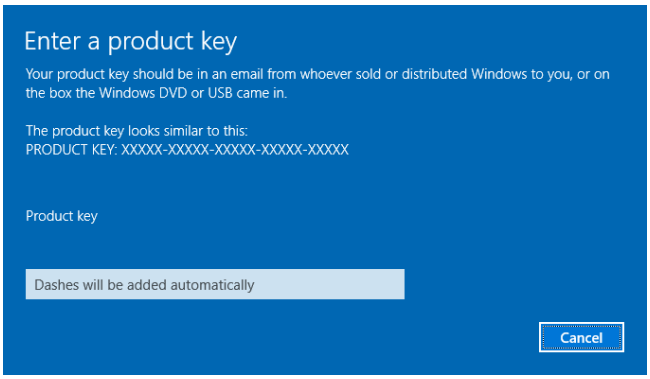
6. Right-click the left bottom of screen, and click **Run** from the menu displayed.



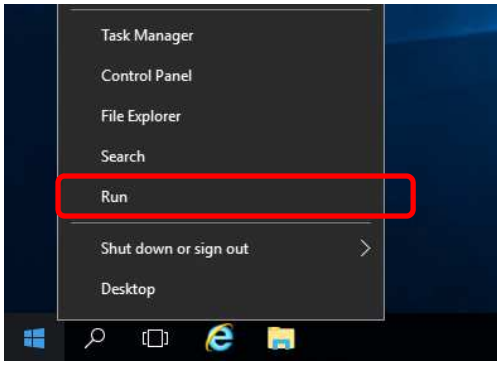
7. Type "slui", and then press the <Enter> key.



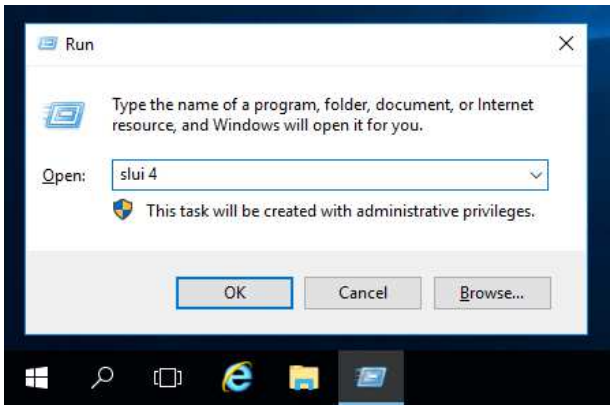
8. You need to replace product keys. Input a product key on the following screen.



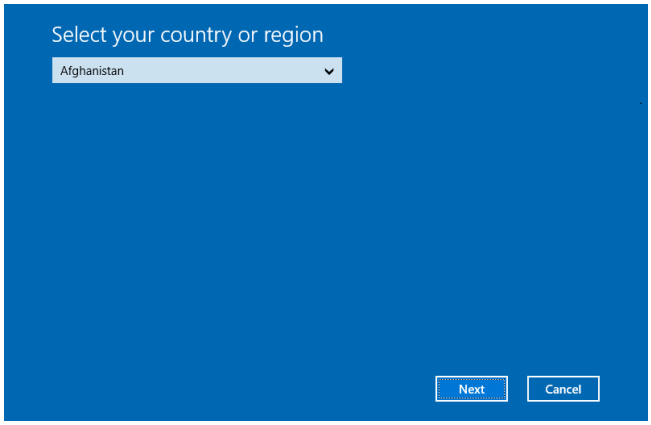
9. Right-click the left bottom of screen, and click **Run** from the menu displayed.



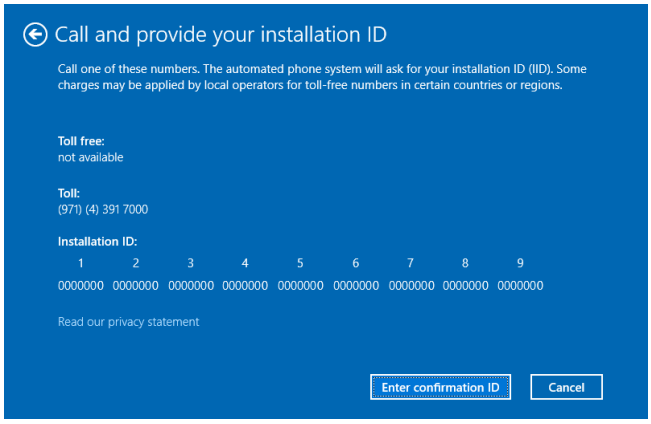
10. Type "slui 4", and then press the <Enter> key.



11. On the next screen, select your country or region, and then click **Next**.

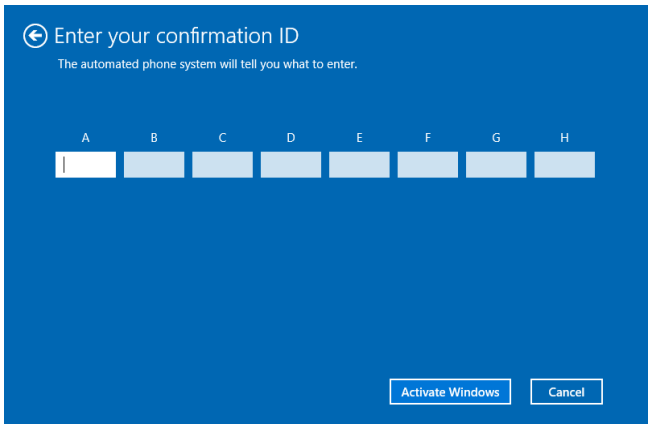


Acquire the installation ID required for license activation.



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

Type the acquired confirmation ID, and then click Activate Windows.



This completes authentication.

5.2 Server Core

1. Confirm if your license is activated.

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

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

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

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

2. Change the product key.

   When using Backup DVD-ROM:

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

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

   When using Windows Server 2016 DVD-ROM:

   You do not need to change the product key.

   Go to the next step.

3. Perform license authentication.

   When connected to the Internet:

   License authentication is performed via the Internet.

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

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

   This completes authentication.

   When not connected to the Internet:

   Use telephone for license authentication.

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

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

   Acquire the installation ID required for license activation.

6. Setup of Windows Server 2016 NIC Teaming (LBFO)

Set up the network adapter teaming feature as shown below.

6.1 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 the <Enter> key.

6.2 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.

6.3 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.

For the latest technical information, go to [Windows Server 2016 Support Information] (shown in [1.7 Downloads]).

7. Setup for Solving Problems

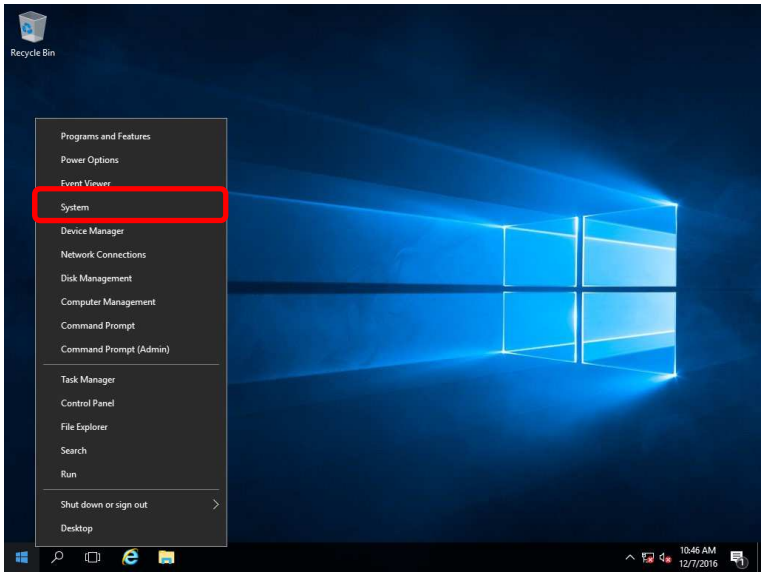
We recommend installing the following features for solving the server failure quickly.

7.1 Specifying Memory Dump Settings (Debug Information)

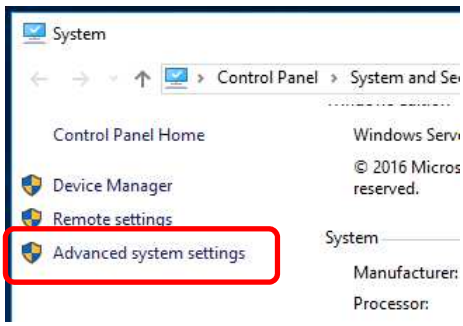
This section explains the procedures for collecting a memory dump (debug information) in the server.

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.

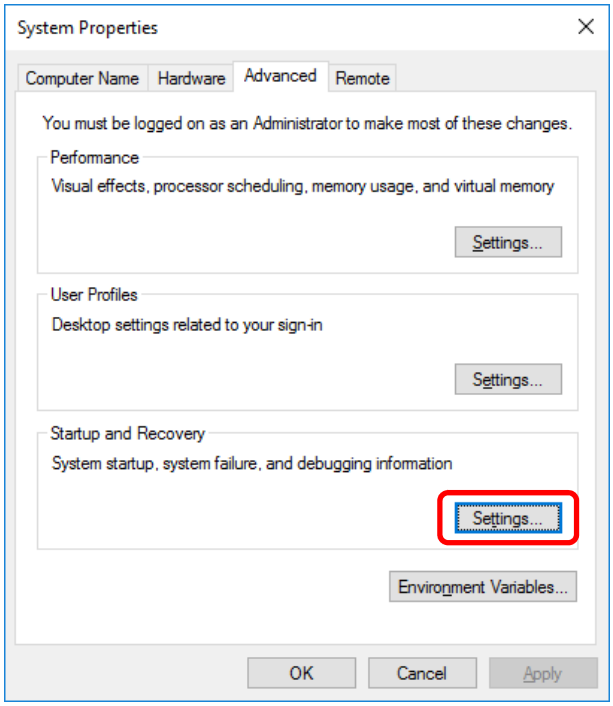
1. Right-click the left bottom of screen, and click **System** from the menu displayed.



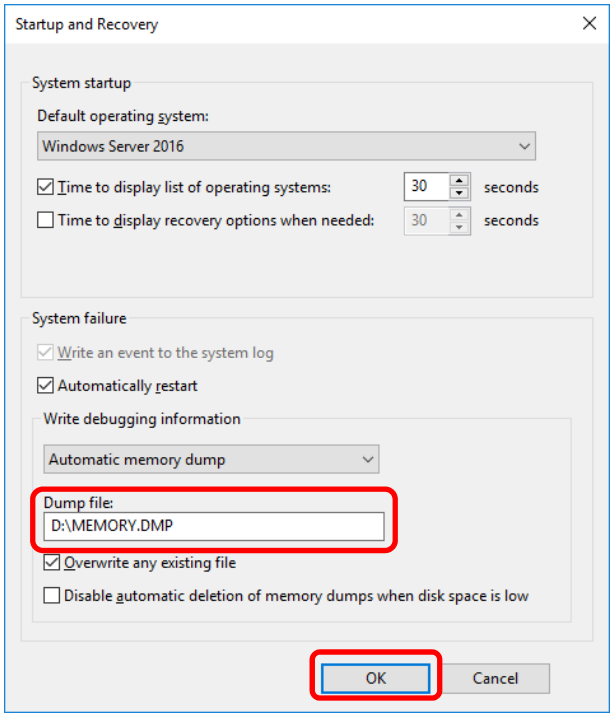
2. Click **Advanced system settings**.



3. In **Startup and Recovery**, click **Settings…**.



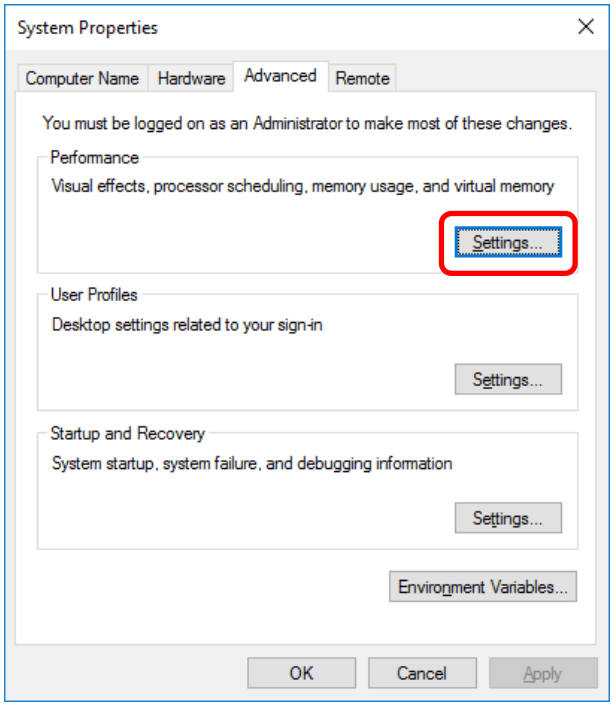
4. Type a file name to store the debug information in the **Dump file** text box, and then click **OK**.



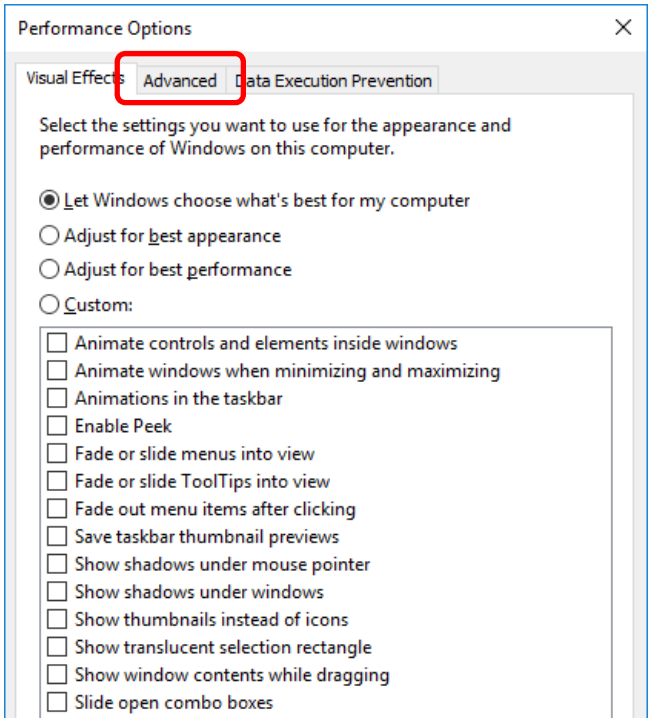
Note the following when specifying a dump file:

- 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.

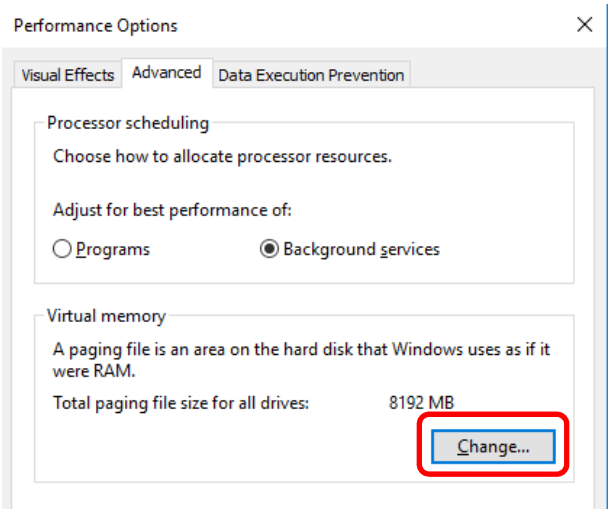
5. In **Performance**, click **Settings**.



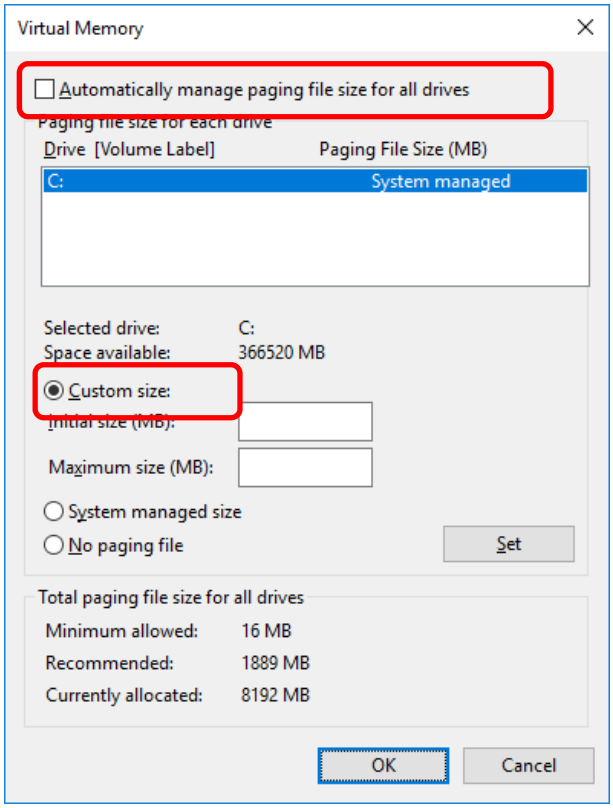
6. Click the **Advanced** tab on the **Performance Options** window.



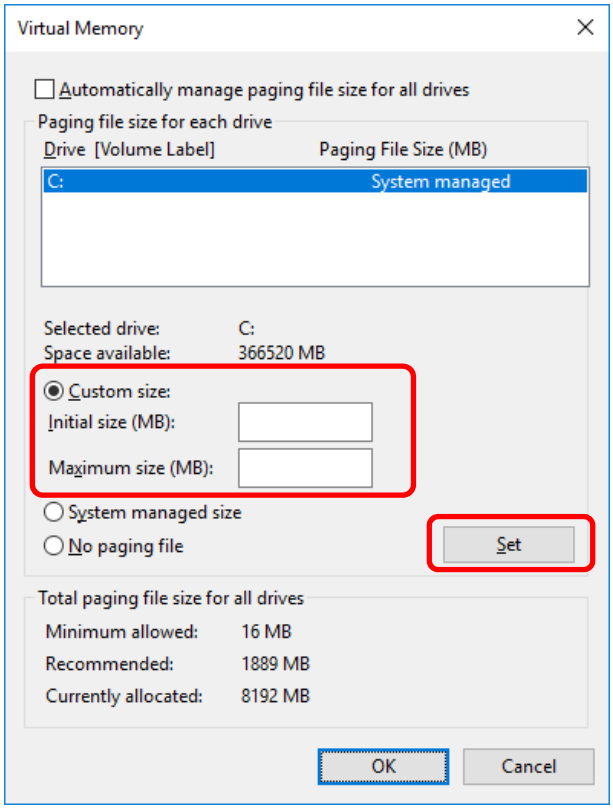
7. In **Virtual memory**, click **Change…**.



8. Clear the **Automatically manage paging file size for all drives** check box, and then click **Custom size**.



9. 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 capacity of physical memory mounted + 400MB or larger) is enough to store the dump file. Make sure to specify a sufficient paging file size (recommended size: Total capacity of physical memory mounted * 1.5 or more).
- See "System Partition" in Chapter 1 (2.1 Before Starting Setup) for recommended value.
- When DIMM is added, re-specify the paging file according to the increased memory size.

10. Click **OK**.

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

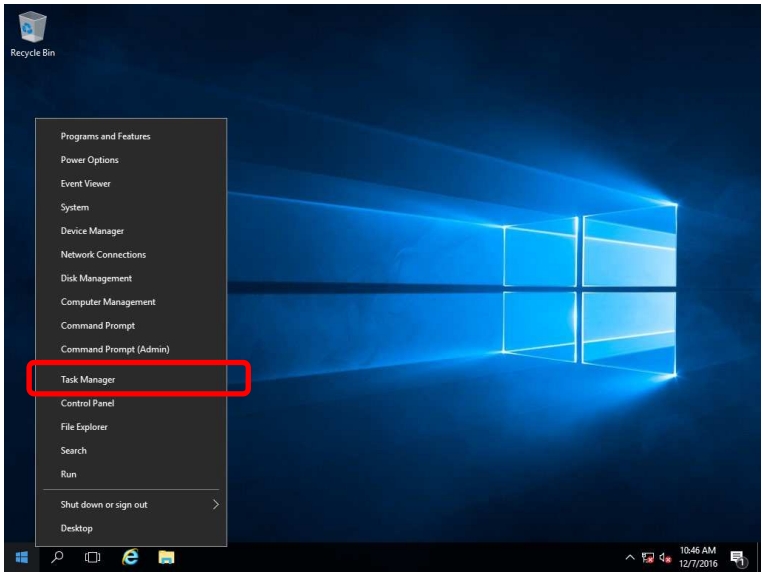
Specification of the memory dump settings is now complete.

7.2 How to Create a User-mode Process Dump File

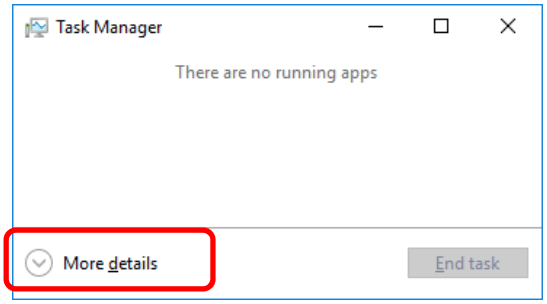
The user-mode process dump file records information when an application error occurs.

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**.

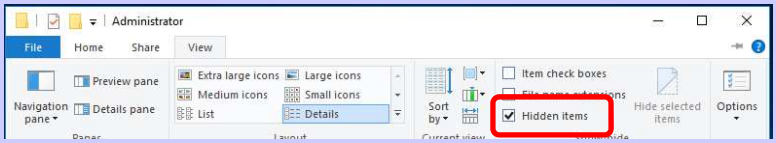


3. Click the **Processes** tab.
4. Right-click the name of the process that you want to get dump information for, and then click **Create Dump File**.
5. A dump file for the process is created in the following folder:

   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.

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2 Maintenance

This chapter provides information for system inspection and maintenance, and how to troubleshoot the problems, which you might need to operate an Express5800 Series 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.

Ⅰ. Failure Information

If the server is broken, you can collect failure information by using the following method.

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

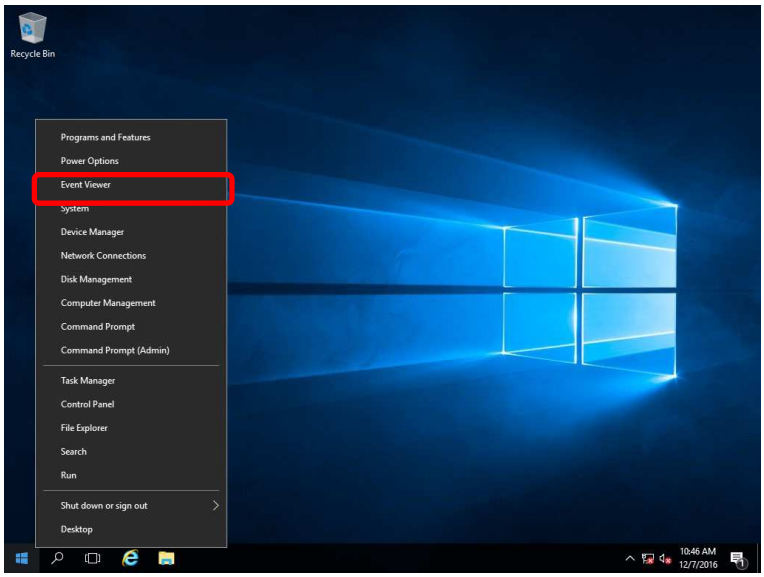
Important **When the system restarts after a failure has occurred, a message may appear indicating virtual memory shortage. Ignore this message and proceed with starting the system. Restarting the system may result in an inability to properly dump the data.**

Ⅰ.Ⅰ Collecting Event Logs

Collection for various event logs that occurred on the server follows 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.

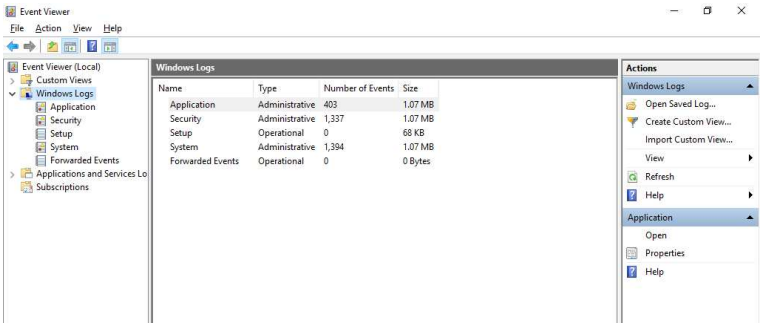


2. Select the type of log in **Windows Logs**.

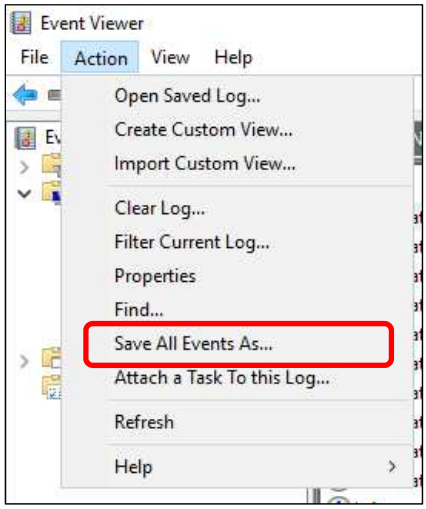
   Application records events related to running applications.

   Security records events related to security.

   System records events that occur in Windows system components.



3. Click **Save All Events As...** from **Action** menu.



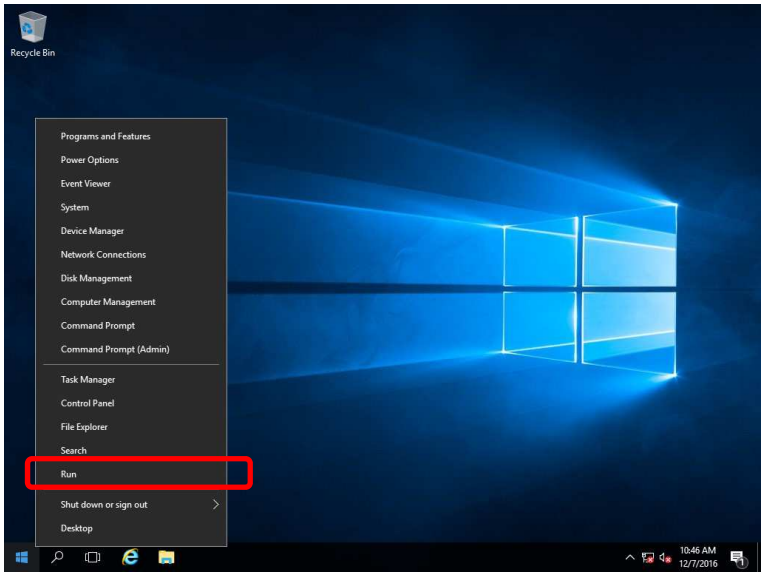
4. Type the file name of the archived log in **File name**.
5. Select the type of the log file you want to save in **Save as type**, and then click **Save**.

1.2 Collecting Configuration Information

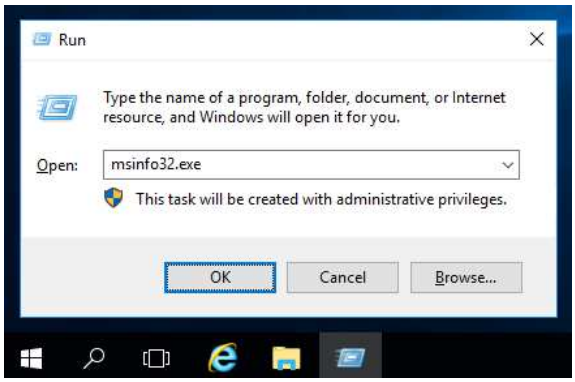
This section describes how to collect hardware information or configuration.

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

Collects diagnostic information related to application errors.

For details, see *Chapter 1 (7.2 How to Create a User-Mode Process Dump File)*.

1.4 Collecting Memory Dump

If an error occurs, the dump file should be saved to acquire necessary information. You can specify any location for saving the diagnostic information. For details, see *Chapter 1 (7.1 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 may affect the system operation.

Important **A message indicating insufficient virtual memory may appear when restarting the system due to an error. Ignore this message and proceed. Restarting the system may result in an inability to properly dump the data.**

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.

2.1 Problem of Installing OS

[?] **The following devices are indicated as faulty devices in a Server Core installation environment of Windows**

- PCI Simple Communications Controller
- SM Bus Controller

→ There is no operational problem.

2.2 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**.

[?] **When N8190-153/154 is used, the names of the Fibre Channel controllers may appear with different names on Device Manager**

→ When N8190-153/154 is used in Windows, a different controller name may be displayed per controller in Device Manager. It is not a problem in operating the system.
To display correct controller names, execute the following file in the Starter Pack.

<drive letter>:**¥*<destination folder>*¥winnt¥drivers¥01_storage¥1_ao_04¥utl¥friendlyname.exe**

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 (4. Setting Up Device Drivers)* and Chapter1 *(3. Applying Starter Pack)*
- If hard disk drives cannot be detected, you cannot recover the Windows system.

3.1 Recovery of Windows Server 2016

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 Windows Setup wizard.

We recommend that this option is performed by the system administrator.

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3

Appendix

1. **List of Windows Event Logs**

   Shows a list of Windows event logs.

I. List of Windows Event Logs

OS

Event Log

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

Windows Server 2016

System Log

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, starting system, or applying Starter Pack		This event does not affect system operation.
27	ixgbt	Warning	Intel(R) Ethernet Controller X540-AT2 #xx Network link is disconnected.
	When starting system or installing Starter Pack		This event does not affect system operation.
27	ixgbi	Warning	Intel(R) Ethernet Controller X540-AT2 #xx Network link is disconnected.
	When installing an OS		This event does not affect system operation.
219	Microsoft-Windows-Kernel-PnP	Warning	The driver ¥Driver¥WudfRd failed to load for the device xxxxxxxxxxxxxxxxx.
	When starting system or connecting a disk		This may be recorded when starting the system or connecting a disk depending on timing, but does not affect 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 Starter Pack		This event does not affect system operation if it is logged when applying Starter Pack.
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 Data Sharing Service service terminated with the following error:
	When running an OS for the first time or rebooting it		This event does not affect system operation.

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.
	When running an OS for the first time or rebooting it		Refer to the following website. http://support.microsoft.com/kb/956479/
10317	Microsoft-Windows-NDIS	Error	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)
	When removing a team		This event does not affect system operation.

Application Log

1014	Microsoft-Windows-Security-SPP	Warning	Acquisition of End User License failed. hr=0x80072EE7
	When running an OS for the first time		This event does not affect system operation if it is not recorded repeatedly after activating the Windows.
1015	Microsoft-Windows-Security-SPP	Warning	Detailed HRESULT. Returned hr=0xC004F022, Original hr=0x80049E00
	When running an OS for the first time		This event does not affect system operation if it is not recorded repeatedly after activating the Windows.
1534	Microsoft-Windows-User Profiles Service	Warning	Profile notification of event Create for component {2c86c843-77ae-4284-9722-27d65366543c} failed, error code is Not implemented.
	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.
8198	Microsoft-Windows-Security-SPP	Error	License Activation (slui.exe) failed with the following error code: hr=0x******** Command-line arguments: RuleId=******************************
	When starting system and installing Starter Pack		This event does not affect system operation if it is not recorded repeatedly after activating the Windows.
8200	Microsoft-Windows-Security-SPP	Error	License acquisition failure details. hr=0x80072EE7
	When starting system and installing Starter Pack		This event does not affect system operation if it is not recorded repeatedly after activating the Windows.

Applications and Services Logs

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.
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)
	When starting system and installing Starter Pack		This event does not affect system operation if it is not recorded after connecting to the internet.
200	Microsoft-Windows-DeviceSetupManager	Warning	A connection to the Windows Update service could not be established.
	When starting system and installing Starter Pack		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.
	When starting system and installing Starter Pack		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.
	When starting system and installing Starter Pack		This event does not affect system operation if it is not recorded after connecting to the internet.
506	Microsoft-Windows-DeviceManagement-Pushrouter	Error	DmWapPushService: Failed to register WNF with EventAggregator for WAP messages received by SMS Router. Result: (0xC002000B).
	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.

Revision Record

Document Number	Date	Notes
CBZ-002473-080-00	July 2017	The first edition