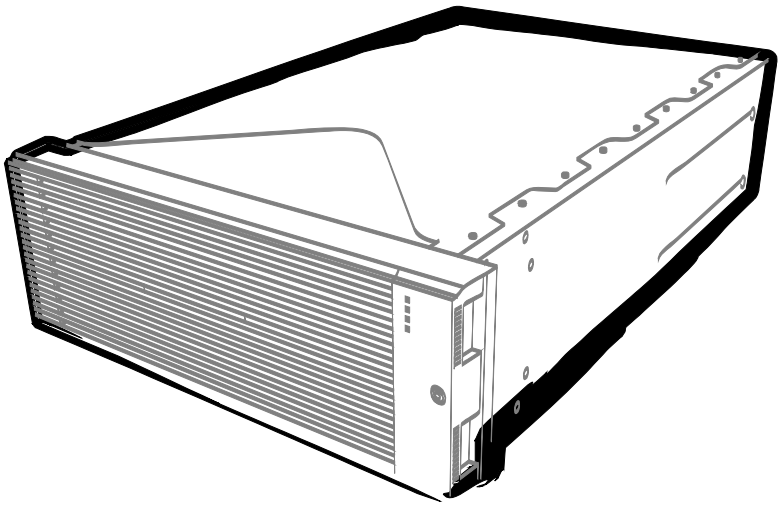
Express5800

NEC



NEC Express Server
Express5800 Series

Express5800/R320c-E4
Model Number: N8800-173F, EXP320P

Express5800/R320c-M4
Model Number: N8800-174F, EXP320Q

Express5800/R320d-E4
Model Number: N8800-184F, EXP320P

Express5800/R320d-M4
Model Number: N8800-185F, EXP320Q

Installation Guide (Windows)

30.104.01-102.03
March 2014, Third Edition

Documents for This Product

Documents for this product are provided as booklets (📖) and as electronic manuals (📄) in the EXPRESSBUILDER DVD (💿).

📖 Precautions for Use	Describes points of caution to ensure the safe use of this server. **Read these cautions before using this server.**
📖 Getting Started	Describes how to use this server, from unpacking to operations. See this guide at first and read the outline of this product.

💿 EXPRESSBUILDER

📄 User's Guide

Chapter 1: General Description	Overviews, names, and functions of the server components
Chapter 2: Preparations	Installation of additional options, connection of peripheral devices, and suitable location for this server
Chapter 3: Setup	System BIOS configurations and summary of EXPRESSBUILDER
Chapter 4: Appendix	Specifications

📄 Installation Guide (Windows)

Chapter 1: Installing OS	Installation of OS and drivers, and important information for installation
Chapter 2: Installing Bundled Software	Installation of bundled software, such as NEC ESMPRO

📄 Maintenance Guide

Chapter 1: Maintenance	Server maintenance and troubleshooting
Chapter 2 Configuring and Upgrading the System	Configure hardware and setup management tool associated with hardware
Chapter 3: Useful Features	Useful features and the detail of system BIOS settings, SAS Configuration Utility, and EXPRESSBUILDER

📄 Other documents

Provides the detail of NEC ESMPRO, BMC Configuration, and the other features.

Contents

Notations Used in This Document

Notations used in the text

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

Important	Indicates critical items that must be followed when handling the 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 the 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

Removable media

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

- USB flash drive
- Flash FDD

Abbreviations of Operating Systems (Windows)

Windows Operating Systems are referred to as follows.

Refer to *Chapter 1* (*1.2 Supported Windows OS)* in *Installation Guide (Windows)* for detailed information.

Notations in this document	Official names of Windows
Windows Server 2012	Windows Server 2012 Standard
	Windows Server 2012 Datacenter
Windows Server 2008 R2	Windows Server 2008 R2 Standard
	Windows Server 2008 R2 Enterprise

POST

POST described in this document refer to the following.

- Power On Self-Test

BMC

BMC described in this document refer to the following.

- Baseboard Management Controller

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	Basic Model Number : EXP320Q
	Trade Name or Registrant : NEC CORPORATION :
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	Использования некоторых Вредных Веществ в электрическом и электронном оборудовании (ТР ОИВВ). Содержание вредных веществ в случаях, не предусмотренных Дополнением №2 ТР ОИВВ: 1. свинец (Pb) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 2. кадмий (Cd) – не превышает 0,01 % веса вещества или в концентрации до 100 миллионных частей; 3. ртуть (Hg) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 4. шестивалентный хром (Cr^{6+})– не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 5. полибромбифенолы (PBB) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей; 6. полибромдифеноловые эфиры (PBDE) – не превышает 0,1 % веса вещества или в концентрации до 1000 миллионных частей.

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NEC Express5800 Series
Express5800/R320c-E4, R320c-M4, R320d-E4, R320d-M4

1

Installing Operating System

This chapter describes how to install an operating system. Read through this chapter to set up the system correctly.

1. **Before Starting Setup**

   Describes the Service Packs and mass storage controllers that EXPRESSBUILDER supplied with this product supports.

2. **Setting Up the Operating System**

   Describes the flow of setting up the operating system.

3. **Setting Up Windows Server 2012**

   Describes how to set up Windows Server 2012.

4. **Setting Up Windows Server 2008 R2**

   Describes how to set up Windows Server 2008 R2.

5. **Setting Up for Solving Problems**

   Describes the features that must be set up in advance so that the server can recover from any trouble immediately and precisely.

6. **Windows OS Parameter File**

   Describes how to set up the operating system by using the parameter file.

7. **Backing Up System Information**

   Describes how to inherit system information when the device is replaced.

8. **Precautions for Using Hyper-V**

   This section describes precautions for using Hyper-V on Express5800/ft series.

1. Before Starting Setup

This section describes available combination of service packs that EXPRESSBUILDER supports, and items that should be confirmed at setup of operating system.

1.1 Starting EXPRESSBUILDER

Use the attached EXPRESSBUILDER to re-install the OS.

To start EXPRESSBUILDER, insert the media into the optical disk drive of the server and power on the server, or press <**Ctrl**> + <**Alt**> + <**Delete**> keys to reboot the server. EXPRESSBUILDER starts from DVD.

Refer to *Chapter 3* (*5. Details of EXPRESSBUILDER*) in the *Maintenance Guide* for more information.

1.2 Supported Windows OS

EXPRESSBUILDER supports the following editions of Windows operating systems:

See the next section (*1.3 Service Pack Support*) for Service Pack.

Name of Windows OS		Supported
Windows Server 2012 *	Windows Server 2012 Standard	✓
	Windows Server 2012 Datacenter	✓
Windows Server 2008 R2 *	Windows Server 2008 R2 Standard	–
	Windows Server 2008 R2 Enterprise	✓

✓ : Supported – : Not Supported

* : Supported on server with GUI or full installation only.

1.3 Service Pack Support

The following combination of operating system installation media and Service Packs are supported by EXPRESSBUILDER.

Service Pack	Windows Server 2012	Windows Server 2008 R2
Service Pack 1 Included	–	✓
NO Service Pack + Service Pack 1	–	✓
NO Service Pack	✓	–

✓ : Supported – : Not Supported

1.4 Mass Storage Controllers Supported by EXPRESSBUILDER

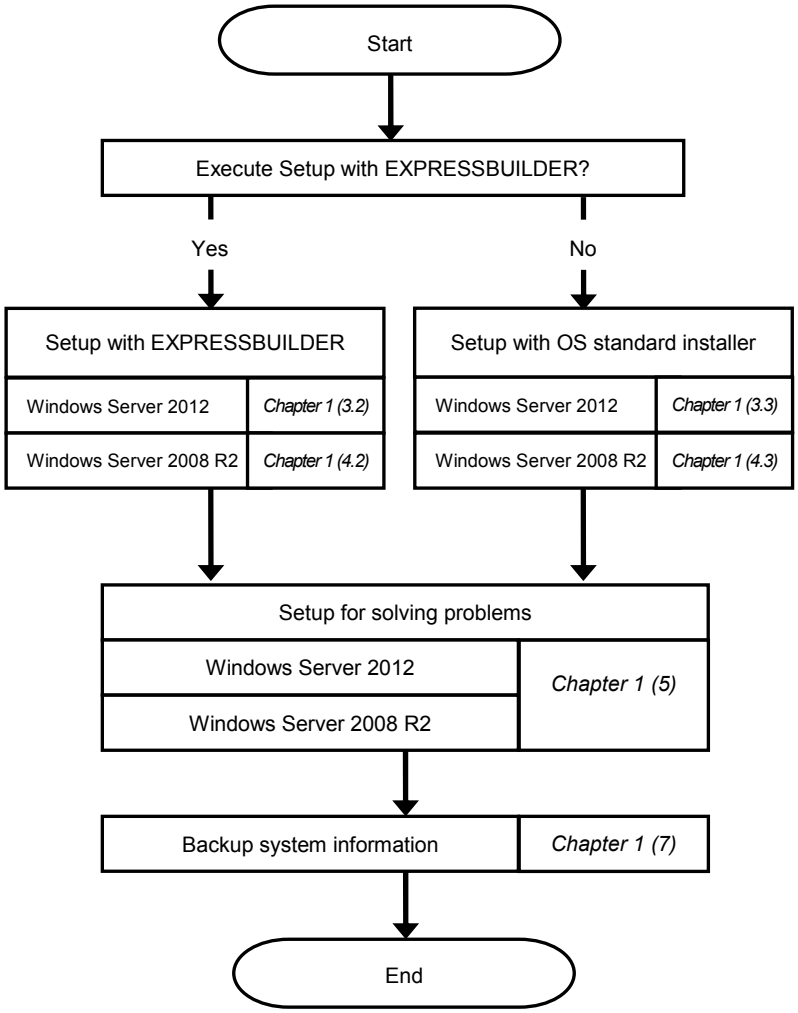
The table below lists the mass storage controllers supported by the supplied EXPRESSBUILDER.

	Windows Server 2012	Windows Server 2008 R2
Other options		
N8803-038 Fibre Channel board kit (8Gbps x 1ch)	✓	✓

✓: Supported by EXPRESSBUILDER

2. Setting Up the Operating System

See the figure below to find a section appropriate to your OS installation.



3. Setting Up Windows Server 2012

Set up Windows Server 2012.

3.1 Before Starting Setup

3.1.1 Precautions

Read through the cautions explained here before starting setup.

EB : Confirm during Setup with EXPRESSBUILDER

OS : Confirm during Setup with Windows standard installer

Hardware configuration		
The following hardware configurations require special procedures.		
EB	OS	**LTO and similar media** Do not set media that is unnecessary to installation during setup.
EB	OS	**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, use Windows standard installer for setup, and allocate the file space required for storing the dump file to other hard disk drives 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 (5. Setup for Solving Problems)*. If the hard disk drive does not have enough space to write the dump file, 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 size to install the OS and paging file, 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 setting up Windows is complete. — 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.
- To collect memory dump by using Dedicated Dump File, a paging file is required in any drive.
- 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

EB OS

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

OS size + paging file size + dump file size + application size

OS size	= 9,400MB
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 4 GB (4,096 MB) and application size is 100 MB, and Full Installation is selected, the partition size is calculated as follows:

9,400MB + (4,096MB × 1.5) + 4,096MB+ 400MB+ 100 MB = 12,460MB

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.

32,768MB (32GB) or more

*1 GB = 1,024 MB

Note

- The above paging file size is 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 installed memory and write debug information, the maximum size of the dump file is "size of installed 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.

Important

For restrictions on size of drive C specific to this server, refer to *Chapter 1 (3.10 Creating Volume).*

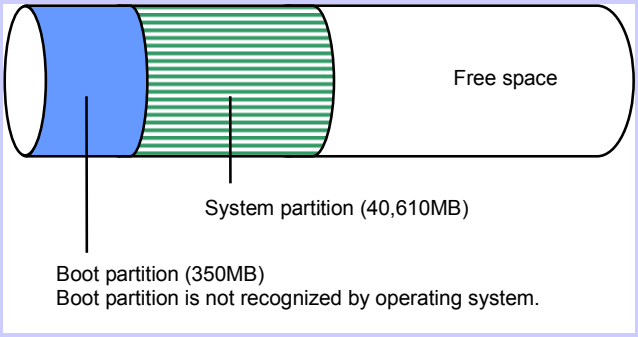
Tips

When new partition is created, 350MB at the top of hard disk drive is secured for boot partition.

Example:

If 40,960MB (40GB) is specified for partition size, usable space will be:

40,960MB – 350MB = 40,610MB



Windows Server 2012 Hyper-V support		
EB	OS	Refer to the following web site for information related to Windows Server 2012 Hyper-V. • http://www.58support.nec.co.jp/global/download/w2012/hyper-v/hyper-v-ws2012.html • See *Chapter 1 (8. Precautions for Using Hyper-V)*.
When compressing system drive		
EB	OS	Do not compress the root directory and the Windows directory. **Tips** The Windows Server 2012 directory is labeled as "Windows". If you compress the root directory and the Windows directory, operational stability cannot be ensured because the Windows File Protection (WFP) may replace an unassigned driver with a signed driver.
Support for NIC teaming in Windows Server 2012		
EB	OS	The NIC teaming feature, which used to be provided by network interface card (NIC) vendors, is built into Windows Server 2012. In Windows Server 2012, this feature is also called "load balancing and failover (LBFO)". **Important** **The server does not support this feature.**
Support for Storage spaces and thin-provisioning in Windows Server 2012		
EB	OS	The server does not support this feature.

3.1.2 Preparation

The following steps are required to prepare for re-installing an OS (setup with EXPRESSBUILDER or Winodws standard installer):

1. If the POWER LED on CPU/IO module is on, shutdown the OS.
2. Unplug the power cord from outlet while the POWER LED is blinking.
3. Perform the preparation process for the server as shown below.
   - Install CPU/IO modules 0 and 1.
   - Install a hard disk drive in slot 0 of CPU/IO module 0.
   - Disconnect all LAN cables.
   - Disconnect the cable for tape device from the connector on SAS board.
   - Disconnect the cable for device from the connector on Fibre Channel board.

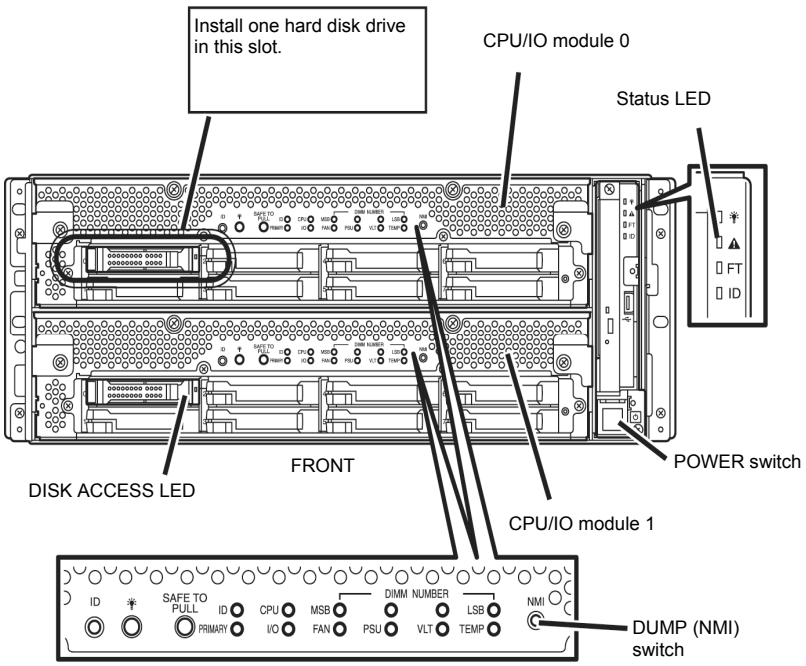
Important

- **Install only one hard disk drive in the slot specified here.**
- **If the hard disk drive is not a new one, physically format it. Refer to *Chapter 3 (3. SAS Configuration Utility)* in *Maintenance Guide* for physical formatting.**

4. Prepare for setup on CPU/IO module 0.

   The location of components that are required for setup or confirmation is as shown in the figure below.

   Install only one hard disk drive in CPU/IO module 0.
   Do not install any hard disk drive in CPU/IO module 1.

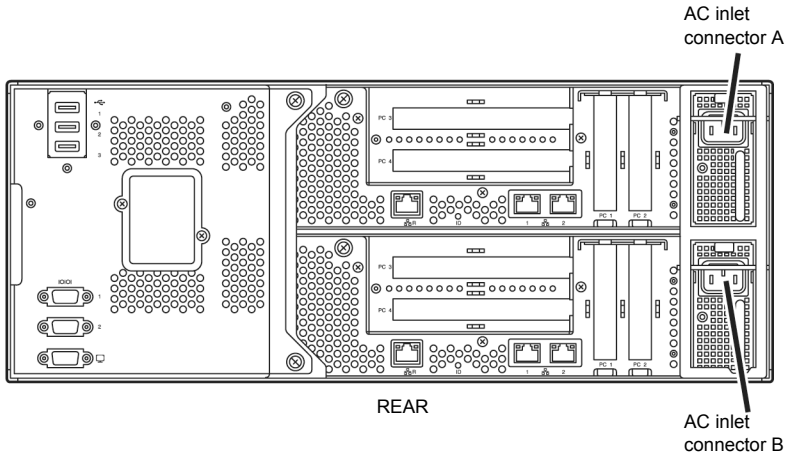


5. Connect power cords to the server in the following order.

   (1) Connect a power cord to AC inlet connector A.

   (2) Connect a power cord to AC inlet connector B.

   (3) Make sure the Status LED on CPU/IO module is unlit.



Note If you disconnect the power cord, wait at least 30 seconds before connect it again.

3.1.3 Disabling OS Boot Monitoring Feature

Before starting setup process, the OS boot monitoring function needs to be disabled.

Important **Be sure to disable boot monitoring function before setting up the system for successful setup. This function is enabled by shipping default.**

Tips For details of operations for BIOS Setup Utility and parameters for boot monitoring function, refer to *Chapter 3 (1. System BIOS)* in *Maintenance Guide*.

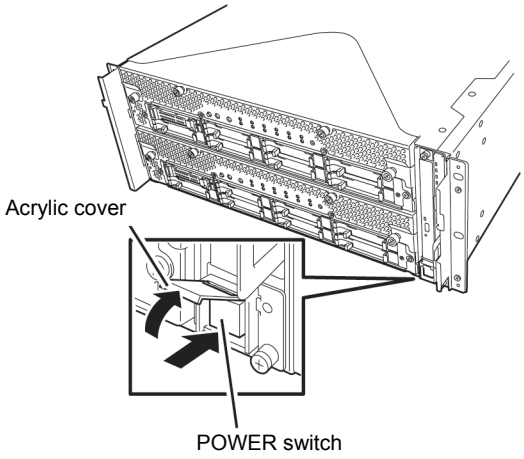
1. Turn on the display and the peripheral equipment connected to the NEC Express5800/ft series.

Note If the power cords are connected to a power controller like a UPS, make sure that it is powered on.

2. Remove the front bezel.
3. Press the POWER switch located on the front side of the server.

   Lift the acrylic cover, and press the POWER switch.

Important **Do not turn off the power before the "NEC" logo appears.**



After a while, the "NEC" logo will appear on the screen.

Tips While the "NEC" logo is displayed on the screen, NEC Express5800/ft series performs a power-on self test (POST) to check itself. OS starts upon completion of POST.

For details, refer to *Chapter 3 (1.1 POST Check)* in *User's Guide*.

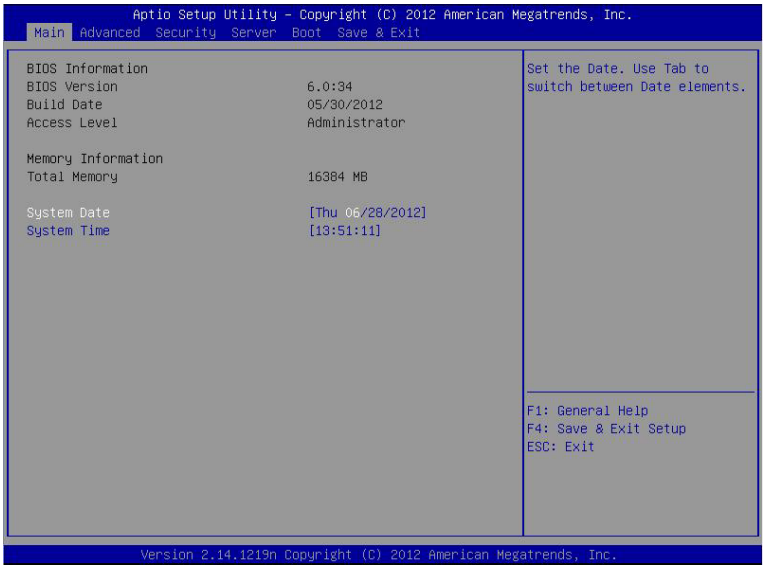
Note If the server finds errors during POST, it will interrupt POST and display the error message. Refer to *Chapter 1 (6.2 POST Error Messages)* in *Maintenance Guide*.

4. When POST proceeds, the following message appears at lower left of the screen.

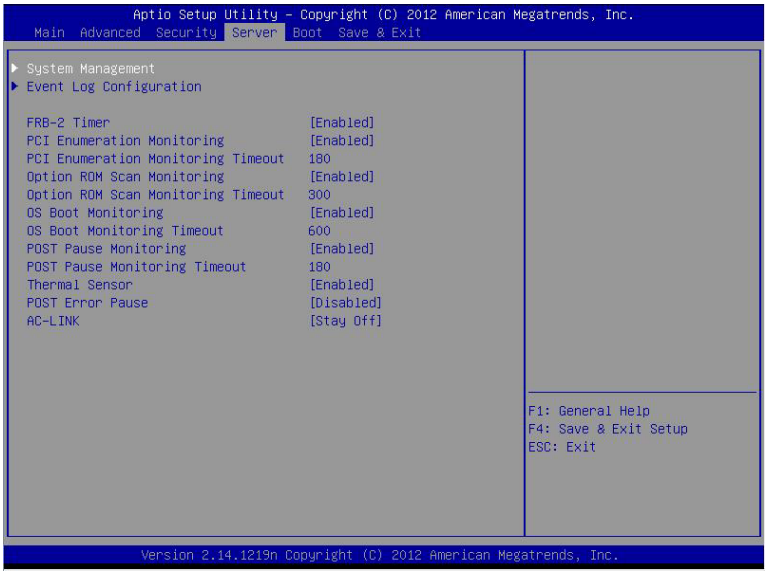
   `Press <F2> SETUP, ...` (The on-screen message depends on your system environment.)

   If you press <**F2**>, SETUP will start after POST, and the Main menu appears. (You can also start SETUP by pressing <**F2**> key while expanding option ROM.)

   Example:

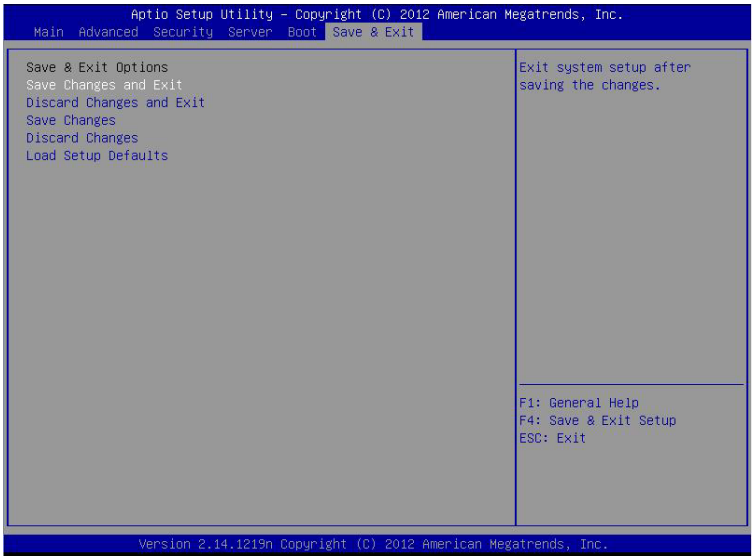


5. When you move the cursor onto **Server**, the **Server** menu appears.



6. Move the cursor onto **OS Boot Monitoring** and press **Enter**.
7. Among the parameters, choose **Disabled** and press **Enter**.

8. Move the cursor onto **Save & Exit**, the **Save & Exit** menu appears.



9. Select **Save changes and Exit**.

   On the confirmation window shown below, select **Yes** to save parameters and exit SETUP.

   System reboots when SETUP completes.

Save configuration and exit?
[Yes] No

Now **OS Boot Monitoring** function is disabled.

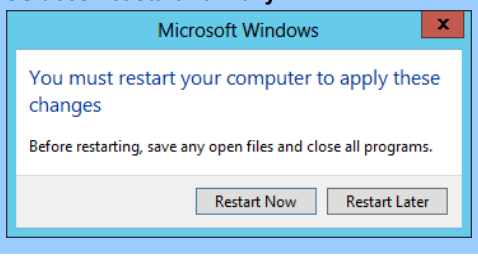
3.2 Setup with EXPRESSBUILDER

This section describes how to install Windows with EXPRESSBUILDER.

Important

- **Setup with EXPRESSBUILDER may delete all data of the hard disk drive depending on the settings. Pay attention to input parameters. You must be especially careful when configuring the following:**
  - **Partition Settings**

  Backing up user data, as needed, is recommended.
- **Before starting setup, be sure to disconnect hard disk drives that is not to be setup. Install those hard disk drives after setup has completed. Conducting setup with hard disk drives being connected may cause existing data to be erased unintentionally. It is recommended to make backup copy of user data before starting setup.**
- **Although some dialog boxes and popup windows are displayed during installing ft Server Control Software in Setup, do not operate from the keyboard and the mouse. Installation is continued automatically.**
  Do not operate especially although the following dialog is displayed. When installation is stopped with operation of a keyboard or a mouse, there is a possibility that OS does not start normally.



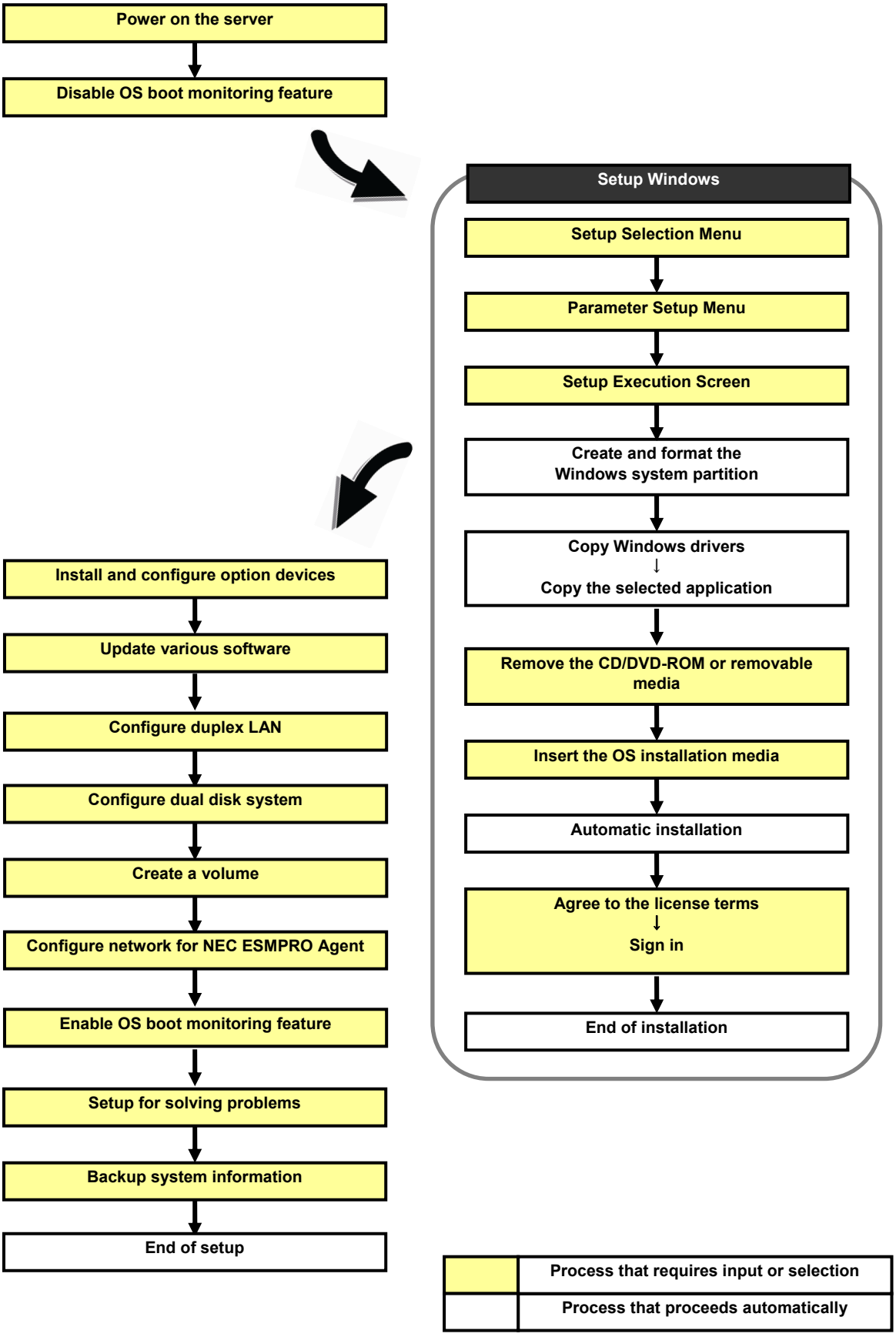
Note

The Scalable Networking Pack (SNP) function is disabled on systems that have been installed by using EXPRESSBUILDER.
The setting of SNP function may affect the system performance.
Contact your sales representative for details.

Tips

- Setup with EXPRESSBUILDER allows you to use a pre-specified parameter file or save the parameters specified in setup as a parameter file on a removable media.
- For details on creating a parameter file, see *Chapter 1 (6. Windows OS Parameter File)*.

3.2.1 Setup flow



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 2012 DVD-ROM*)
- **First Steps Guide**
- **EXPRESSBUILDER DVD**
- **ft Server Control Software UPDATE media**

  Used to update ft Server Control Software. This might not be provided with your server.
- Prepare if needed:
  - Removable media for Windows OS parameter file
  - **ft Server Control Software update module**
    See *Chapter 1 (3.7.1 Applying ft Server Control Software Update Module)* for more information.

3.2.3 Before setting up

During Setup with EXPRESSBUILDER, parameters are specified through the wizard. You can also save the parameters as one file (a parameter file) in removable media.

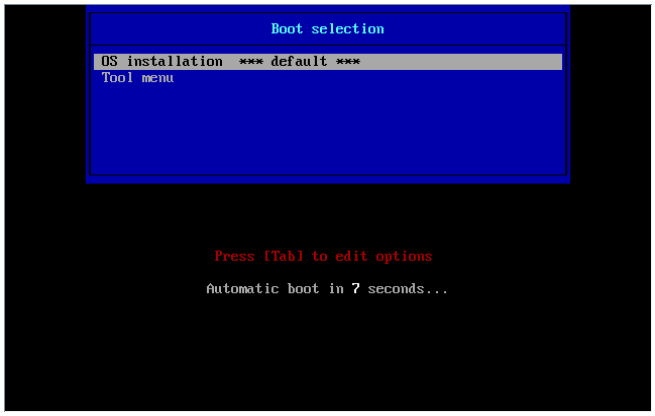
Note Read through the items in *Chapter 1 (3.1 Before Starting Setup)* prior to installing Windows.

3.2.4 Setup procedure

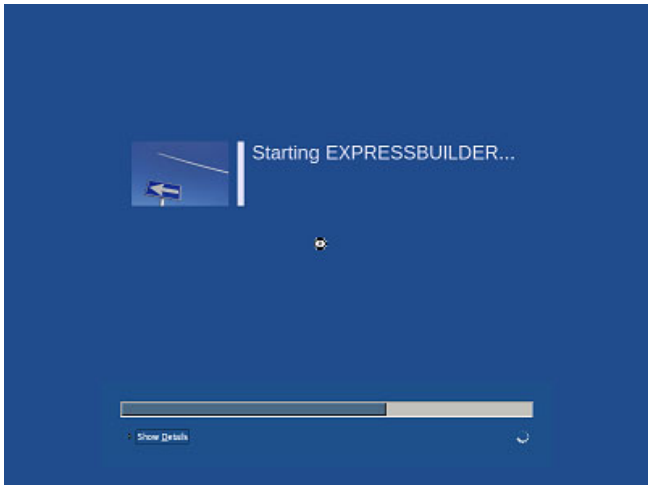
1. Prepare for setup according to *Chapter 1 (3.1.2 Preparation)*.
2. Be sure to disable OS Boot Monitoring feature according to *Chapter 1 (3.1.3 Disabling OS Boot Monitoring Feature)*.

Important **OS Boot Monitoring feature is enabled by the shipping default. Setup process will fail if this feature is enabled.**

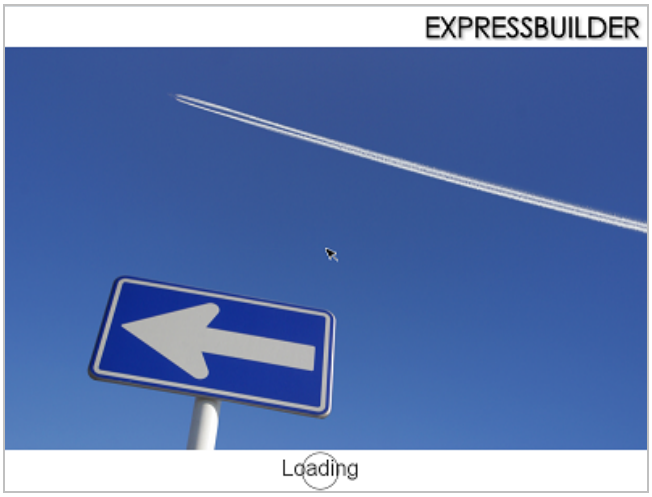
3. Turn the display unit power on, and then turn the server power on.
4. Start EXPRESSBUILDER according to *Chapter 1 (1.1 Starting EXPRESSBUILDER)*.
5. When the following message appears, select **OS installation *** default *****.



The following window appears.



The server starts from EXPRESSBUILDER.



6. Select **English** on the language selection window, and then click **OK**.

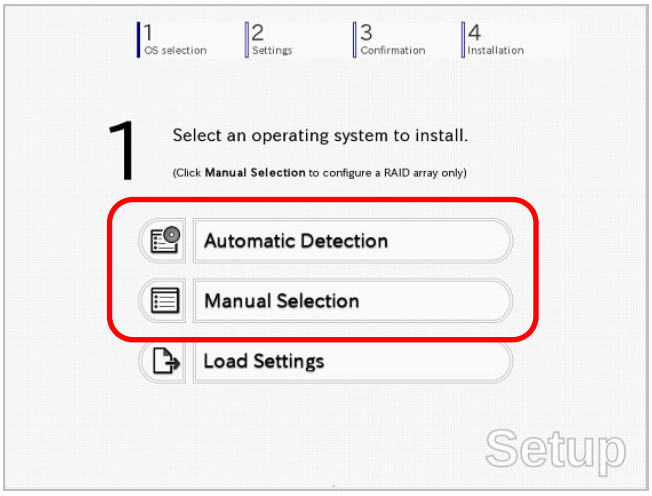
7. Click **Setup**.

8. On the **OS selection** menu, select the OS to install or specify the parameter file.

   ☐ When not using parameter file: Go to Step 9.
   ☐ When using a parameter file: Go to Step 10.

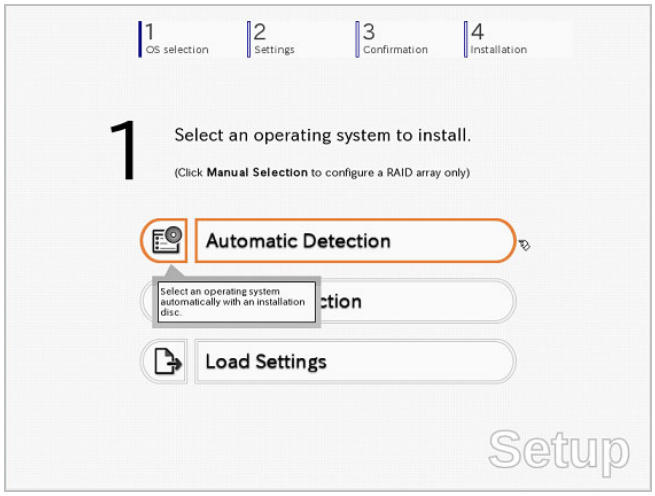
Note When setting up again, parameter input via the wizard can be omitted by loading the saved parameter file.

9. When *not using* a parameter file, select an OS by either of the following two ways:

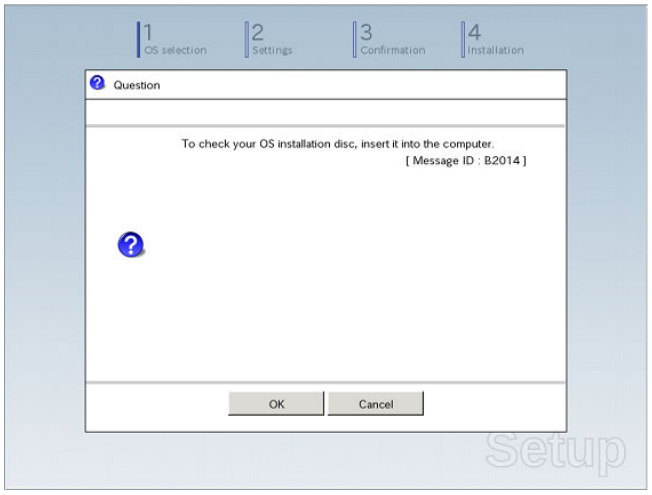


To automatically detect the OS on the OS installation media:

(1) Click **Automatic Detection**.

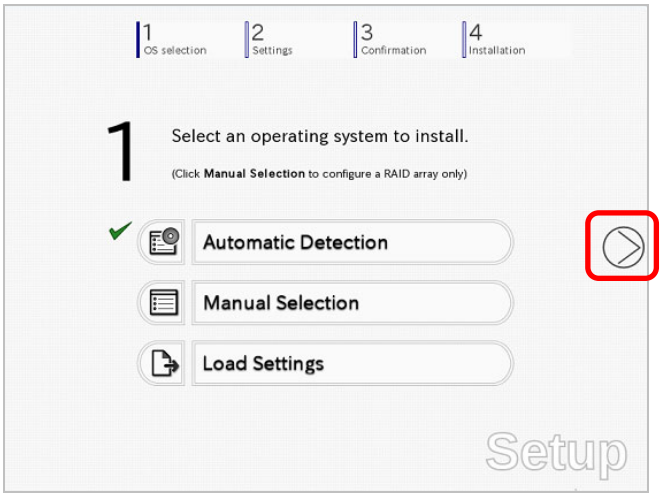


Insert the OS installation media, and then click **OK**.



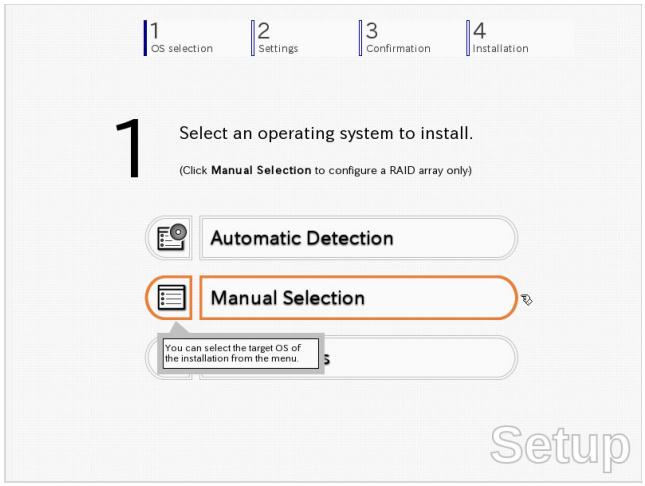
(2) Click ▷ on the right side of the screen.

→ Go to step 11.

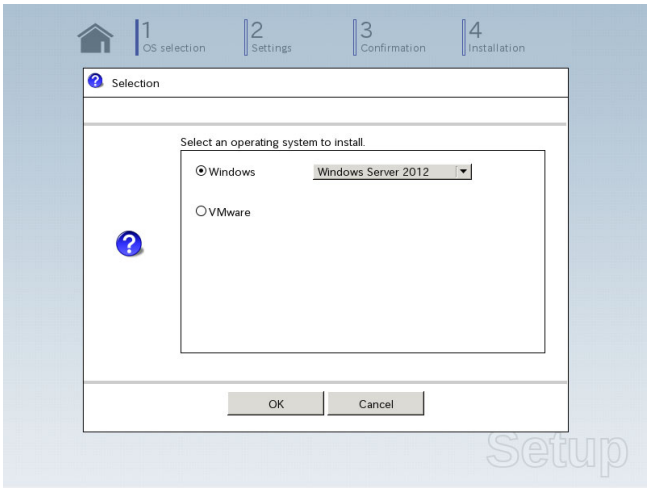


To select an OS from the menu:

(1) Click **Manual Selection**.

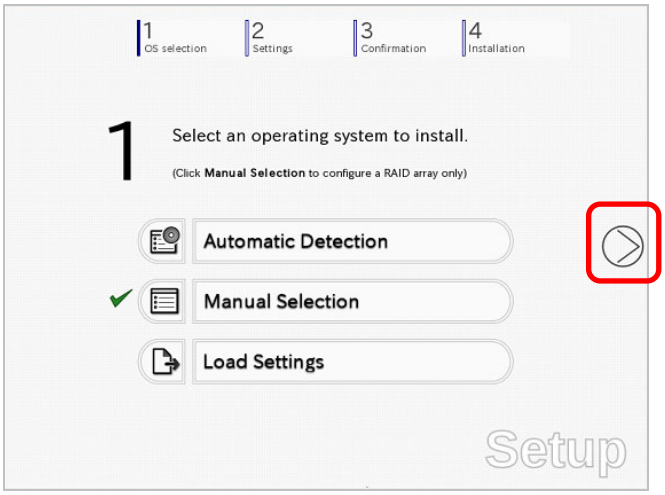


(2) From the pull-down menu, select **Windows Server 2012**, and then click **OK**.

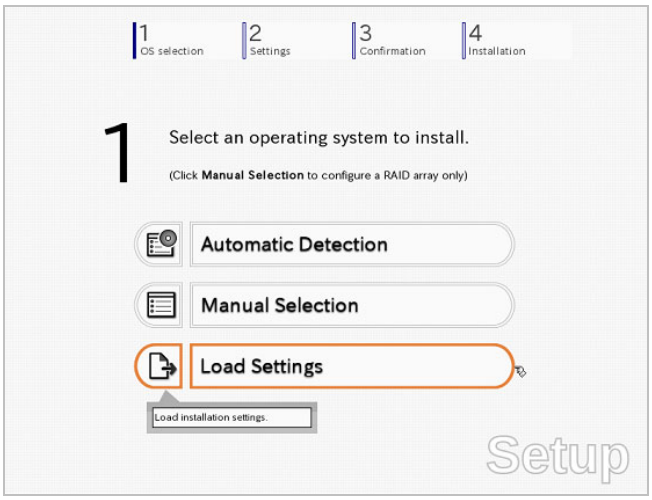


(3) Click ▷ on the right side of the screen.

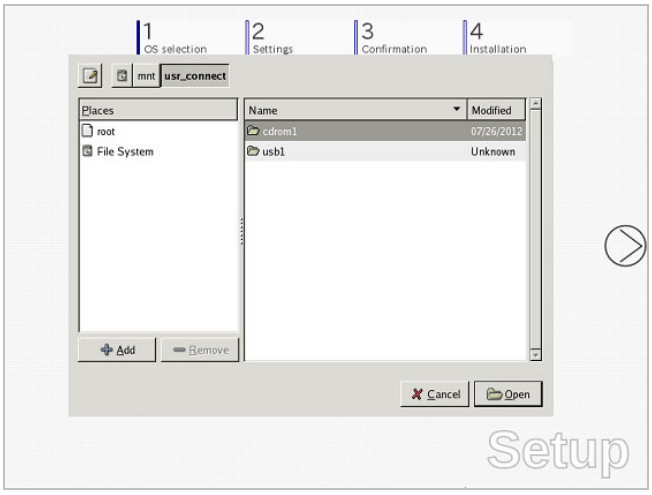
→ Go to step 11.



10. When *using* the parameter file, click **Load Settings**.

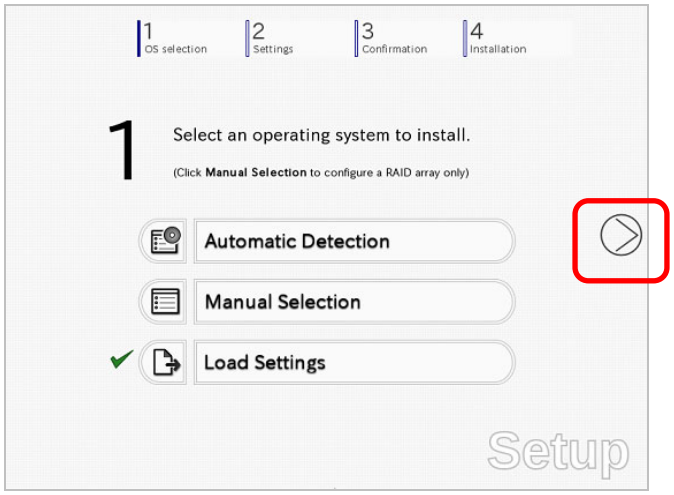


Follow the on-screen instruction to load the parameter file (*.tre).

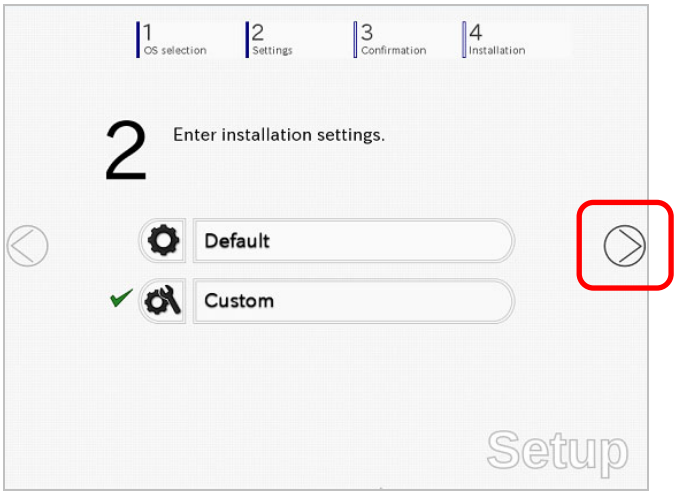


Tips For the removable media in which the parameter file is saved, see "**/mnt/usr_connect/usb***" (* indicates a number).

Click ▷ on the right side of the screen.



When the following screen appears, click ▷ on the right side of the screen.
Click **Custom** to check and modify the setting in the wizard.

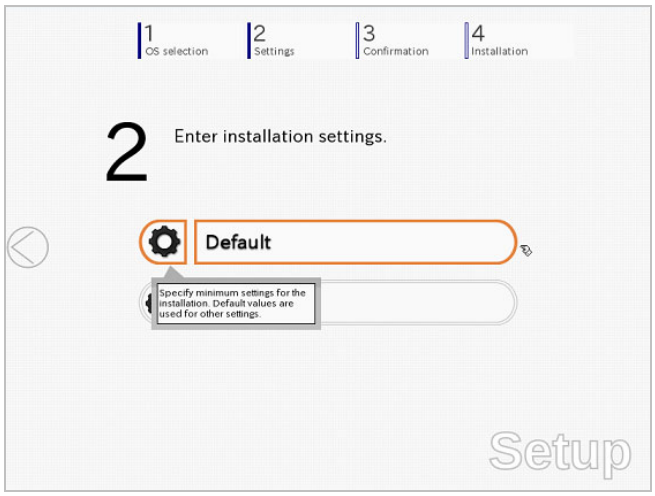


→ Go to step 12.

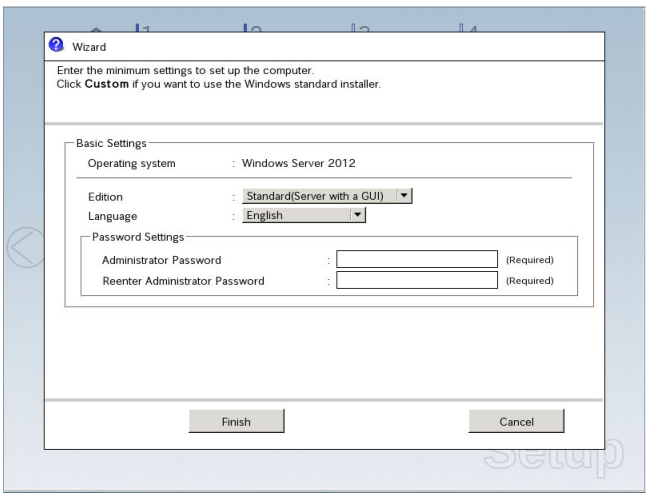
11. Specify the setup parameters by using either of the following methods:

Use Default:

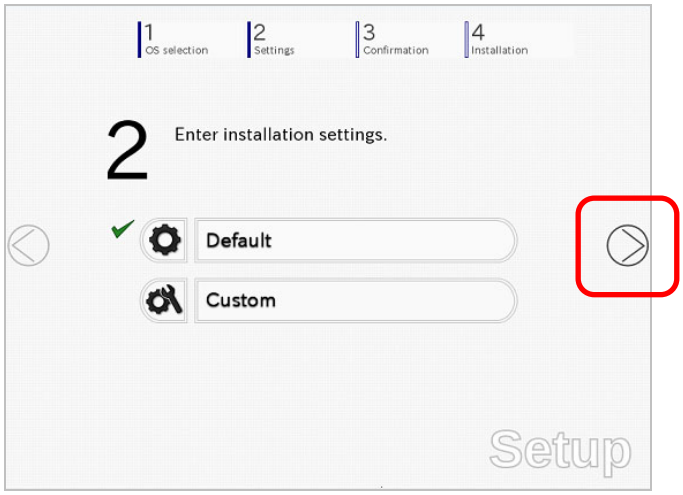
(1) Click **Default**.



(2) Type the password, and then click **Finish**.



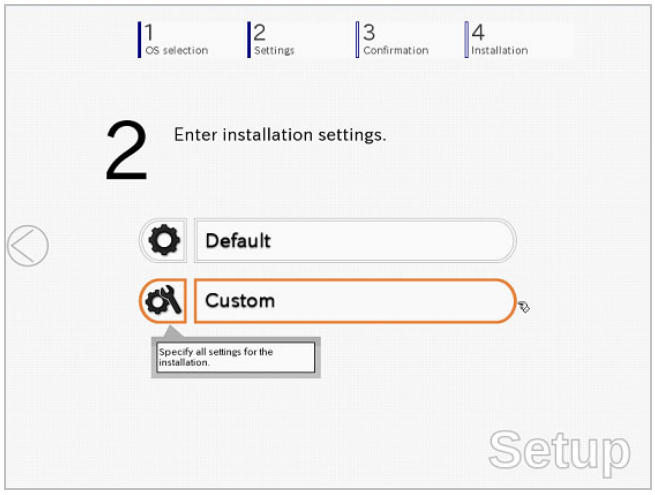
(3) Click ⊳ on the right side of the screen.



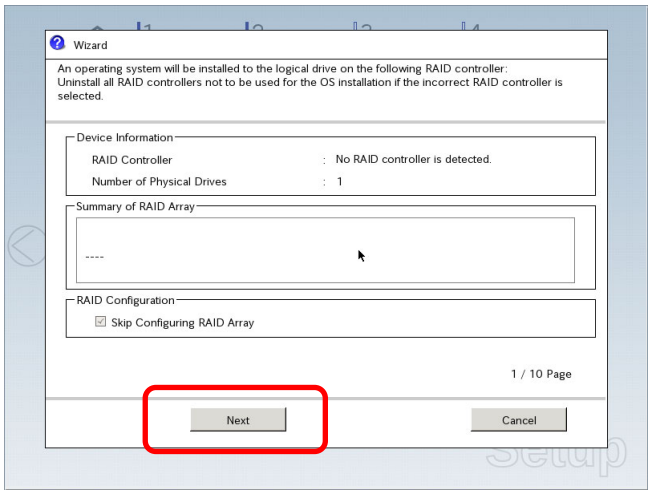
→ Go to step 12.

Use Custom:

(1) Click **Custom**.

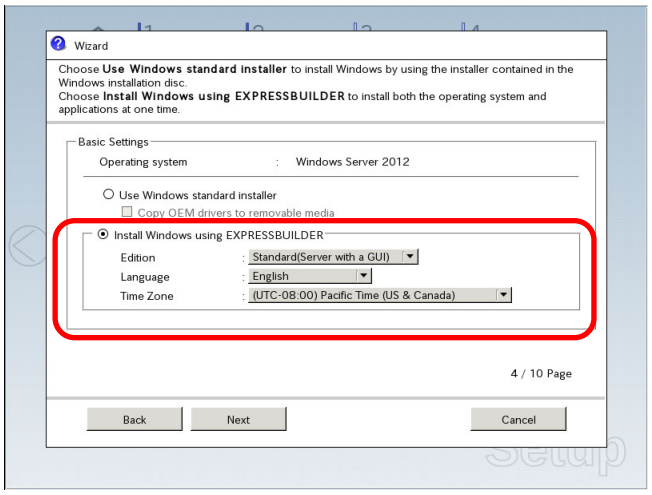


(2) RAID Configuration is unavailable on this server. Click **Next**.



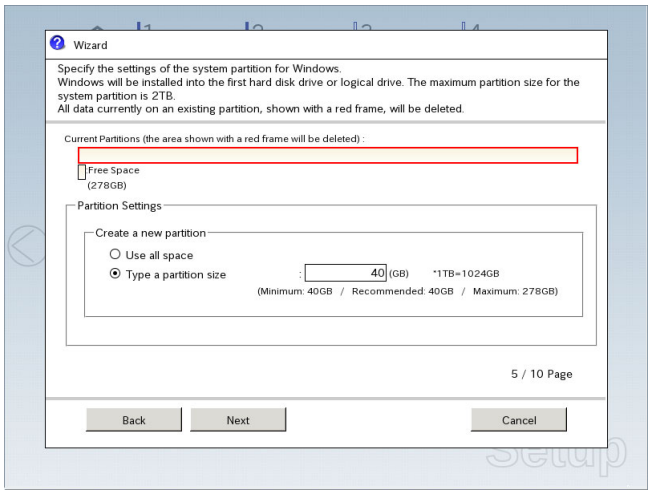
(3) Check the settings specified for **Basic Settings**.

Modify the settings as needed, and then click **Next**.



(4) Check the settings specified for **Partition Settings**.

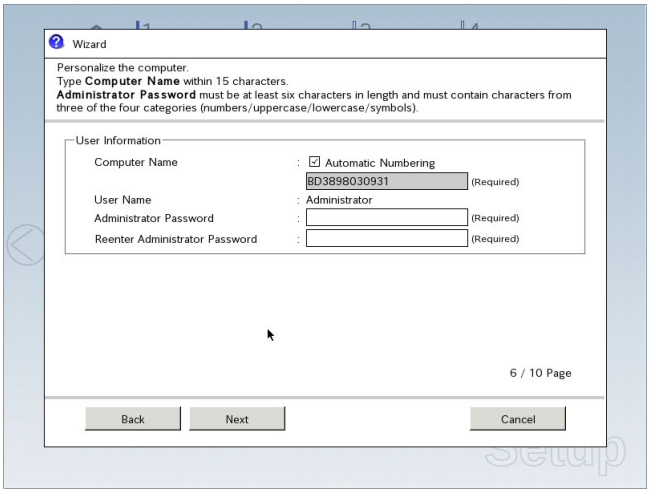
Modify the settings as needed, and then click **Next**.



Important

- **Partition size**
  - **Specify a partition size larger than the minimum required for installing the operating system. (See *Chapter 1 (3.1 Before Starting Setup)*.)**
  - **Specify a partition size not exceeding 2,097,152MB.**
- **The entire contents of the destination hard disk drive will be erased.**

(5) Enter the user information, and then click **Next**.



Note

Computer name and Administrator Password are required parameters.
Enter Administrator Password that satisfies the following conditions:

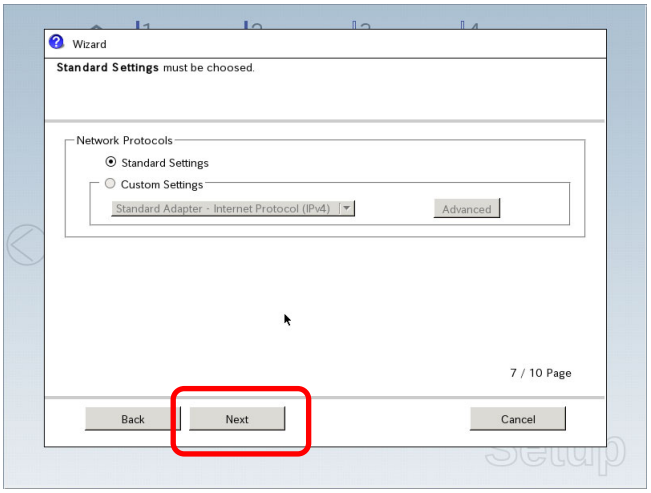
- Contains 6 or more characters
- Contains characters from at least three of the following categories: numbers, uppercase alphabetic characters, lowercase alphabetic characters, and symbols.

Tips

- The Computer name has been assigned by automatic assignment function. If you need to assign another computer name, remove the checkmark from "**Automatic Numbering**", and enter the desired computer name.
- If a parameter file is used for setup or if you return to a previous screen, •••••• is displayed in the Administrator password and Confirm Administrator password text boxes.

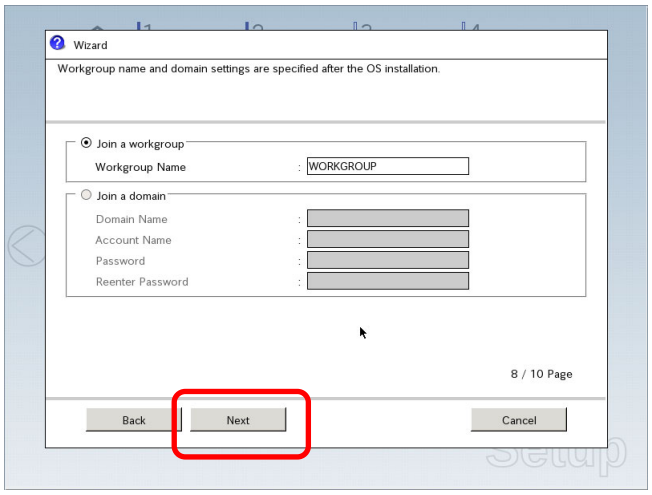
(6) **Network Protocols** is unavailable on this server.

Click **Next**.



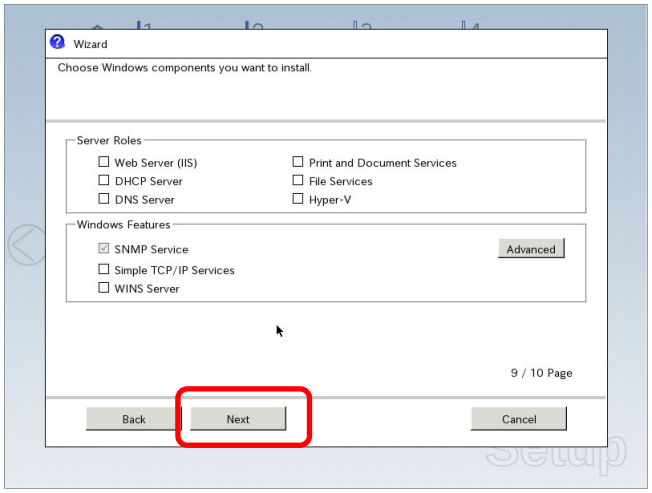
(7) Specifying domain or workgroup is unavailable on this server.

Click **Next**.



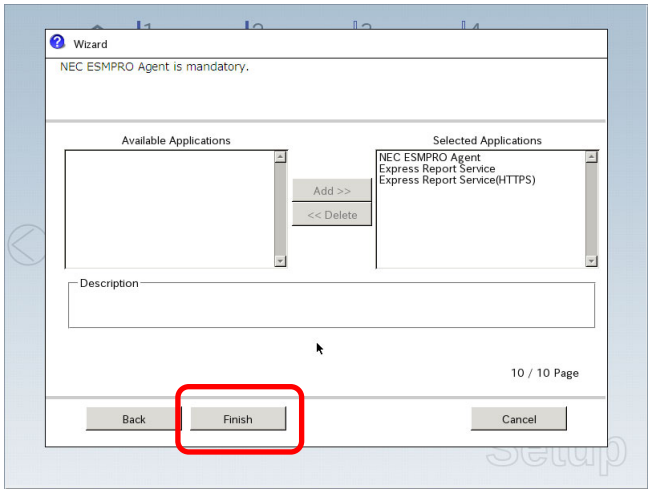
(8) Check the settings of Windows components.

Modify the settings as needed, and then click **Next**.

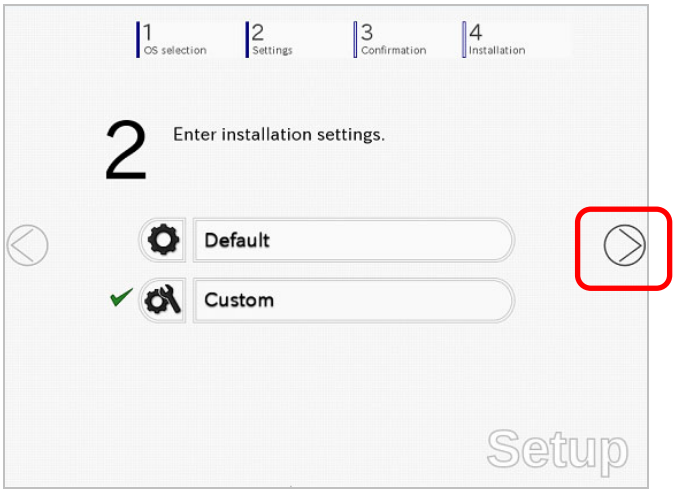


(9) Check the settings of applications.

Click **Finish**.

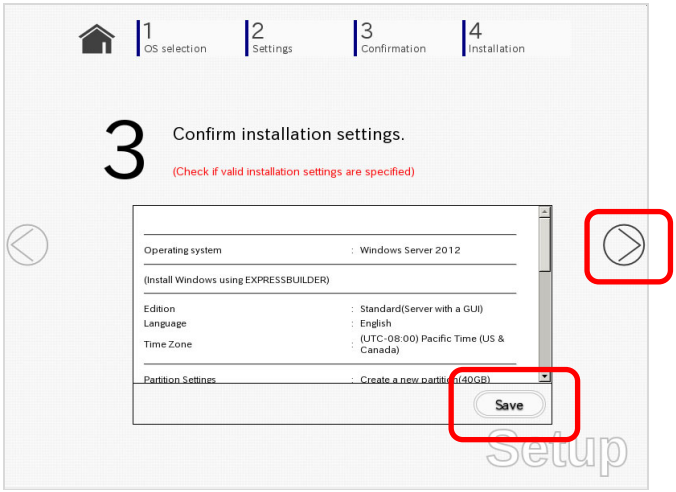


On the screen as shown below, click ▷ on the right side of the screen.



12. Check the settings.

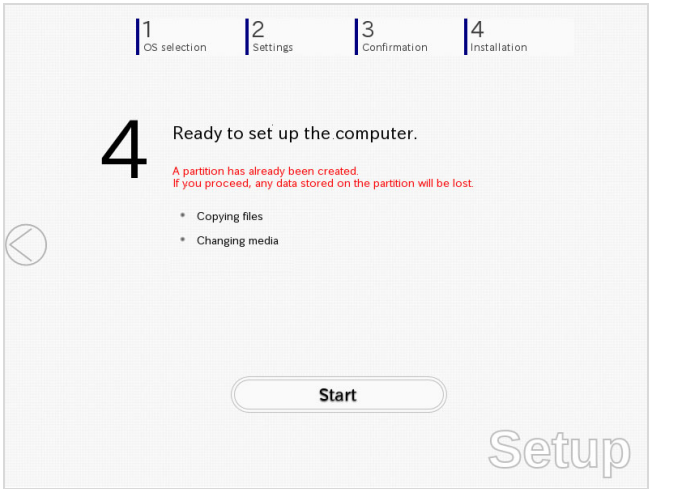
    To save the settings, click **Save**.



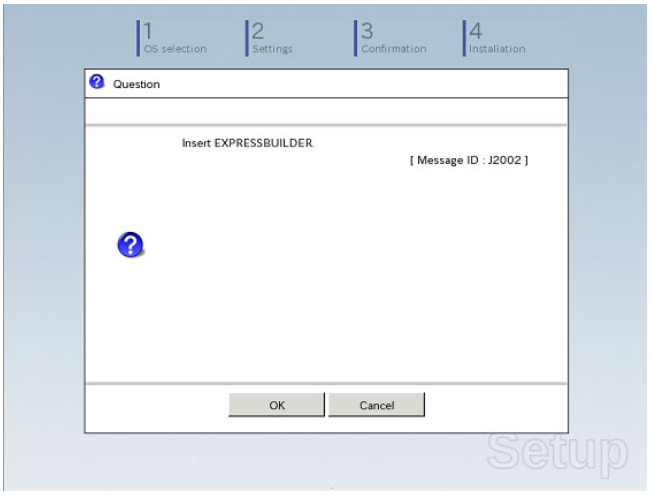
Click ▷ on the right side of the screen.

13. The setup process starts.

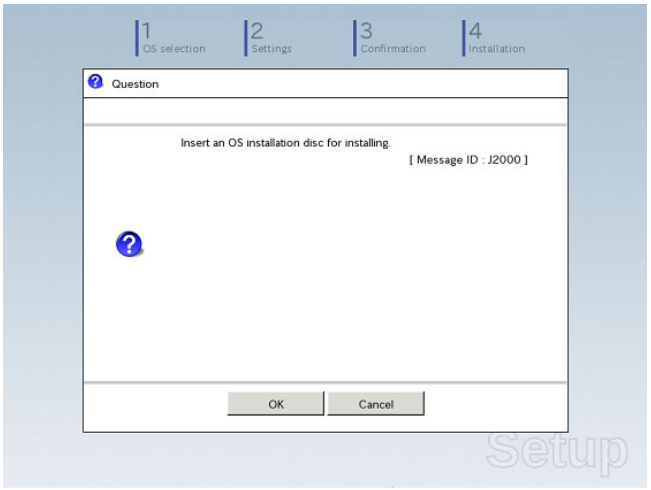
    Click **Start** to continue setup.



14. Insert the EXPRESSBUILDER disk into the optical disk drive, and then click **OK**.

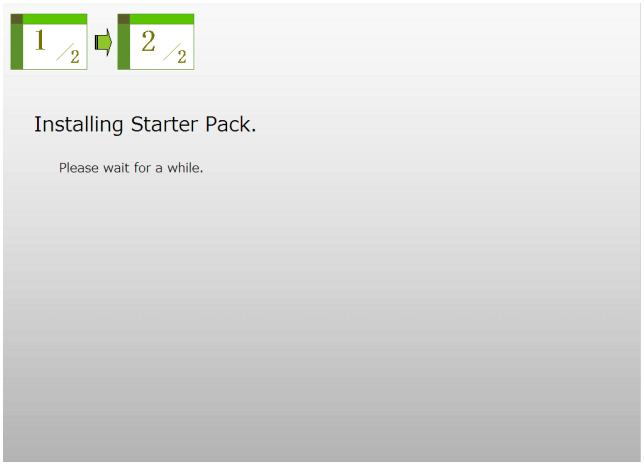


15. Insert the OS installation media into the optical disk drive, and then click **OK**.

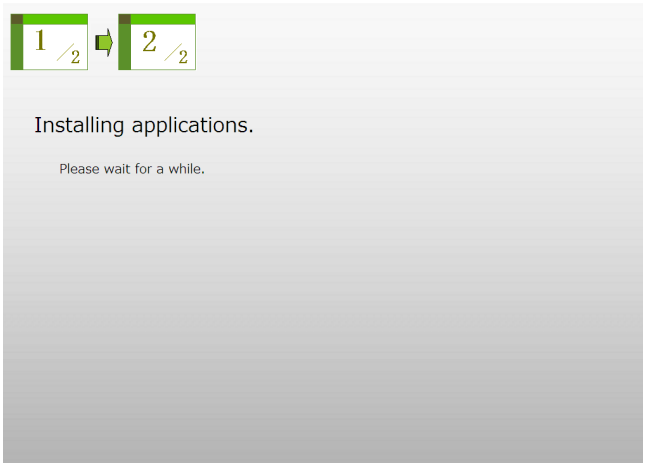


16. The Starter Pack and the selected applications are automatically installed.

    Wait until the process completes without performing any operation.



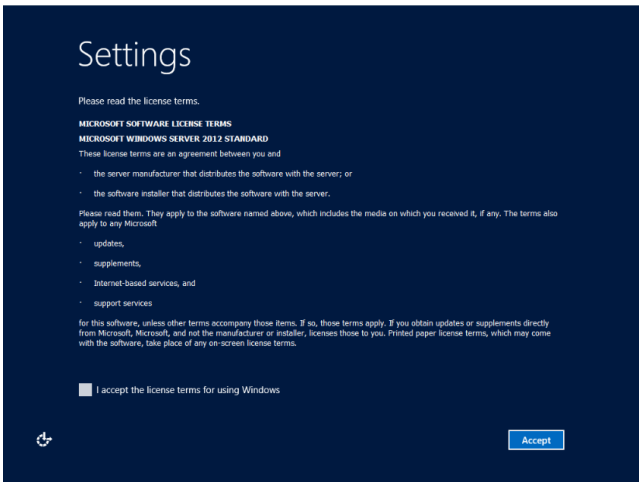
Screen displayed when Starter Pack is being installed



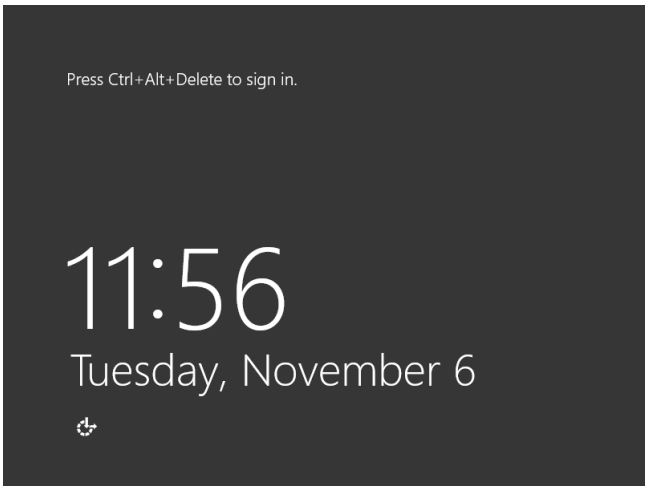
Screen displayed when an application is being installed

17. Read the terms of **License Agreement**.

    If you agree, select **I accept the license terms**, and then click **Start**.

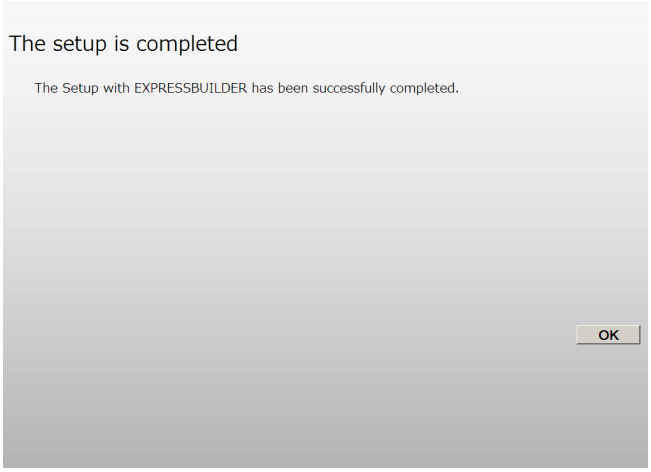


18. When the following message appears, press <**Ctrl**> + <**Alt**> + <**Del**> keys to sign-in.



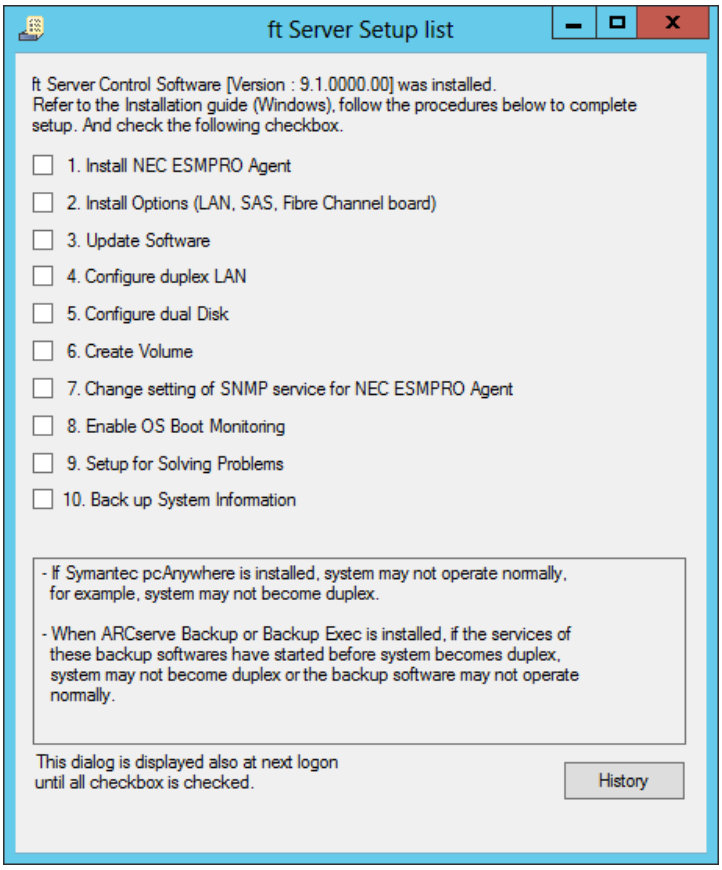
When the following message appears, enter your password.

19. Click **OK**.



20. When **ft Server Setup list** appears, confirm the list items.

    Provide setup for the item which is unchecked.



❑ Install Options (LAN, SAS, Fibre Channel Board)

If you have an option board that is not yet installed, install it according to *Chapter 2 (6.7 PCI Card)* in *Maintenance Guide*.

❑ Update Software

See Chapter 1 (*3.7.1 Applying ft Server Control Software Update Module*).

❑ Configure duplex LAN

See *Chapter 1 (3.8 Duplex LAN Configuration)*.

❑ Configure dual Disk

See *Chapter 1 (3.9 Configuring Duplexed Disks)*.

❑ Create Volume

See *Chapter 1 (3.10 Creating Volume)*.

❑ Change setting of SNMP service for NEC ESMPRO Agent

As described in *Chapter 2 (1.1 NEC ESMPRO Agent (for Windows),* setup SNMP service by referring to *NEC ESMPRO Agent Installation Guide (Windows)*.

❑ Enable OS Boot Monitoring

See *Chapter 1 (3.12 Enabling OS Boot Monitoring Feature)*.

❑ Setup for Solving Problems

See *Chapter 1 (5. Setup for Solving Problems)*.

Tips If necessary, perform license authentication procedure according to *Chapter 1 (3.13 License Authentication)*.

❑ Back up System Information

See *Chapter 1 (7. Backing Up System Information)*.

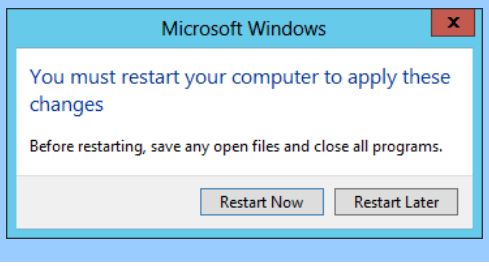
Setup with EXPRESSBUILDER is now complete.

3.3 Setup with Windows Standard Installer

This section describes how to install Windows with Windows Standard Installer.

Important

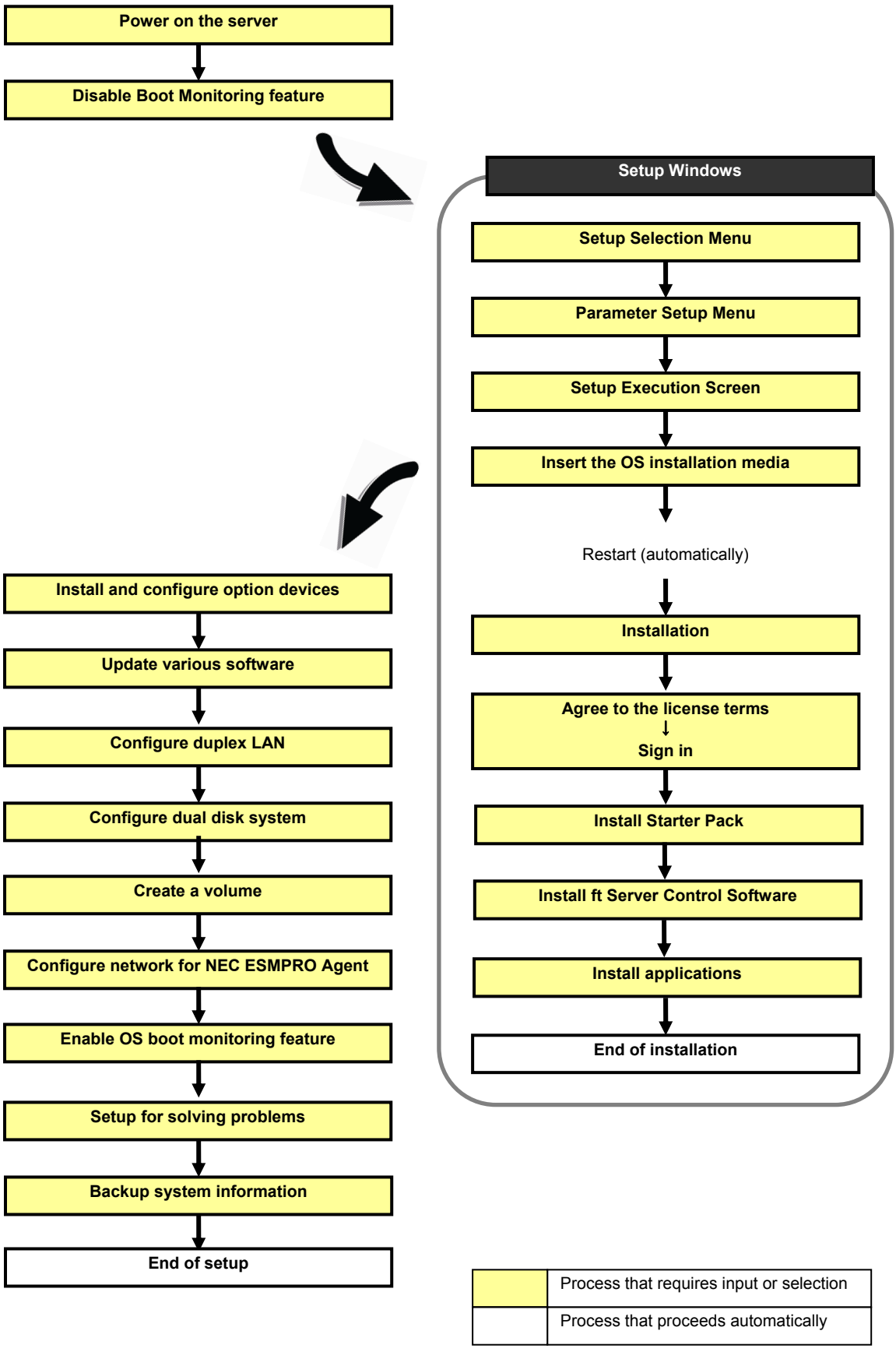
- **Setup with Windows standard Installer may erase all data in the hard disk drive depending on the settings. Pay attention to input parameters.**
  Backing up user data, as needed, is recommended.
- **Although some dialog boxes and popup windows are displayed during installing ft Server Control Software in Setup, do not operate from the keyboard and the mouse. Installation is continued automatically.**
  Do not operate especially although the following dialog is displayed. When installation is stopped with operation of a keyboard or a mouse, there is a possibility that OS does not start normally.



Tips

- Setup with Windows Standard Installer allows you to use a pre-specified parameter file or save the parameters specified in setup as a parameter file on a removable media.
- For details on creating a parameter file, see *Chapter 1* (*6. Windows OS Parameter File)*.

3.3.1 Setup flow



3.3.2 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 2012 DVD-ROM*)
- **First Steps Guide**
- **EXPRESSBUILDER DVD**
- **ft Server Control Software UPDATE media**

  Used to update ft Server Control Software. This might not be provided with your server.
- Prepare if needed:
  - **Removable media for Windows OS parameter file**
  - **ft Server Control Software update module**
    See *Chapter 1 (3.7.1 Applying ft Server Control Software Update Module)* for more information.

3.3.3 Before setting up

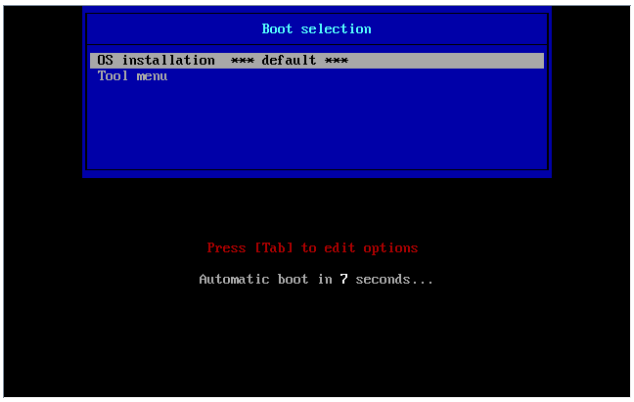
Before starting setup, read through *Chapter 1 (3.1 Before Starting Setup)* for successful setup.

3.3.4 Setup procedure

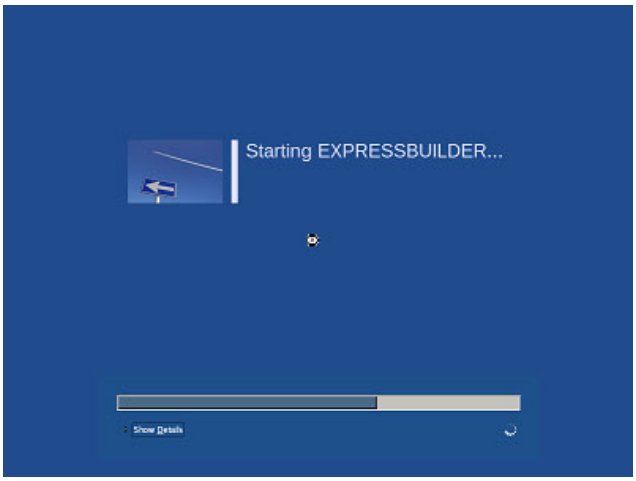
1. Prepare for setup *according to Chapter 1 (3.1.2 Preparation)*.
2. Be sure to disable OS Boot Monitoring feature according to *Chapter 1 (3.1.3 Disabling OS Boot Monitoring Feature)*.

Important **OS Boot Monitoring feature is enabled by the shipping default. Setup process will fail if this feature is enabled.**

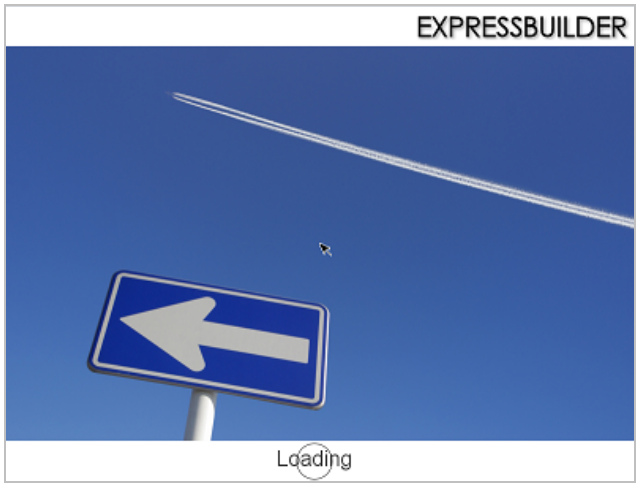
3. Power on the display unit, and then power on the server.
4. Start EXPRESSBUILDER according to *Chapter 1 (1.1 Starting EXPRESSBUILDER)*.
5. When the following message appears, select **OS installation *** default *****.



The following window appears.



The server starts from EXPRESSBUILDER.



6. Select **English** on the language selection window, and then click **OK**.

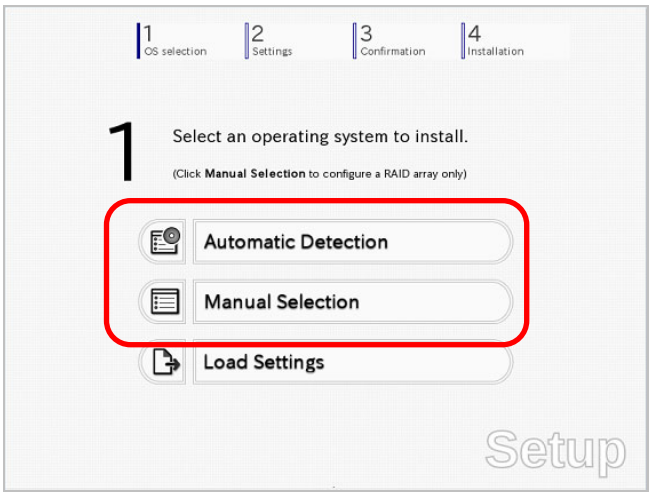
7. Click **Setup**.

8. On the **OS selection** menu, select the OS to install or specify the parameter file.

   ☐ When not using parameter file: Go to Step 9.
   ☐ When using a parameter file: Go to Step 10.

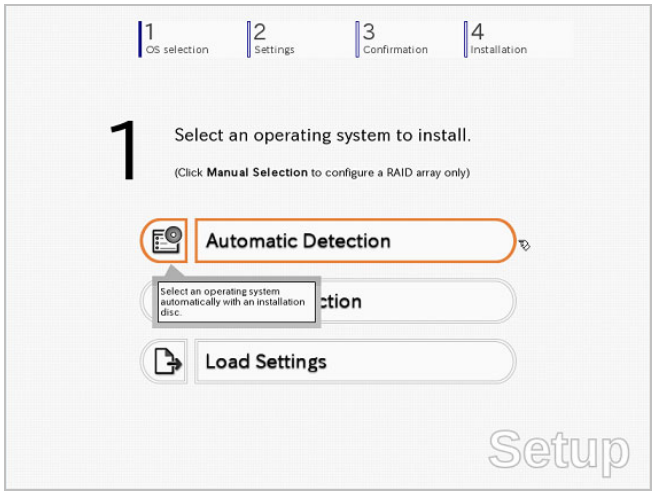
Note When setting up again, parameter input via the wizard can be omitted by loading the saved parameter file.

9. When *not using* a parameter file, select an OS by either of the following two ways:

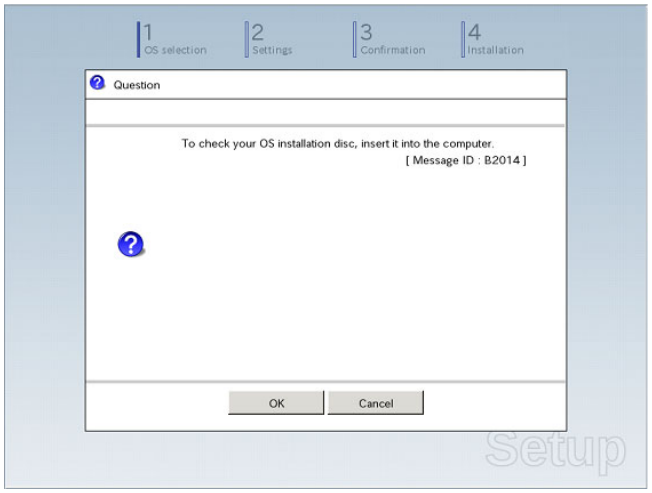


To automatically detect the OS on the OS installation media:

(1) Click **Automatic Detection**.

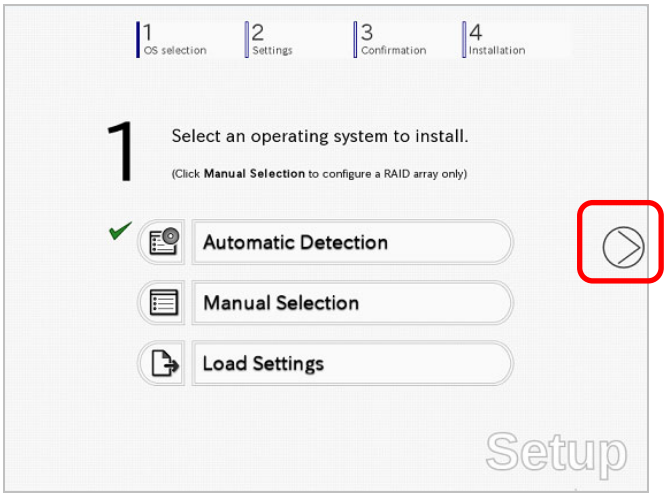


Insert the OS installation media, and then click **OK**.



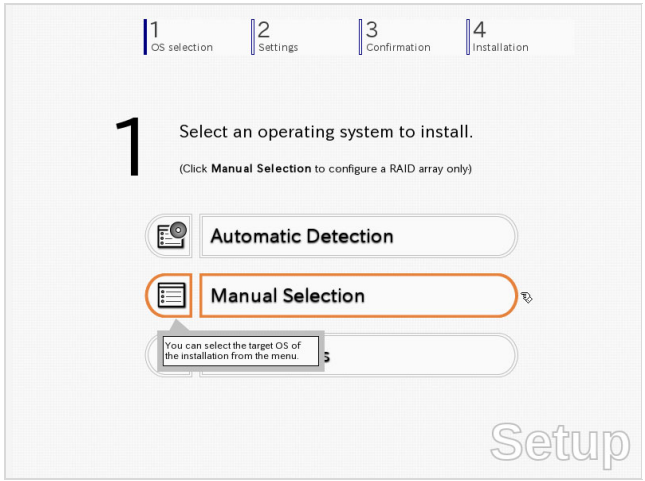
(2) Click ▷ on the right side of the screen.

→ Go to step 11.

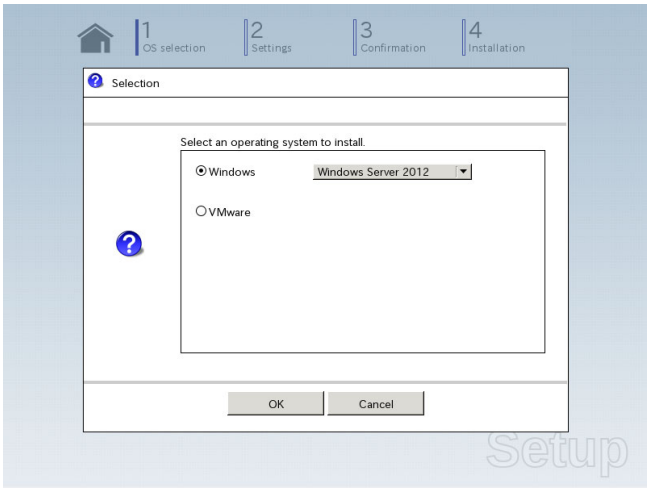


To select an OS from the menu:

(1) Click **Manual Selection**.

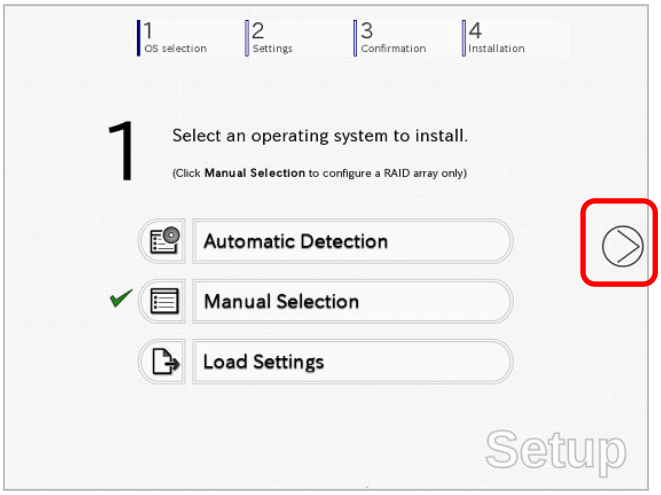


(2) From the pull-down menu, select **Windows Server 2012**, and then click **OK**.

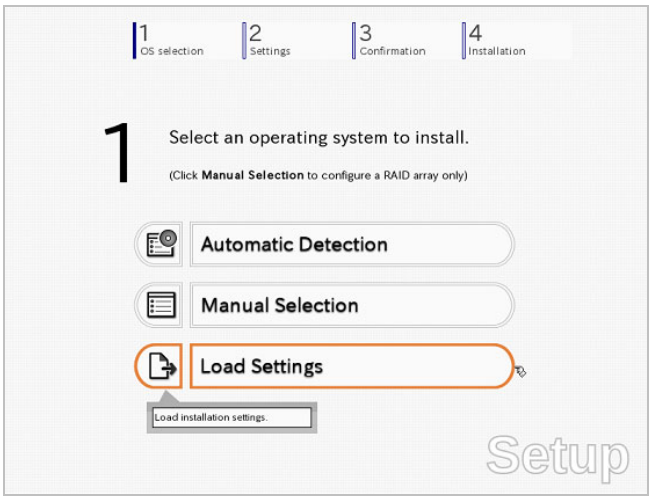


(3) Click ▷ on the right side of the screen.

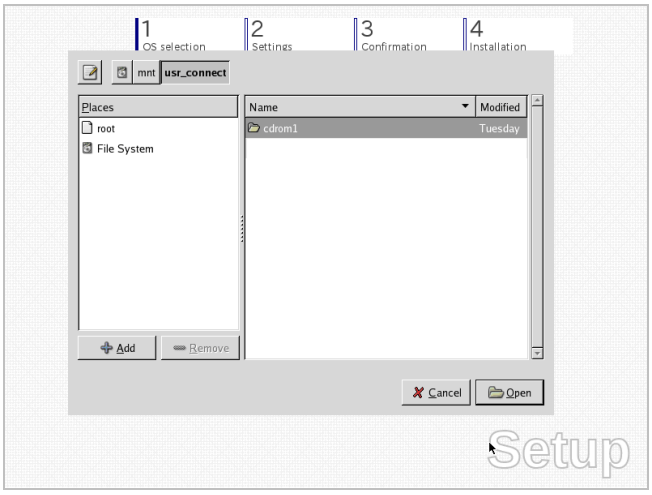
→ Go to step 11.



10. When *using* the parameter file, click **Load Settings**.



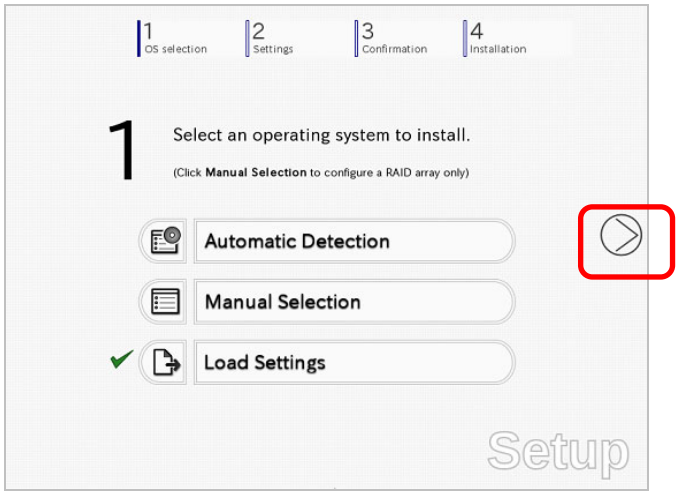
Follow the on-screen instruction to load the parameter file (*.tre).



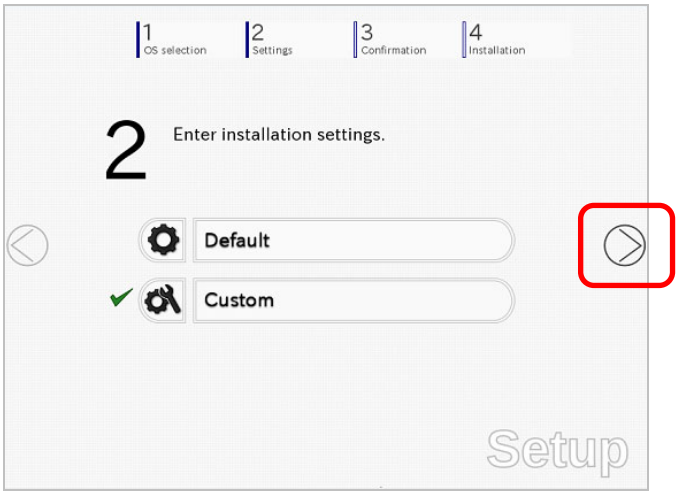
Tips

For the removable media in which the parameter file is saved, see **"/mnt/usr_connect/usb*"** (* indicates a number).

Click ▷ on the right side of the screen.

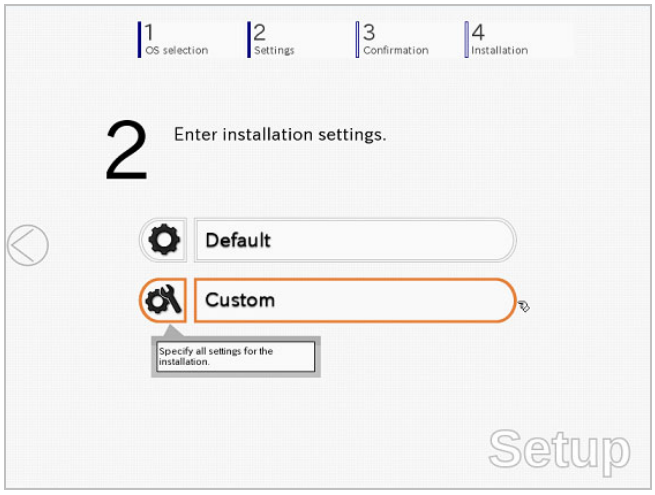


When the following screen appears, click ▷ on the right side of the screen.
Click **Custom** to check and modify the setting in the wizard.

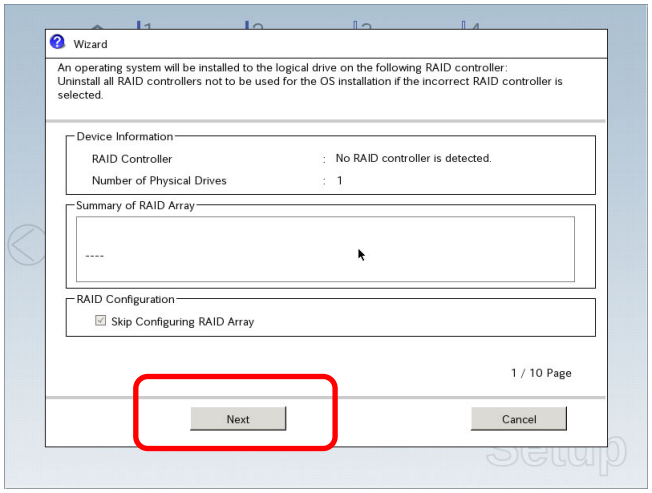


→ Go to step 12.

11. Click **Custom**.

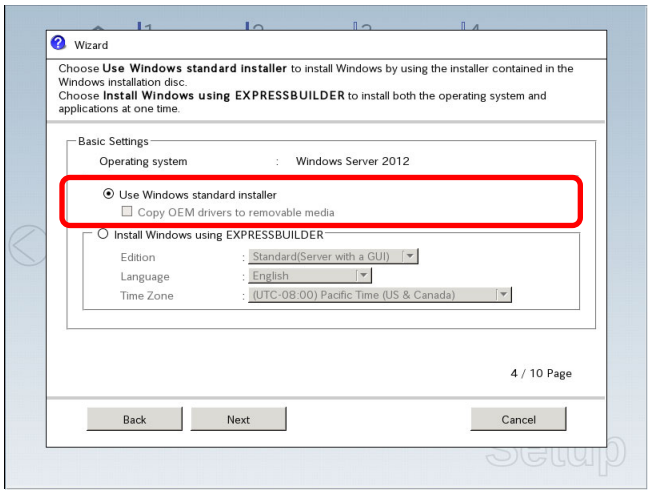


(1) RAID Configuration is unavailable on this server. Click **Next**.

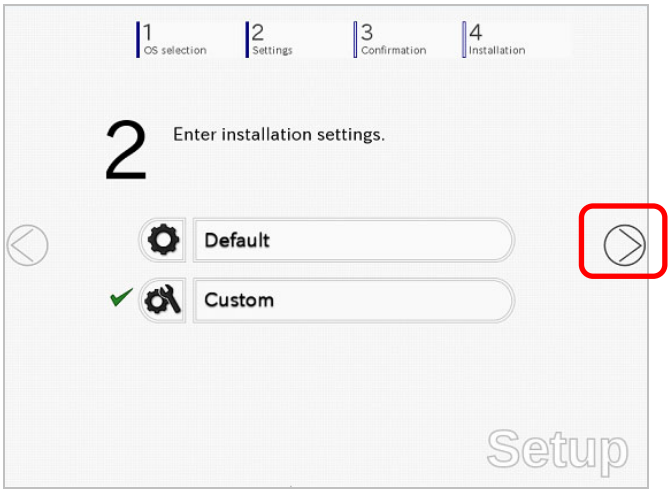


(2) Check the settings specified for **Basic Settings**.

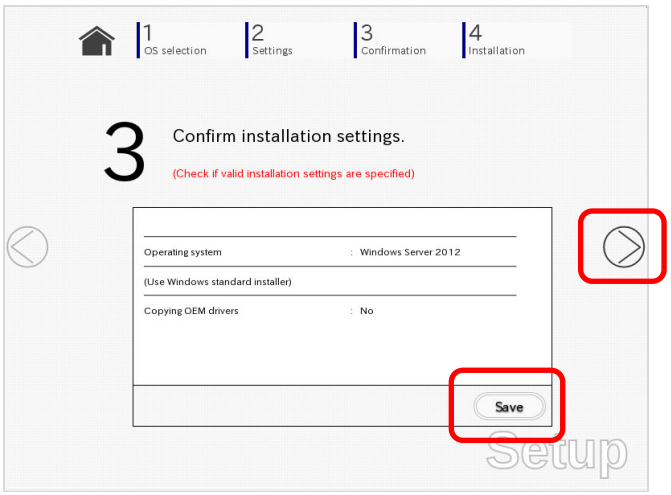
Select **Use Windows standard installer**, and then click **Next**.



(3) On the following screen, click ▷ on the right side of the screen.



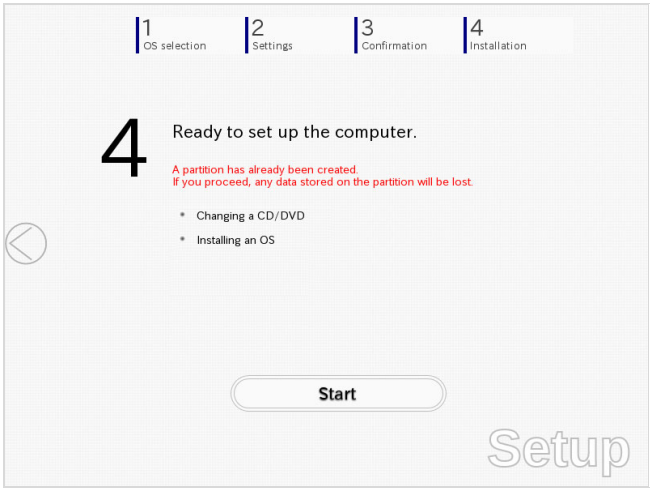
12. Check the parameter settings.
    To save the settings, click **Save**.



Click ▷ on the right side of the screen.

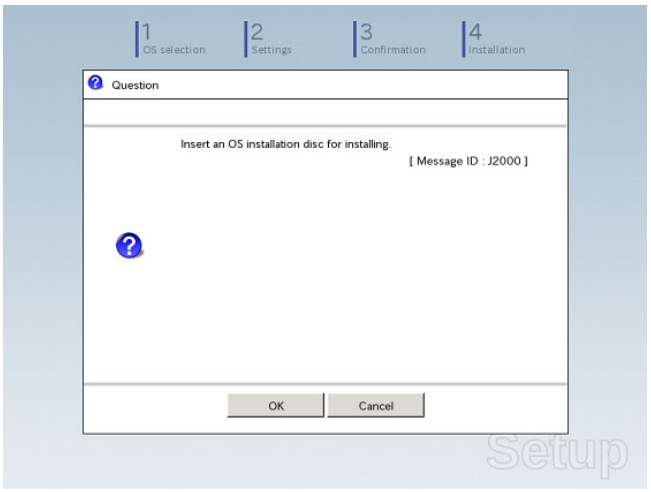
13. The setup process starts.

    Click **Start** to continue setup.



14. Proceed with setup according to on-screen message.

    Insert the OS installation media into the disk drive, and then click **OK**.



15. The server reboots automatically.
16. The system starts from the OS installation media.

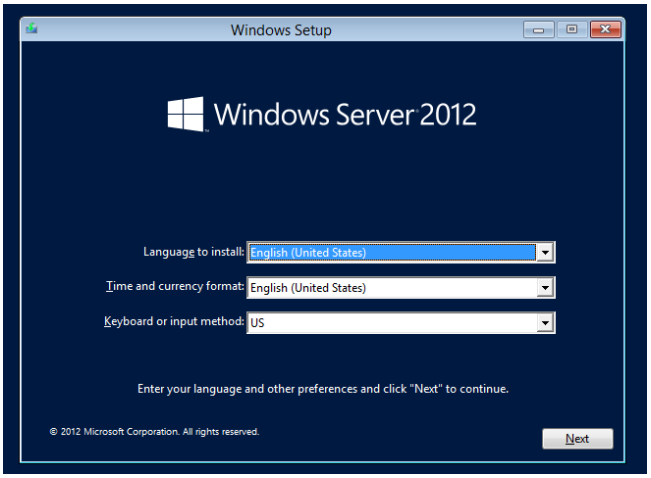
    If an operating system is already installed on the hard disk drive, the message “Press any key to boot from CD or DVD…” is displayed on the top of the screen. Press <**Enter**> key to boot from OS installation media.

    The boot sequence proceeds and the message “Windows is loading files…” appears.

    Note If “Windows is loading files...” message does not appear, <**Enter**> key was not pressed correctly. Reboot and retry.

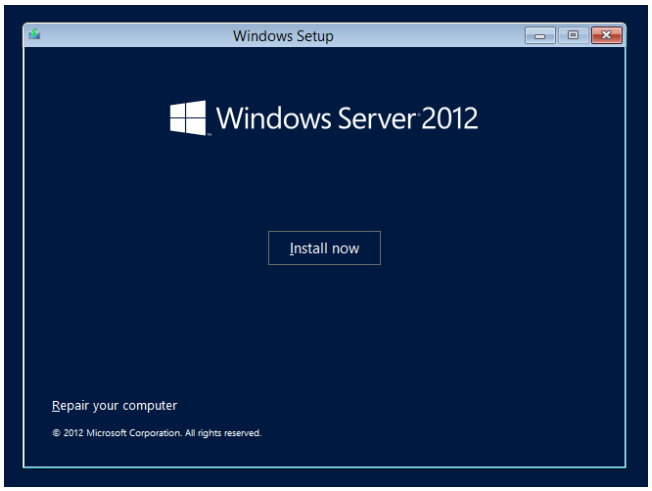
    This step is unnecessary if no operating system exists.

17. Click **Next** at default settings.



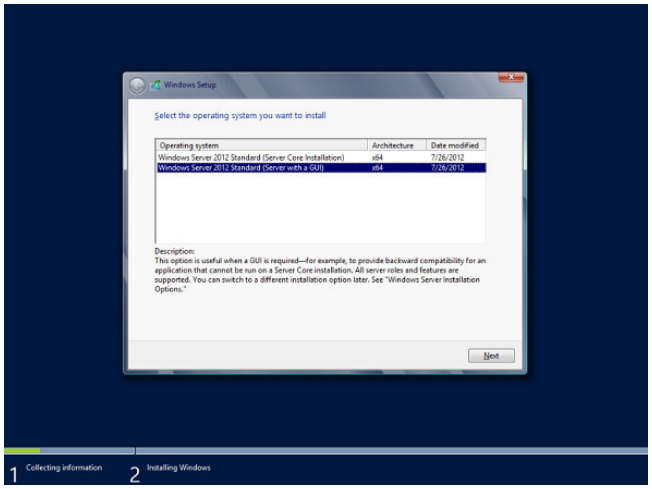
18. Click **Install Now**.

    Windows Server 2012 installation starts.



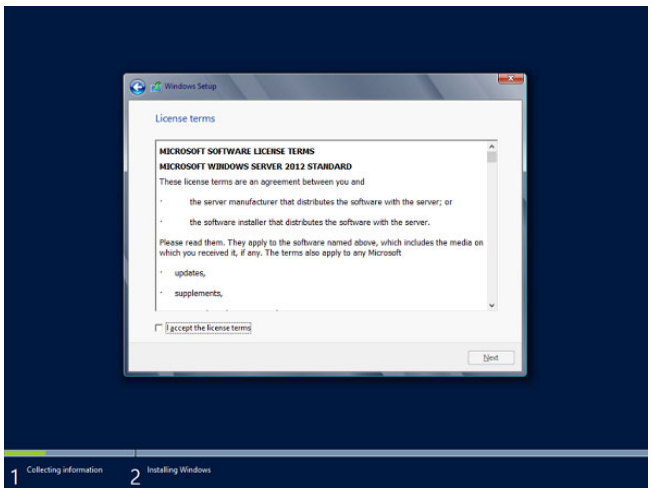
19. Select the operating system to install, and the click **Next**.

    The screen display differs depending on an OS installation media you are using.



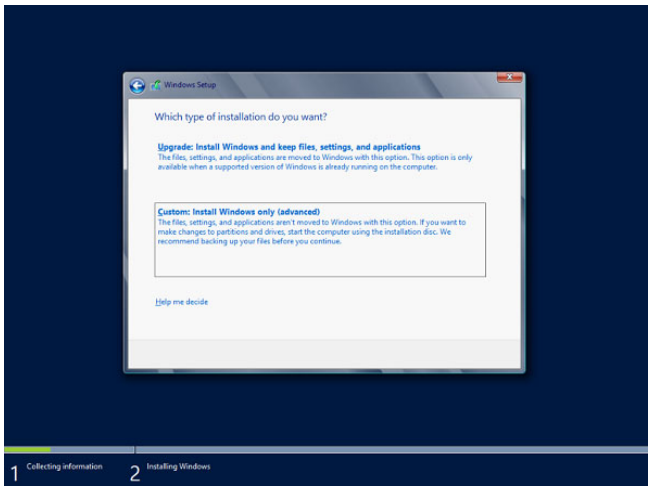
20. Confirm the content of the license agreement.

    If you agree, select **I accept the license terms** and then click **Next**.

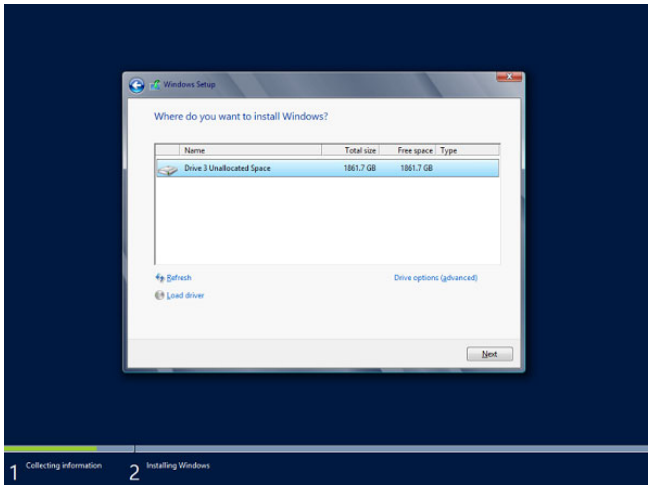


21. Select the installation type.

    Select **Custom: Install Windows only (advanced)** in this case.

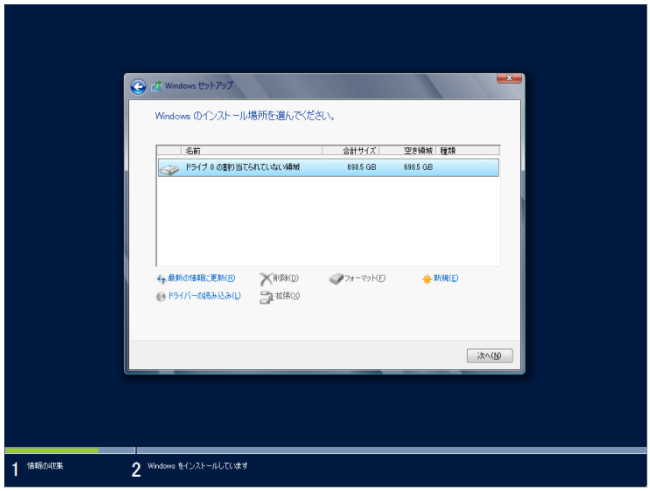


22. If the disk has no OS installed, click Drive options (advanced).

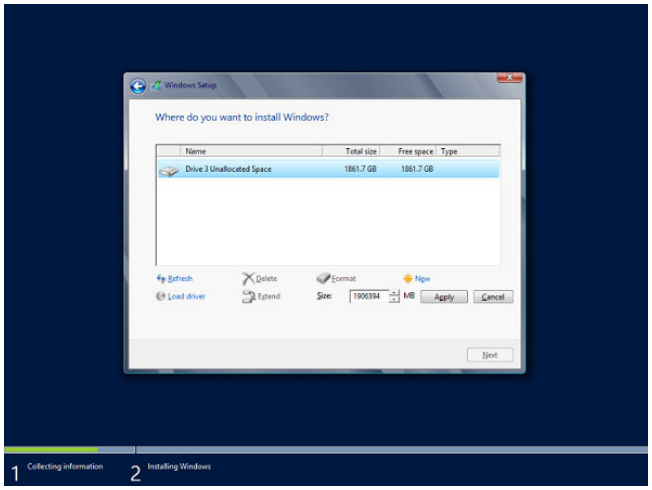


    If you are going to setup the disk with OS being installed, go to the next step.
    If the partition has already been created, go to step 26.

23. Click **New**.



24. Specify the partition size in the **Size**, and the click **Apply**.

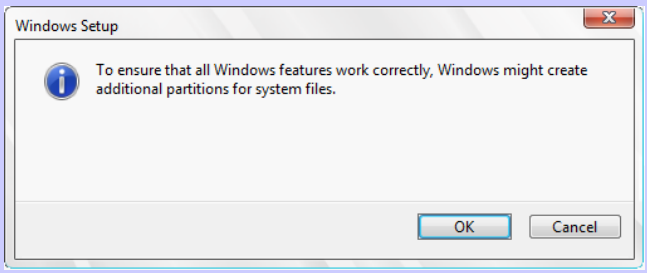


Note

The partition size must be 2TB or smaller.

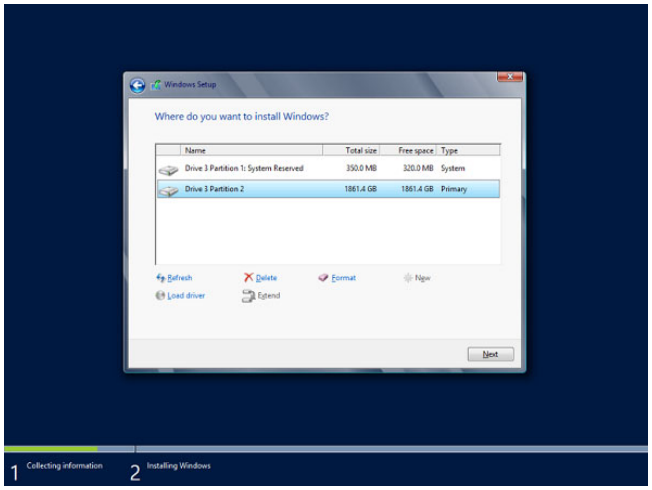
Tips

When creating new partition, 350MB of boot partition is secured. When the following message appears, click **OK**.



25. Select the partition created in step 24, and then click **Format**.

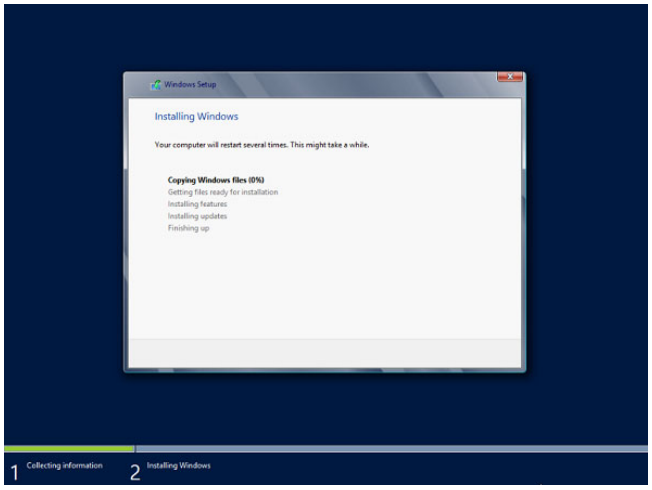
26. Select the created partition, and then click **Next**.



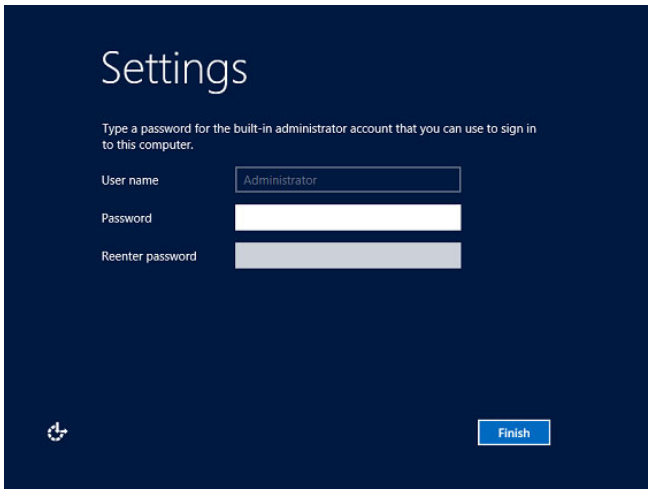
Tips

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

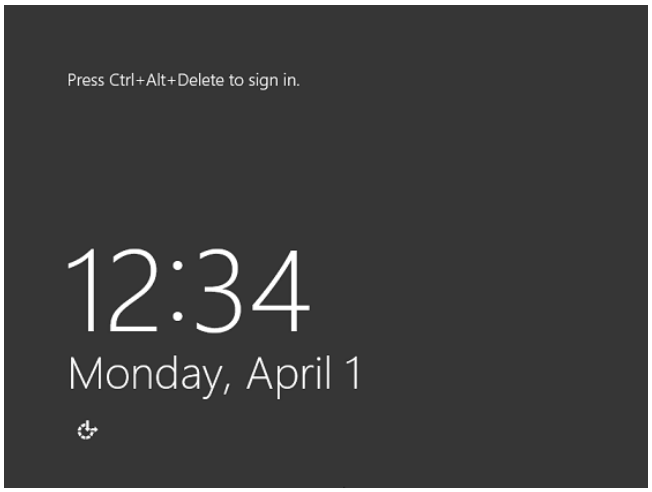
When the following message appears, Windows installation starts automatically.



27. Type a password and click **Finish**.



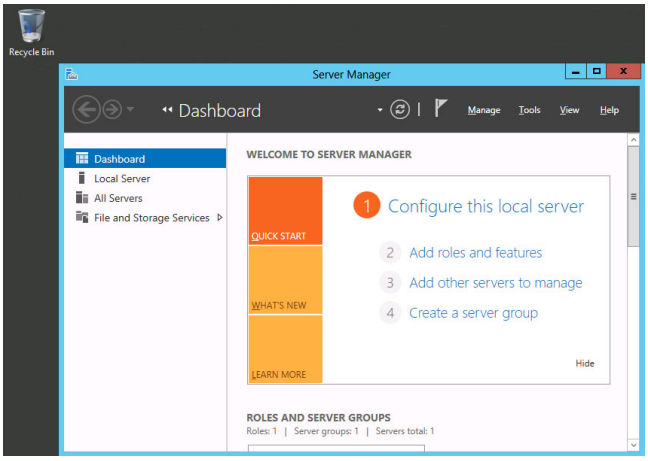
28. To Sign-in to Windows Server 2012, press <Ctrl> + <Alt> + <Del> on the screen below.



29. Type the password and press **Enter**.

Windows Server 2012 starts.

30. The following screen appears according to the contents selected (or displayed) in Step 19.

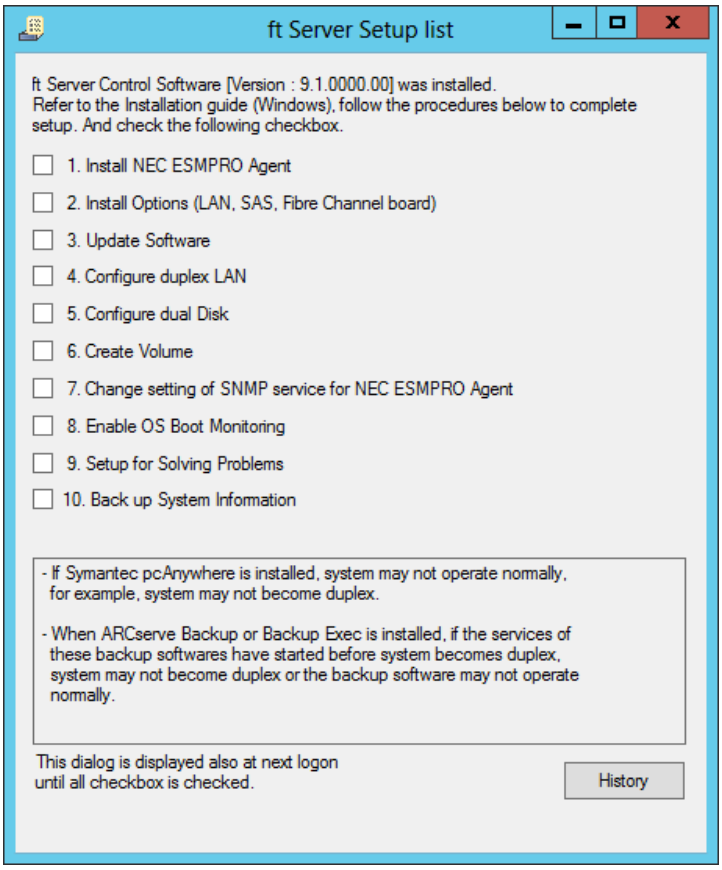


31. Install Starter Pack by referring to *Chapter 1* (*3.4 Installing Starter Pack)*.
32. Install the ft Server Control Software according to *Chapter 1 (3.5 Installing ft Server Control Software)*. When installation completes, Setup Checklist appears on screen.
33. Install the NEC ESMPRO Agent.

Tips

See *Chapter 2 (1.1 NEC ESMPRO Agent (for Windows)* for installation of NEC ESMPRO Agent.

34. When **ft Server Setup list** appears, confirm the list items.
Provide setup for the item which is unchecked.



❑ Install Options (LAN, SAS, Fibre Channel board)

If you have an option board that is not yet installed, install it according to *Chapter 2 (5.7 PCI Card)* in *Maintenance Guide*.

❑ Update Software

See *Chapter 1 (3.7.1 Applying ft Server Control Software Update Module)*.

❑ Configure duplex LAN

See *Chapter 1 (3.8 Duplex LAN Configuration)*.

❑ Configure dual Disk

See Chapter 1 *(3.9 Configuring Duplexed Disks)*.

❑ Create Volume

See *Chapter 1 (3.10 Creating Volume)*.

❑ Change setting of SNMP service for NEC ESMPRO Agent

As described in *Chapter 2 (1.1 NEC ESMPRO Agent (for Windows),* setup SNMP service by referring to *NEC ESMPRO Agent Installation Guide (Windows)*.

❑ Enable OS Boot Monitoring

See *Chapter 1 (3.12 Enabling OS Boot Monitoring Feature)*.

❑ Setup for Solving Problems

See *Chapter 1 (5. Setup for Solving Problems)*.

Tips If necessary, perform license authentication procedure according to *Chapter 1 (3.13 License Authentication)*.

❑ Back up System Information

See *Chapter 1 (7. Backing Up System Information)*.

Setup with Windows standard installer is now complete.

3.4 Installing Starter Pack

Starter Pack contains drivers customized for this server.
Be sure to apply Starter Pack before running the system.

Important

Also install Starter Pack in the following cases.

- **The system configurations have changed (when internal option devices have been added or removed)**
  If a dialog box prompting you to restart appears after changing system configurations, click No and then install Starter Pack.
- **If the system was restored using a restore process**
- **If a system has been restored using the backup tool**

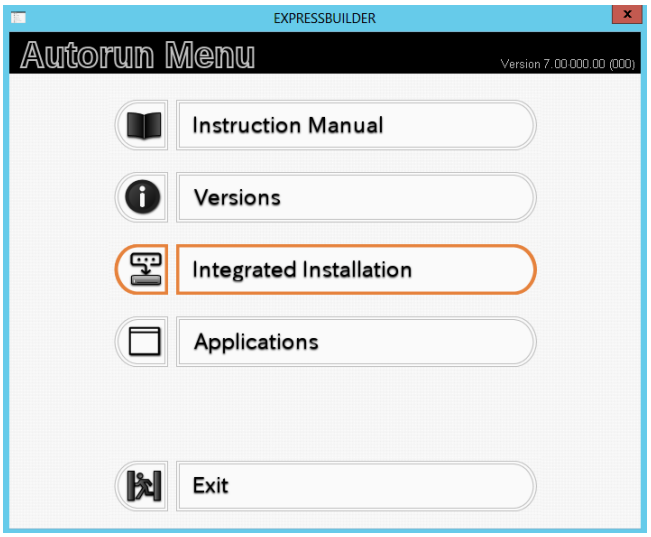
Note

The Scalable Networking Pack (SNP) function is disabled upon Starter Pack installation is complete.
The setting of SNP function may affect the system performance.

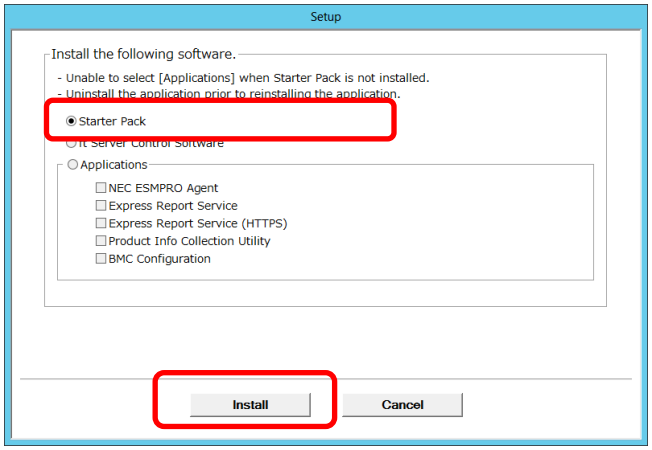
Tips

If the OS is installed by using EXPRESSBUILDER, Starter Pack is already applied. If the configuration is not changed, you do not need to apply Starter Pack again.

1. Log in to the system with the built-in administrator (or user with administrative privileges).
2. Insert EXPRESSBUILDER DVD into the optical disk drive.
3. Click **Integrated Installation** on the menu.



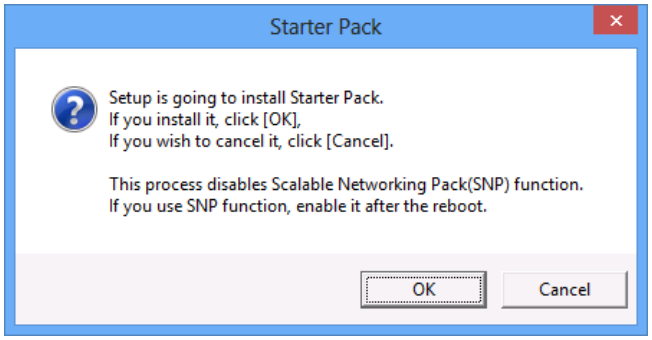
On the following screen, make sure that the **Starter Pack** option is selected, and then click **Install**.



Tips If Starter Pack is already installed, the **ft Server Control Software** is selected by default. To install Starter Pack again, select the **Starter Pack**.

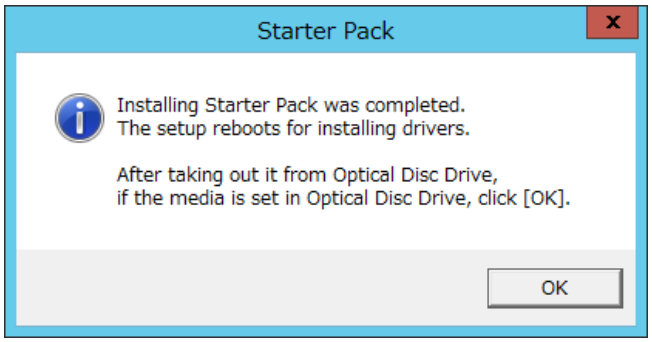
4. Read the message, and then click **OK**.

   Starter Pack installation starts.



5. The following message appears when Starter Pack installation is complete.

   Follow the instructions in the message, and remove EXPRESSBUILDER DVD.



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

Installation of Starter Pack is now complete.

3.5 Installing ft Server Control Software

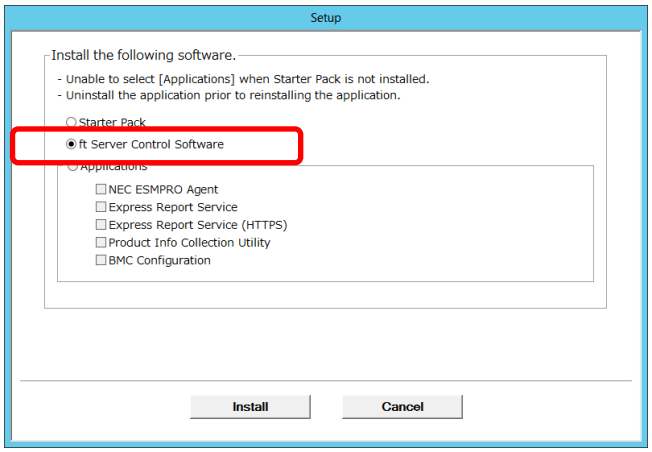
You must quit all programs including Microsoft management console.

1. Install ft Server Control Software in the following procedure.

   When ft Server Control Software UPDATE media is not provided:

   (1) After logging on to the system as a user with the Administrative account, insert the EXPRESSBUILDER DVD into the optical disk drive of the server.

   (2) On the menu screen, click **Integrated Installation**, select **ft Server Control Software** on the menu, and then click **Install**.



   When ft Server Control Software UPDATE media is provided:

   Install ft Server Control Software from the UPDATE media according to *Instruction Manual* that comes with the media.

   Follow the instructions to proceed with the installation.

   Note The message "**ft Server Control Software, Now Installing... Please Wait.**" is displayed during installation.
   Do not use the keyboard or mouse while this message is being displayed.

2. When installation starts, a message "If there is a disc in the DVD drive, please remove it." will be displayed. If EXPRESSBUILDER DVD is set in optical disk drive, remove it.
3. The system is rebooted several times during the installation. After the system is rebooted, log in again as the user logged in before rebooting.

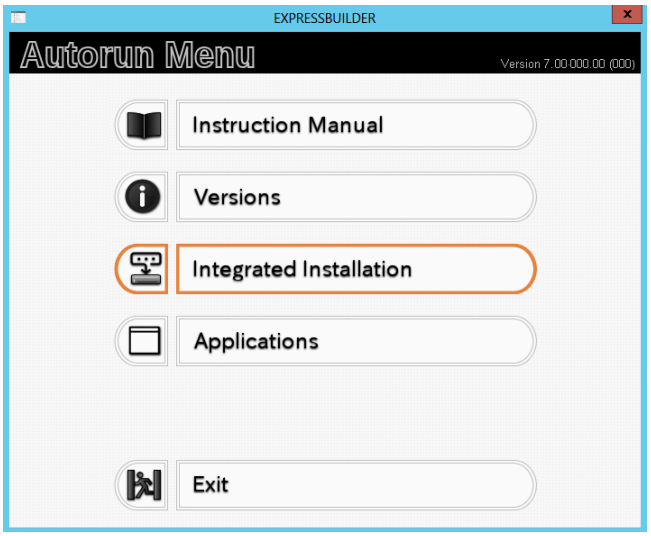
   Installation of the ft Server Control Software resumes after you logged on.
4. When the message "Installation is finished" is displayed, click **OK** to reboot the server.

   Note Change the screen to check the message by using the taskbar, as the message may hide behind the screen.

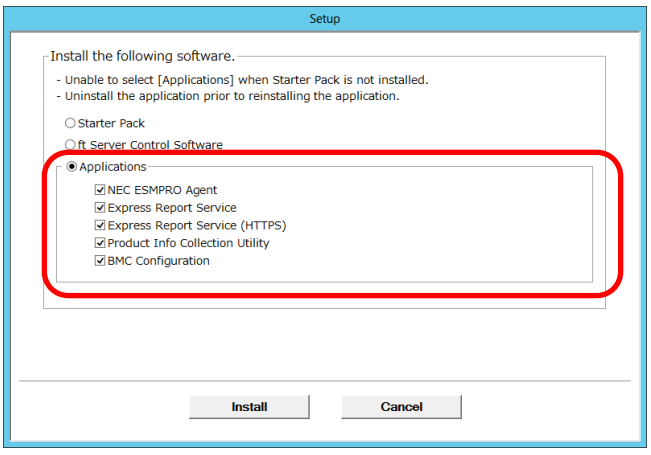
3.6 Installing Applications

EXPRESSBUILDER contains applications including NEC ESMPRO Agent and NEC ESMPRO Manager. Some applications stored in EXPRESSBUILDER can be installed collectively by performing the procedures described below. When installing these applications individually, see *Chapter 2 (Installing Bundled Software)*. This feature is available only on the server with Full Installation.

1. Logon to Windows on the server with the Built-in Administrator (or an account having administrative privilege).
2. Insert the EXPRESSBUILDER DVD into the optical disk drive and run **\autorun\dispatcher_x64.exe**.
3. Click **Integrated Installation** on the menu.



4. On the following screen, select **Applications**, and select the check boxes corresponding to the applications to install, and then click **Install**.



Note

- Applications available for installation are selected by default.
- An application that has been already installed need to be uninstalled before installing it again.
- If your system environment does not satisfy the prerequisite for an application, you cannot install it. (For details, refer to the on-screen information and *Chapter 2 (Installing Bundled Software.)*

The selected applications are installed automatically.

5. When a message appears, click **Restart**, and then remove the EXPRESSBUILDER disk from the optical disk drive.

Now installation of applications is completed.

3.7 Setup Various Software

3.7.1 Applying ft Server Control Software Update Module

If you use ft Server Control Software UPDATE media, refer to the installation procedure enclosed in the UPDATE media to apply the update.

Note

- Be sure to disable OS Boot Monitoring feature before updating ft Server Control Software according to *Chapter 1 (3.1.3 Disabling OS Boot Monitoring Feature)*. In addition, disconnect all the network cables from the server before starting update.
- Upon completion of update, set OS Boot Monitoring feature to **Enabled**.
- If ft Server Control Software is updated in dual LAN configuration, the name of team is deleted from display name of LAN card. It does not affect system operation, however, if you want to return them to original state, remove the team and create it again.
- When you update ft Server Control Software in the state of non-activating the LAN port which is not used, the LAN port is activated after updating. You need to make the LAN port to non-activation state again.

3.7.2 Applying Security Patches and QFE

When applying security patches and QFE, there is no restriction specific to ft Server is imposed. Apply patches according to your system environment.

Important

As for Windows service pack, use only the one provided with the server. Do not apply any other service pack.

3.8 Duplex LAN Configuration

The Express5800/ft series builds a duplex LAN configuration by using "Stratus emb-82576 2-Port Gigabit Adapter" or "Stratus emb-X540 2-Port Copper 10 Gigabit Adapter (*)" mounted as standard on the CPU/IO module and the additional LAN card "Stratus 82576 2-Port Copper Gigabit Adapter" or "Stratus X540 1-Port Copper 10 Gigabit Adapter".

(*) Express5800/R320c-E4 and R320d-E4 does not have this adapter.

(1) Overview

The duplex LAN configuration is of three types as described below:

- Adapter Fault Tolerance (AFT)

  AFT is a feature that places more than one LAN adapters on the same switch, and automatically switches the process of the active adapter to the backup adapter when any trouble occurred on the active adapter. STP (Spanning Tree Protocol) on switch must be disabled.

- Adaptive Load Balancing (ALB)

  ALB includes features of AFT, and enhances the throughput by distributing packet transmission by using LAN adapters simultaneously.

  Receive Load Balancing (RLB) is enabled by default. Disable RLB and remove adapter priority when using ALB.

- Switch Fault Tolerance (SFT)

  SFT is a feature that provides redundant network, as two adapters are connected to corresponding two switches. One is assigned to the active adapter and the other is assigned to the standby adapter. Usually the active adapter is used for communication.

  Spanning Tree Protocol (STP) function is required to construct the path redundancy on the switch devices.

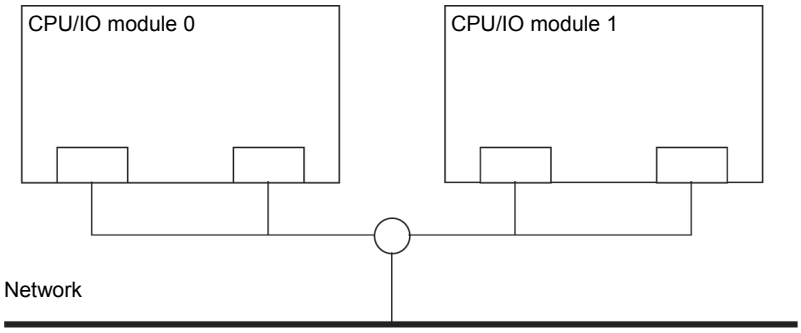
  When you build the environment, you need to set the switch priority in order to maintain the path to the active adapter after the path information is updated if a switch on the path is broken. In addition, you need to set the priority to use the standby adapter's switch if the active adapter's switch is broken.

The other modes, "Static Link Aggregation", "IEEE 802.3ad Link Aggregation", and "Virtual Machine Load Balancing" do not contribute to enhancement of network availability. When a fault occurs, the communication performed on the failed adapter is not taken over by the standby adapter but lost.

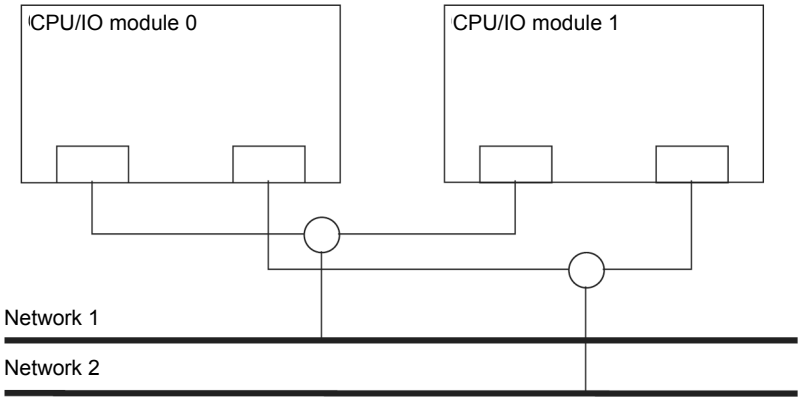
(2) Rules of Duplex Configuration on Express5800/ft series

When building duplex configuration, be sure to use both adapters CPU/IO module 0 and 1.

Example 1) Configure the duplex network which enhances the service life by using all adapters.



Example 2) Configure the duplex network which corresponds to multiple LAN connection.



(3) Configuring Duplex LAN

This section describes how to configure duplex LAN.

Note

- Because the configuration from the remote site may fail, you need to log on as an Administrator or a member of Administrators group.
- The screen images are subject to change because of the network driver version.Substitute as appropriate when content has been modified.

1. Select **Start** → **Administrative Tool** → **Computer Management** → **Device Manager**.

Note

Check **Network Adapter**, and if LAN adapters are duplicated as shown below, remove all LAN adapters from **Device Manager**, then select **Action** – **Scan for hardware changes**.

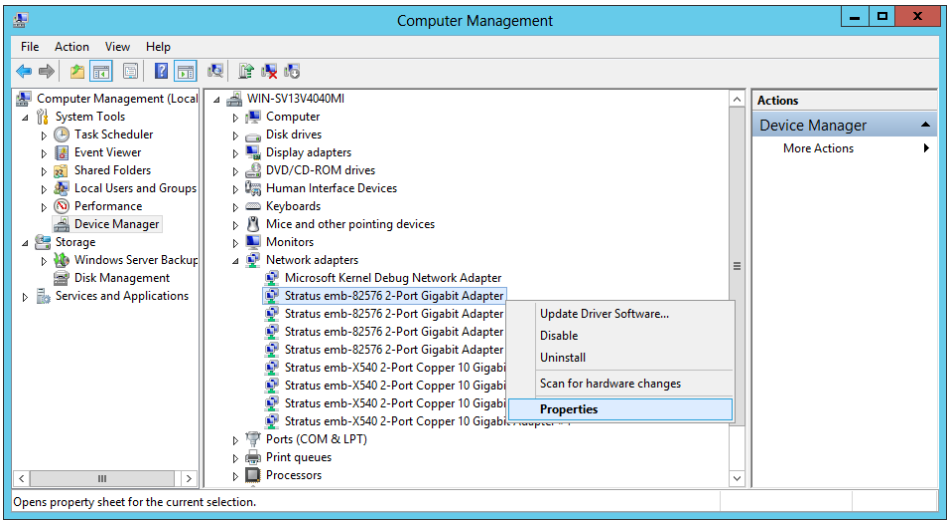
Stratus emb-82576 2-Port Gigabit Adapter
Stratus emb-82576 2-Port Gigabit Adapter
Stratus emb-82576 2-Port Gigabit Adapter #2
Stratus emb-82576 2-Port Gigabit Adapter #2

The display will be as follows when the actions are performed properly.

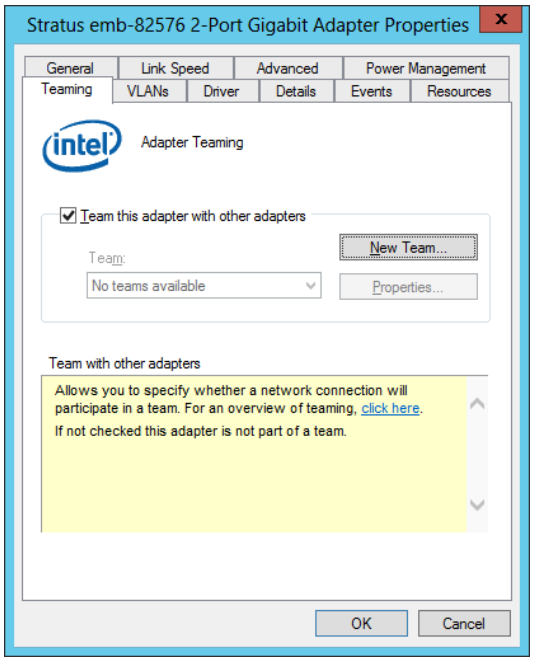
Stratus emb-82576 2-Port Gigabit Adapter
Stratus emb-82576 2-Port Gigabit Adapter #2
Stratus emb-82576 2-Port Gigabit Adapter #3
Stratus emb-82576 2-Port Gigabit Adapter #4

When 10GBASE-T is used, the network adapter names"Stratus emb-X540 2-Port Copper 10 Gigabit Adapter" and "Stratus X540 1-Port Copper 10 Gigabit Adapter" are displayed.

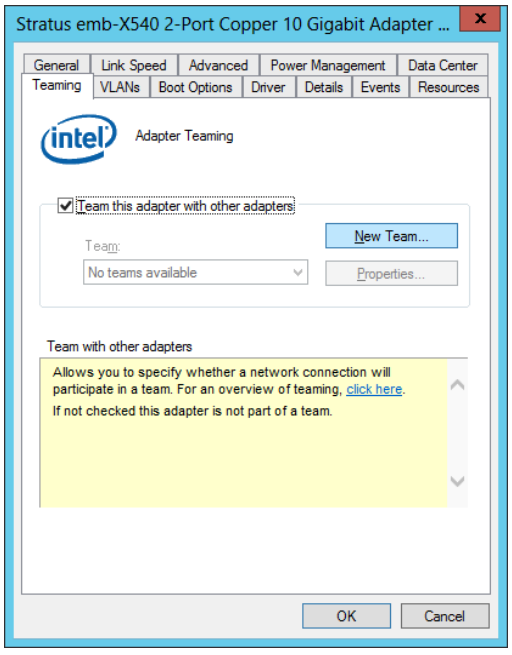
2. Select a target LAN Adapter. Select **Properties** from the right-click menu to open the **Properties** window.



3. Select the **Teaming** tab on the **Properties** dialog box. Select the **Team this adapter with other adapters**, and then click the **New Team…** button.

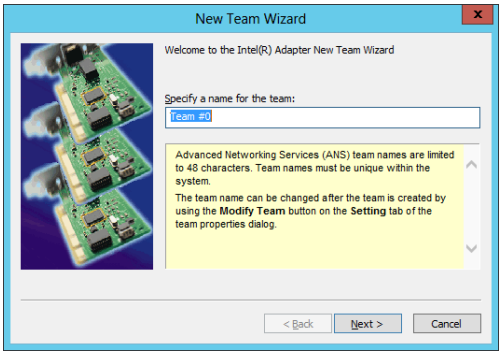


Stratus emb-82576 2-Port Gigabit Adapter and Stratus 82576 2-Port Copper Gigabit Adapter is used

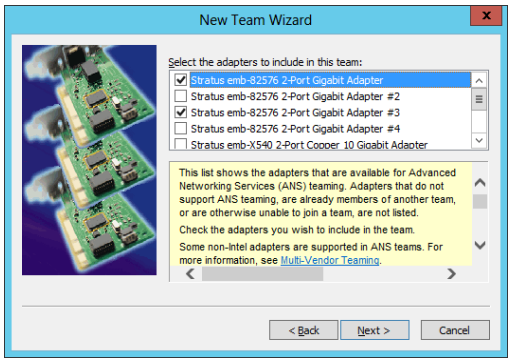


Stratus emb-X540 2-Port Copper 10 Gigabit Adapter and Stratus X540 1-Port Copper 10 Gigabit Adapter is used

4. Enter the team name and click **Next**.



5. Select the adapters to include in the team and click **Next**.



Note

Check "PCI bus" and "Function (*)" of adapters to be included in the team.
Use adapters of the same functionality. Create a team with an adapter having smaller PCI bus number and an adapter having larger PCI bus number.

(*) "Function" can be verified in **General** tab of **Properties** window.

PCI bus: Smaller value (PCI module #0 side)
Larger value (PCI module #1 side)

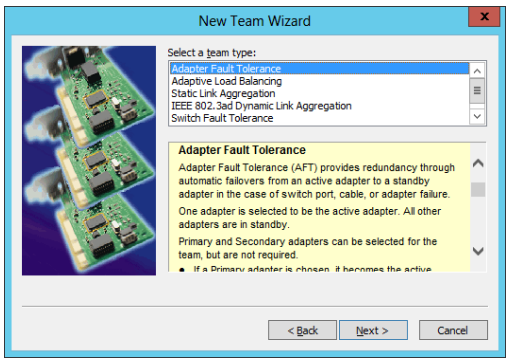
Function: 0 (Port #0 side)
1 (Port #1 side)

Example:

Team 0
PCI bus (smaller value), Function 0 (Port #0 side)
PCI bus (larger value), Function 0 (Port #0 side)

Team 1
PCI bus (smaller value), Function 1 (Port #1 side)
PCI bus (larger value), Function 1 (Port #1 side)

6. Select **Adapter Fault Tolerance**, **Adaptive Load Balancing**, or **Switch Fault Tolerance** as a team mode. Click **Next**.



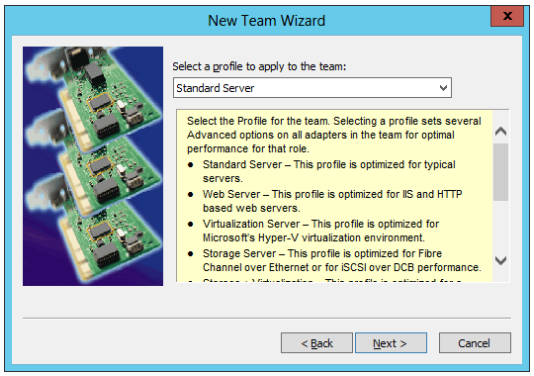
Note

Virtual Machine Load Balancing is displayed when Hyper-V feature is enabled.

7. Select **Standard Server** from the dropdown list on **Select a profile to apply to the team**, and click **Next**.

Note

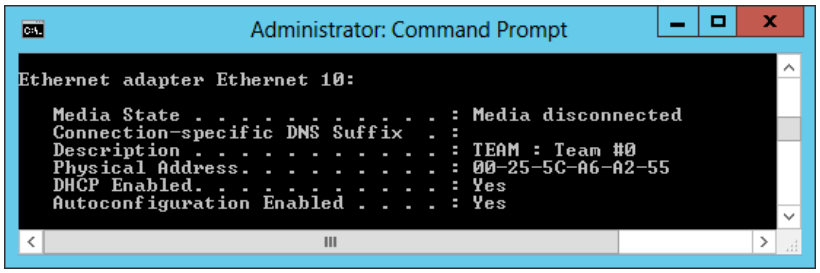
The dialog box "**Select a profile to apply to the team**" may not be displayed.
In such a case, go to Step 8.



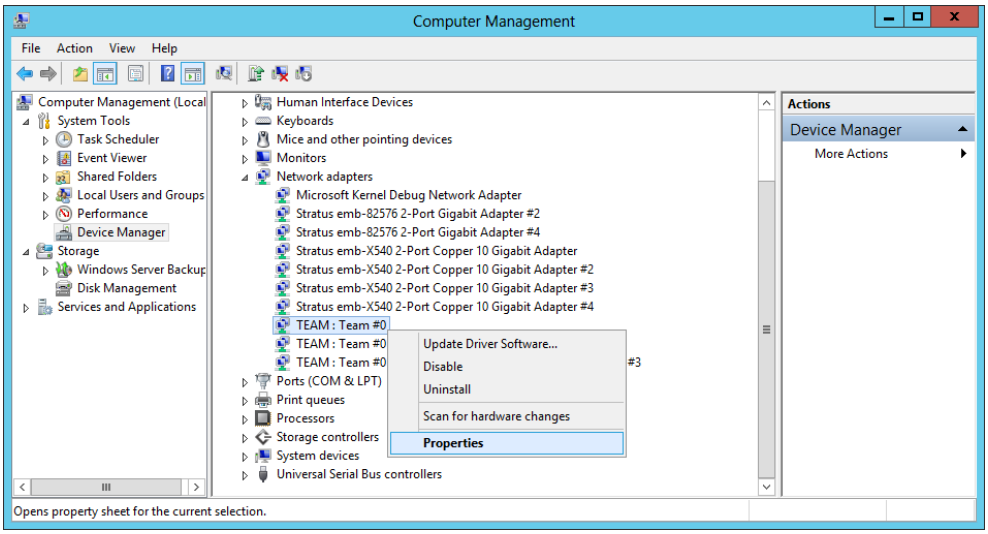
8. Click **Finish**.

9. Start Command prompt and enter as follows to check the physical MAC address of team adapter.

```
> ipconfig /all
```

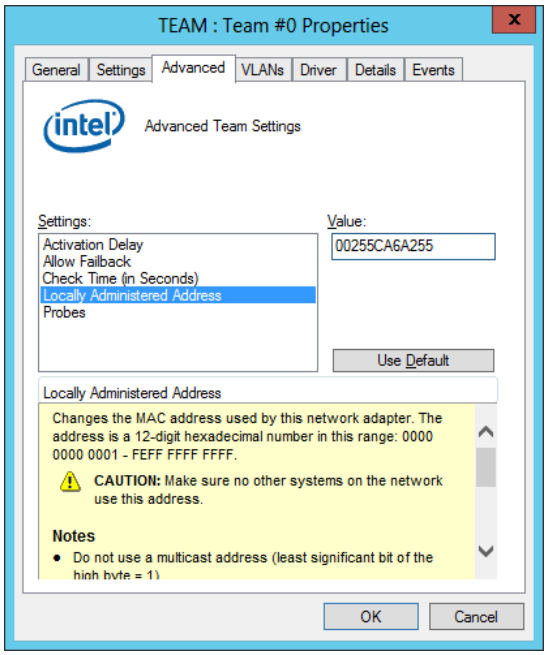


10. Select the Team Adapter you have set from **Device Manager**. Select **Properties** from the right-click menu to open the properties dialog box.



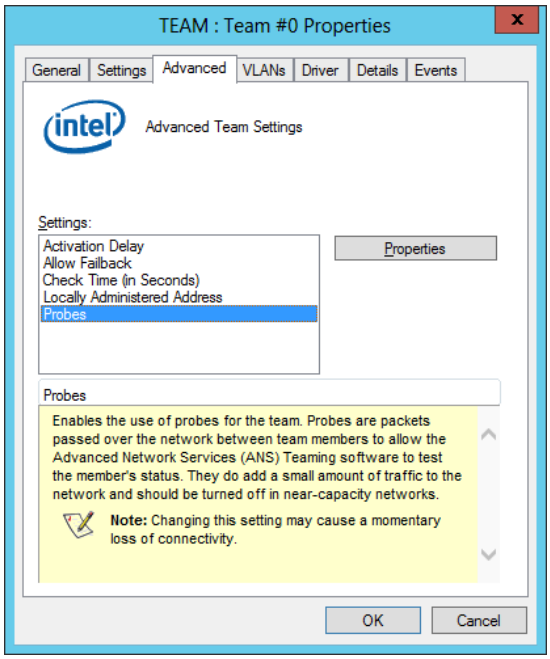
11. Set the MAC address for Team Adapter as follows:

- Select the **Advanced** tab on the Properties dialog box. Select **Locally Administered Address** from the **Settings** list box
- Enter the MAC address of a Team Adapter, which you have checked in Step 9 in the **Value:** text box.
- Click **OK**.

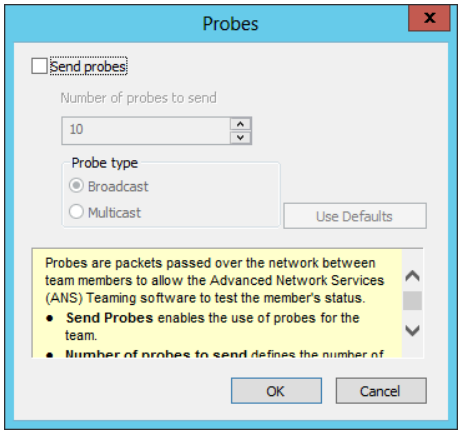


12. Disable probe function when the team configured with only two adapters.

– Select the **Advanced** tab in the **Properties** window. Select **Probes** from the **Settings** list box.



– Click **Properties** and uncheck to **Send Probes**.



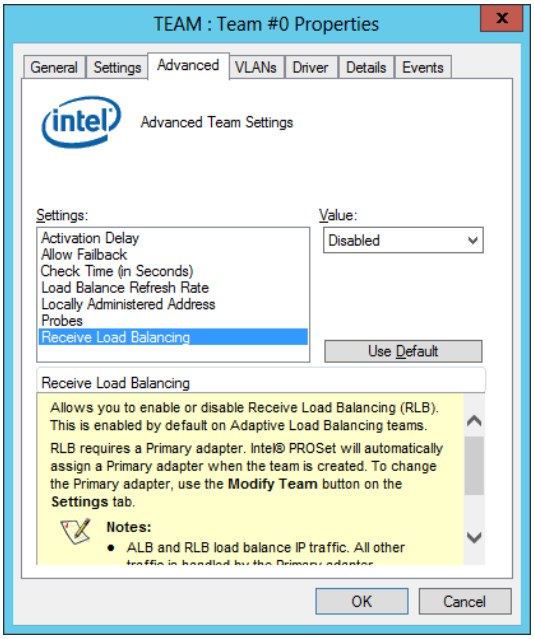
– Click **OK**.

The Probe setting is not displayed when **Switch Fault Torelance (SFT)** feature is specified. Go to Step 13.

Note When **Probe** is enabled in an environment where the team is configured with two adapters, if either of adapters fails, the other (healthy) adapter may be recognized as failed. If the team is configured with four adapters, you do not need to disable **Probe**.

13. When you select **Adaptive Load Balancing** as a team mode, you need to disable **Receive Load Balancing** and remove the adapter priority.

(1) Select the **Advanced** tab on the properties dialog box. Select **Receive Load Balancing** from the **Settings:** list box, and then select **Disabled** from the **Value:** drop down list.

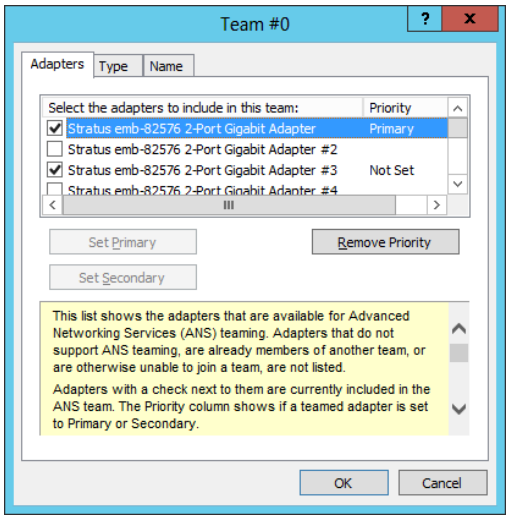


(2) Click **OK** to apply a change. The dialog will close.

(3) Show the properties dialog again.

(4) Select the **Settings** tab on the Properties dialog box and click **Modify Team** button to display the dialog box.

(5) Select the adapter that the priority is set, and then press the **Remove Priority** button to remove the priority.



(6) Click **OK** to close the dialog box.

3.9 Configuring Duplexed Disks

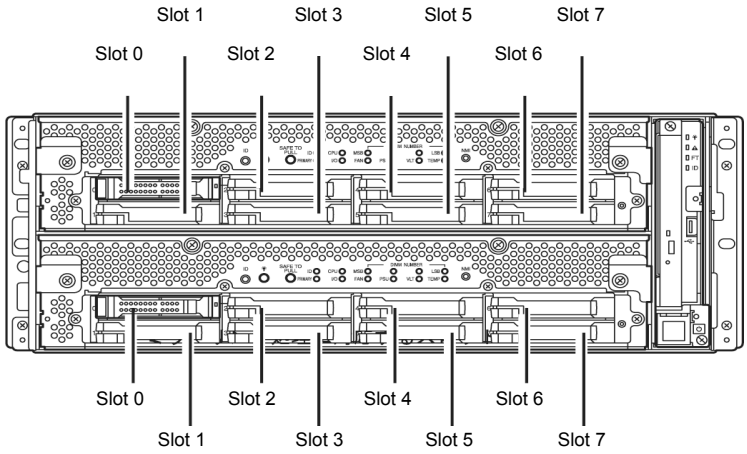
Express5800/ft series secures data by setting dual disk configuration using RDR (Rapid Disk Resync) function. Be sure to make dual disk settings according to the procedure described below.

Important

- **Set dual disk configuration by the RDR (Rapid Disk Resync) function. If you want to use other disk management tool (e.g. VERITAS Storage Foundation), install it after performing procedure in *Chapter 1 (5. Setup for Solving Problems).***
- **CPU/IO module has a processor function part and IO function part, and monitors and manages each part. The IO function part is referred to as PCI module in this section.**
- **All hard disk drives installed in built-in slots need to be duplexed. See *Chapter 1 (3.9 (1) Setting Dual Disk Configuration by RDR (Rapid Disk Resync) function)* and duplex the hard disk drives in each slot.**

(1) Setting Dual Disk Configuration by RDR (Rapid Disk Resync) function

The server sets dual configuration for each disk by the RDR function of the ft Server Control Software.
By setting RDR, as the following figure and table show, dual configuration is set between the disks of the corresponding slots, and these disks are recognized as one virtual disk by OS (such as Disk Management and Device Manager).



Slots corresponding to the mirroring process

Corresponding slot
PCI module 10 Slot 0 ⇔ PCI module 11 Slot 0
PCI module 10 Slot 1 ⇔ PCI module 11 Slot 1
PCI module 10 Slot 2 ⇔ PCI module 11 Slot 2
PCI module 10 Slot 3 ⇔ PCI module 11 Slot 3
PCI module 10 Slot 4 ⇔ PCI module 11 Slot 4
PCI module 10 Slot 5 ⇔ PCI module 11 Slot 5
PCI module 10 Slot 6 ⇔ PCI module 11 Slot 6
PCI module 10 Slot 7 ⇔ PCI module 11 Slot 7

* In the table above, PCI module names correspond as follows:
PCI module (for CPU/IO module 0) - PCI module 10
PCI module (for CPU/IO module 1) - PCI module 11

Note

- To perform this procedure, you need to log on as an Administrator.
- RDR can only be set on the basic disk inserted into the built-in slot of NEC Express5800/ft series. It cannot be set on the dynamic disk.
- For the disk on which RDR is set, use the products with the same model number.
- Be sure to configure the RDR settings in the same way not only when the OS is installed but also when the disk is added to the PCI module.
- Create partitions only after the duplication of the hard disk drives are configured.
- Be sure to use a basic disk as the system disk. Only a data disk can be used for a dynamic disk.

Dual disk configuration procedure differs depending on the procedure whether it is for the system disk (slot 0) or the data disk (slot 1 to slot 7).

Tips

To configure the dual disk of the system disk, see *(2) System Disk Dual Configuration Procedure* below.

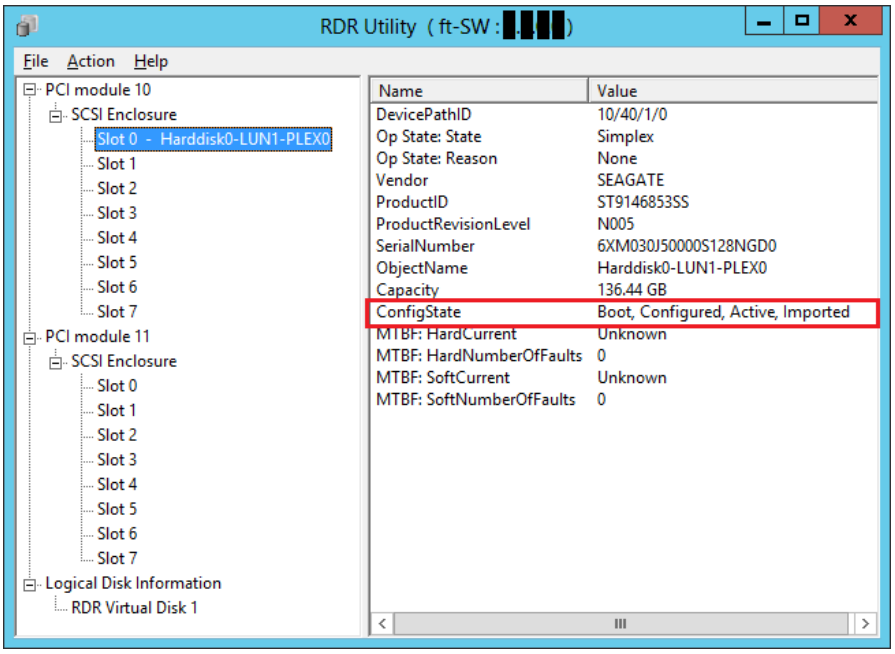
To configure the dual disk of the data disk, see *(3) Data Disk Dual Configuration Procedure* below.

(2) System Disk Dual Configuration Procedure

Configure the dual disk of the system disk with the following procedure.

From **Start**, click **RDR Utility** to start RDR Utility.

1. On the left pane of the RDR Utility, select **Slot 0** of **PCI Module 10** and confirm that "**ConfigState**" on the right pane shows "**Boot, Configured, Active, Imported**".



Tips

- For details of RDR Utility, refer to *Chapter 2 (1.2 Disk Operations Using RDR (Rapid Disk Resync) Function)* in the *Maintenance Guide*.
- The display of RDR Utility does not refresh automatically. From the menu, go to **Action** and click **Refresh** or press **F5** key every time you conduct disk-related operations such as connecting/disconnecting disks or configuring the RDR.
- On RDR Utility, PCI module names appear as follows.
  - PCI module (CPU/IO module 0) − PCI module 10
  - PCI module (CPU/IO module 1) − PCI module 11

2. Insert the disk for the dual configuration to the Slot 0 of PCI Module 11.

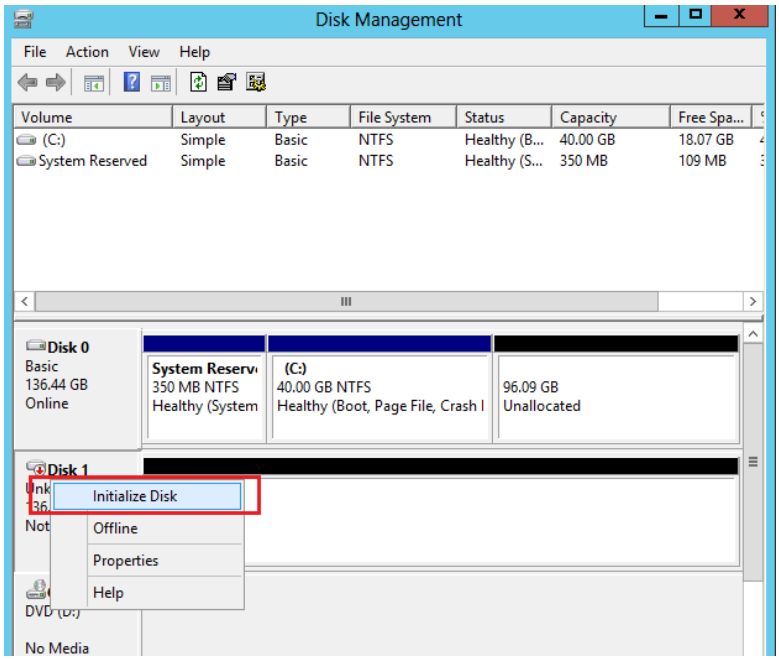
Important

For a disk to be inserted, use a new or physically formatted disk which has the same capacity as the synchronization source. If such a disk is not used, disks are not duplicated successfully.

As for physical format, refer to *Chapter 3 (3. SAS Configuration Utility)* in *Maintenance Guide*.

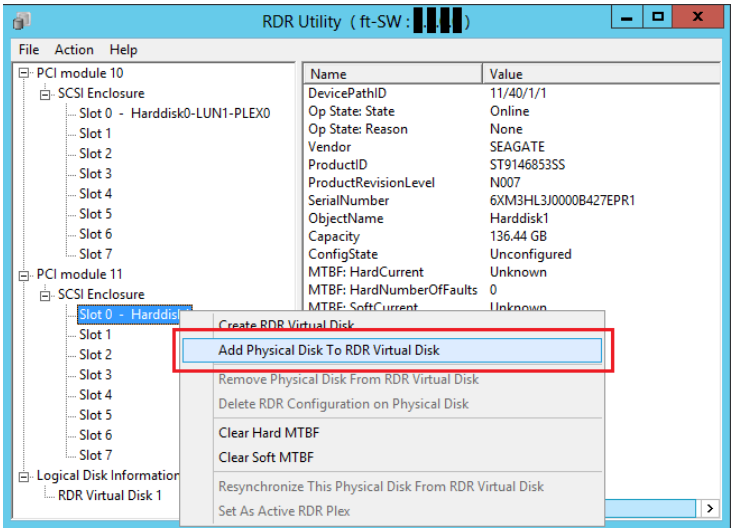
3. From **Start**, select **Control Panel**, **Administrative Tools** and start **Computer Management**.
   On the tree in the left pane, click **Disk Management**.

   If the inserted disk is indicated as **Not Initialized** in the right pane, right-click the disk and initialize it.

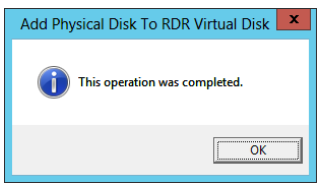


Important **When a disk is inserted or initialized, a popup window asking for rebooting the system may be displayed, but there is no need to reboot it. Select Restart Later and close the popup window.**

4. On the left tree of RDR Utility, right-click **Slot 0** disk of **PCI Module 11** and click **Add Physical Disk To RDR Virtual Disk**.



5. Click **OK**.



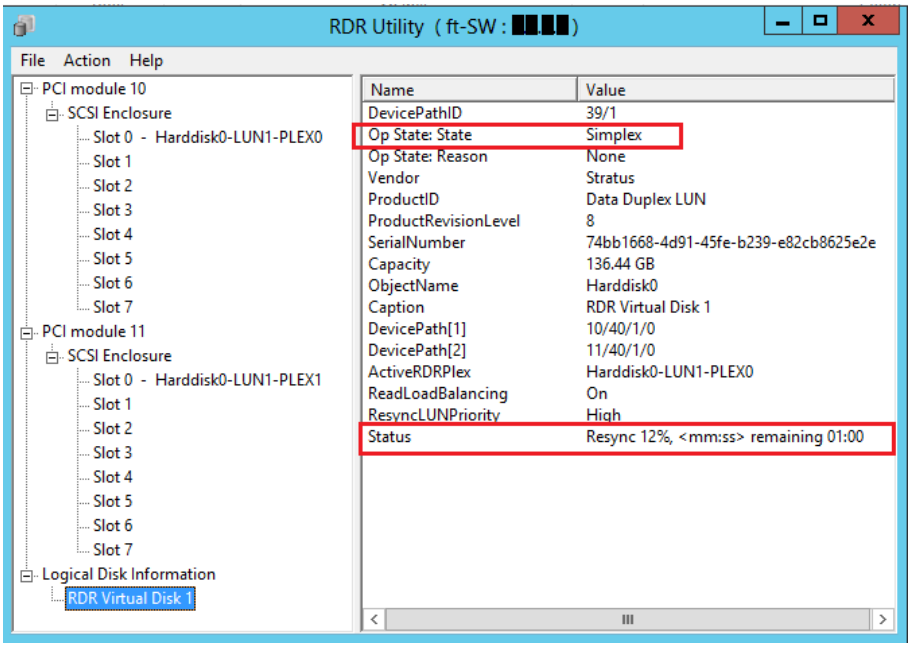
6. Verify that disk synchronization has started and the status of the DISK ACCESS LED and RDR Utility display changes as the following table.

Synchronizing

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Amber (Blinking)	Simplex	–
Destination disk	Amber (Blinking)	Syncing	–
RDR Virtual Disk	–	Simplex	Resync x % (x = 0, 4, 8, ..., 96)

Tips

- DISK ACCESS LED is lit green when hard disk drive is accessed.
  If access is made while synchronization is in progress (LED is blinking amber), it seems that the green and amber LEDs are lit alternately.
- The time required for synchronization varies depending on the partition size on the disk. For a 136 GB partition, it takes about 100 minutes.



Important

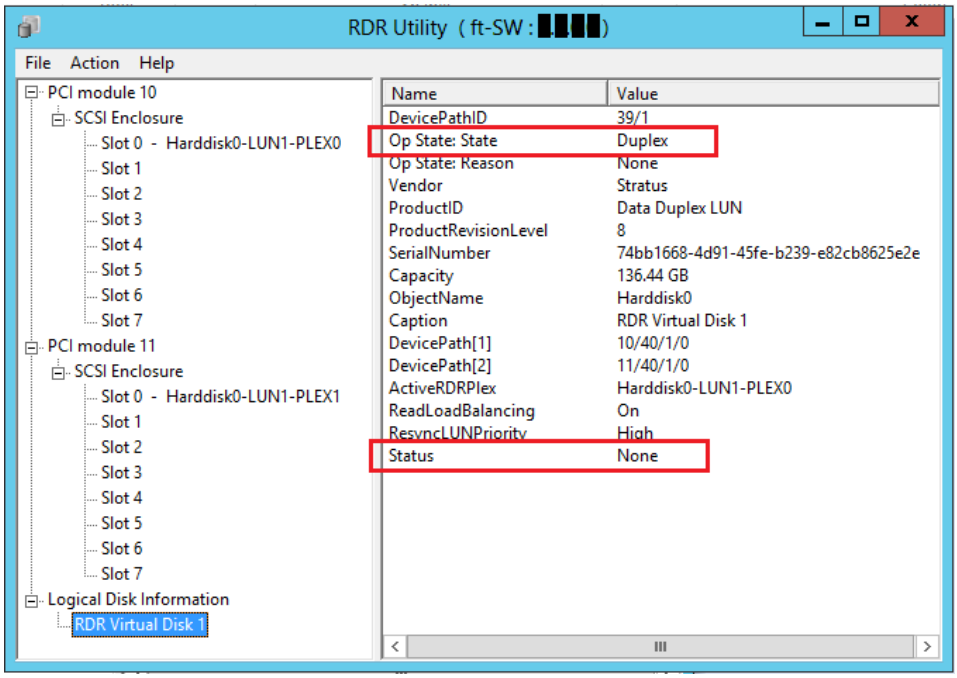
- **If the system is rebooted during synchronization, the process cannot be completed. Do not restart the system until the synchronization is completed.**
- **When the system is halted without shutting down OS properly due to forced shutdown or others, the entire area of the partition on the synchronized disks will be resynchronized after the system is restarted.**

Synchronization completed

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Green (Blinking)	Duplex	–
Destination disk	Green (Blinking)	Duplex	–
RDR Virtual Disk	–	Duplex	None

Tips

DISK ACCESS LED is lit green only when hard disk drive is accessed.
If no access is made, the LED seems to be unlit.



(3) Data Disk Dual Configuration Procedure

Follow the procedure below to configure dual data disk for the slots 1 to 7.

Note

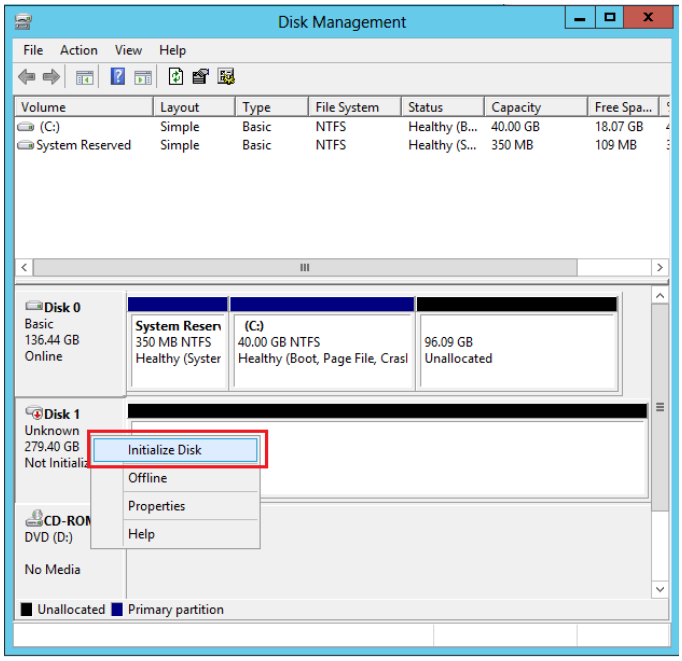
The following shows how to configure dual disk for the slot 1. If you want to configure the dual disk for slot 2 to slot 7, read "slot 1" as the slots you want to make dual configuration and perform the procedure.

1. Insert a disk for the dual configuration into the slot 1 of PCI Module 10.

   If a disk is already mounted, this procedure is not necessary. Go to step 4.

2. From **Start**, select **Control Panel**, **Administrative Tools** and start **Computer Management**. On the tree in the left pane, click **Disk Management**.

   If the inserted disk is indicated as **Not Initialized** in the right pane, right-click the disk and initialize it.



Important

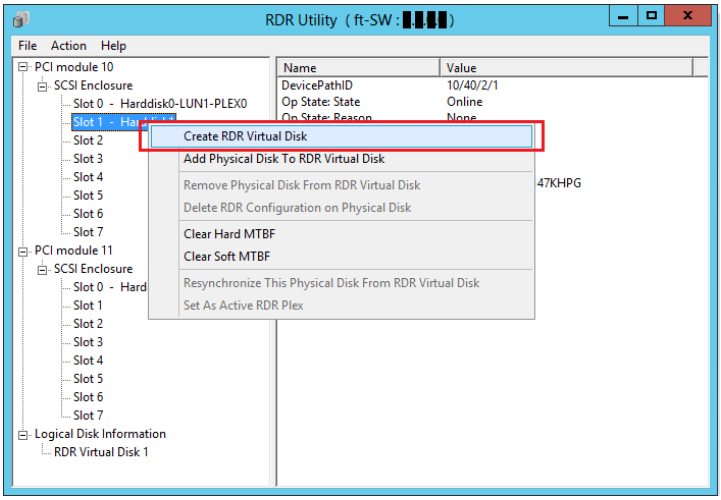
- **When a disk is inserted or initialized, a popup window asking for rebooting the system may be displayed, but there is no need to reboot it. Select Restart Later and close the popup window.**
- **Disk may become offline when RDR is set. In this case, use "Disk Management" to make it online.**

3. From **Start**, click **RDR Utility** to start RDR Utility.

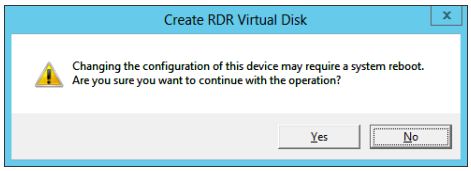
4. On the left pane of the RDR Utility, right click on the **Slot 1** disk of **PCI Module 10** and select **Create RDR Virtual Disk**.

Tips

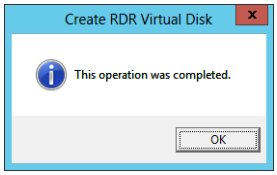
Depending on the disk condition, RDR setting may take some time and RDR Utility may pause for a few minutes. There is no error, so wait until the process is completed.



5. Click **Yes**.



6. Click **OK**.



Important

If RDR is specified to a disk which contains the system partition or partition which cannot be unmounted, the system restart pop-up message appears. If you click Yes, the system is restarted in two minutes automatically. Go on to Step 7. when the system is restarted.

7. Insert the disk to set dual configuration into the slot 1 of PCI module 11, and perform the Step 2.

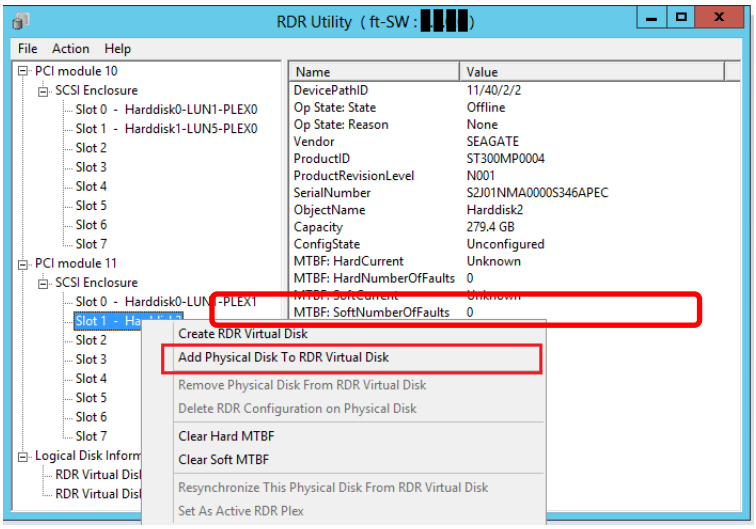
   If a hard disk drive is already mounted, this procedure is not necessary. Perform the Step 2 only.

Important

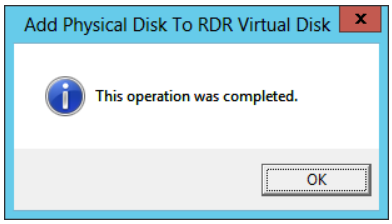
For a disk to be inserted, use a new or physically formatted disk which has the same capacity as the synchronization source. If such a disk is not used, disks are not duplicated successfully.

As for physical format, refer to *Chapter 3 (2. SAS Configuration Utility)* in *Maintenance Guide*.

8. Right-click the **Slot 1** of the **PCI module 11** from the left pane of RDR Utility, and then click **Add Physical Disk To RDR Virtual Disk**.



9. Click **OK**.



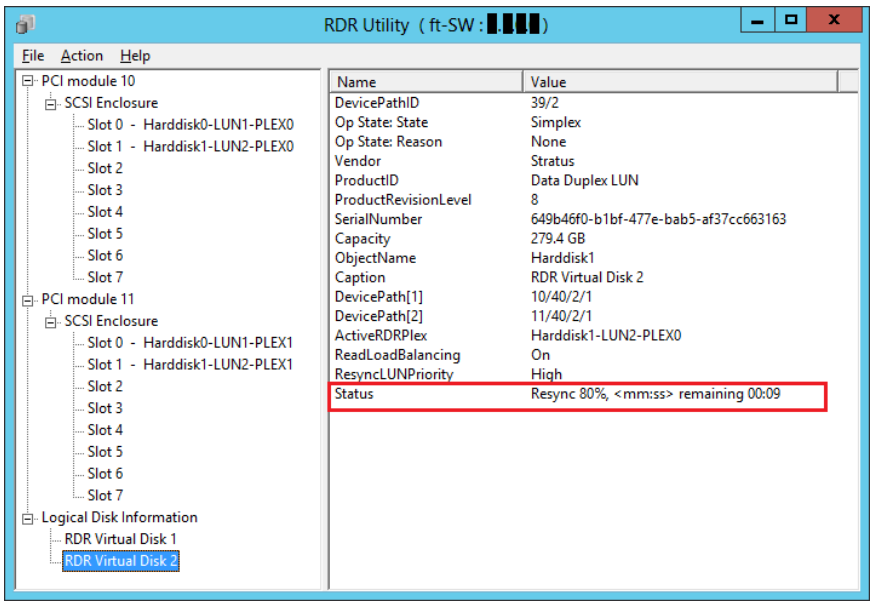
10. Verify that disk synchronization has started and the status of the DISK ACCESS LED and RDR Utility display changes as the following table.

Synchronizing

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Green (Blinking)	Online	–
Destination disk	Amber (Blinking)	Syncing	–
RDR Virtual Disk	–	Simplex	Resync x % (x=0,4,8,....,96)

Tips

- DISK ACCESS LED is lit green when hard disk drive is accessed.
  If access is made while synchronization is in progress (LED is blinking amber), it seems that the green and amber LEDs are lit alternately.
- The time required for synchronization varies depending on the partition size on the disk.
  For a 136 GB partition, it takes about 100 minutes. When no partition exists on the disk, synchronization is completed immediately after the RDR is set, and **Op State: State** changes to **Duplex**.
  However, when the dynamic disk is used, the time required for synchronization depends on the disk size regardless of whether or not a partition exists. For a 136 GB disk, it takes about 100 minutes.



Important

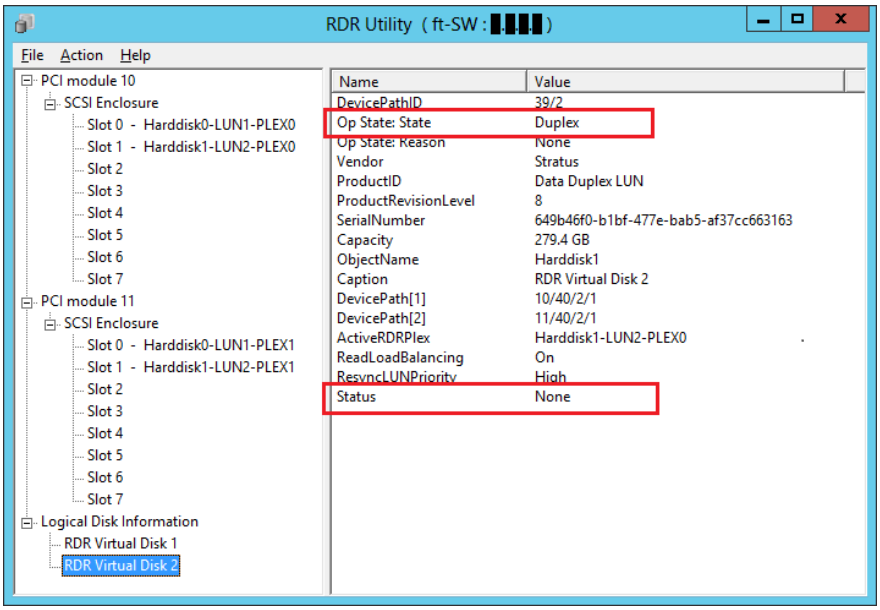
- **If the system is rebooted during synchronization, the process cannot be completed. Do not restart the system until the synchronization is completed.**
- **When the system is halted without shutting down Windows properly due to forced shutdown or others, the entire area of the partition on the synchronized disks will be resynchronized after the system is restarted.**

Synchronization completed

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Green (Blinking)	Online	–
Destination disk	Green (Blinking)	Online	–
RDR Virtual Disk	–	Duplex	None

Tips

DISK ACCESS LED is lit green only when hard disk drive is accessed.
If no access is made, the LED seems to be unlit.



3.10 Creating Volume

For NEC Express5800/ft series, you need to set mirroring for each disk by the RDR function. If you created a new partition or volume on the disk that has been set RDR and dual configuration, the area is mirrored automatically. You do not need to perform mirroring for each partition or volume.

Important

- **Note the following issues when you execute Active Upgrade under the status that the OS installed disk has partitions other than the system partition.**
  - **All the data upgrade is discarded for the system disk of the Production Side that runs Active Upgrade.**
- **A mirrored volume (RAID-1) or RAID-5 volume cannot be used on a dynamic disk.**

3.11 Installing Bundled Software for the Server

NEC ESMPRO Agent and NEC ESMPRO Manager are contained in EXPRESSBUILDER.

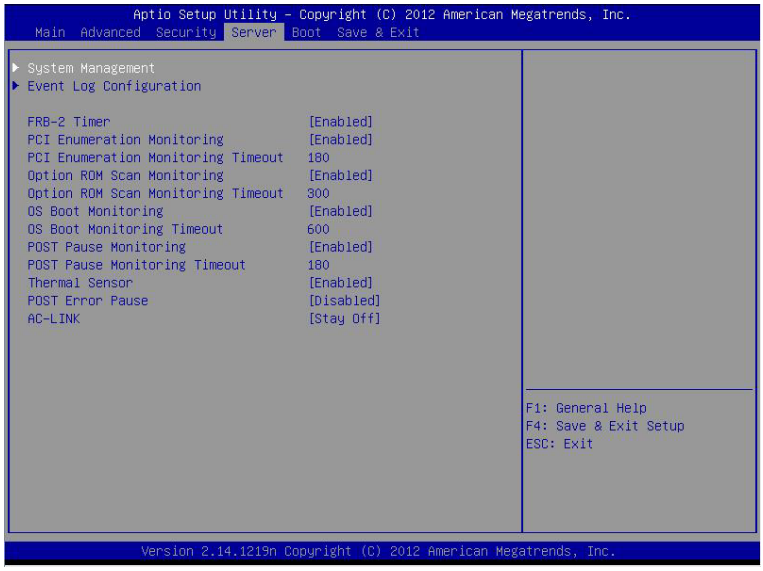
Make sure that the installed utilities are shown on **Start** - **Program**s or on **Control Panel**. If you did not install these utilities during setup with EXPRESSBUILDER, install them individually by according to *Chapter 2* (*Installing Bundled Software*).

3.12 Enabling OS Boot Monitoring Feature

Enables OS Boot Monitoring feature.

Set OS Boot Monitoring feature to **Enabled** on BIOS SETUP according to *Chapter 1 (3.1.3 Disabling OS Boot Monitoring Feature)*. Then, specify the timeout time for **OS Boot Monitoring Timeout** parameter appropriately.

Tips Specify the timeout time in seconds. Default setting is 600 seconds (10 minutes).



3.13 License Authentication

To use Windows Server 2012, you need to perform license authentication procedure.

Confirm if your license is authenticated. If not, perform the following procedures to have your license authenticated.

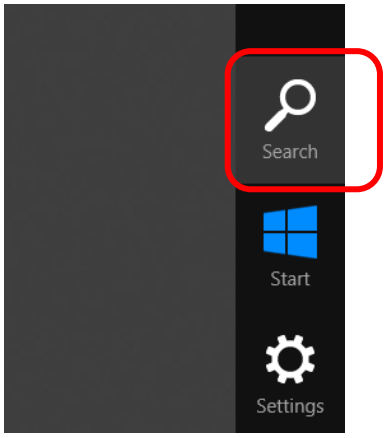
Connect to the Internet to perform the authentication procedure.

Or, use the telephone to perform the authentication procedure.

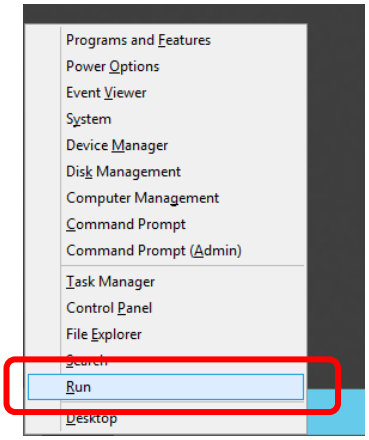
1. Click **Search** on the **Charms** bar.

   (Or, right-click the bottom left corner on the screen, and then click **Run**.)

Search

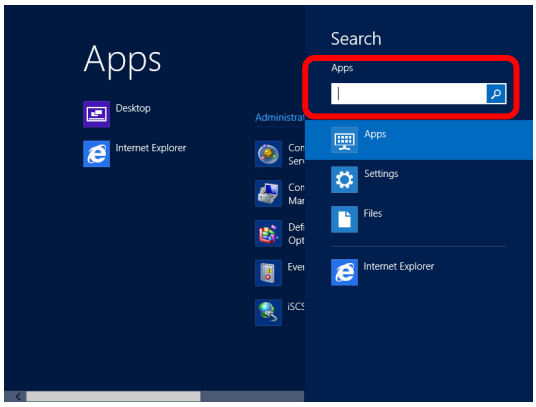


Run

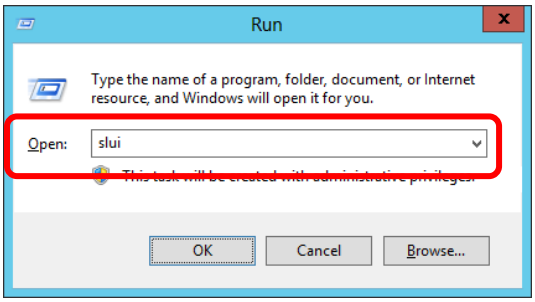


2. Enter "slui" in the **Search** box, and then press the <Enter> key.

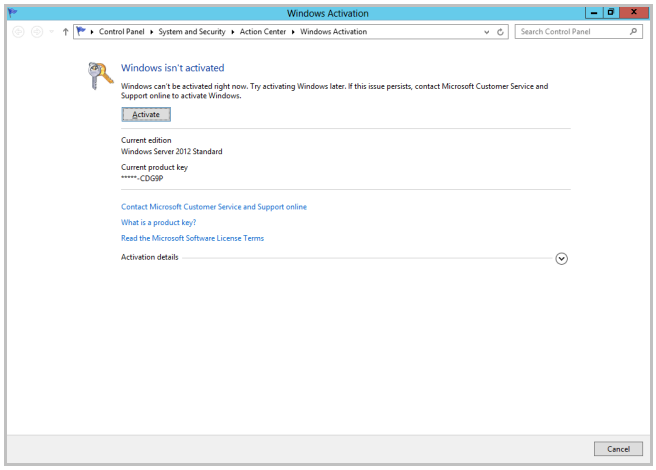
Search



Run



3. Read the contents, and then continue the license authentication procedure.



Tips If your license is already authenticated, you do not need to perform this procedure.

Windows activation is now complete.

3.14 Confirming the ft Server Control Software Version

The following describes how to check the version of ft Server Control Software, which consists of various types of software for fault tolerance.

Perform the procedure when you need to check the ft Server Control Software version of the current system before adding devices to NEC Express5800/ft series or updating ft Server Control Software.

Confirm the version following the steps below, and take a note of the displayed version number.

Version: ___.___.__________._____

1. Log on to the system with an account that has administrator privilege.
2. Open **Control Panel** from the **Start** menu.
3. Open **Programs and Features**.

   If the **Programs and Features** icon is not displayed, open **Programs** and click **Programs and Features**.
4. Check the version of **ftServer Control Software** from the list of programs.

3.15 Setting TCP/IP Timeout

Timeout values of TCP/IP are changed at setup by adding the following registries on Express5800/ft series.

HKLM\System\CurrentControlSet\Services\Tcpip\Parameters

Value: TcpMaxDataRetransmissions

Type: REG_DWORD

Default: 8

This setting is required if Hyper-V is enabled.

If you are not using Hyper-V on your server, this setting is not required. To restore the factory-set value, run the following batch file with administrator account, and restart the server.

C:\Program Files\NEC\HAS_SW\SUPPORT

SetTcpMaxDR_OsDef.bat

To restore the factory-set value, run the following batch file with administrator account, and restart the server.

C:\Program Files\NEC\HAS_SW\SUPPORT

ResetTcpMaxDR_FtDef.bat

3.16 Checklist Display Function at Installation

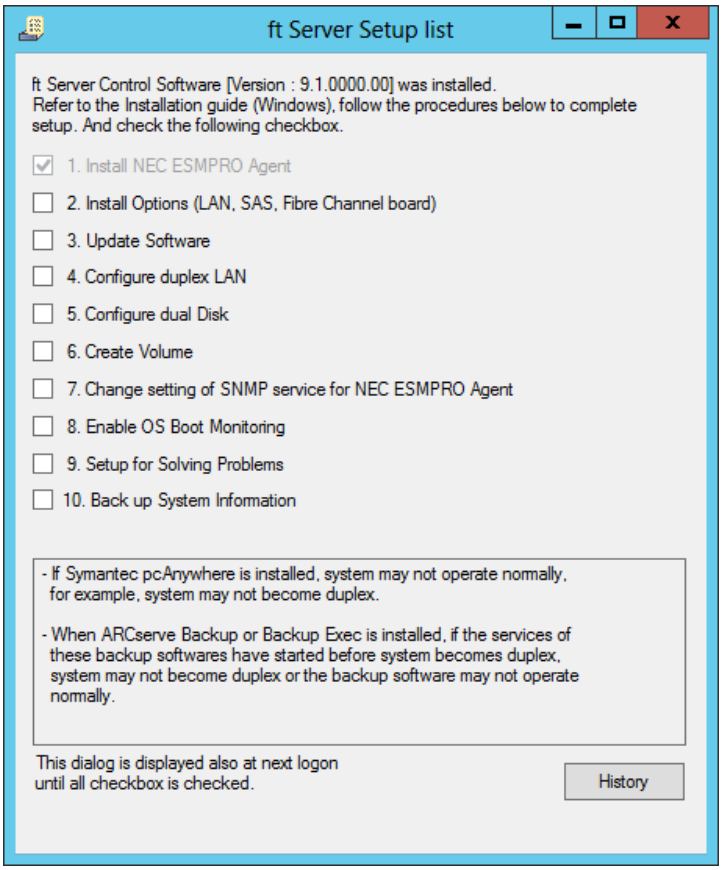
The server has a factory-installed feature that displays Setup Checklist during installation to support configuration work. This feature starts after ft Server Control Software is installed at re-installation.

Using this checklist, you can proceed setup work while viewing the items required for setup.

(1) Displaying setup list

When you logon the system with builtin Administrator account, **ft Server Setup list** automatically appears. The checklist appears everytime you logon the system unless you specify not to display at next logon.

The first line of dialog shows the version of ft Server Control Software.
The version number depends on the time of shipment and software upgraded status.



Setup Check List

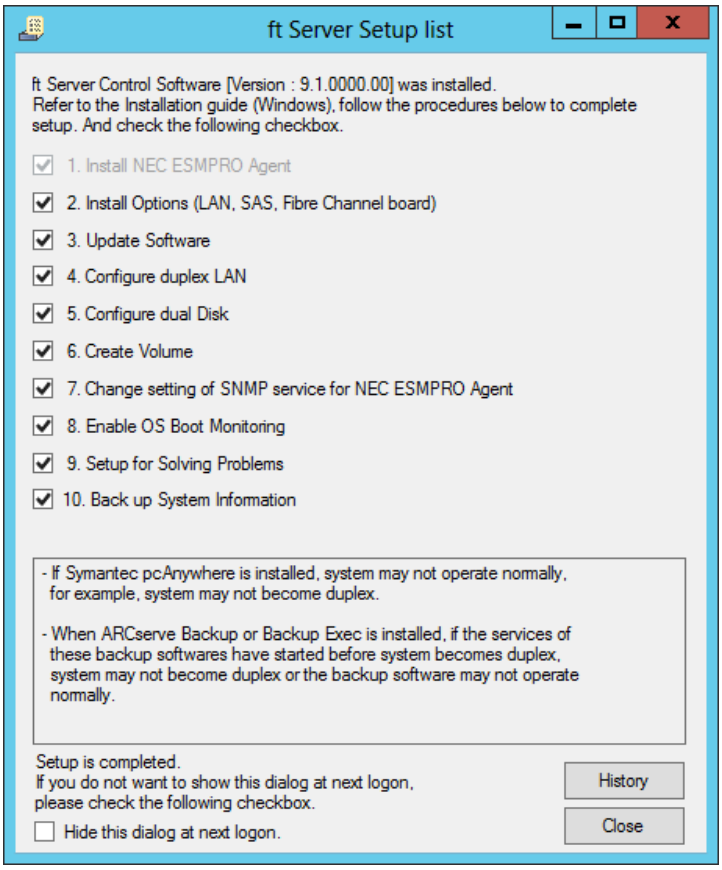
The following item is checked automatically, and if installation of it is finished, it is dimmed.

1. Install NEC ESMPRO Agent

For the other items, click the checkbox to check it when you have finished setup of relevant item.

If you put a mouse onto check item, a help window that shows the page where detailed information is described in User's Guide or Installation Guide.

If all items are checked, a checkbox "Hide this dialog at next logon" appears at bottom of dialog. If you do not want to display this checklist, click the checkbox and close dialog.



When all items are checked:

This checklist is not displayed during update of ft Server Control Software.

(2) Re-displaying setup checklist

If you want to open the dialog again, logon the system with built-in Administrator account, and run the following file.

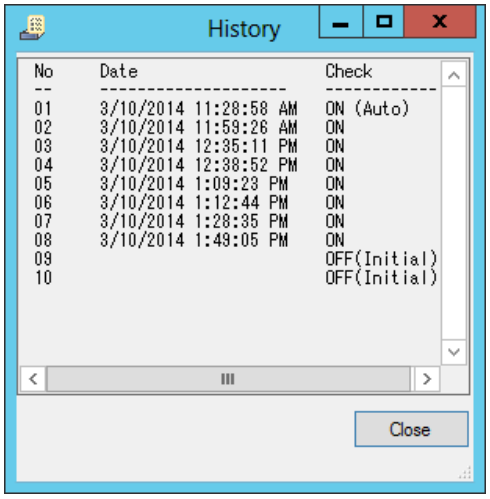
C:\Program Files\NEC\HAS_SW\ftServerSetuplist

ftServerSetupList.exe

Only the user having built-in Administrator account can open this checklist, and can start only one at a time.

(3) Displaying check history

Click the **History** button to confirm the date and time each item was checked.



Check history

Check column displays:

ON:	Item that was checked
ON (Auto):	Item that was checked automatically
OFF (Initial):	Item that is not checked yet
OFF:	Item that was checked once but unchecked later

4. Setting Up Windows Server 2008 R2

Set up Windows Server 2008 R2.

4.1 Before Starting Setup

4.1.1 Precautions

Read through the precautions explained here before starting setup.

EB : Confirm during Setup with EXPRESSBUILDER

OS : Confirm during Setup with Windows standard installer

Hardware configuration		
The following hardware configurations require special procedures.		
EB	OS	**Media such as LTO, and similar media** Do not set media such as LTO during setup.
EB	OS	**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, use Windows standard installer for setup, and 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 destination to store the debug information (required dump file size) by referring to *Chapter 1 (5. 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 size to install the OS and paging file, 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 setting up using Windows Standard Installer is complete. – 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 + 300 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 + 300 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 + 300 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 + 300 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 300 MB** → The total paging file size in all drives is "installed memory size + 300 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 + 300 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 + 300 MB" or more.
- Dedicated Dump File cannot be placed in dynamic volumes.
- To collect memory dump by using Dedicated Dump File, a paging file is required in any drive.
- 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

EB OS

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

OS size + paging file size + dump file size + application size

OS size	= 15,600MB (Windows Server 2008 R2 ＋ Service Pack 1) = 8,400MB (Windows Server 2008 R2 with Service Pack 1)
Paging file size (recommended)	= installed memory size × 1.5
Dump file size	= installed memory size + 300MB
Application size	= as required by the application

For example, if the installed memory size is 1 GB (1,024 MB) and application size is 100 MB, and the full installation is selected, the partition size is calculated as follows:

8,000MB ＋(1,024MB × 1.5) ＋1,024MB ＋300MB ＋100MB

＝10,960MB

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

The following partition sizes are recommended.

32,768MB (32GB) or more

*1 GB = 1,024 MB

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 + 300 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.

Important

For restrictions on size of drive C specific to this server, refer to *Chapter 1 (4.11 Creating Volume)*.

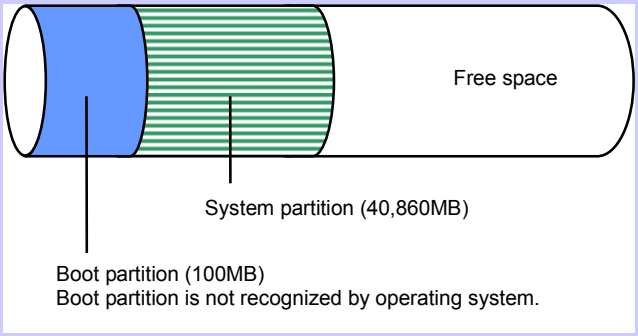
Tips

When new partition is created, 100MB at the top of hard disk drive is secured for boot partition.

Example:

If 40,960MB (40GB) is specified for partition size, usable space will be:

40,960MB – 100MB = 40,860MB



Hyper-V2.0 support

EB OS

Refer to the following web site for information related to Hyper-V2.0.

- http://www.58support.nec.co.jp/global/download/w2k8r2/hyper-v/hyper-v-v2.html
- See *Chapter 1 (8. Precautions for Using Hyper-V)*.

Installing Service Pack

EB OS

- If the OS installation media contains Service Pack 1, you need not apply the service pack again.
- You can install the Service Pack on the server. When the Service Pack is not attached to your system, prepare it by yourself.

License authentication

EB OS

License authentication might be required, depending on the installation of Windows.
For details, see Chapter 1 (*4.14 License Authentication)*.

Note

- Activate within 30 days following installation.
- A Virtual Product Key is used when installing in a virtual environment. It is not used when directly installing an operating system to a physical server.

When compressing system drive

EB OS

Do not compress the root directory and the Windows directory.

Tips

The Windows Server 2008 R2 directory is labeled as "Windows".

If you compress the root directory and the Windows directory, operational stability cannot be ensured because the Windows File Protection (WFP) may replace an unassigned driver with a signed driver.

4.1.2 Preparation

The following steps are required to prepare for re-installing an OS (setup with EXPRESSBUILDER or Winodws standard installer):

1. If the POWER LED on CPU/IO module is on, shutdown the OS.
2. Unplug the power cord from outlet while the POWER LED is blinking.
3. Perform the preparation process for the server as shown below.
   - Install CPU/IO modules 0 and 1.
   - Install a hard disk drive in slot 0 of CPU/IO module 0.
   - Disconnect all LAN cables.
   - Disconnect the cable for tape device from the connector on SAS board.
   - Disconnect the cable for device from the connector on Fibre Channel board.

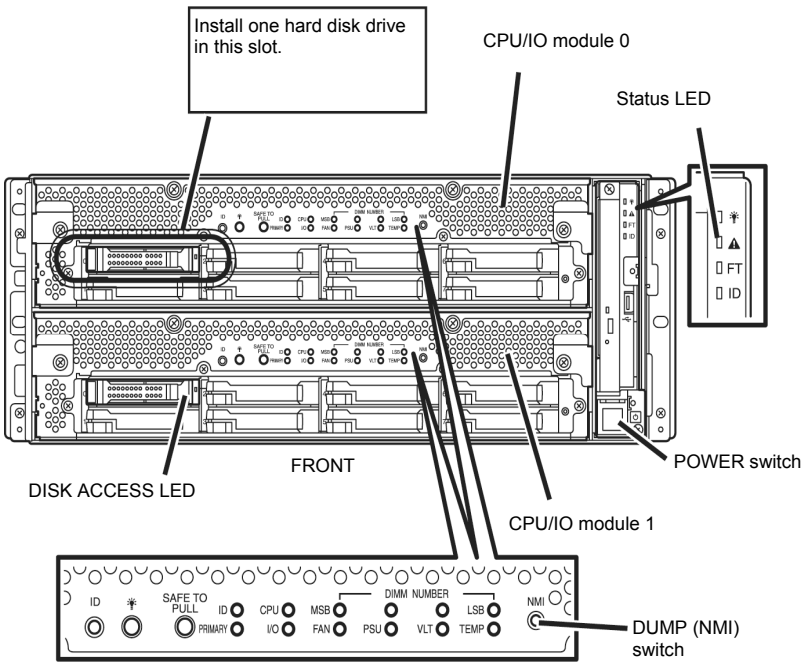
Important

- **Install only one hard disk drive in the slot specified here.**
- **If the hard disk drive is not a new one, physically format it. Refer to *Chapter 3 (3. SAS Configuration Utility)* in *Maintenance Guide* for physical formatting.**

4. Prepare for setup on CPU/IO module 0.

   The location of components that are required for setup or confirmation is as shown in the figure below.

   Install only one hard disk drive in CPU/IO module 0.
   Do not install any hard disk drive in CPU/IO module 1.

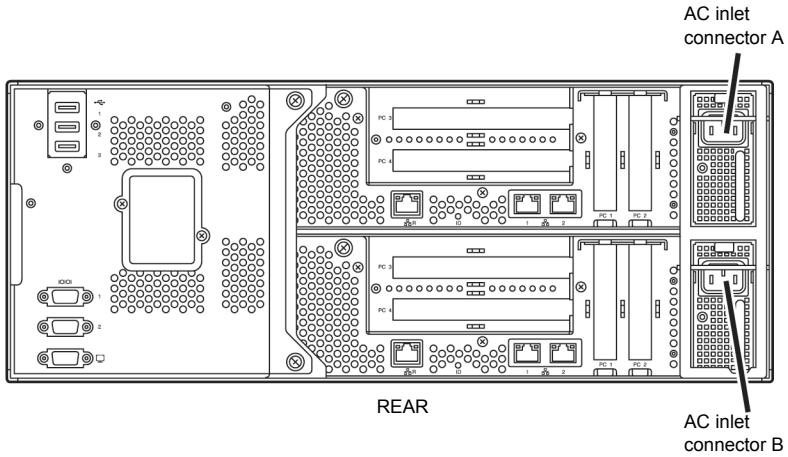


5. Connect power cords to the server in the following order.

   (1) Connect a power cord to AC inlet connector A.

   (2) Connect a power cord to AC inlet connector B.

   (3) Make sure the Status LED on CPU/IO module is unlit.



Note If you disconnect the power cord, wait at least 30 seconds before connect it again.

4.1.3 Disabling OS Boot Monitoring Feature

Before starting setup process, the OS boot monitoring function needs to be disabled.

Important **Be sure to disable boot monitoring function before setting up the system. This function is enabled by shipping default.**

Tips For details of operations for BIOS Setup Utility and parameters for boot monitoring function, refer to *Chapter 3 (1. System BIOS)* in *Maintenance Guide*.

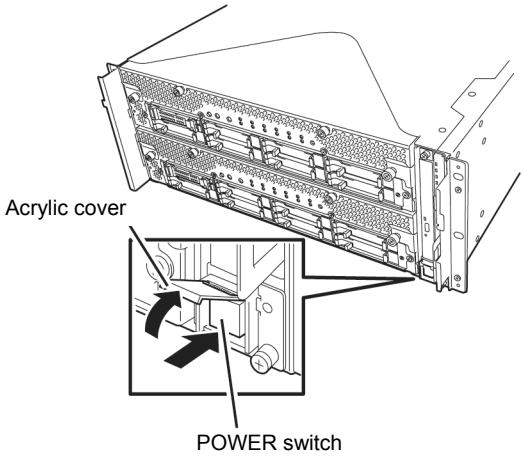
1. Turn on the display and the peripheral equipment connected to the NEC Express5800/ft series.

Note If the power cords are connected to a power controller like a UPS, make sure that it is powered on.

2. Remove the front bezel.
3. Press the POWER switch located on the front side of the server.

   Lift the acrylic cover, and press the POWER switch.

Important **Do not turn off the power before the "NEC" logo appears.**



After a while, the "NEC" logo will appear on the screen.

Tips While the "NEC" logo is displayed on the screen, NEC Express5800/ft series performs a power-on self test (POST) to check itself. OS starts upon completion of POST.

For details, refer to *Chapter 3 (1.1 POST Check)* in *User's Guide*.

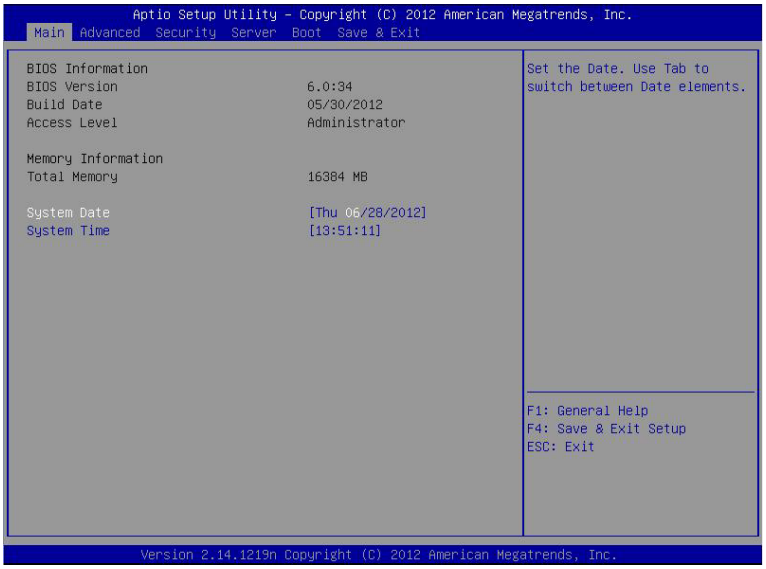
Note If the server finds errors during POST, it will interrupt POST and display the error message. Refer to *Chapter 1 (6.2 POST Error Messages)* in *Maintenance Guide*.

4. When POST proceeds, the following message appears at lower left of the screen.

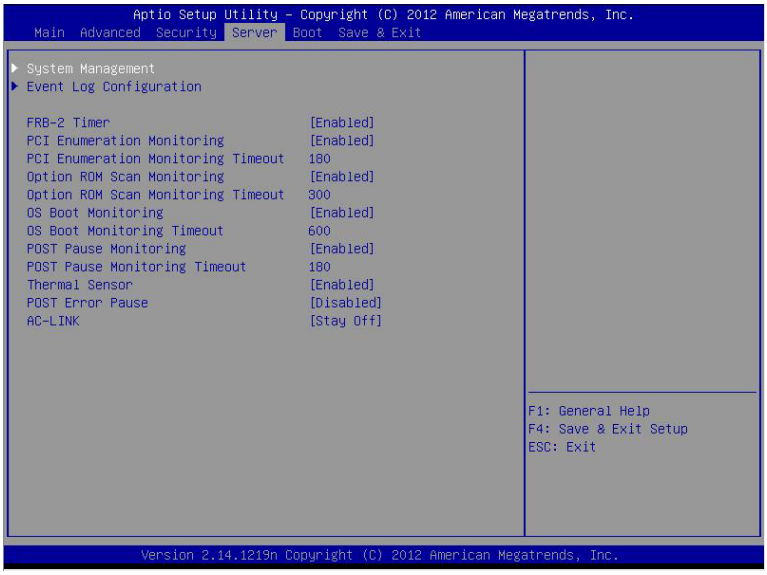
   `Press <F2> SETUP, ...` (The on-screen message depends on your system environment.)

   If you press <**F2**>, SETUP will start after POST, and the Main menu appears. (You can also start SETUP by pressing <**F2**> key while expanding option ROM.)

   Example:

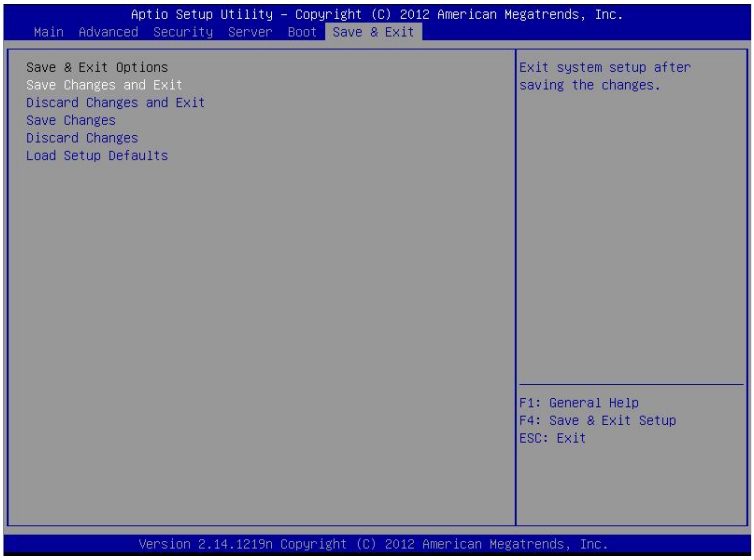


5. When you move the cursor onto **Server**, the **Server** menu appears.



6. Move the cursor onto **OS Boot Monitoring** and press **Enter**.
7. Among the parameters, choose **Disabled** and press **Enter**.

8. Move the cursor onto **Save & Exit**, the **Save & Exit** menu appears.



9. Select **Save changes and Exit**.

   On the confirmation window shown below, select **Yes** to save parameters and exit SETUP.

   System reboots when SETUP completes.

Save configuration and exit?
[Yes] No

Now **OS Boot Monitoring** function is disabled.

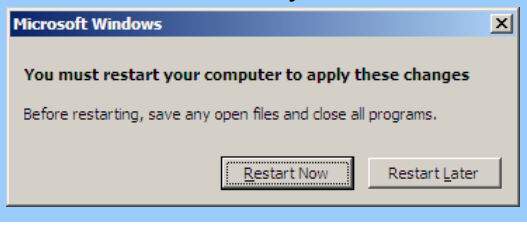
4.2 Setup with EXPRESSBUILDER

This section describes how to install Windows with EXPRESSBUILDER.

Important

- **Setup with EXPRESSBUILDER may delete all data of the hard disk drive depending on the settings. Pay attention to input parameters. You must be especially careful when configuring the following:**
  - **Partition Settings in the Windows Setup wizard**

  Backing up user data, as needed, is recommended.
- **Before starting setup, be sure to disconnect hard disk drives that is not to be setup. Install those hard disk drives after setup has completed. Conducting setup with hard disk drives being connected may cause existing data to be erased unintentionally. It is recommended to make backup copy of user data before starting setup.**
- **Although some dialog boxes and popup windows are displayed during installing ft Server Control Software in Setup, do not operate from the keyboard and the mouse. Installation is continued automatically.**
  Do not operate especially although the following dialog is displayed. When installation is stopped with operation of a keyboard or a mouse, there is a possibility that OS does not start normally.



Note

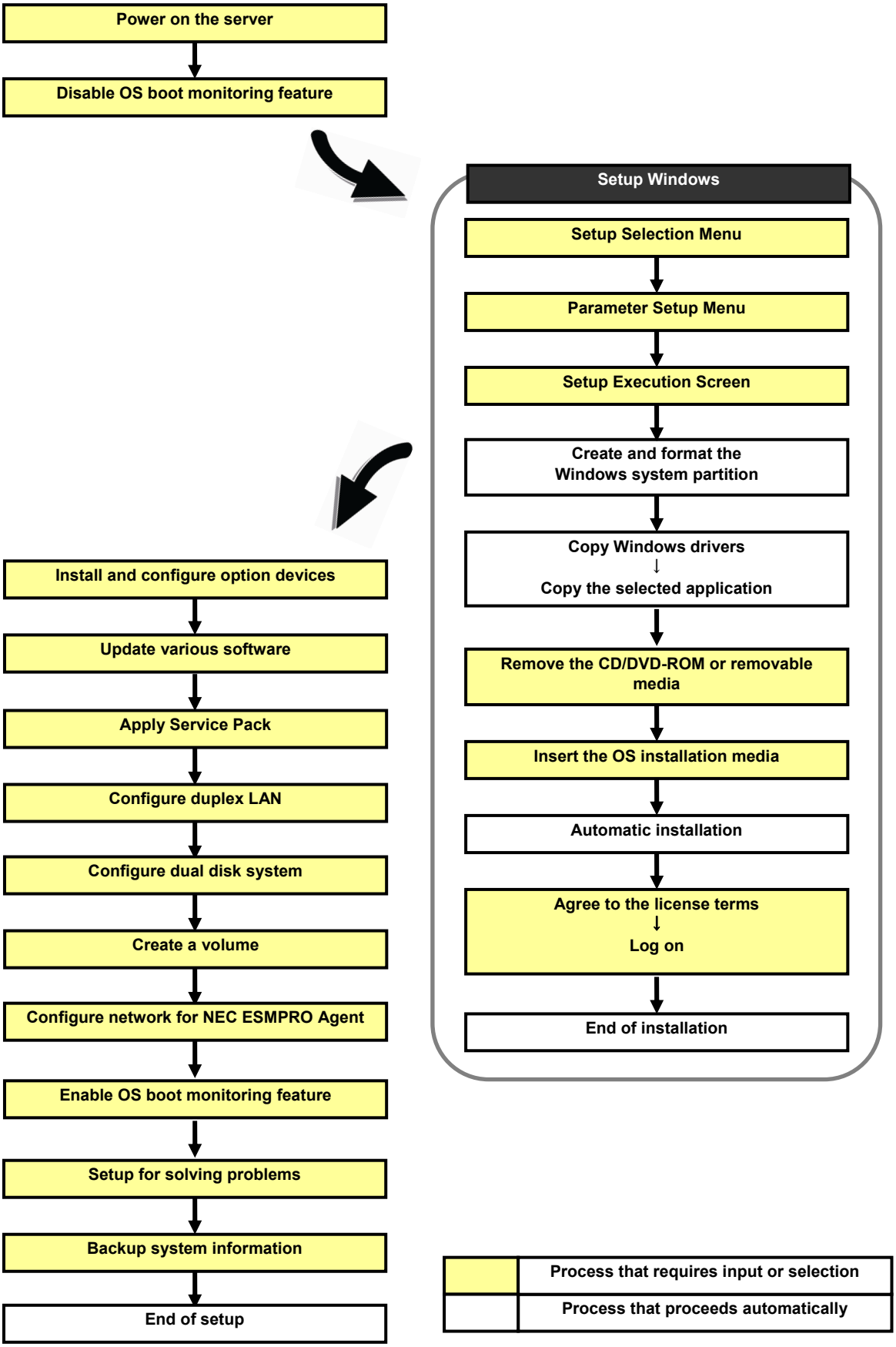
The Scalable Networking Pack (SNP) function is disabled on systems that have been installed by using EXPRESSBUILDER.
The setting of SNP function may affect the system performance.
Contact your sales representative for details.

Tips

Setup with EXPRESSBUILDER allows you to use a pre-specified parameter file or save the parameters specified in setup as a parameter file on a removable media.

For details on creating a parameter file, see *Chapter 1 (6. Windows OS Parameter File)*.

4.2.1 Setup flow



4.2.2 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 2008 R2 DVD-ROM*)
    (If your OS install media does not contain Service Pack 1, prepare it.)
- **First Steps Guide**
- **EXPRESSBUILDER DVD**
- **ft Server Control Software UPDATE media**

  Used to update ft Server Control Software. This might not be provided with your server.
- Prepare if needed:
  - **Removable media for Windows OS parameter file**
  - **Service Pack**
    (If the OS installation media contains Service Pack 1, you need not apply the service pack again.)
- **ft Server Control Software update module**

  See *Chapter 1 (4.8.1 Applying ft Server Control Software Update Module)* for more information.

4.2.3 Before setting up

During Setup with EXPRESSBUILDER, parameters are specified through the wizard. You can also save the parameters as one file (a parameter file) in removable media.

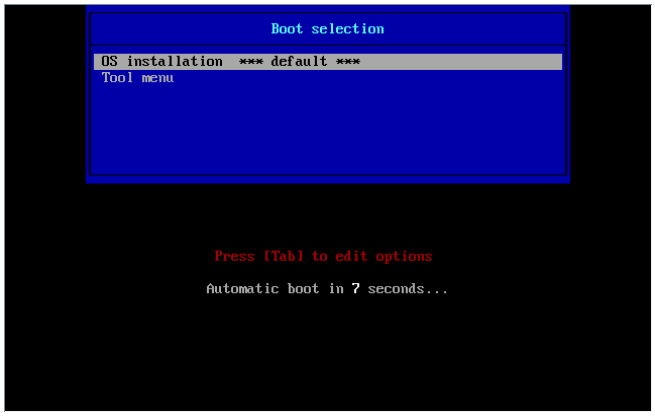
Note Read through the items in *Chapter 1 (4.1 Before Starting Setup*) prior to installing Windows.

4.2.4 Setup procedure

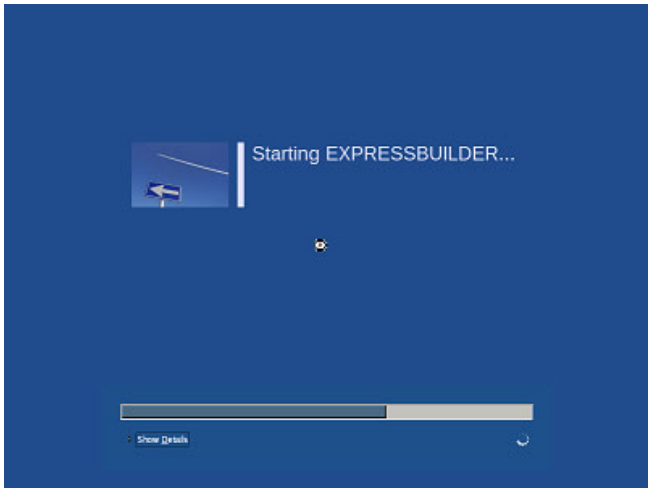
1. Prepare for setup according to *Chapter 1 (4.1.2 Preparation)*.
2. Be sure to disable OS Boot Monitoring feature according to *Chapter 1 (4.1.3 Disabling OS Boot Monitoring Feature)*.

Important **OS Boot Monitoring feature is enabled by the shipping default. Setup process will fail if this feature is enabled.**

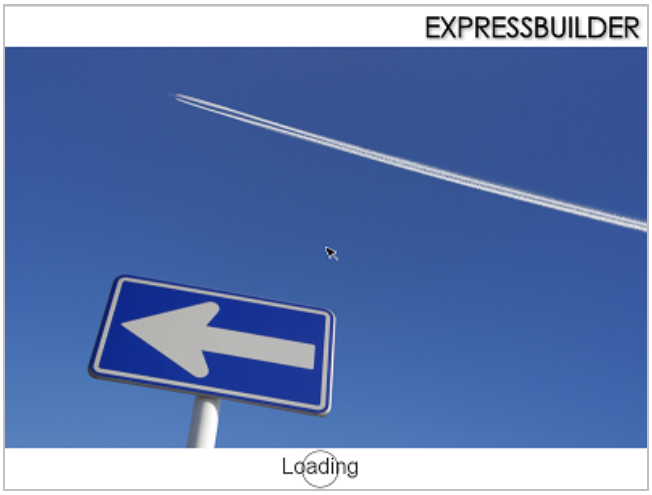
3. Turn the display unit power on, and then turn the server power on.
4. Start EXPRESSBUILDER according to *Chapter 1 (1.1 Starting EXPRESSBUILDER)*.
5. When the following message appears, select **OS installation *** default *****.



The following window appears.



The server starts from EXPRESSBUILDER.



6. Select **English** on the language selection window, and then click **OK**.

7. Click **Setup**.

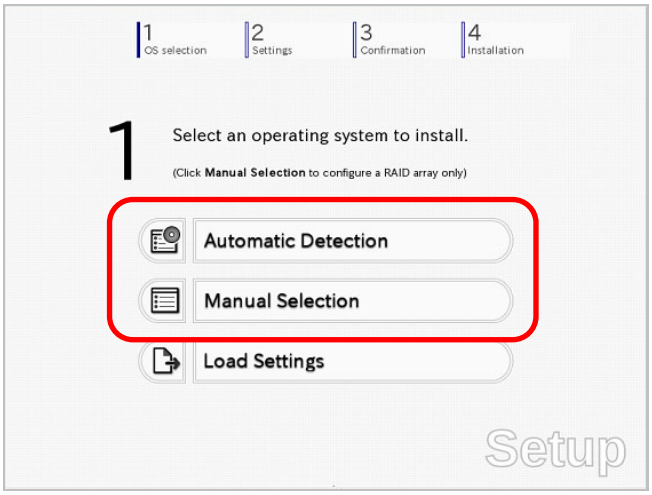
8. On the **OS selection** menu, select the OS to install or specify the parameter file.

   ☐ When not using parameter file: Go to Step 9.

   ☐ When using a parameter file: Go to Step 10.

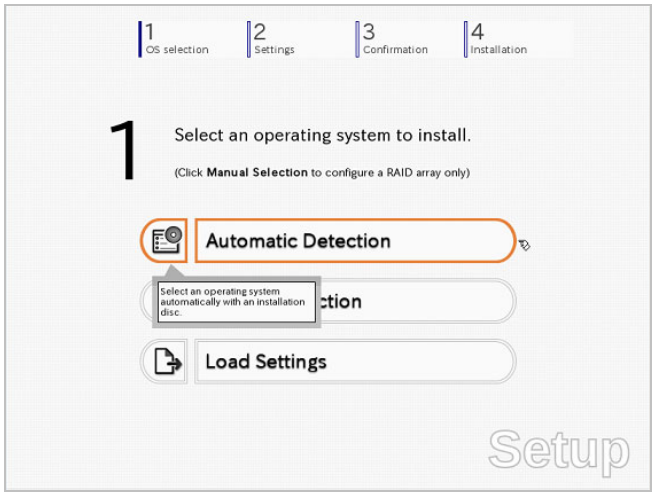
Note When setting up again, parameter input via the wizard can be omitted by loading the saved parameter file.

9. When *not using* a parameter file, select an OS by either of the following two ways:

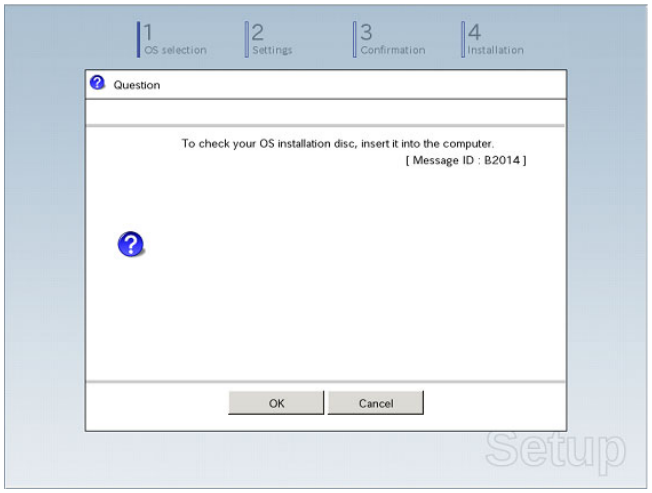


To automatically detect the OS on the OS installation media:

(1) Click **Automatic Detection**.

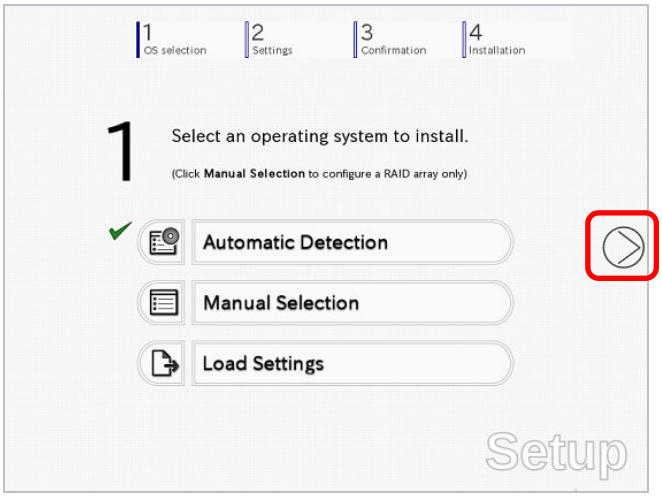


Insert the OS installation media, and then click **OK**.



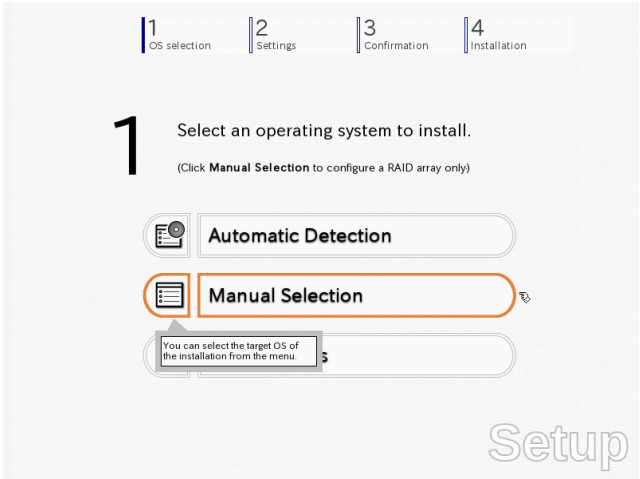
(2) Click ▷ on the right side of the screen.

→ Go to step 11.

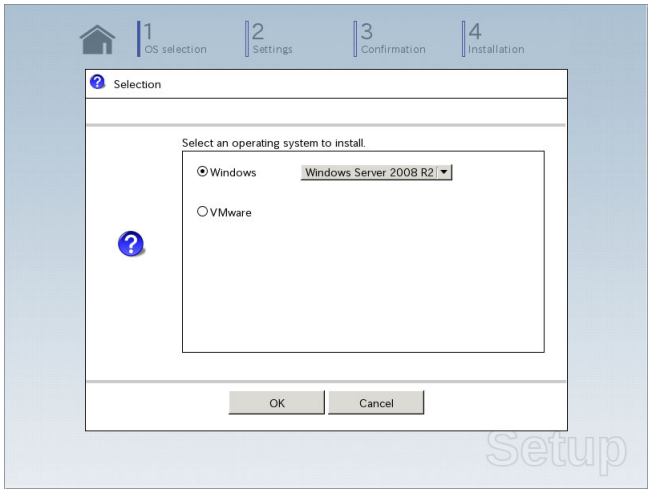


To select an OS from the menu:

(1) Click **Manual Selection**.

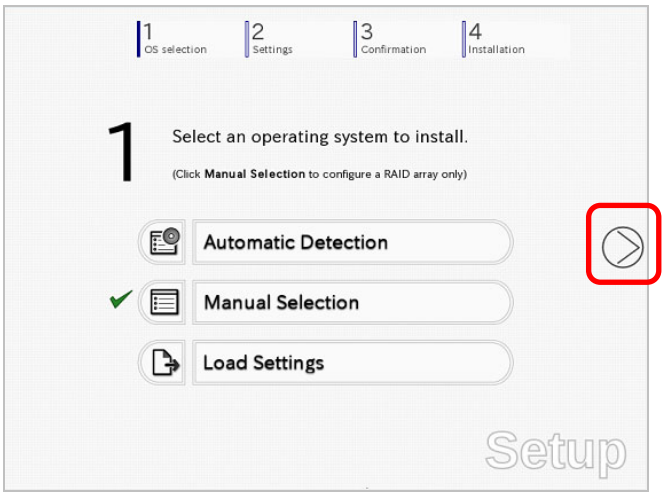


(2) From the pull-down menu, select **Windows Server 2008 R2**, and then click **OK**.

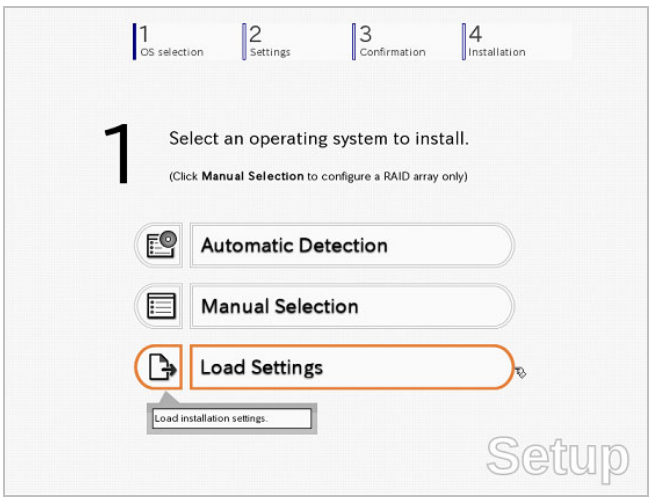


(3) Click ▷ on the right side of the screen.

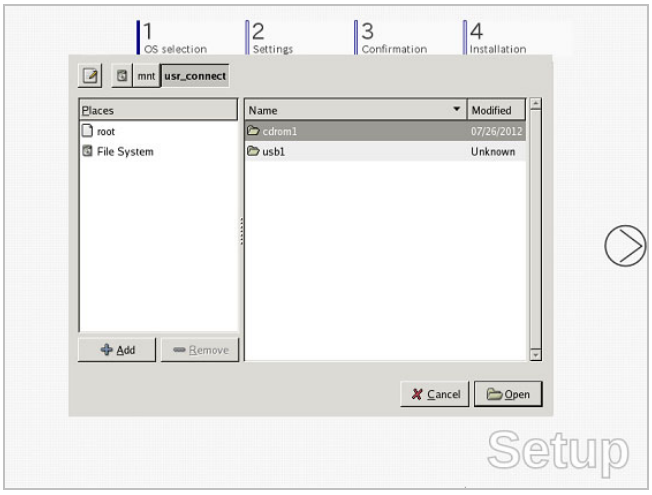
→ Go to step 11.



10. When *using* the parameter file, click **Load Settings**.



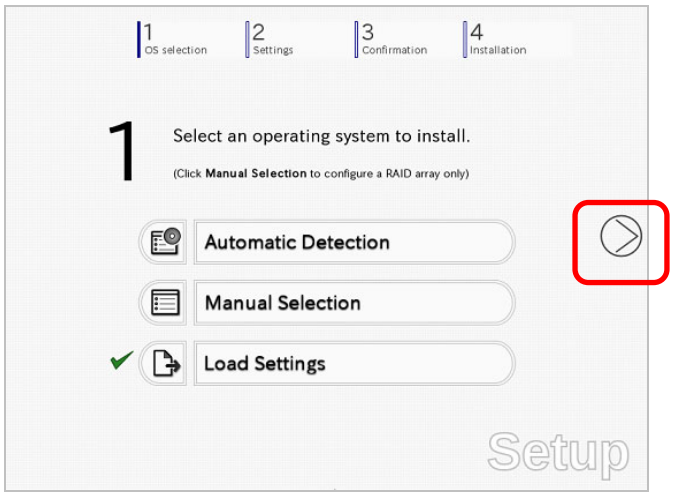
Follow the on-screen instruction to load the parameter file (*.tre).



Tips

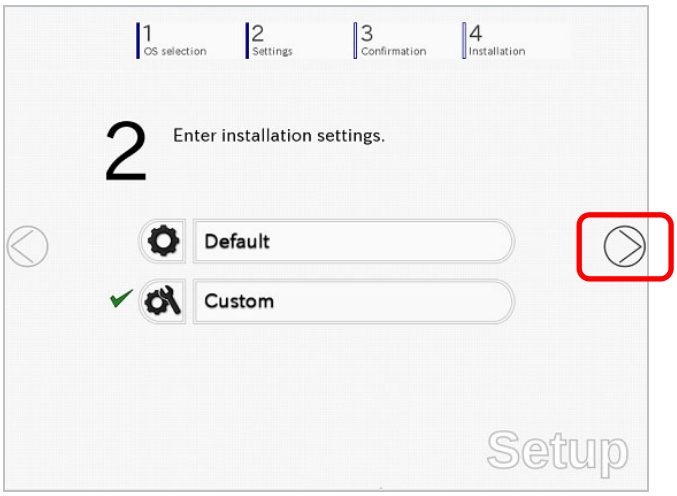
For the removable media in which the parameter file is saved, see **"/mnt/usr_connect/usb*"** (* indicates a number).

Click ⓒ on the right side of the screen.



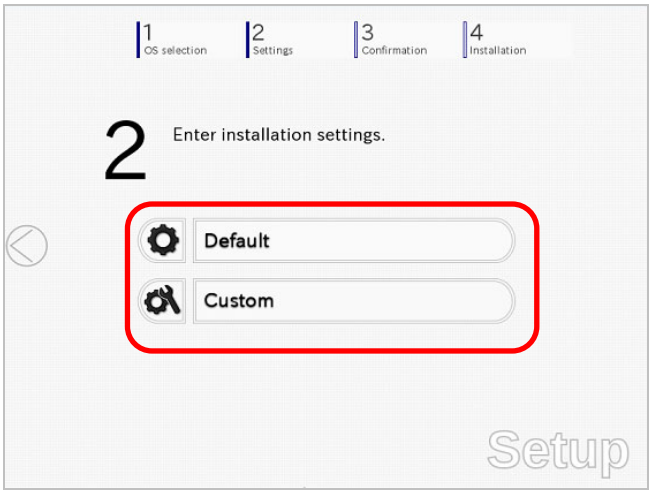
When the following screen appears, click ▷ on the right side of the screen.

Click **Custom** to check and modify the setting in the wizard.



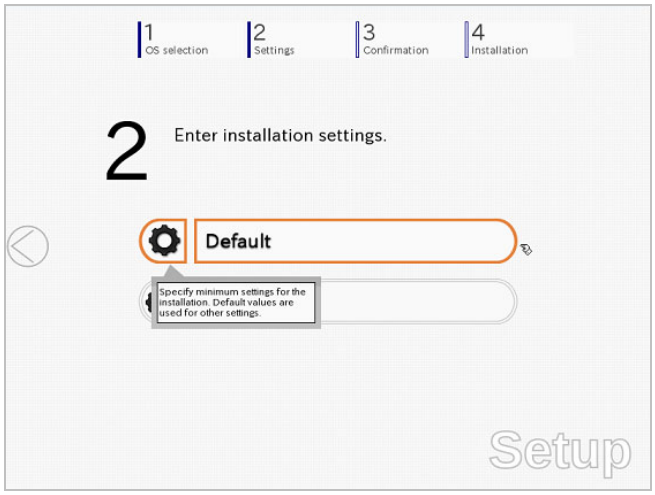
→ Go to step 12.

11. Specify the setup parameters by using either of the following methods:

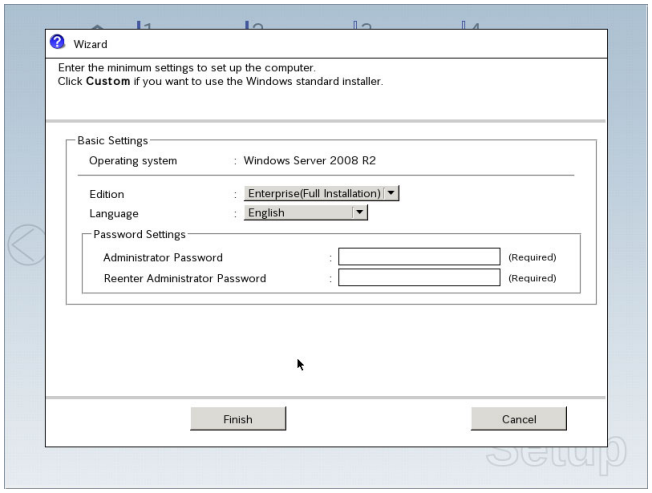


Use Default:

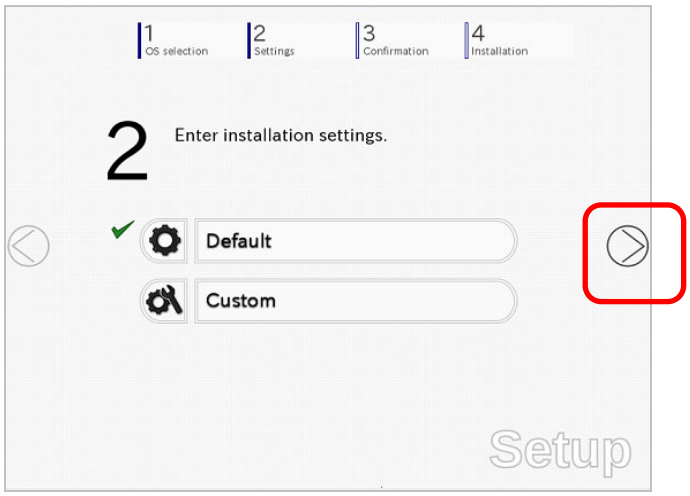
(1) Click **Default**.



(2) Type the password, and then click **Finish**.



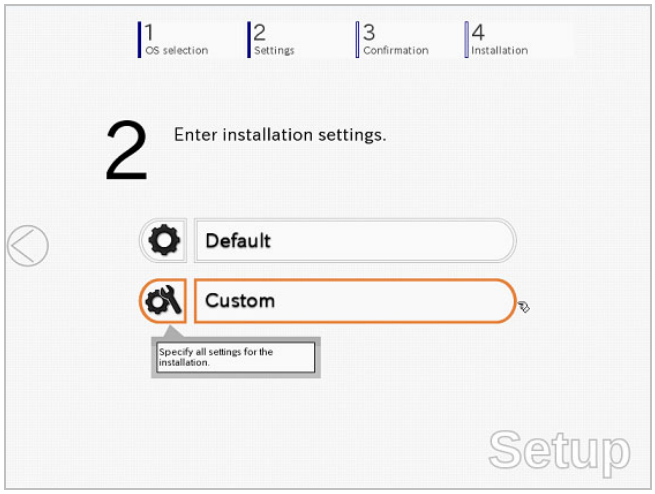
Click ⓒ on the right side of the screen.



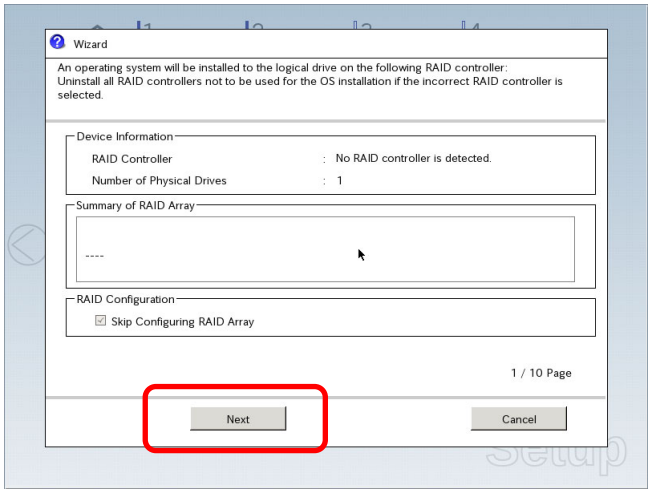
→ Go to step 12.

Use Custom:

(1) Click **Custom**.

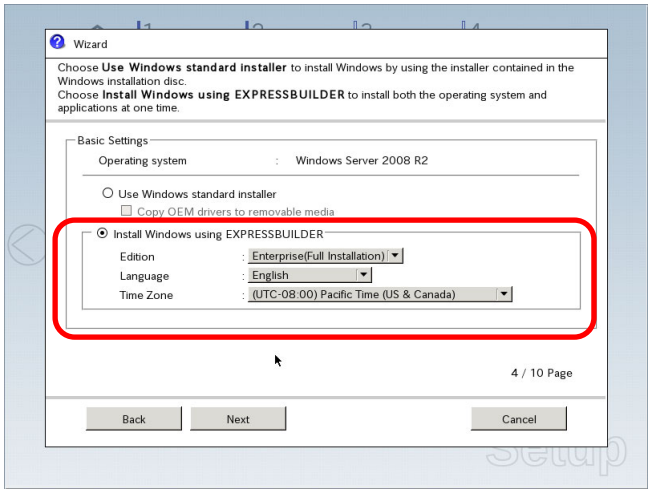


(2) RAID Configuration is unavailable on this server. Click **Next**.



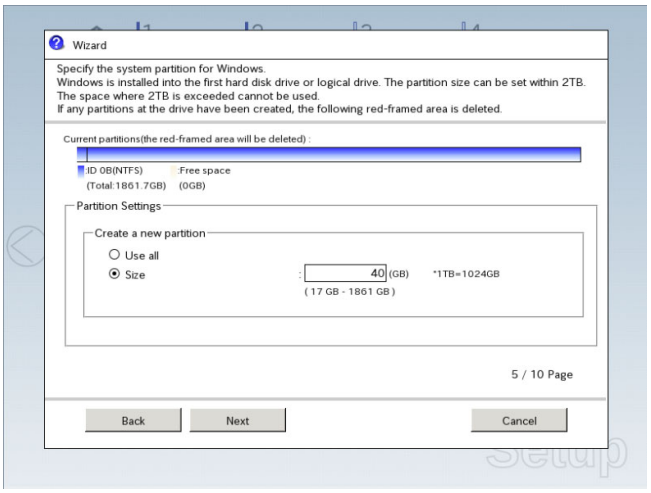
(3) Check the settings specified for **Basic Settings**.

Modify the settings as needed, and then click **Next**.



(4) Check the settings specified for **Partition Settings**.

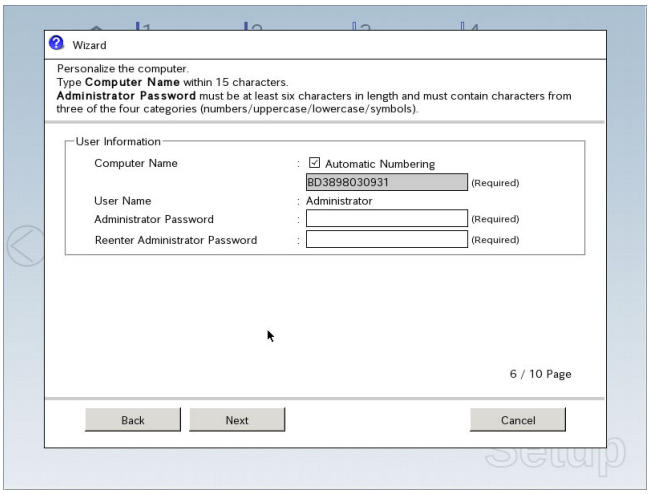
Modify the settings as needed, and then click **Next**.



Important

- **Partition size**
  - **Specify a partition size larger than the minimum required for installing the operating system. (See *Chapter 1 (4.1 Before Starting Setup)*.)**
  - **Specify a partition size not exceeding 2,097,152MB.**
- **The entire contents of the destination hard disk drive will be erased.**

(5) Enter the user information, and then click **Next**.



Note

Computer name and Administrator Password are required parameters.

Enter Administrator Password that satisfies the following conditions:

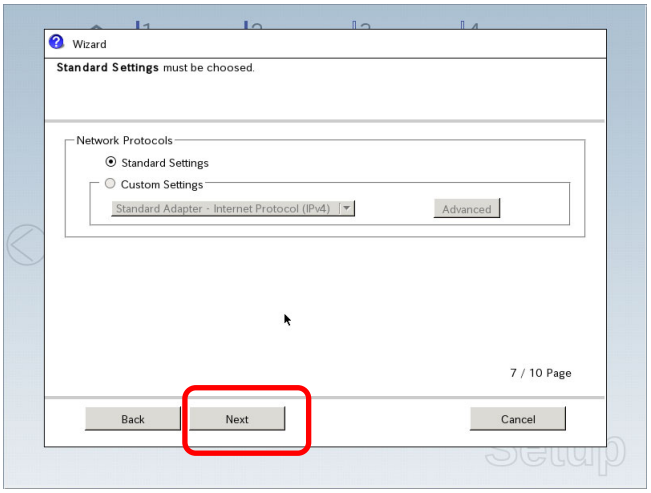
- Contains 6 or more characters
- Contains characters from at least three of the following categories: numbers, uppercase alphabetic characters, lowercase alphabetic characters, and symbols.

Tips

- The Computer name has been assigned by automatic assignment function. If you need to assign another computer name, remove the checkmark from "**Automatic Numbering**", and enter the desired computer name.
- If a parameter file is used for setup or if you return to a previous screen, •••••• is displayed in the Administrator password and Confirm Administrator password text boxes.

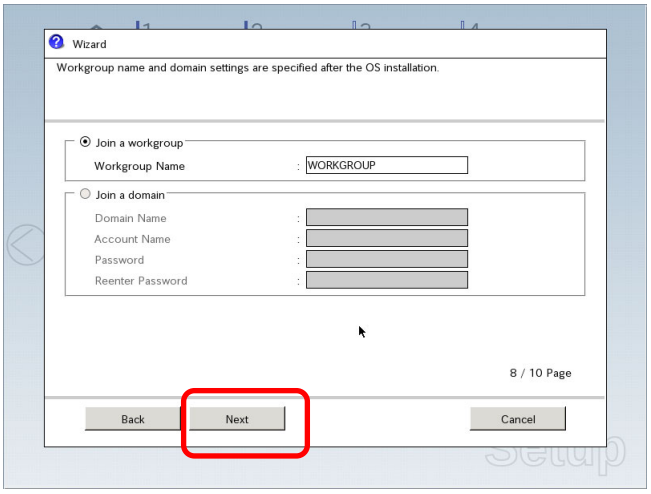
(6) **Network Protocols** is unavailable on this server.

Click **Next**.



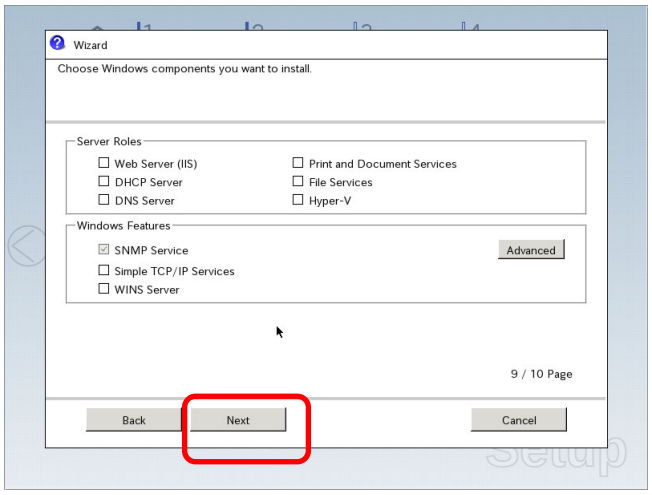
(7) Specifying domain or workgroup is unavailable on this server.

Click **Next**.



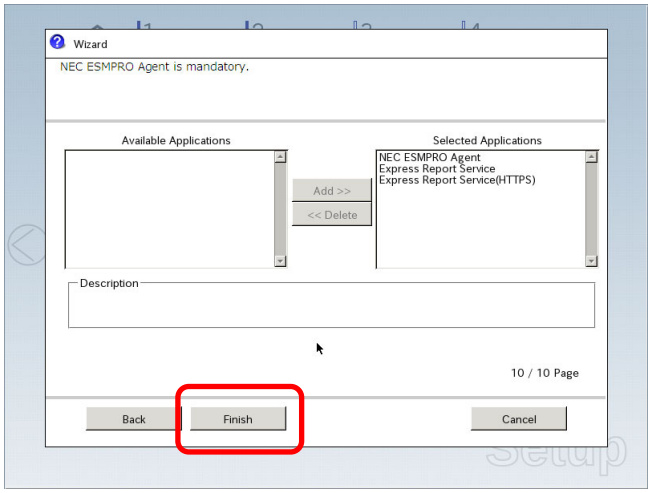
(8) Check the settings of Windows components.

Modify the settings as needed, and then click **Next**.

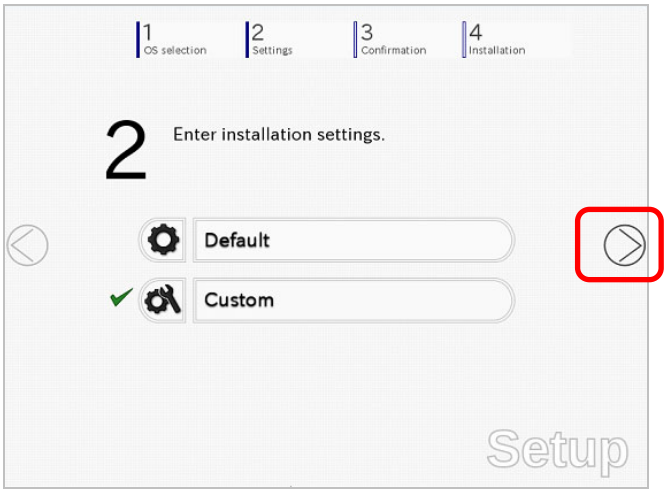


(9) Check the settings of applications.

Click **Finish**.

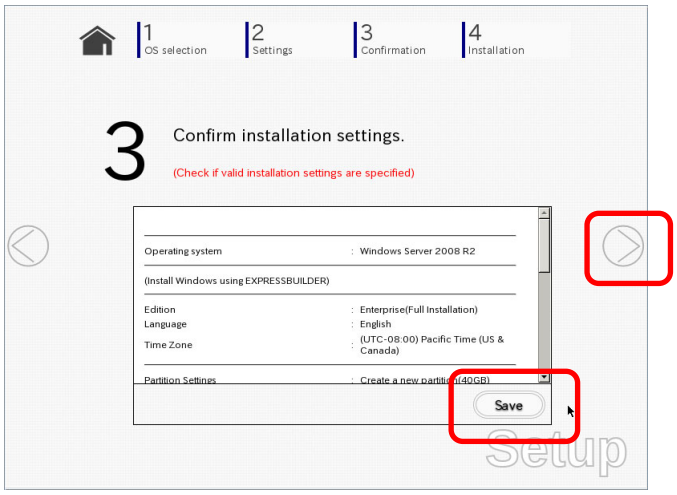


On the screen as shown below, click ⊳ on the right side of the screen.



12. Check the settings.

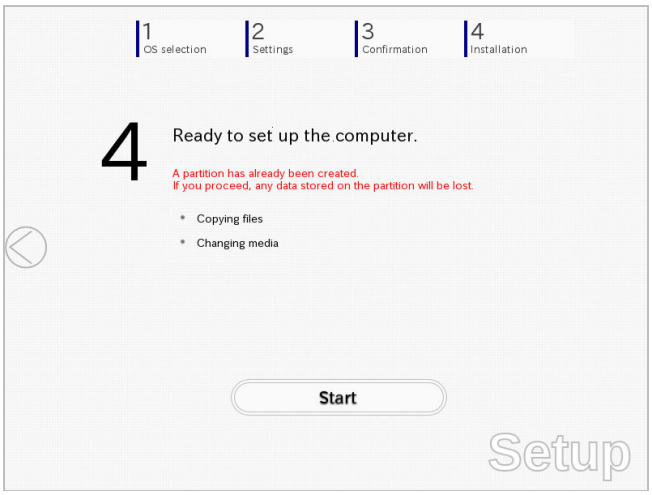
    To save the settings, click **Save**.



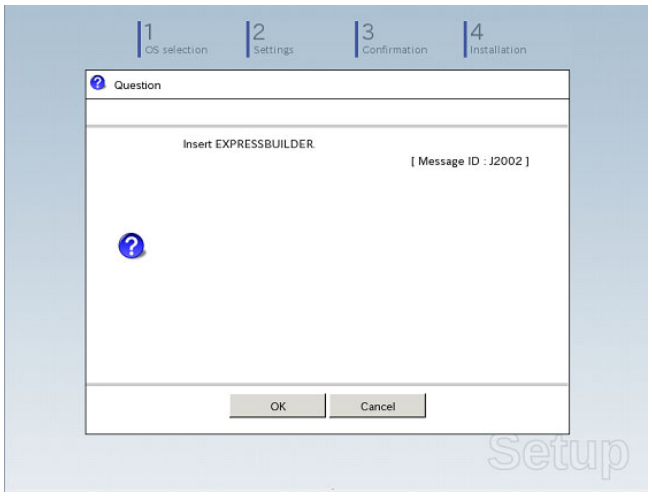
    Click ▷ on the right side of the screen.

13. The setup process starts.

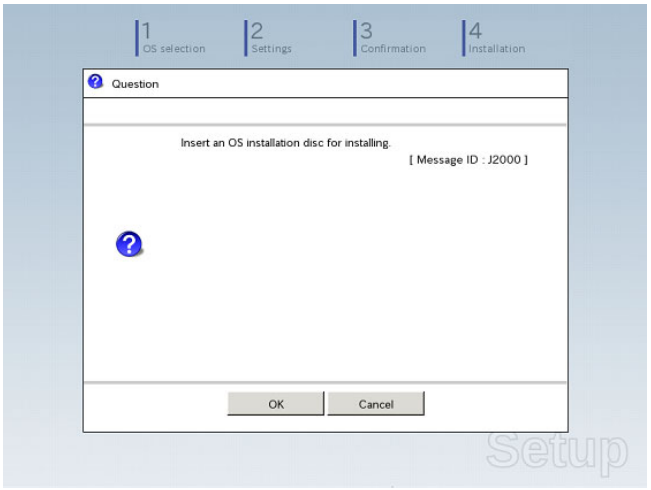
    Click **Start** to continue setup.



14. Insert the EXPRESSBUILDER disk into the optical disk drive, and then click **OK**.



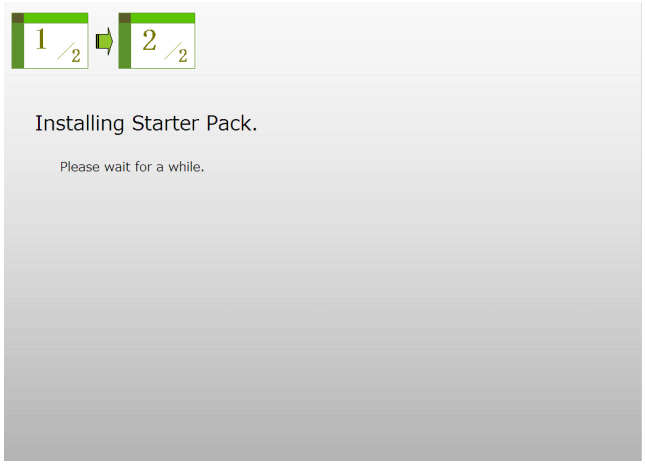
15. Insert the OS installation media into the optical disk drive, and then click **OK**.



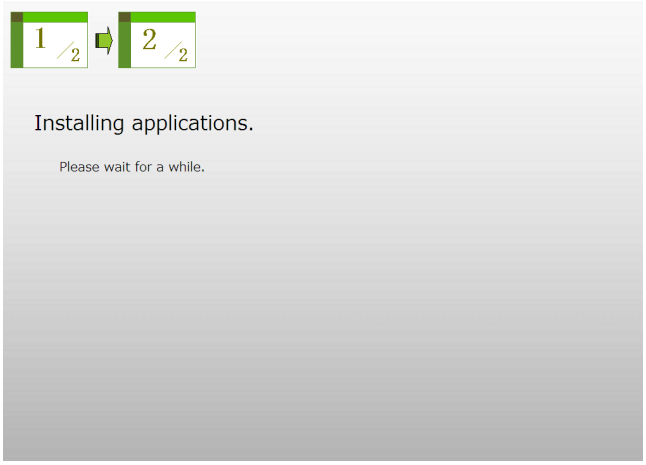
The setup proceeds automatically.
Wait for approximately 40 minutes without performing any operation.

16. The Starter Pack and the selected applications are automatically installed.

    Wait until the process completes without performing any operation.



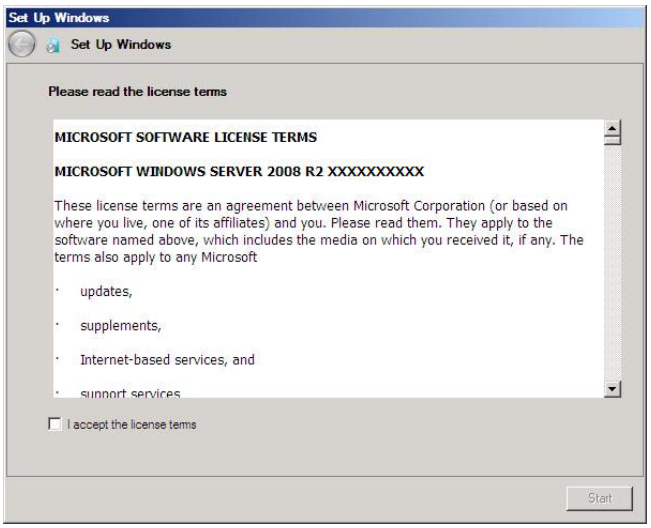
Screen displayed when Starter Pack is being installed



Screen displayed when an application is being installed

17. Read the terms of **License Agreement**.

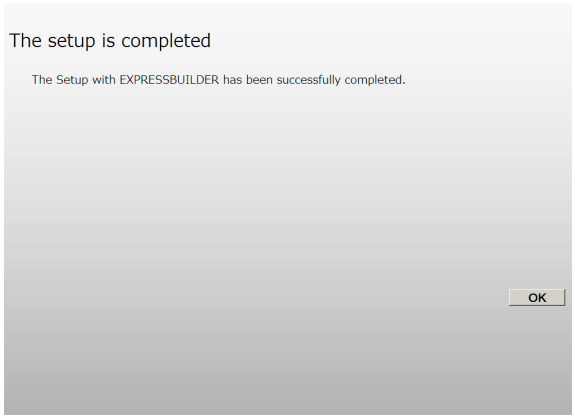
    If you agree, select **I accept the license terms**, and then click **Start** (Full installation only).



18. When the following message appears, press <**Ctrl**> + <**Alt**> + <**Del**> keys.

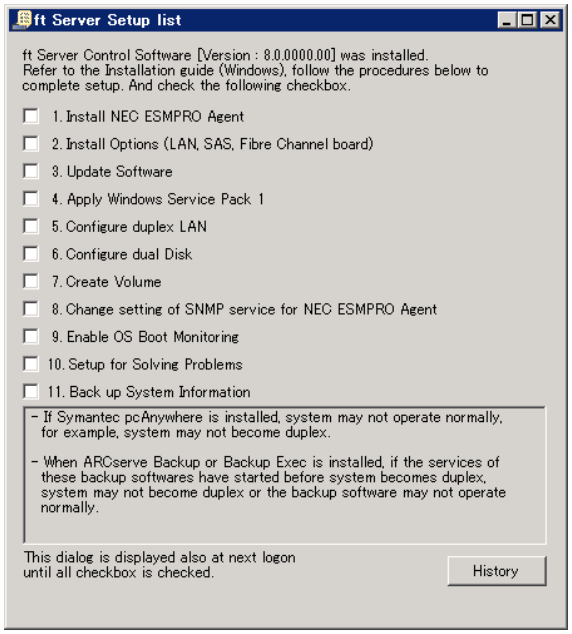
    Type your password you have set in Step 9-(2) or 9-(5) into the text box, and then click  .

19. Click **OK**.



20. When **ft Server Setup list** appears, confirm the list items.

    Provide setup for the item which is unchecked.



❑ Install Options (LAN, SAS, Fibre Channel Board)

If you have an option board that is not yet installed, install it according to *Chapter 2 (5.7 PCI Card)* in *Maintenance Guide*.

❑ Update Software

See Chapter 1 (4.8.1 Applying ft Server Control Software Update Module).

❑ Apply Windows Service Pack

See *Chapter 1 (4.7 Applying Service Pack)*.

Service Pack 1 is applied if you use the OS install media containing Service Pack 1.

❑ Configure duplex LAN

See *Chapter 1 (4.9 Duplex LAN Configuration)*.

❑ Configure dual Disk

See *Chapter 1 (4.10 Configuring Duplexed Disks)*.

❑ Create Volume

See *Chapter 1 (4.11 Creating Volume)*.

❑ Change setting of SNMP service for NEC ESMPRO Agent

As described in *Chapter 2 (1.1 NEC ESMPRO Agent (for Windows),* setup SNMP service by referring to *NEC ESMPRO Agent Installation Guide (Windows)*.

❑ Enable OS Boot Monitoring

See *Chapter 1 (4.13 Enabling OS Boot Monitoring Feature)*.

❑ Setup for Solving Problems

See *Chapter 1 (5. Setup for Solving Problems)*.

Tips If necessary, perform license authentication procedure according to *Chapter 1 (4.14 License Authentication)*.

❑ Back up System Information

See *Chapter 1 (7. Backing Up System Information)*.

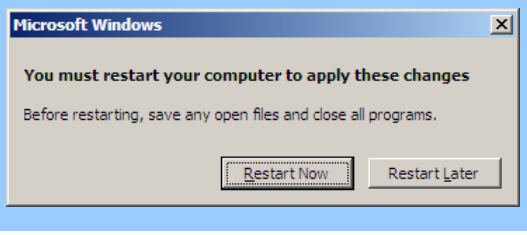
Setup with EXPRESSBUILDER is now complete.

4.3 Setup with Windows Standard Installer

This section describes how to install Windows with Windows Standard Installer.

Important

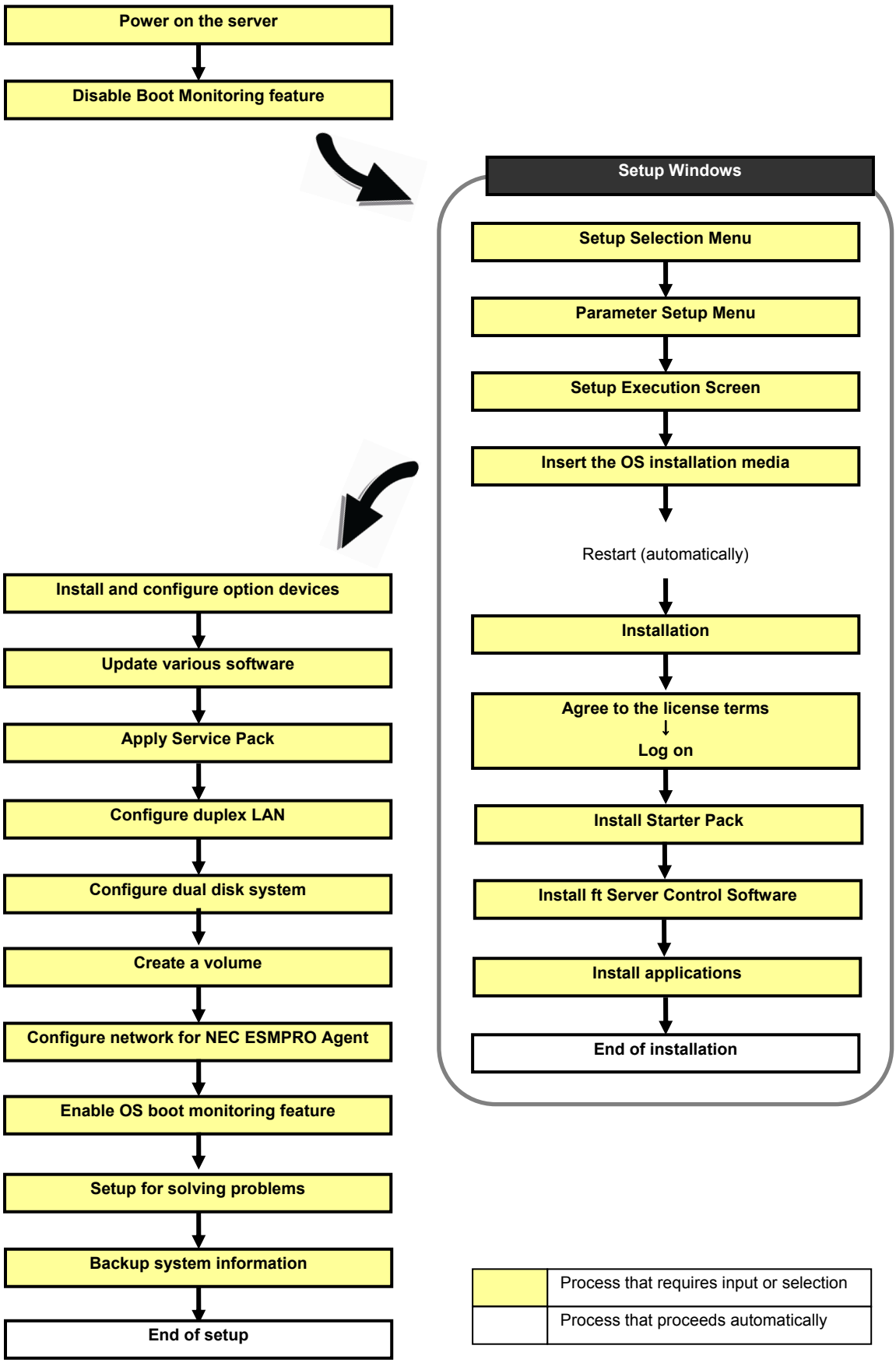
- **Setup with Windows standard Installer may erase all data in the hard disk drive depending on the settings. Pay attention to input parameters.**
  Backing up user data, as needed, is recommended.
- **Although some dialog boxes and popup windows are displayed during installing ft Server Control Software in Setup, do not operate from the keyboard and the mouse. Installation is continued automatically.**
  Do not operate especially although the following dialog is displayed. When installation is stopped with operation of a keyboard or a mouse, there is a possibility that OS does not start normally.



Tips

- Setup with Windows Standard Installer allows you to use a pre-specified parameter file or save the parameters specified in setup as a parameter file on a removable media.
- For details on creating a parameter file, see *Chapter 1* (*6. Windows OS Parameter File)*.

4.3.1 Setup flow



4.3.2 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 2008 R2 DVD-ROM*)
    (If your OS install media does not contain Service Pack 1, prepare it.)
- **First Steps Guide**
- **EXPRESSBUILDER DVD**
- **ft Server Control Software UPDATE media**

  Used to update ft Server Control Software. This might not be provided with your server.
- Prepare if needed:
  - **Removable media for Windows OS parameter file**
  - **Service Pack**
    (If the OS installation media contains Service Pack 1, you need not apply the service pack again.)
  - **ft Server Control Software update module**
    See *Chapter 1 (4.8.1 Applying ft Server Control Software Update Module)* for more information.

4.3.3 Before setting up

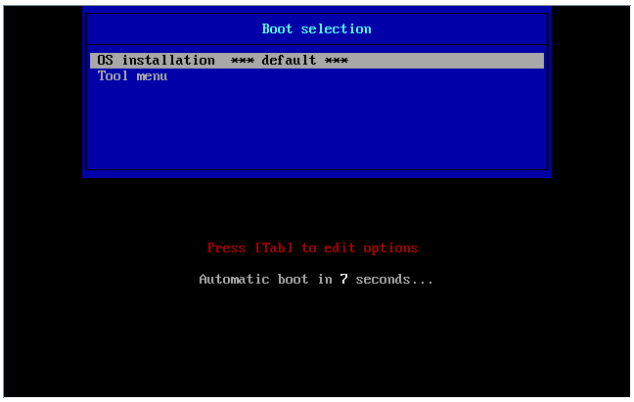
Before starting setup, read through *Chapter 1 (4.1 Before Starting Setup)* for successful setup.

4.3.4 Setup procedure

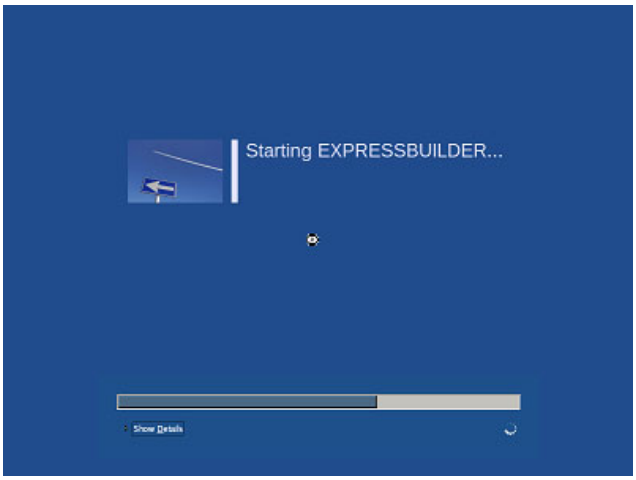
1. Prepare for setup *according to Chapter 1 (4.1.2 Preparation)*.
2. Be sure to disable OS Boot Monitoring feature according to *Chapter 1 (4.1.3 Disabling OS Boot Monitoring Feature)*.

Important **OS Boot Monitoring feature is enabled by the shipping default. Setup process will fail if this feature is enabled.**

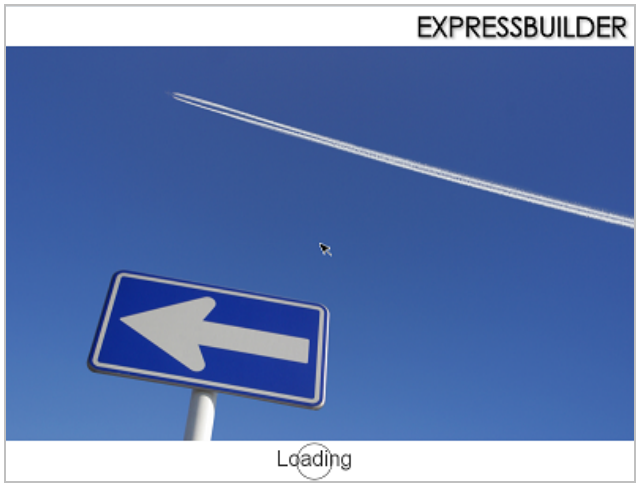
3. Power on the display unit, and then power on the server.
4. Start EXPRESSBUILDER according to *Chapter 1 (1.1 Starting EXPRESSBUILDER)*.
5. When the following message appears, select **OS installation *** default *****.



The following window appears.



The server starts from EXPRESSBUILDER.



6. Select **English** on the language selection window, and then click **OK**.

7. Click **Setup**.

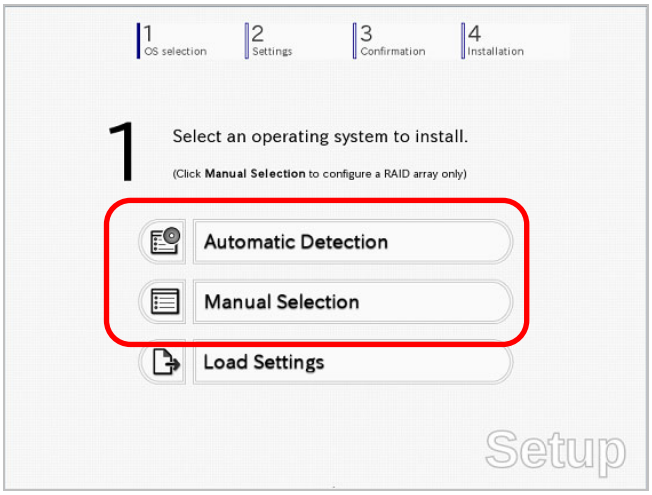
8. On the **OS selection** menu, select the OS to install or specify the parameter file.

   ☐ When not using parameter file: Go to Step 9.

   ☐ When using a parameter file: Go to Step 10.

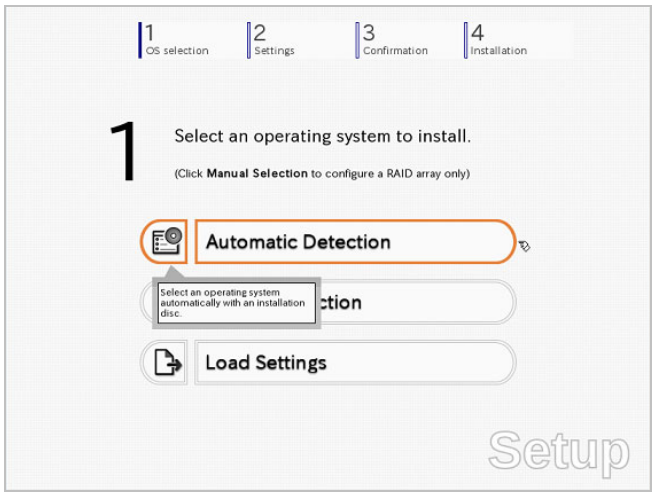
Note When setting up again, parameter input via the wizard can be omitted by loading the saved parameter file.

9. When *not using* a parameter file, select an OS by either of the following two ways:

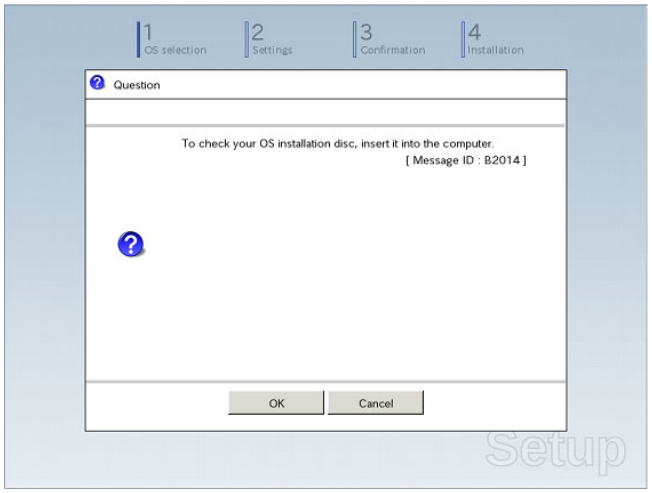


To automatically detect the OS on the OS installation media:

(1) Click **Automatic Detection**.

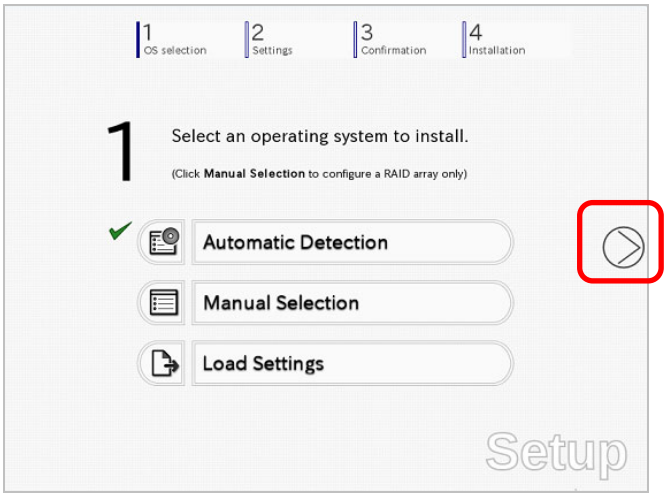


Insert the OS installation media, and then click **OK**.



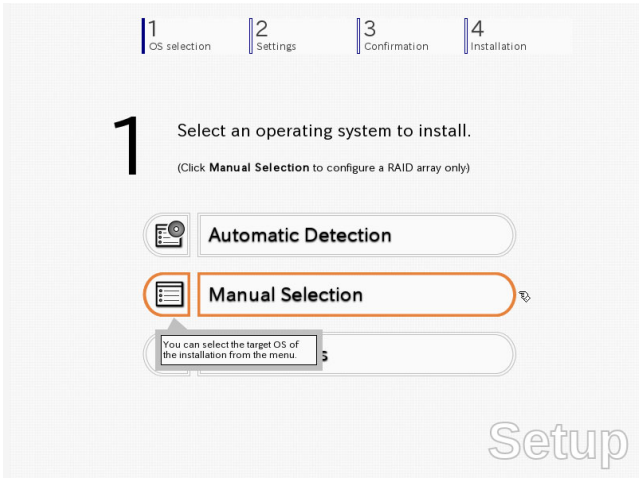
(2) Click ⊳ on the right side of the screen.

→ Go to step 11.

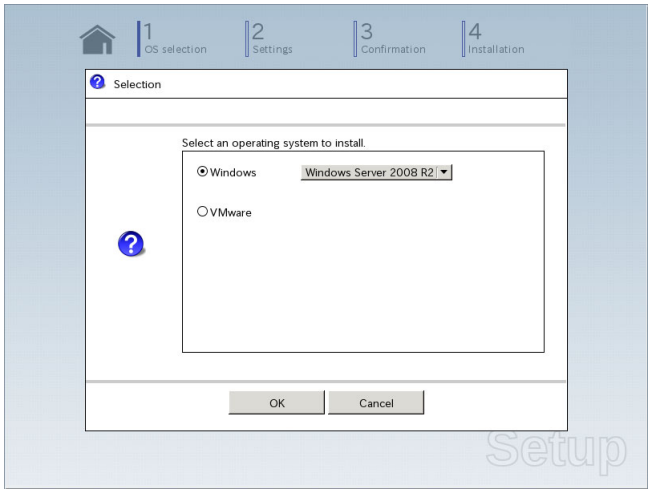


To select an OS from the menu:

(1) Click **Manual Selection**.

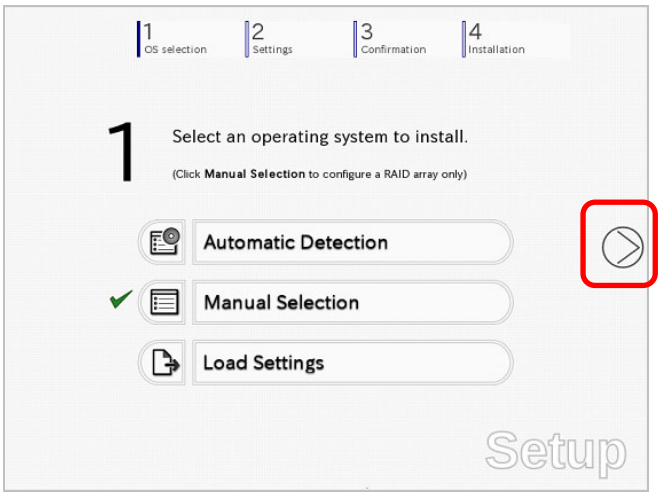


(2) From the pull-down menu, select **Windows Server 2008 R2**, and then click **OK**.

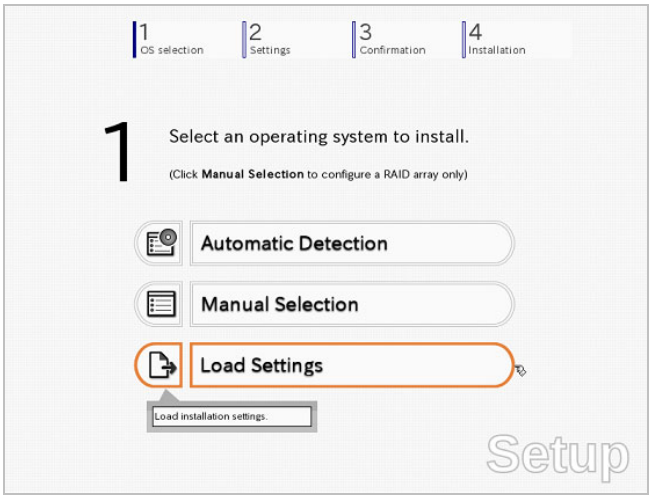


(3) Click ▷ on the right side of the screen.

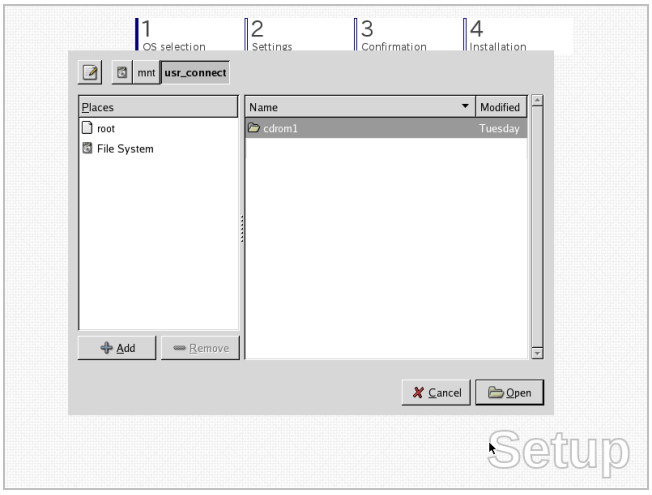
→ Go to step 11.



10. When *using* the parameter file, click **Load Settings**.



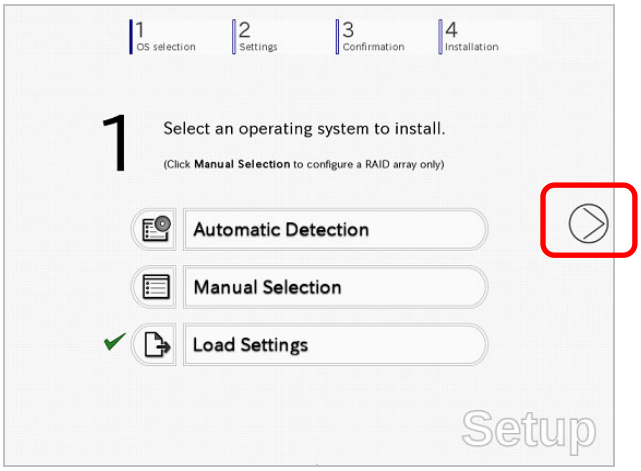
Follow the on-screen instruction to load the parameter file (*.tre).



Tips

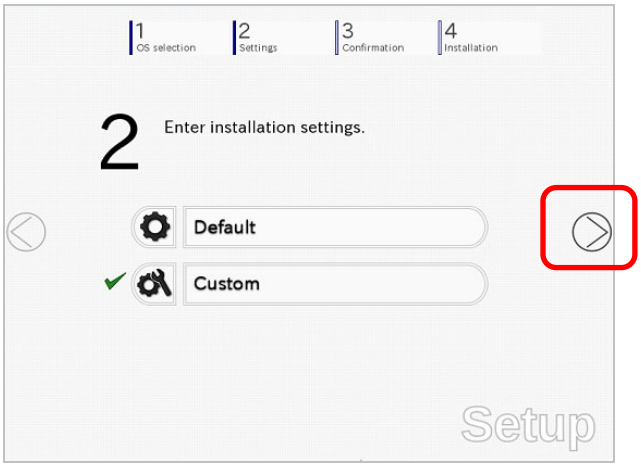
For the removable media in which the parameter file is saved, see **"/mnt/usr_connect/usb*"** (* indicates a number).

Click ▷ on the right side of the screen.



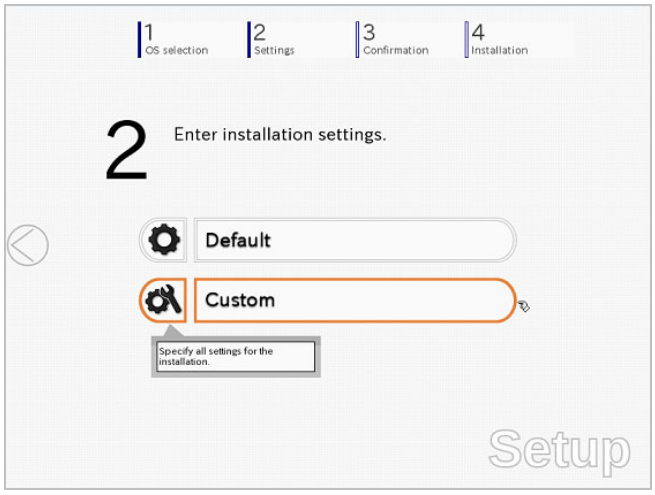
When the following screen appears, click ▷ on the right side of the screen.

Click **Custom** to check and modify the setting in the wizard.

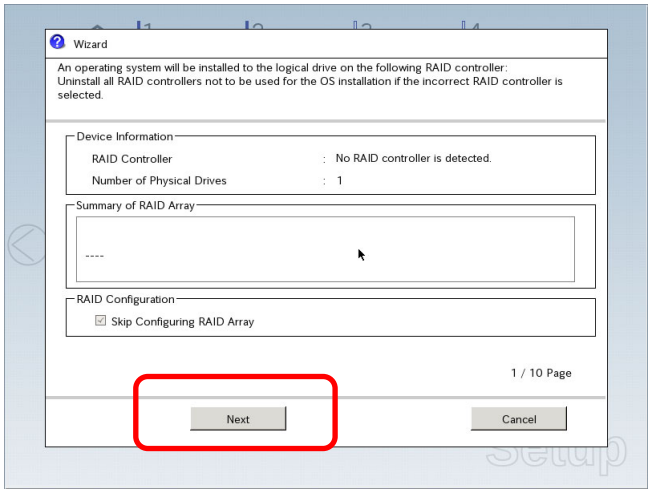


→ Go to step 12.

11. Click **Custom**.

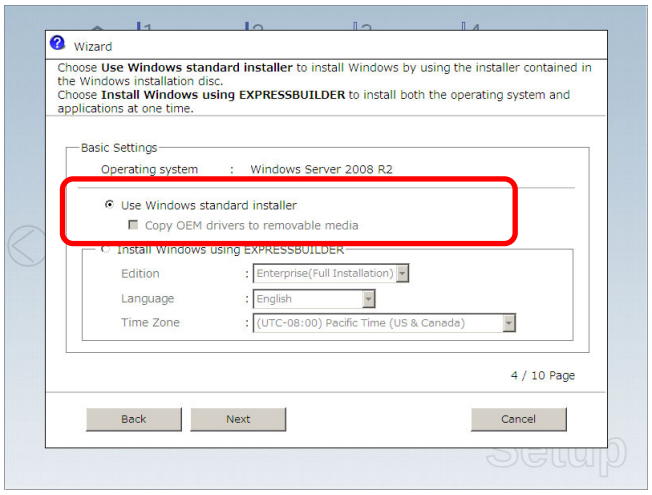


(1) RAID Configuration is unavailable on this server. Click **Next**.

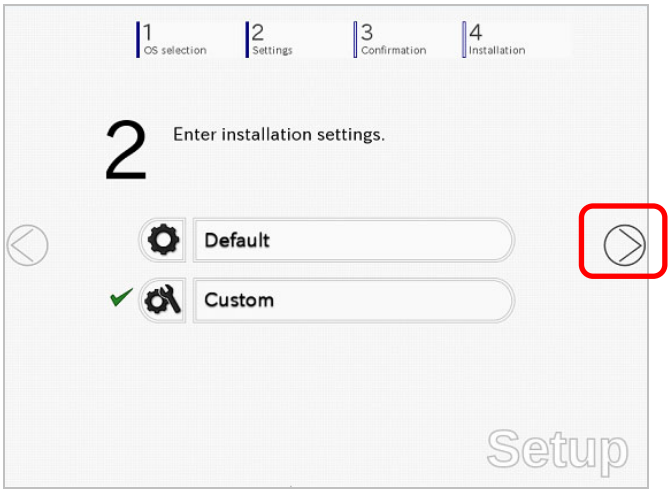


(2) Check the settings specified for **Basic Settings**.

Select **Use Windows standard installer**, and then click **Next**.

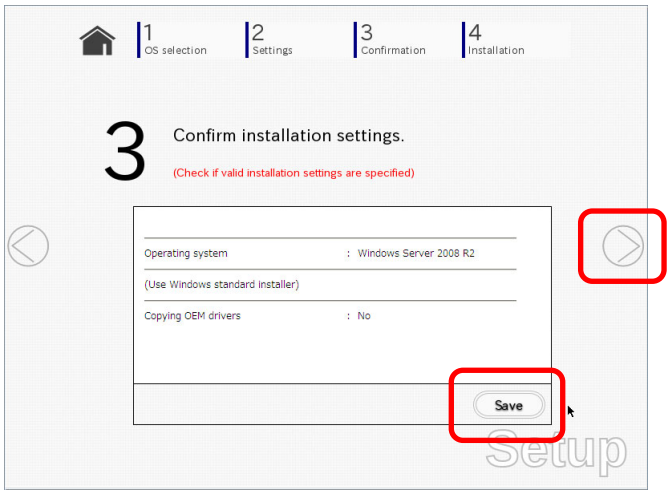


(3) On the following screen, click ▷ on the right side of the screen.



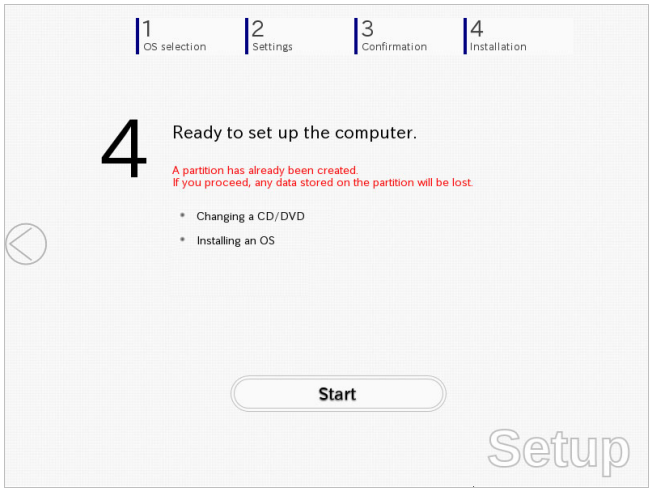
12. Check the parameter settings.

    To save the settings, click **Save**.



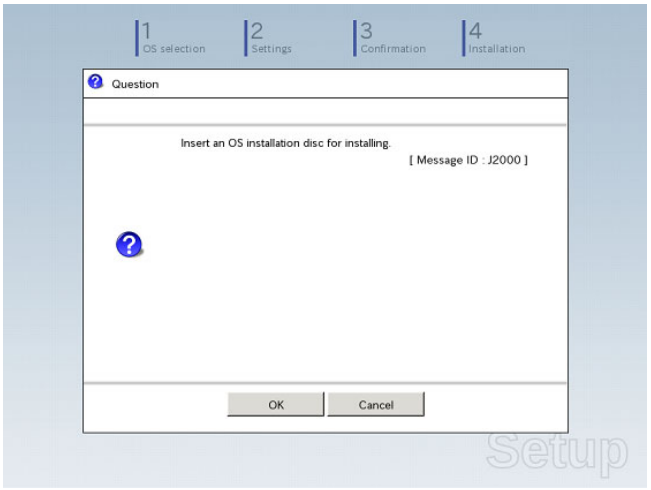
    Click ▷ on the right side of the screen.

13. The setup process starts.Click **Start** to continue setup.



    Proceed with setup according to on-screen message.

14. Insert the OS installation media into the disk drive, and then click **OK**.



15. The server reboots automatically.
16. The system starts from the OS installation media.

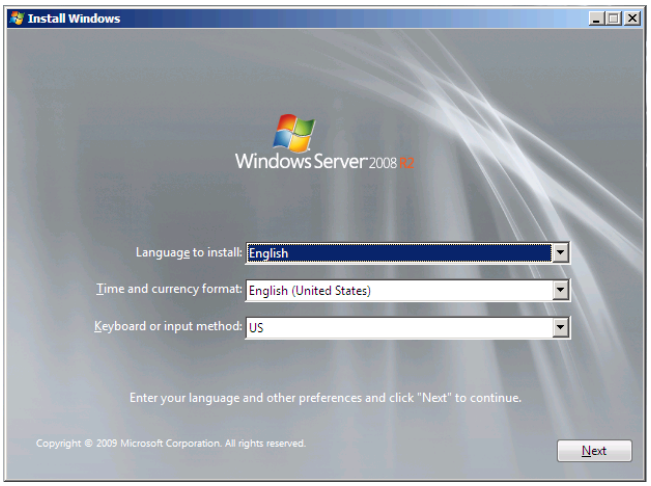
    If an operating system is already installed on the hard disk drive, the message “Press any key to boot from CD or DVD…” is displayed on the top of the screen. Press <**Enter**> key to boot from OS installation media.

    The boot sequence proceeds and the message “Windows is loading files…” appears.

    Note If “Windows is loading files...” message does not appear, <**Enter**> key was not pressed correctly. Reboot and retry.

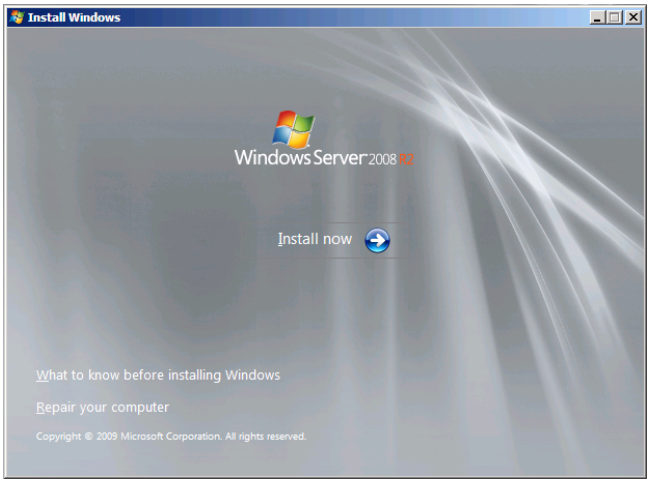
    This step is unnecessary if no operating system exists.

17. Click **Next** at default settings.



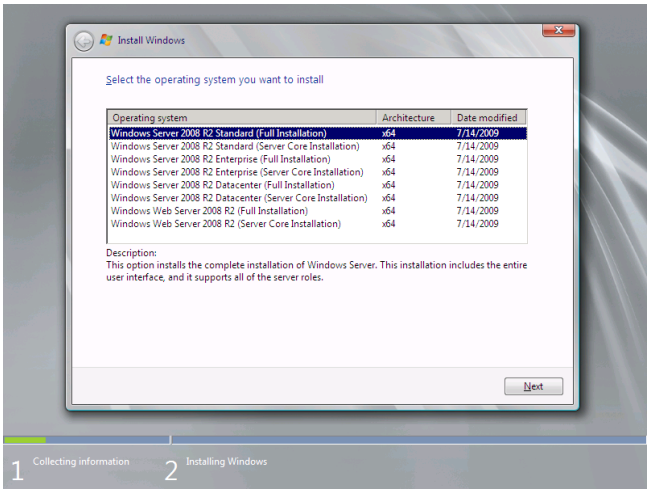
18. Click **Install Now** .

    Windows Server 2008 R2 installation starts.

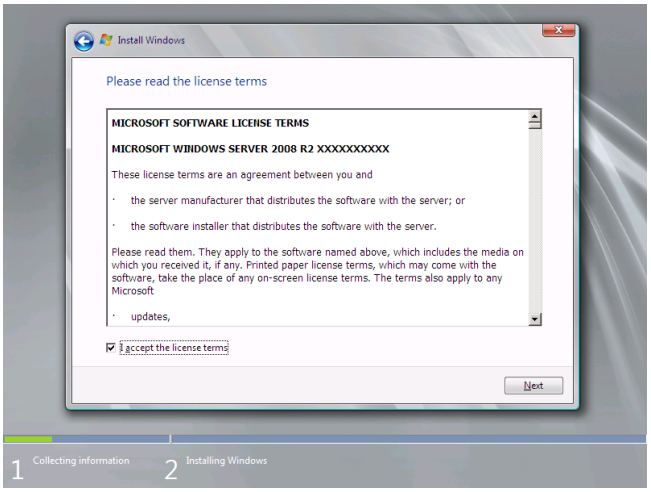


19. Select the edition of the Windows you are going to install and the installation type.

    The screen display differs depending on an OS installation media you are using.

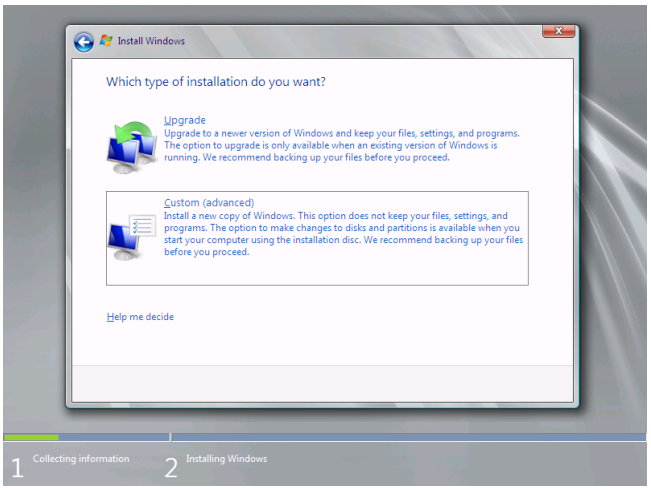


20. Confirm the content of the license agreement.If you agree, select **I accept the license terms** and then click **Next**.



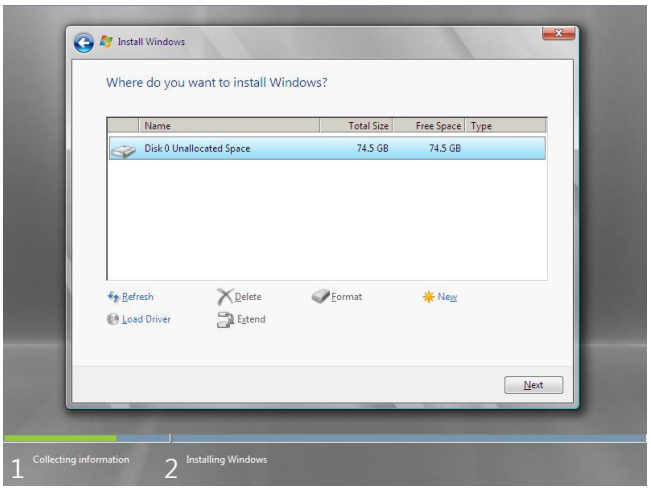
21. Select the installation type.

    Select **Custom (advanced)** in this case.



22. “Where do you want to install Windows?” window appears.
23. Select a hard disk drive in which partition is to be created, click **Drive options (advanced)**.

    If a partition has already been created, go to step 26.



24. Click **New**.

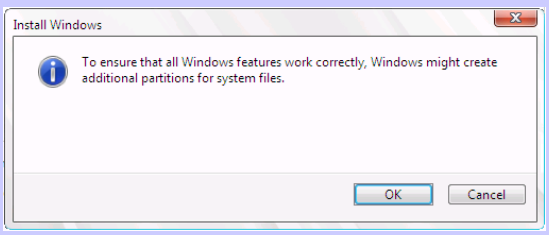
    Specify the partition size in the **Size** box, and then click **Apply**.

Note

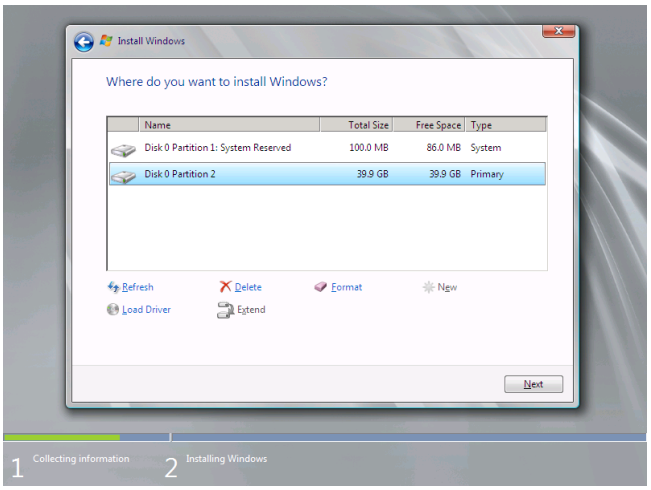
The partition size must be 2TB or smaller.

Tips

When creating new partition, 100MB of boot partition is secured. When the following message appears, click **OK**.

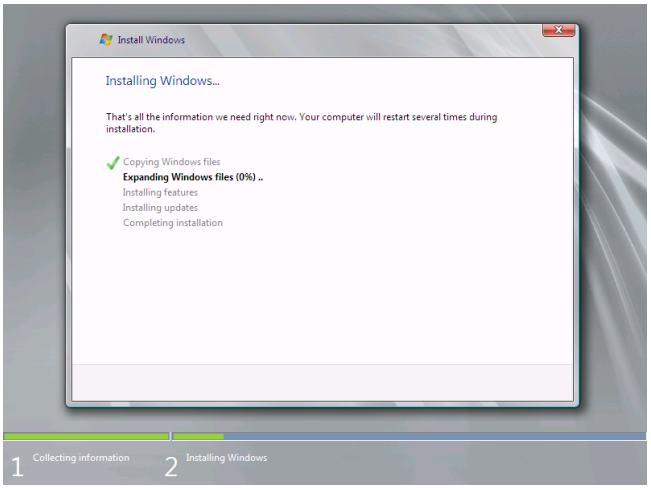


25. Select the partition created in step 24, and then click **Format**.
26. Select the created partition, and then click **Next**.



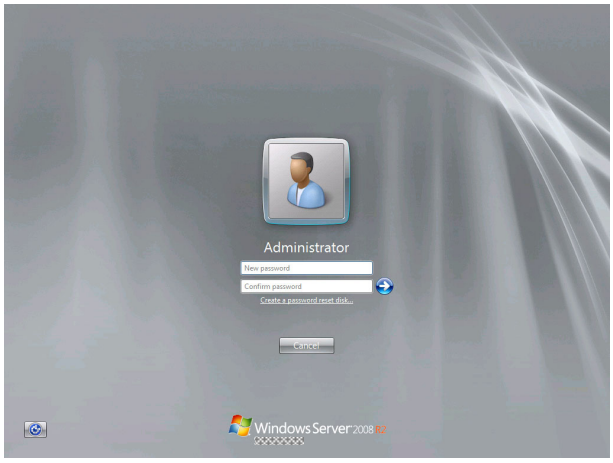
Tips The number of partitions displayed differs depending on the hardware configuration.

The following message appears and Windows installation starts.



27. After the installation of Windows Server 2008 R2 is completed, the following window appears, prompting you to change your password, click **OK**.

28. Change your password, and then click the button.

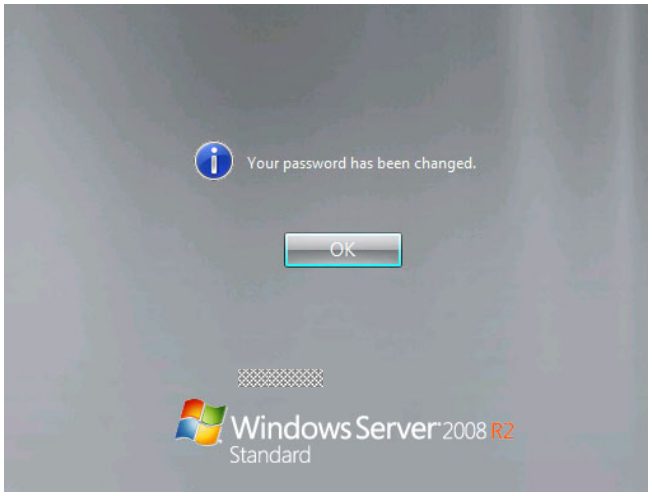


Tips

Passwords must satisfy the following requirements.

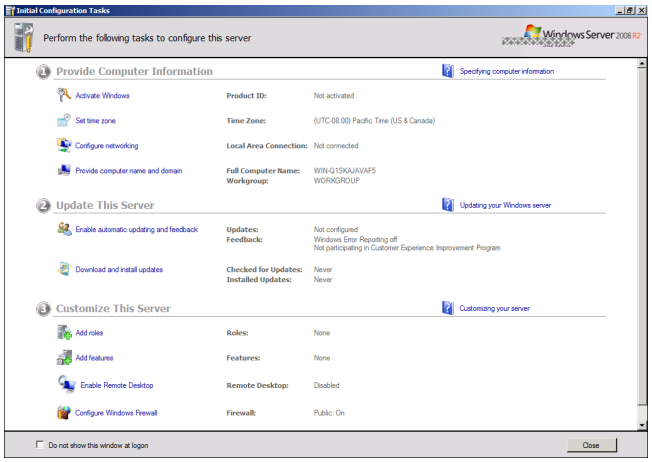
- Contains 6 or more characters.
- Contains characters from at least three of the following categories: numbers, uppercase letters, lowercase letters, and symbols.

29. Click **OK**.



30. Confirm the following according to the settings selected (displayed) in Step 19.

    When the **Initial Configuration Tasks** window appears after you logged on, enter the user information.



31. Install Starter Pack by referring to *Chapter 1* (*4.4 Installing Starter Pack)*.

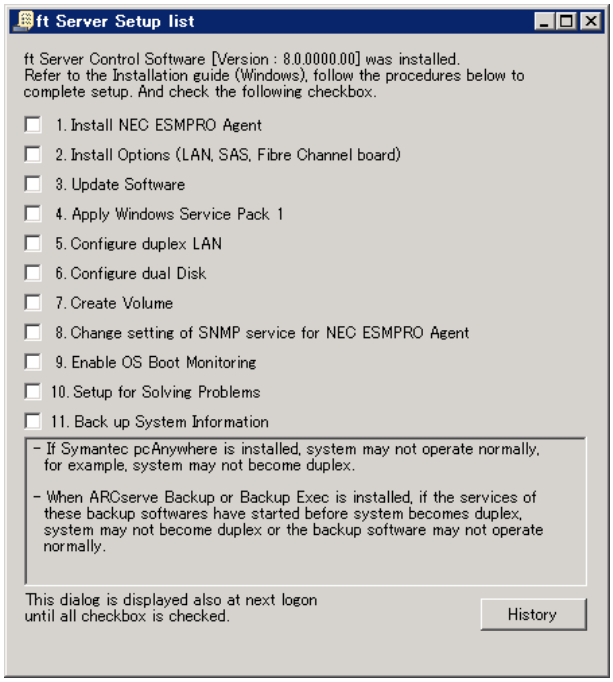
32. Install the ft Server Control Software according to *Chapter 1 (4.5 Installing ft Server Control Software)*. When installation completes, Setup Checklist appears on screen.

33. Install the NEC ESMPRO Agent.

Tips

See *Chapter 2 (1.1 NEC ESMPRO Agent (for Windows)* for installation of NEC ESMPRO Agent.

34. When **ft Server Setup list** appears, confirm the list items.
    Provide setup for the item which is unchecked.



❑ Install Options (LAN, SAS, Fibre Channel board)

If you have an option board that is not yet installed, install it according to *Chapter 2 (5.7 PCI Card)* in *Maintenance Guide*.

❑ Update Software

See *Chapter 1 (4.8.1 Applying ft Server Control Software Update Module)*.

❑ Apply Windows Service Pack

See *Chapter 1 (4.7 Applying Service Pack)*.

Service Pack 1 is applied if you use the OS install media containing Service Pack 1.

❑ Configure duplex LAN

See *Chapter 1 (4.9 Duplex LAN Configuration)*.

❑ Configure dual Disk

See Chapter 1 *(4.10 Configuring Duplexed Disks)*.

❑ Create Volume

See *Chapter 1 (4.11 Creating Volume)*.

❑ Change setting of SNMP service for NEC ESMPRO Agent

See *Chapter 2 (Installing Bundled Software)*.

❑ Enable OS Boot Monitoring

See *Chapter 1 (4.13 Enabling OS Boot Monitoring Feature)*.

❑ Setup for Solving Problems

See *Chapter 1 (4. Setup for Solving Problems)*.

Tips If necessary, perform license authentication procedure according to *Chapter 1 (4.14 License Authentication)*.

❑ Back up System Information

See *Chapter 1 (7. Backing Up System Information)*.

Setup with Windows standard installer is now complete.

4.4 Installing Starter Pack

Starter Pack contains drivers customized for this server.
Be sure to apply Starter Pack before running the system.

Important

Also install Starter Pack in the following cases.

- **The system configurations have changed (when internal option devices have been added or removed)**
  If a dialog box prompting you to restart appears after changing system configurations, click No and then install Starter Pack.
- **If the system was restored using a restore process**
- **If a system has been restored using the backup tool**

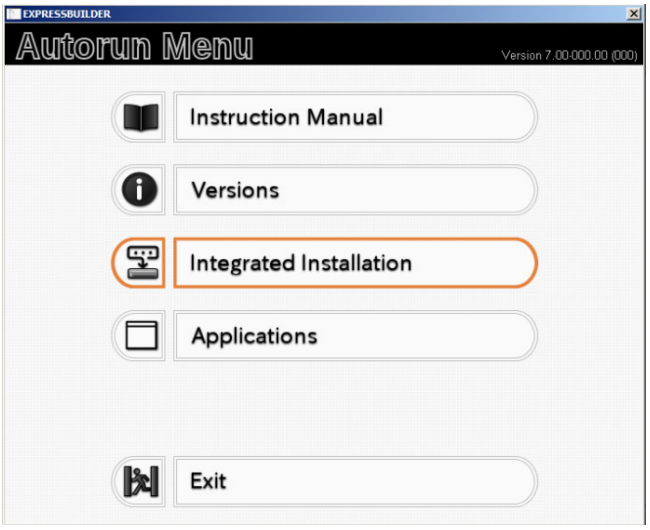
Note

The Scalable Networking Pack (SNP) function is disabled upon Starter Pack installation is complete.
The setting of SNP function may affect the system performance.

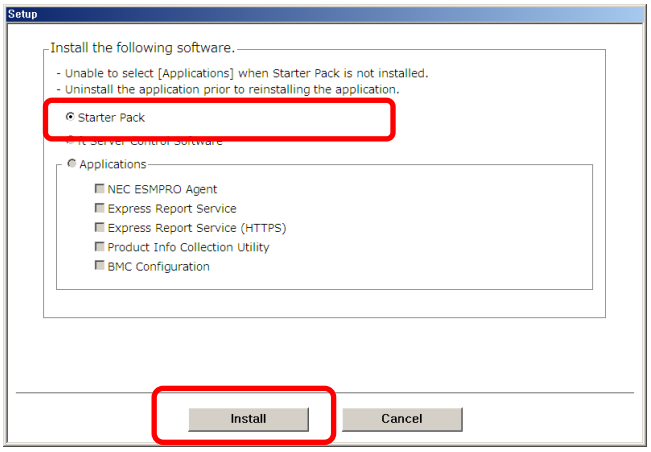
Tips

If the OS is installed by using EXPRESSBUILDER, Starter Pack is already applied. If the configuration is not changed, you do not need to apply Starter Pack again.

1. Log in to the system with the built-in administrator (or user with administrative privileges).
2. Insert EXPRESSBUILDER DVD into the optical disk drive.
3. Click **Integrated Installation** on the menu.



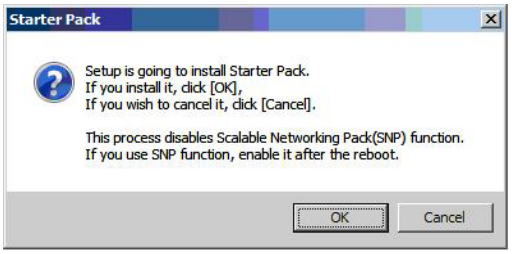
On the following screen, make sure that the **Starter Pack** option is selected, and then click **Install**.



Tips If Starter Pack is already installed, the **ft Server Control Software** is selected by default. To install Starter Pack again, select the **Starter Pack**.

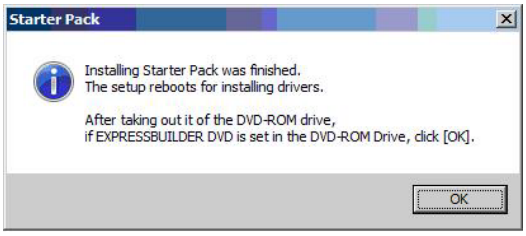
4. Read the message, and then click **OK**.

   Starter Pack installation starts.



5. The following message appears when Starter Pack installation is complete.

   Follow the instructions in the message, and remove EXPRESSBUILDER DVD.



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

Installation of Starter Pack is now complete.

4.5 Installing ft Server Control Software

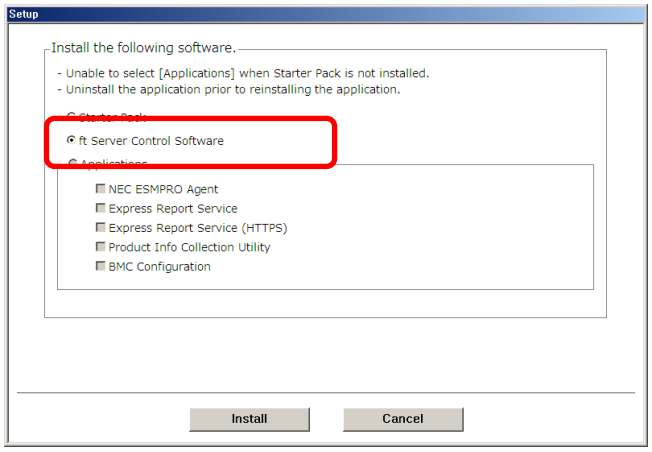
You must quit all programs including Microsoft management console.

1. Install ft Server Control Software in the following procedure.

   When ft Server Control Software UPDATE media is not provided:

   (1) After logging on to the system as a user with the Administrative account, insert the EXPRESSBUILDER DVD into the optical disk drive of the server.

   (2) On the menu screen, click **Integrated Installation**, select **ft Server Control Software** on the menu, and then click **Install**.



   When ft Server Control Software UPDATE media is provided:

   Install ft Server Control Software from the UPDATE media according to *Instruction Manual* that comes with the media.

   Follow the instructions to proceed with the installation.

   Note The message "**ft Server Control Software, Now Installing... Please Wait.**" is displayed during installation.
   Do not use the keyboard or mouse while this message is being displayed.

2. When installation starts, a message "If there is a disc in the DVD drive, please remove it." will be displayed. If EXPRESSBUILDER DVD is set in optical disk drive, remove it.
3. The system is rebooted several times during the installation. After the system is rebooted, log in again as the user logged in before rebooting.
4. Installation of the ft Server Control Software resumes after you logged on.
5. When the message "Installation is finished" is displayed, click **OK** to reboot the server.

   Note Change the screen to check the message by using the taskbar, as the message may hide behind the screen.

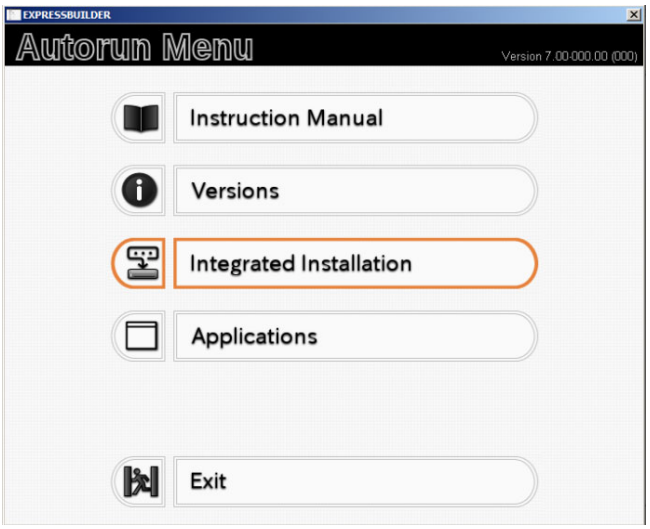
4.6 Installing Applications

EXPRESSBUILDER contains applications including NEC ESMPRO Agent and NEC ESMPRO Manager. Some applications stored in EXPRESSBUILDER can be installed collectively by performing the procedures described below. When installing these applications individually, see *Chapter 2 (Installing Bundled Software)*. This feature is available only on the server with Full Installation.

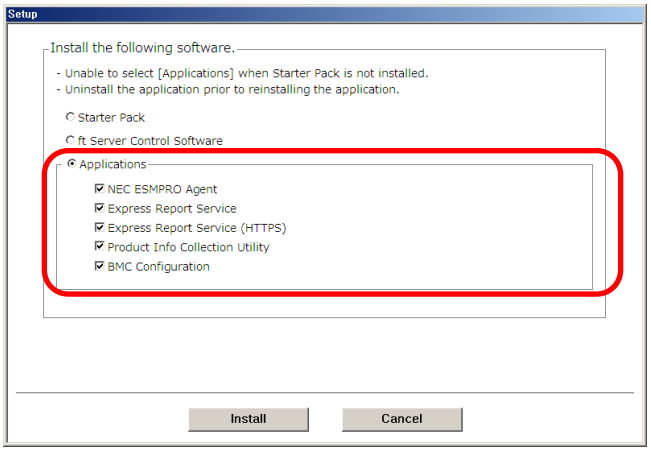
1. Logon to Windows on the server with the Built-in Administrator (or an account having administrative privilege).

2. Insert the EXPRESSBUILDER DVD into the optical disk drive, double-click **dispatcher_x64.exe** in the following folder.
   <*EXPRESSBUILDER*>:**\autorun\dispatcher_x64.exe**

3. Click **Integrated Installation** on the menu.



4. On the following screen, select **Applications**, and select the check boxes corresponding to the applications to install, and then click **Install**.



Note

- Applications available for installation are selected by default.
- An application that has been already installed need to be uninstalled before installing it again.
- If your system environment does not satisfy the prerequisite for an application, you cannot install it. (For details, refer to the on-screen information and *Chapter 2 (Installing Bundled Software.)*

The selected applications are installed automatically.

5. When a message appears, click **Restart**, and then remove the EXPRESSBUILDER disk from the optical disk drive.

Now installation of applications is completed.

4.7 Applying Service Pack

When applying Service Pack 1, refer to *"About Windows Server 2008 R2 Service Pack 1"* on the web site below.

http://www.58support.nec.co.jp/global/download/w2008r2/sp1.html

4.8 Setup Various Software

4.8.1 Applying ft Server Control Software Update Module

If you use ft Server Control Software UPDATE media, refer to the installation procedure enclosed in the UPDATE media to apply the update.

Note

- Be sure to disable OS Boot Monitoring feature before updating ft Server Control Software according to *Chapter 1 (4.1.3 Disabling OS Boot Monitoring Feature)*. In addition, disconnect all the network cables from the server before starting update.
- Upon completion of update, set OS Boot Monitoring feature to **Enabled**.
- If ft Server Control Software is updated in dual LAN configuration, the name of team is deleted from display name of LAN card. It does not affect system operation, however, if you want to return them to original state, remove the team and create it again.
- When you update ft Server Control Software in the state of non-activating the LAN port which is not used, the LAN port is activated after updating. You need to make the LAN port to non-activation state again.

4.8.2 Applying Security Patches and QFE

When you use the server for the first time, apply the QFE for knowledge information listed below, for stable operation of your server. You can obtain these QFEs from Microsoft web site.

- KB2471472

  An NDIS device cannot be failed over on a fault-tolerant system that is running Windows 7 or Windows Server 2008 R2 after you remove another NDIS device.
  (http://support.microsoft.com/kb/2471472)

- KB2528507

  Fails to collect memory dump in Windows 7 (x64) or Windows Server 2008 R2 SP1 environment.
  (http://support.microsoft.com/kb/2528507)

  Note that KB2528507 must be applied on the system where Windows Server 2008 R2 Service Pack 1 has already been applied.

  The QFEs listed below contains the infomation of KB2528507, therefore, if you apply any of these QFEs, you need not to apply KB2528507 furthermore.
  KB2534366, KB2556532, KB2633171, KB2724197, KB2799494, KB2813170, KB2859537, KB2872339

- KB2528984

  Functionality issues on USB devices that are connected to a Windows 7-based computer on an Intel platform
  (http://support.microsoft.com/kb/2528984)

Refer to Microsoft knowledge base for details of QFE. These QFEs may be included in the other update programs in future. If such a program is already applied, you need not to apply these programs.

When applying security patches and QFE, there is no restriction specific to ft Server is imposed. Apply patches according to your system environment.

Important

As for Windows service pack, use only the one provided with the server. Do not apply any other service pack.

4.9 Duplex LAN Configuration

The Express5800/ft series builds a duplex LAN configuration by using "Stratus emb-82576 2-Port Gigabit Adapter" or "Stratus emb-X540 2-Port Copper 10 Gigabit Adapter (*)" mounted as standard on the CPU/IO module and the additional LAN card "Stratus 82576 2-Port Copper Gigabit Adapter" or "Stratus X540 1-Port Copper 10 Gigabit Adapter".

(*) Express5800/R320c-E4 and R320d-E4 model do not have this adapter.

(1) Overview

The duplex LAN configuration is of three types as described below:

- Adapter Fault Tolerance (AFT)

  AFT is a feature that places more than one LAN adapters on the same switch, and automatically switches the process of the active adapter to the backup adapter when any trouble occurred on the active adapter. STP (Spanning Tree Protocol) on switch must be disabled.

- Adaptive Load Balancing (ALB)

  ALB includes features of AFT, and enhances the throughput by distributing packet transmission by using LAN adapters simultaneously.

  Receive Load Balancing (RLB) is enabled by default. Disable RLB and remove adapter priority when using ALB.

- Switch Fault Tolerance (SFT)

  SFT is a feature that provides redundant network, as two adapters are connected to corresponding two switches. One is assigned to the active adapter and the other is assigned to the standby adapter. Usually the active adapter is used for communication.

  Spanning Tree Protocol (STP) function is required to construct the path redundancy on the switch devices.

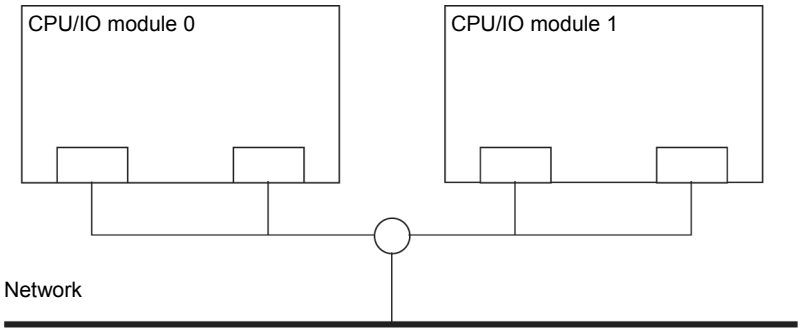
  When you build the environment, you need to set the switch priority in order to maintain the path to the active adapter after the path information is updated if a switch on the path is broken. In addition, you need to set the priority to use the standby adapter's switch if the active adapter's switch is broken.

The other modes, "Static Link Aggregation", "IEEE 802.3ad Link Aggregation", and "Virtual Machine Load Balancing" do not contribute to enhancement of network availability. When a fault occurs, the communication performed on the failed adapter is not taken over by the standby adapter but lost.

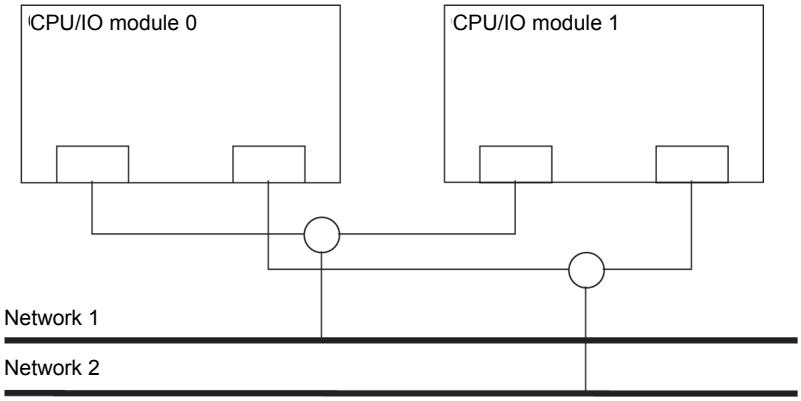
(2) Rules of Duplex Configuration on Express5800/ft series

When building duplex configuration, be sure to use both adapters CPU/IO module 0 and 1.

Example 1) Configure the duplex network which enhances the service life by using all adapters.



Example 2) Configure the duplex network which corresponds to multiple LAN connection.



(3) Configuring Duplex LAN

This section describes how to configure duplex LAN.

Note

- Because the configuration from the remote site may fail, you need to log on as an Administrator or a member of Administrators group.
- The screen images are subject to change because of the network driver version.Substitute as appropriate when content has been modified.

1. Select **Start** → **Administrative Tool** → **Computer Management** → **Device Manager**.

Note

Check **Network Adapter**, and if LAN adapters are duplicated as shown below, remove all LAN adapters from **Device Manager**, then select **Action** – **Scan for hardware changes**.

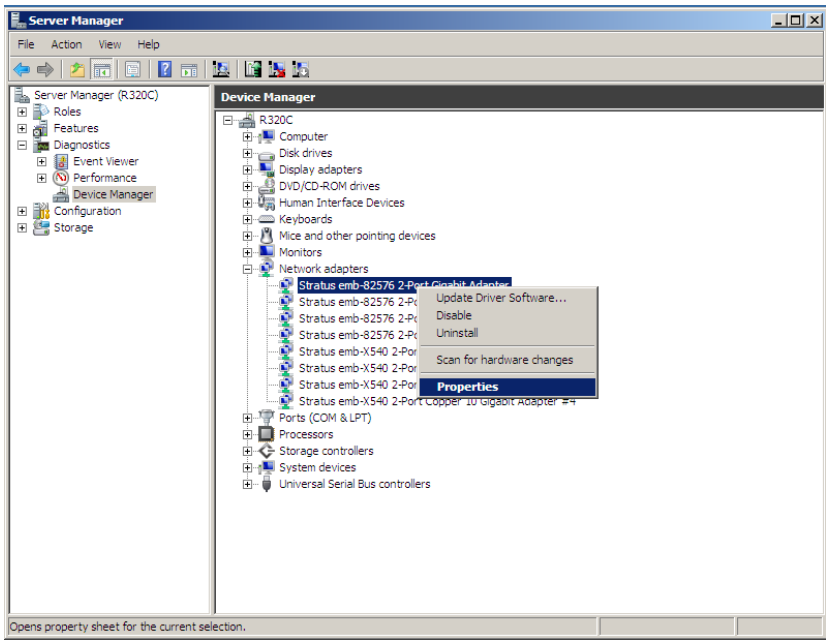
Stratus emb-82576 2-Port Gigabit Adapter
Stratus emb-82576 2-Port Gigabit Adapter
Stratus emb-82576 2-Port Gigabit Adapter #2
Stratus emb-82576 2-Port Gigabit Adapter #2

The display will be as follows when the actions are performed properly.

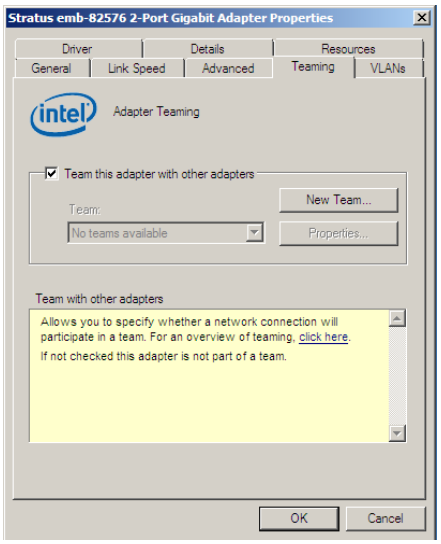
Stratus emb-82576 2-Port Gigabit Adapter
Stratus emb-82576 2-Port Gigabit Adapter #2
Stratus emb-82576 2-Port Gigabit Adapter #3
Stratus emb-82576 2-Port Gigabit Adapter #4

When 10GBASE-T is used, the network adapter names"Stratus emb-X540 2-Port Copper 10 Gigabit Adapter" and "Stratus X540 1-Port Copper 10 Gigabit Adapter" are displayed.

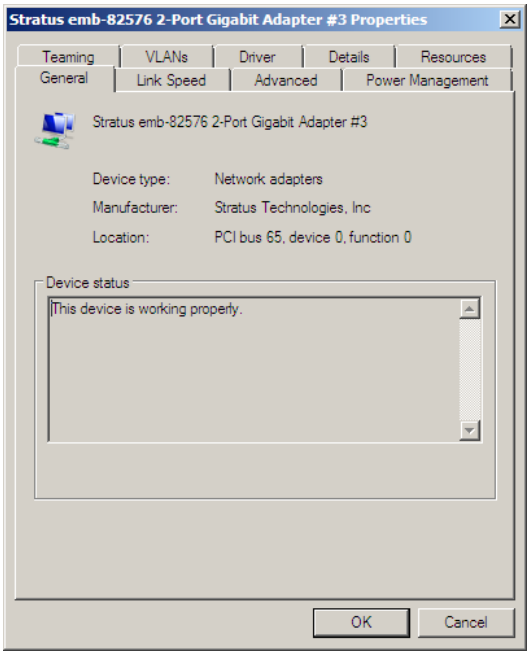
2. Select a target LAN Adapter. Select **Properties** from the right-click menu to open the **Properties** window.



3. Select the **Teaming** tab on the **Properties** dialog box. Select the **Team this adapter with other adapters**, and then click the **New Team…** button.

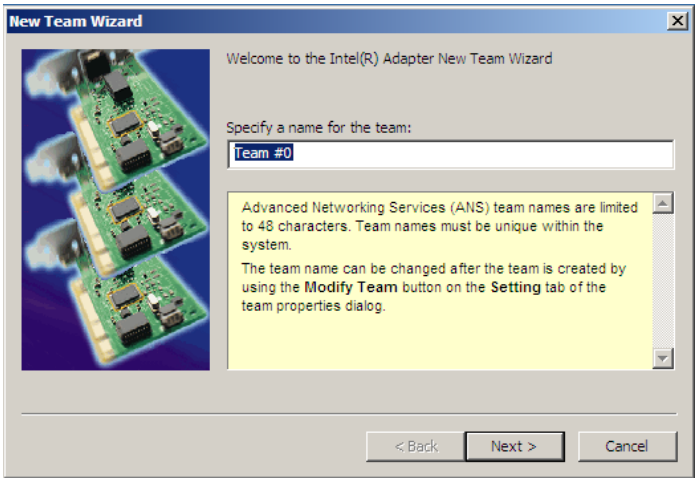


Stratus emb-82576 2-Port Gigabit Adapter and
Stratus 82576 2-Port Copper Gigabit Adapter is used



Stratus emb-X540 2-Port Copper 10 Gigabit Adapter and
Stratus X540 1-Port Copper 10 Gigabit Adapter is used

4. Enter the team name and click **Next**.

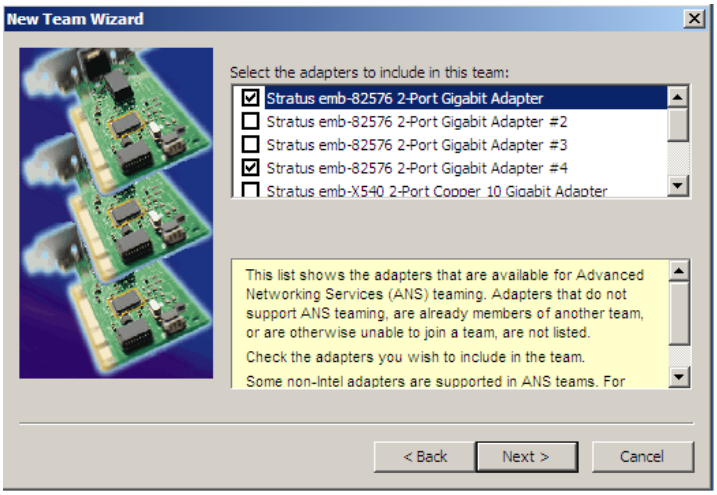


Note

Specify the team name with 3 or more characters.

If the team name is specified with 3 or less characters, creating the secondary team will fail with the following pop-up message displayed:
"Failed to create a team."

5. Select the adapters to include in the team and click **Next**.



Note

Check "PCI bus" and "Function (*)" of adapters to be included in the team.
Use adapters of the same functionality. Create a team with an adapter having smaller PCI bus number and an adapter having larger PCI bus number.

(*) "Function" can be verified in **General** tab of **Properties** window.

PCI bus: Smaller value (PCI module #0 side)
Larger value (PCI module #1 side)

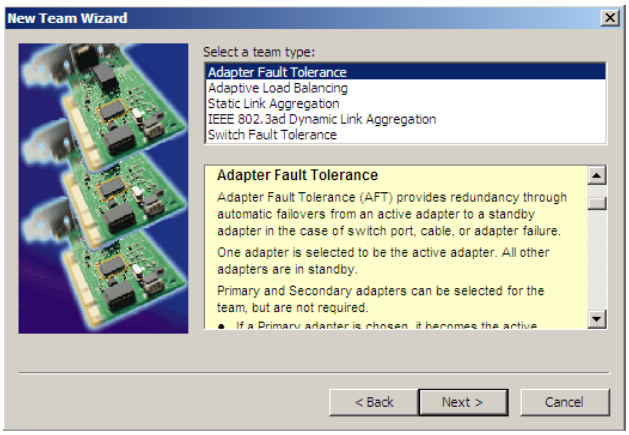
Function: 0 (Port #0 side)
1 (Port #1 side)

Example:

Team 0
PCI bus (smaller value), Function 0 (Port #0 side)
PCI bus (larger value), Function 0 (Port #0 side)

Team 1
PCI bus (smaller value), Function 1 (Port #1 side)
PCI bus (larger value), Function 1 (Port #1 side)

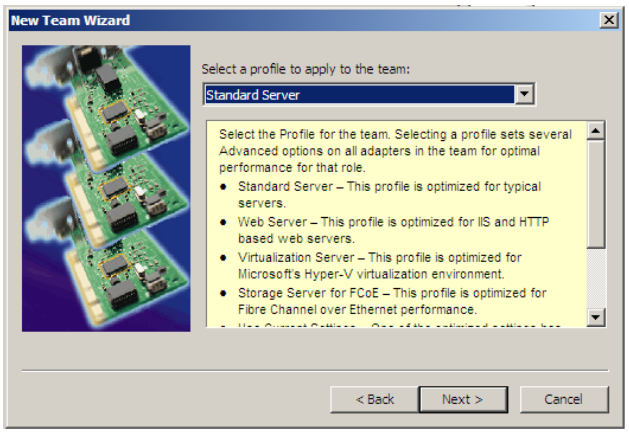
6. Select **Adapter Fault Tolerance**, **Adaptive Load Balancing**, or **Switch Fault Tolerance** as a team mode. Click **Next**.



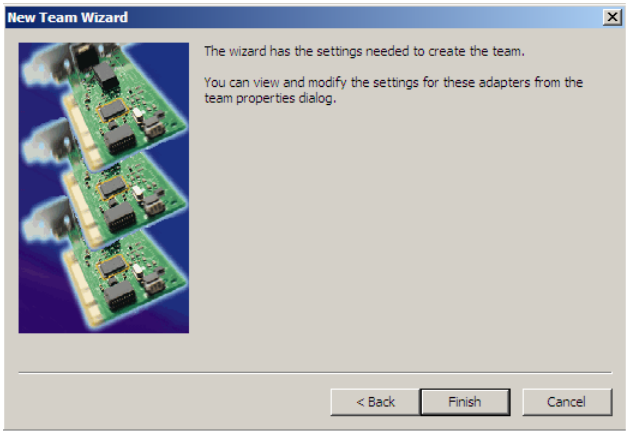
Note **Virtual Machine Load Balancing** is displayed when Hyper-V feature is enabled.

7. Select **Standard Server** from the dropdown list on **Select a profile to apply to the team**, and click **Next**.

Note The dialog box "**Select a profile to apply to the team**" may not be displayed.
In such a case, go to Step 8.

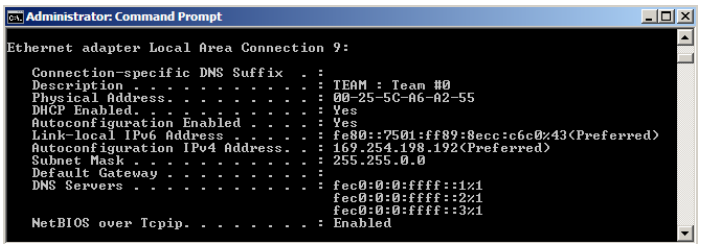


8. Click **Finish**.

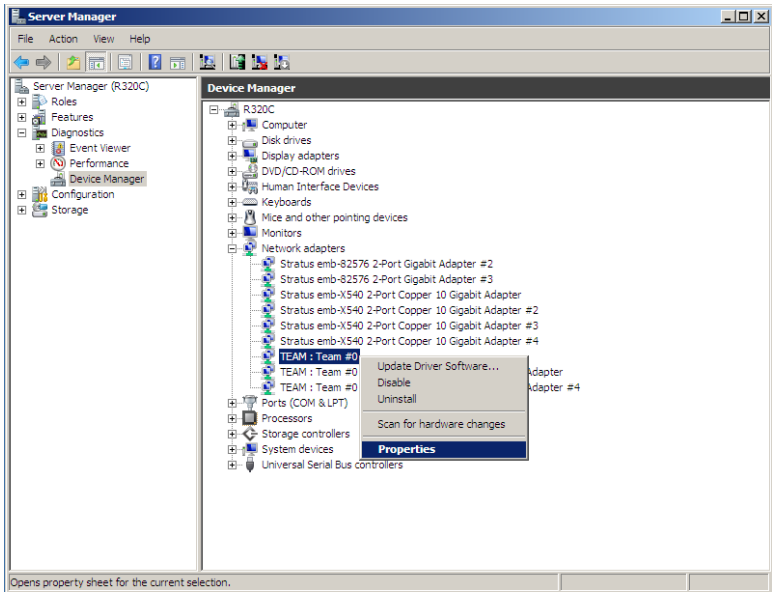


9. Start Command prompt and enter as follows to check the physical MAC address of team adapter.

```
> ipconfig /all
```

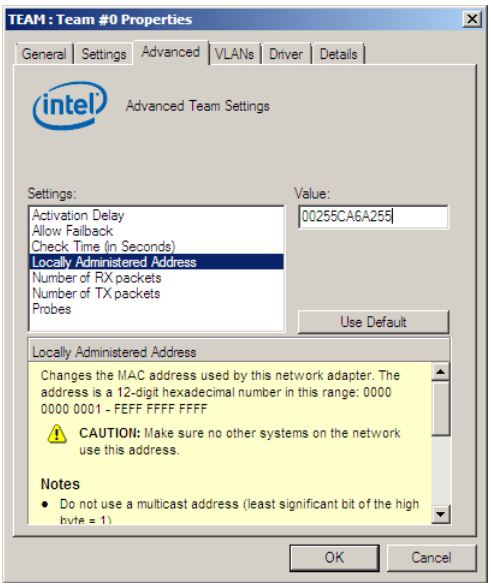


10. Select the Team Adapter you have set from **Device Manager**. Select **Properties** from the right-click menu to open the properties dialog box.



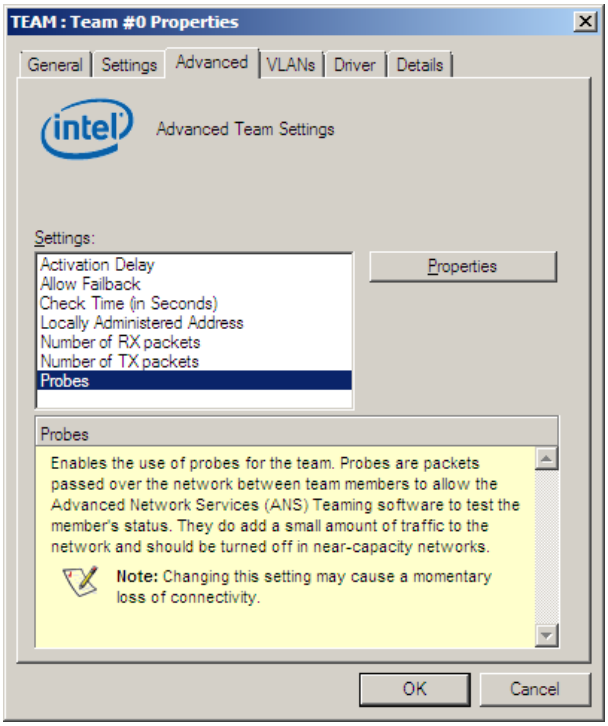
11. Set the MAC address for Team Adapter as follows:

- Select the **Advanced** tab on the Properties dialog box. Select **Locally Administered Address** from the **Settings** list box
- Enter the MAC address of a Team Adapter, which you have checked in Step 9 in the **Value:** text box.
- Click **OK**.

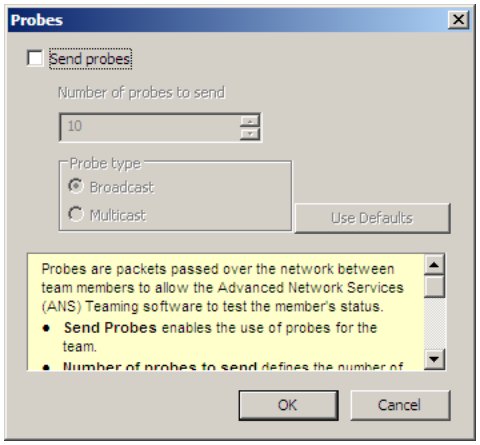


12. Disable probe function when the team configured with only two adapters.

– Select the **Advanced** tab in the **Properties** window. Select **Probes** from the **Settings** list box.



– Click **Properties** and uncheck to **Send Probes**.



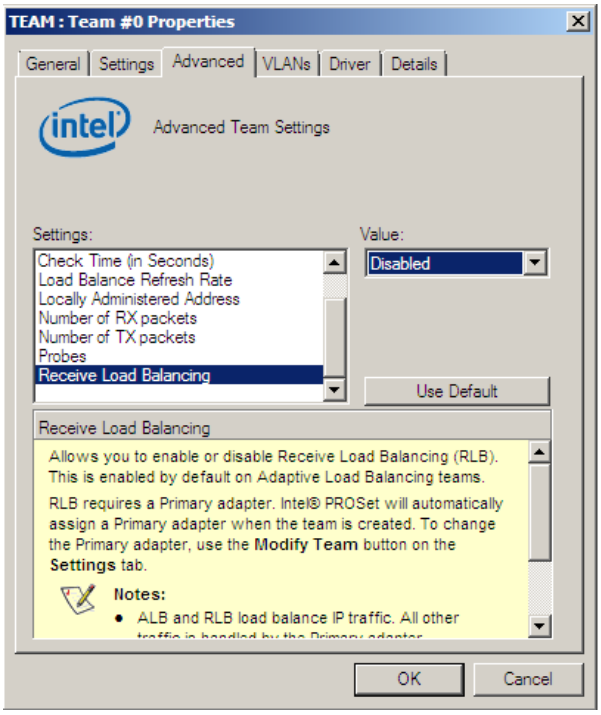
– Click **OK**.

The Probe setting is not displayed when **Switch Fault Torelance (SFT)** feature is specified. Go to Step 13.

Note When **Probe** is enabled in an environment where the team is configured with two adapters, if either of adapters fails, the other (healthy) adapter may be recognized as failed. If the team is configured with four adapters, you do not need to disable **Probe**.

13. When you select **Adaptive Load Balancing** as a team mode, you need to disable **Receive Load Balancing** and remove the adapter priority.

(1) Select the **Advanced** tab on the properties dialog box. Select **Receive Load Balancing** from the **Settings:** list box, and then select **Disabled** from the **Value:** drop down list.

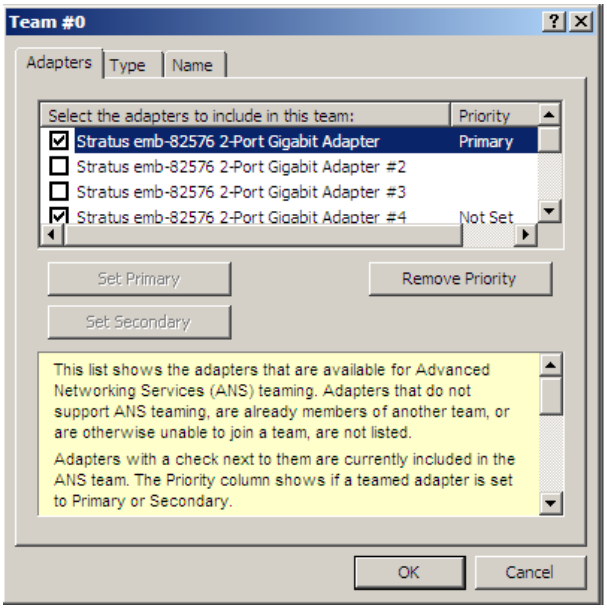


(2) Click **OK** to apply a change. The dialog will close.

(3) Show the properties dialog again.

(4) Select the **Settings** tab on the Properties dialog box and click **Modify Team** button to display the dialog box.

(5) Select the adapter that the priority is set, and then press the **Remove Priority** button to remove the priority.



(6) Click **OK** to close the dialog box.

4.10 Configuring Duplexed Disks

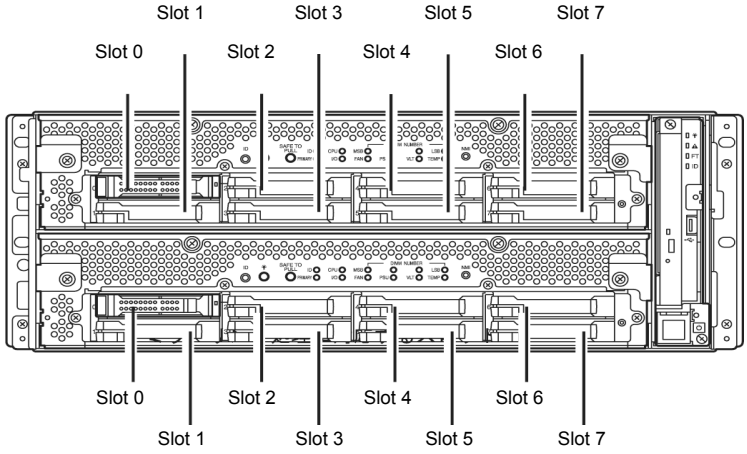
Express5800/ft series secures data by setting dual disk configuration using RDR (Rapid Disk Resync) function. Be sure to make dual disk settings according to the procedure described below.

Important

- **Set dual disk configuration by the RDR (Rapid Disk Resync) function. If you want to use other disk management tool (e.g. VERITAS Storage Foundation), install it after performing procedure in *Chapter 1 (4. Setup for Solving Problems).***
- **CPU/IO module has a processor function part and IO function part, and monitors and manages each part. The IO function part is referred to as PCI module in this section.**
- **All hard disk drives installed in built-in slots need to be duplexed. See *Chapter 1 (4.10 (1) Setting Dual Disk Configuration by RDR (Rapid Disk Resync) function)* and duplex the hard disk drives in each slot.**

(1) Setting Dual Disk Configuration by RDR (Rapid Disk Resync) function

The server sets dual configuration for each disk by the RDR function of the ft Server Control Software.
By setting RDR, as the following figure and table show, dual configuration is set between the disks of the corresponding slots, and these disks are recognized as one virtual disk by Windows (such as Disk Management and Device Manager).



Slots corresponding to the mirroring process

Corresponding slot
PCI module 10 Slot 0 ⇔ PCI module 11 Slot 0
PCI module 10 Slot 1 ⇔ PCI module 11 Slot 1
PCI module 10 Slot 2 ⇔ PCI module 11 Slot 2
PCI module 10 Slot 3 ⇔ PCI module 11 Slot 3
PCI module 10 Slot 4 ⇔ PCI module 11 Slot 4
PCI module 10 Slot 5 ⇔ PCI module 11 Slot 5
PCI module 10 Slot 6 ⇔ PCI module 11 Slot 6
PCI module 10 Slot 7 ⇔ PCI module 11 Slot 7

* In the table above, PCI module names correspond as follows:
PCI module (for CPU/IO module 0) - PCI module 10
PCI module (for CPU/IO module 1) - PCI module 11

Note

- To perform this procedure, you need to log on as an Administrator.
- RDR can only be set on the basic disk inserted into the built-in slot of NEC Express5800/ft series. It cannot be set on the dynamic disk.
- For the disk on which RDR is set, use the products with the same model number.
- Be sure to configure the RDR settings in the same way not only when the OS is installed but also when the disk is added to the PCI module.
- Create partitions only after the duplication of the hard disk drives are configured.
- Be sure to use a basic disk as the system disk. Only a data disk can be used for a dynamic disk.

Dual disk configuration procedure differs depending on the procedure whether it is for the system disk (slot 0) or the data disk (slot 1 to slot 7).

Tips

To configure the dual disk of the system disk, see *(2) System Disk Dual Configuration Procedure* below.

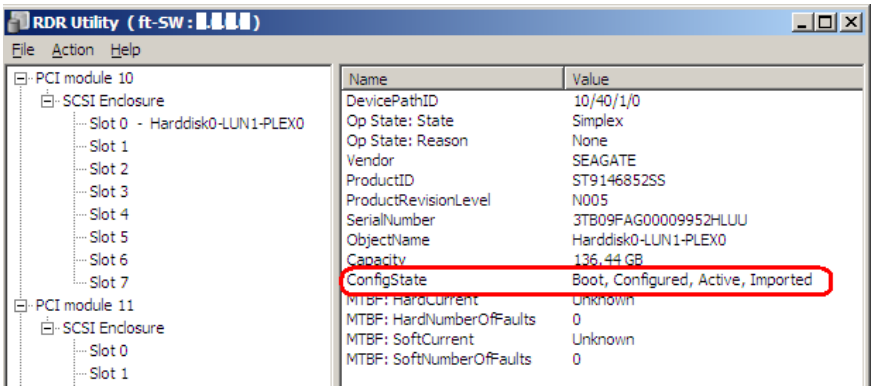
To configure the dual disk of the data disk, see *(3) Data Disk Dual Configuration Procedure* below.

(2) System Disk Dual Configuration Procedure

Configure the dual disk of the system disk with the following procedure.

From **Start**, select **All Programs** then **RDR** and click **RDR Utility** to start RDR Utility.

1. On the left pane of the RDR Utility, select **Slot 0** disk of **PCI Module 10** and confirm that "**ConfigState**" on the right pane shows "**Boot, Configured, Active, Imported**".



Tips

- For details of RDR Utility, refer to *Chapter 2 (1.2 Disk Operations Using RDR (Rapid Disk Resync) Function)* in the *Maintenance Guide*.
- The display of RDR Utility does not refresh automatically. From the menu, go to **Action** and click **Refresh** or press **F5** key every time you conduct disk-related operations such as connecting/disconnecting disks or configuring the RDR.
- On RDR Utility, PCI module names appear as follows.
  - PCI module (CPU/IO module 0) − PCI module 10
  - PCI module (CPU/IO module 1) − PCI module 11

2. Insert the disk for the dual configuration to the Slot 0 of PCI Module 11.

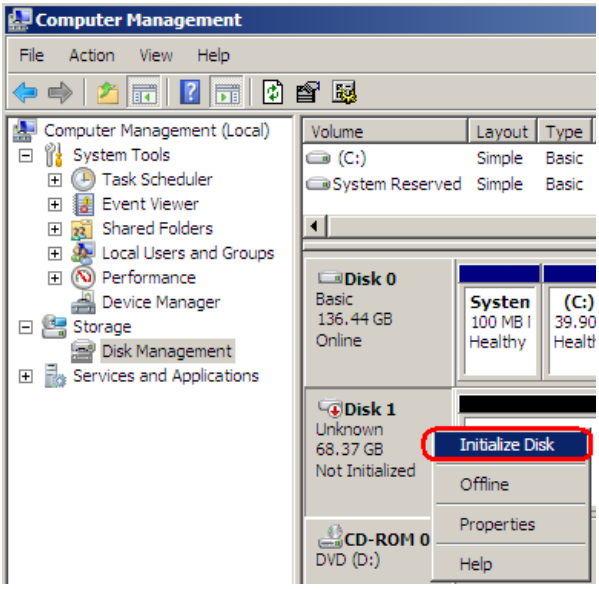
Important

For a disk to be inserted, use a new or physically formatted disk which has the same capacity as the synchronization source. If such a disk is not used, disks are not duplicated successfully.

As for physical format, refer to *Chapter 3 (3. SAS Configuration Utility)* in *Maintenance Guide*.

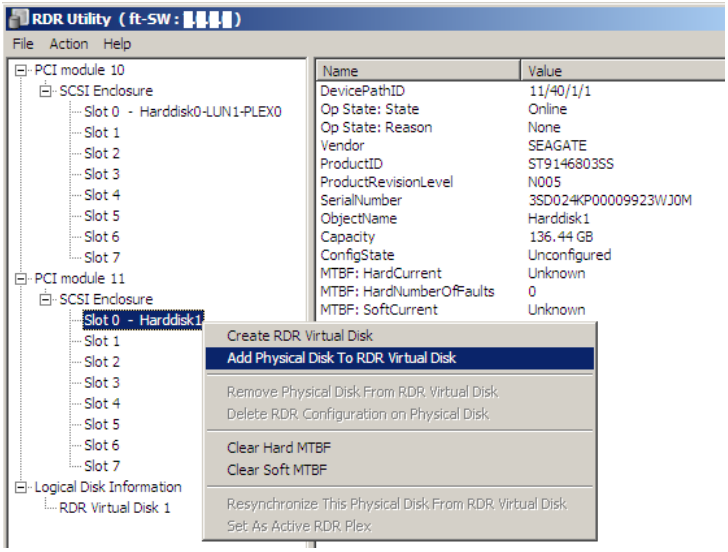
3. From **Start**, select **Control Panel**, **Administrative Tools** and start **Computer Management**. On the tree in the left pane, click **Disk Management**.

   If the inserted disk is indicated as **Not Initialized** in the right pane, right-click the disk and initialize it.

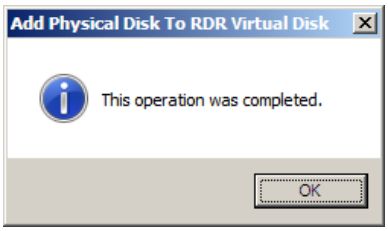


Important **When a disk is inserted or initialized, a popup window asking for rebooting the system may be displayed, but there is no need to reboot it. Select Restart Later and close the popup window.**

4. On the left tree of RDR Utility, right-click **Slot 0** disk of **PCI Module 11** and click **Add Physical Disk To RDR Virtual Disk**.



5. Click **OK**.



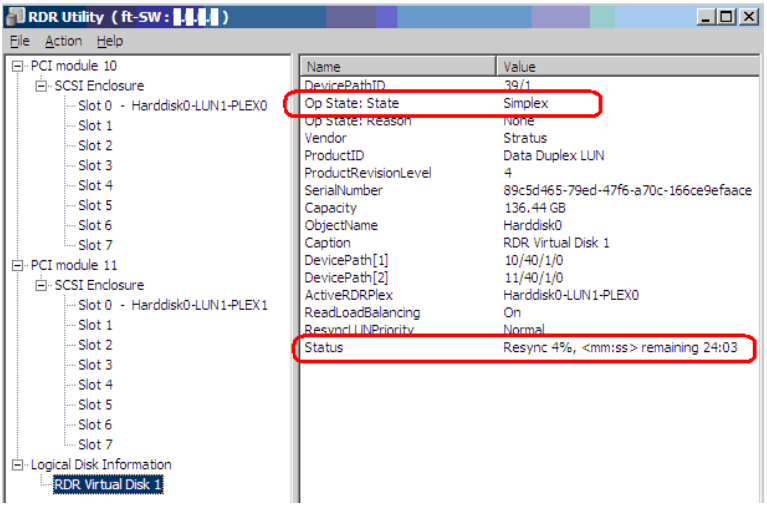
6. Verify that disk synchronization has started and the status of the DISK ACCESS LED and RDR Utility display changes as the following table.

Synchronizing

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Amber (Blinking)	Simplex	–
Destination disk	Amber (Blinking)	Syncing	–
RDR Virtual Disk	–	Simplex	Resync x % (x = 0, 4, 8, ..., 96)

Tips

- DISK ACCESS LED is lit green when hard disk drive is accessed.
  If access is made while synchronization is in progress (LED is blinking amber), it seems that the green and amber LEDs are lit alternately.
- The time required for synchronization varies depending on the partition size on the disk. For a 136 GB partition, it takes about 100 minutes.



Important

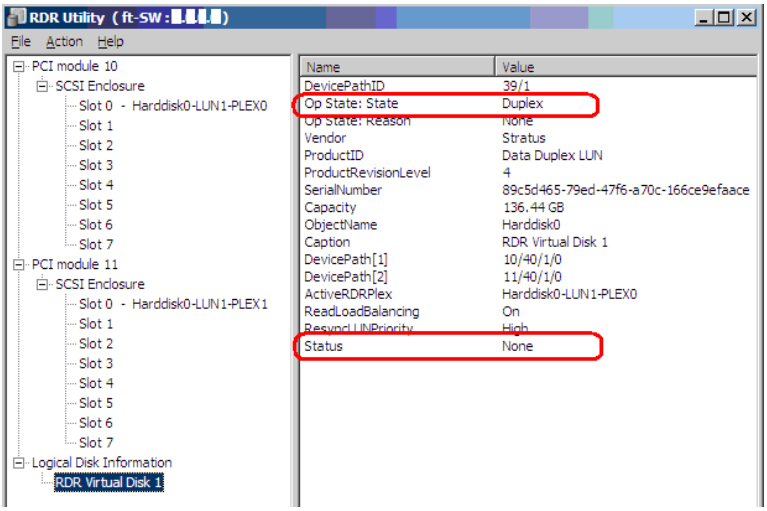
- **If the system is rebooted during synchronization, the process cannot be completed. Do not restart the system until the synchronization is completed.**
- **When the system is halted without shutting down Windows properly due to forced shutdown or others, the entire area of the partition on the synchronized disks will be resynchronized after the system is restarted.**

Synchronization completed

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Green (Blinking)	Duplex	–
Destination disk	Green (Blinking)	Duplex	–
RDR Virtual Disk	–	Duplex	None

Tips

DISK ACCESS LED is lit green only when hard disk drive is accessed.
If no access is made, the LED seems to be unlit.



(3) Data Disk Dual Configuration Procedure

Follow the procedure below to configure dual data disk for the slots 1 to 7.

Note

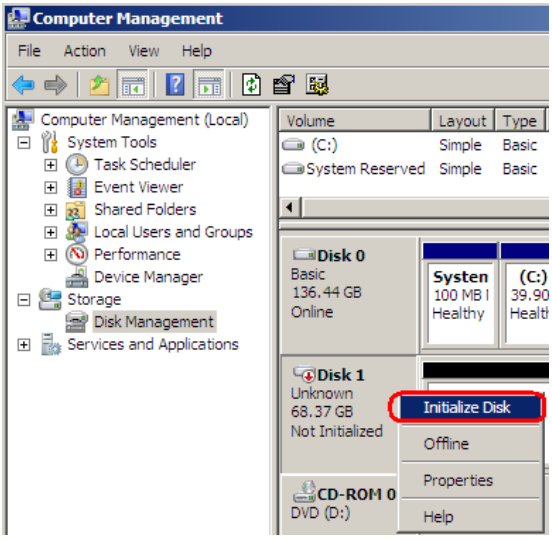
The following shows how to configure dual disk for the slot 1. If you want to configure the dual disk for slot 2 to slot 7, read "slot 1" as the slots you want to make dual configuration and perform the procedure.

1. Insert a disk for the dual configuration into the slot 1 of PCI Module 10.

   If a disk is already mounted, this procedure is not necessary. Go to step 4.

2. From **Start**, select **Control Panel**, **Administrative Tools** and start **Computer Management**. On the tree in the left pane, click **Disk Management**.

   If the inserted disk is indicated as **Not Initialized** in the right pane, right-click the disk and initialize it.



Important

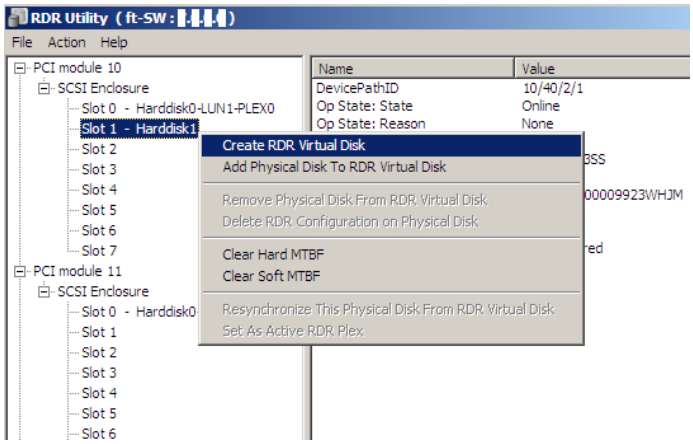
- **When a disk is inserted or initialized, a popup window asking for rebooting the system may be displayed, but there is no need to reboot it. Select Restart Later and close the popup window.**
- **Disk may become offline when RDR is set. In this case, use "Disk Management" to make it online.**

3. From **Start**, select **All Programs** then **RDR** and click **RDR Utility** to start RDR Utility.

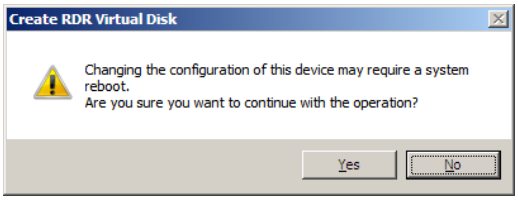
4. On the left pane of the RDR Utility, right click on the **Slot 1** disk of **PCI Module 10** and select **Create RDR Virtual Disk**.

Tips

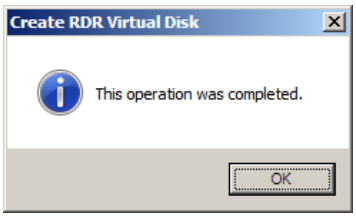
Depending on the disk condition, RDR setting may take some time and RDR Utility may pause for a few minutes. There is no error, so wait until the process is completed.



5. Click **Yes**.



6. Click **OK**.



Important

If RDR is specified to a disk which contains the system partition or partition which cannot be unmounted, the system restart pop-up message appears. If you click Yes, the system is restarted in two minutes automatically. Go on to Step 8. when the system is restarted.

7. Insert the disk to set dual configuration into the slot 1 of PCI module 11, and perform the Step 2.

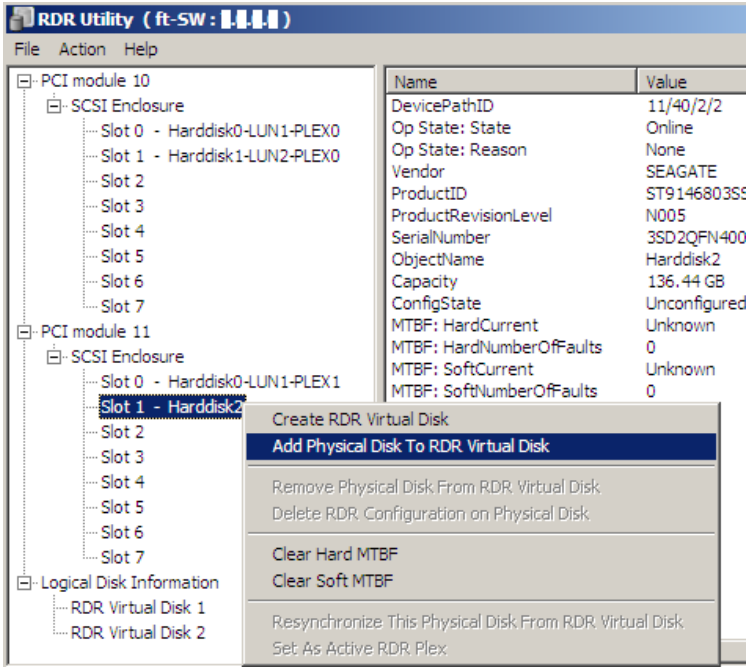
   If a hard disk drive is already mounted, this procedure is not necessary. Perform the Step 2 only.

Important

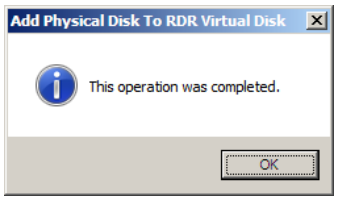
For a disk to be inserted, use a new or physically formatted disk which has the same capacity as the synchronization source. If such a disk is not used, disks are not duplicated successfully.

As for physical format, refer to *Chapter 3 (2. SAS Configuration Utility)* in *Maintenance Guide*.

8. Right-click the **Slot 1** of the **PCI module 11** from the left pane of RDR Utility, and then click **Add Physical Disk To RDR Virtual Disk**.



9. Click **OK**.



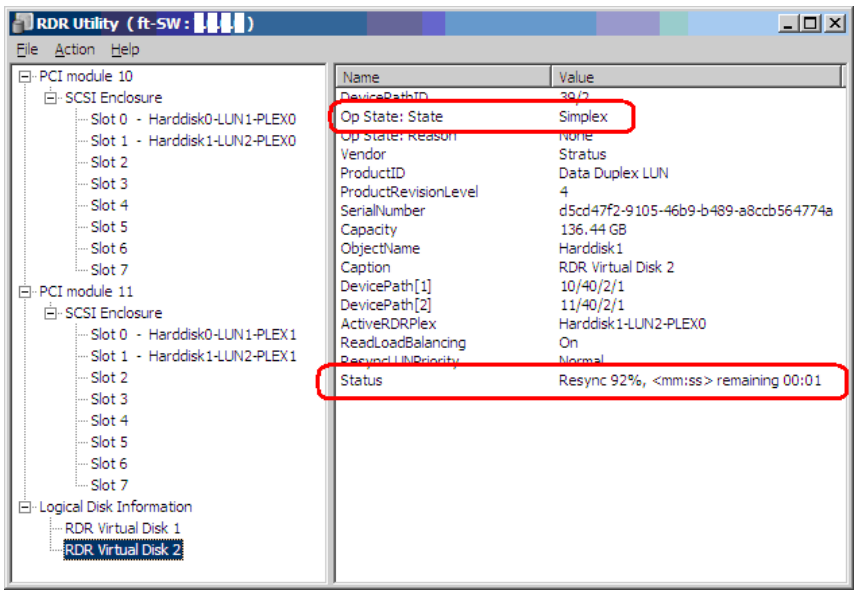
10. Verify that disk synchronization has started and the status of the DISK ACCESS LED and RDR Utility display changes as the following table.

Synchronizing

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Green (Blinking)	Online	–
Destination disk	Amber (Blinking)	Syncing	–
RDR Virtual Disk	–	Simplex	Resync x % (x=0,4,8,....,96)

Tips

- DISK ACCESS LED is lit green when hard disk drive is accessed.
  If access is made while synchronization is in progress (LED is blinking amber), it seems that the green and amber LEDs are lit alternately.
- The time required for synchronization varies depending on the partition size on the disk.
  For a 136 GB partition, it takes about 100 minutes. When no partition exists on the disk, synchronization is completed immediately after the RDR is set, and **Op State: State** changes to **Duplex**.
  However, when the dynamic disk is used, the time required for synchronization depends on the disk size regardless of whether or not a partition exists. For a 136 GB disk, it takes about 100 minutes.



Important

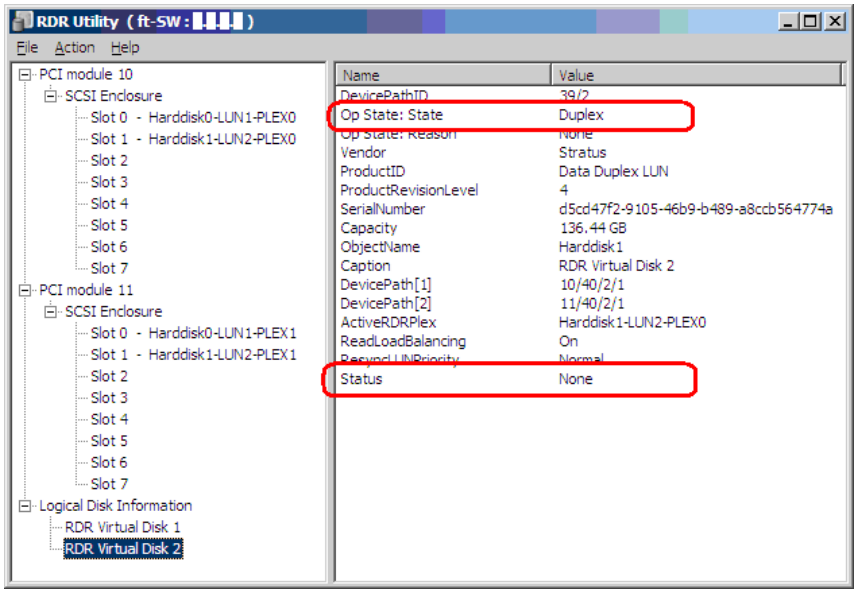
- **If the system is rebooted during synchronization, the process cannot be completed. Do not restart the system until the synchronization is completed.**
- **When the system is halted without shutting down Windows properly due to forced shutdown or others, the entire area of the partition on the synchronized disks will be resynchronized after the system is restarted.**

Synchronization completed

	DISK ACCESS LED	RDR Utility	
		Op State: State	Status
Source disk	Green (Blinking)	Online	–
Destination disk	Green (Blinking)	Online	–
RDR Virtual Disk	–	Duplex	None

Tips

DISK ACCESS LED is lit green only when hard disk drive is accessed.
If no access is made, the LED seems to be unlit.



4.11 Creating Volume

For NEC Express5800/ft series, you need to set mirroring for each disk by the RDR function. If you created a new partition or volume on the disk that has been set RDR and dual configuration, the area is mirrored automatically. You do not need to perform mirroring for each partition or volume.

Important

- **Note the following issues when you execute Active Upgrade under the status that the OS installed disk has partitions other than the system partition.**
  - **All the data upgrade is discarded for the system disk of the Production Side that runs Active Upgrade.**
- **A mirrored volume (RAID-1) or RAID-5 volume cannot be used on a dynamic disk.**

4.12 Installing Bundled Software for the Server

NEC ESMPRO Agent and NEC ESMPRO Manager are contained in EXPRESSBUILDER.

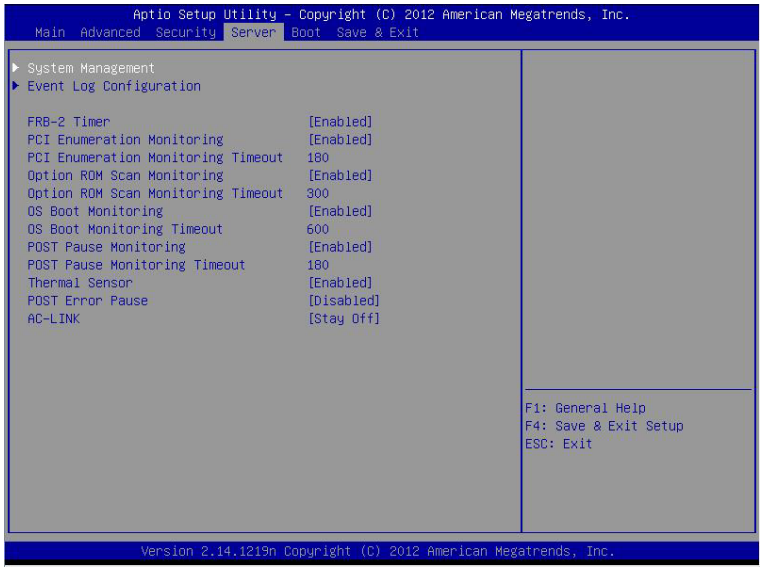
Make sure that the installed utilities are shown on **Start** - **Program**s or on **Control Panel**. If you did not install these utilities during setup with EXPRESSBUILDER, install them individually by according to *Chapter 2* (*Installing Bundled Software*).

4.13 Enabling OS Boot Monitoring Feature

Enables OS Boot Monitoring feature.

Set OS Boot Monitoring feature to **Enabled** on BIOS SETUP according to *Chapter 1 (4.1.3 Disabling OS Boot Monitoring Feature)*. Then, specify the timeout time for **OS Boot Monitoring Timeout** parameter appropriately.

Tips Specify the timeout time in seconds. Default setting is 600 seconds (10 minutes).

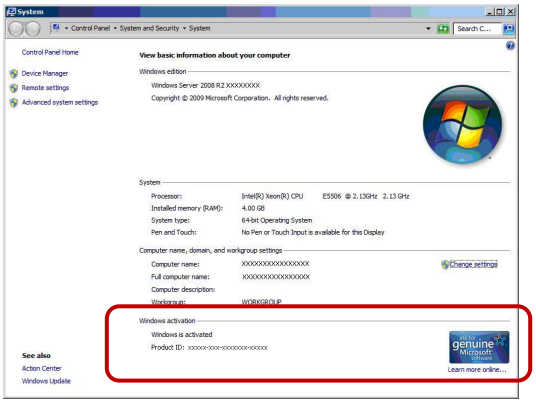


4.14 License Authentication

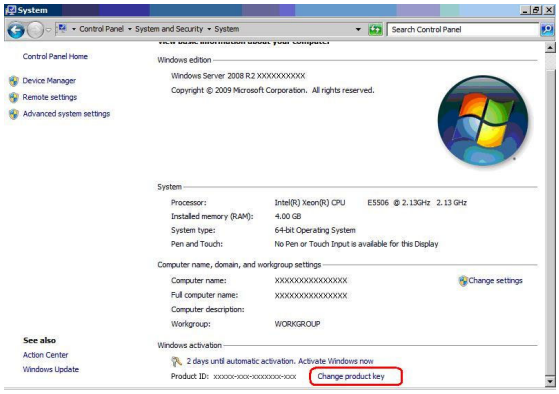
Confirm whether the license has been authenticated. If it has not, perform the license authentication procedure.

The following describes the license authentication procedure.

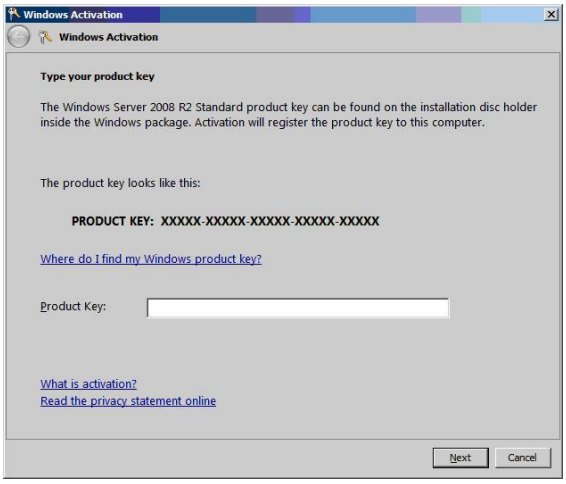
1. Open the **Control Panel** from the **Start** menu, click **System and Security**, and then select **System**.
   If the following message appears, Windows has already been activated on your system. You do not need to complete this procedure.



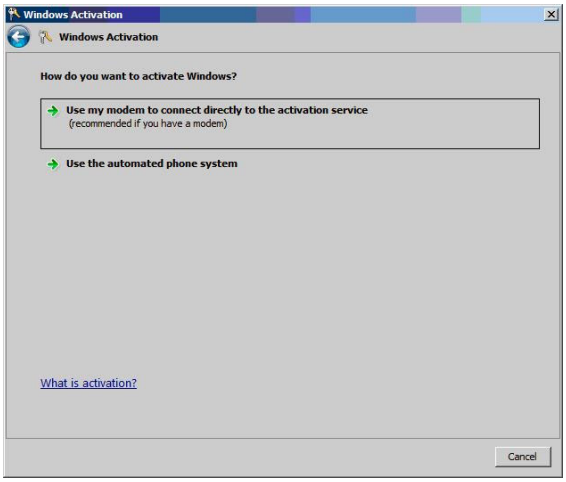
2. If you installed from Backup DVD-ROM, replace the product key.
   When the following window appears, click **Change product key**.



3. When the following window appears, enter the product key found on the COA label, and then click **Next**.



4. Follow the instructions in the following message to start the license authentication process.



Windows activation is now complete.

4.15 Confirming the ft Server Control Software Version

The following describes how to check the version of ft Server Control Software, which consists of various types of software for fault tolerance.

Perform the procedure when you need to check the ft Server Control Software version of the current system before adding devices to NEC Express5800/ft series or updating ft Server Control Software.

Confirm the version following the steps below, and take a note of the displayed version number.

Version: ___.___.__________._____

1. Log on to the system with an account that has administrator privilege.
2. Open **Control Panel** from the **Start** menu.
3. Open **Programs and Features**.

   If the Programs and Features icon is not displayed, open Programs and click Programs and Features.
4. Check the version of **ftServer Control Software** from the list of programs.

4.16 Setting TCP/IP Timeout

Timeout values of TCP/IP are changed at setup by adding the following registries on Express5800/ft series.

HKLM\System\CurrentControlSet\Services\Tcpip\Parameters

Value: TcpMaxDataRetransmissions

Type: REG_DWORD

Default: 8

This setting is required if Hyper-V is enabled.

If you are not using Hyper-V on your server, this setting is not required. To restore the factory-set value, run the following batch file with administrator account, and restart the server.

C:\Program Files\NEC\HAS_SW\SUPPORT

SetTcpMaxDR_OsDef.bat

To restore the factory-set value, run the following batch file with administrator account, and restart the server.

C:\Program Files\NEC\HAS_SW\SUPPORT

ResetTcpMaxDR_FtDef.bat

4.17 Checklist Display Function at Installation

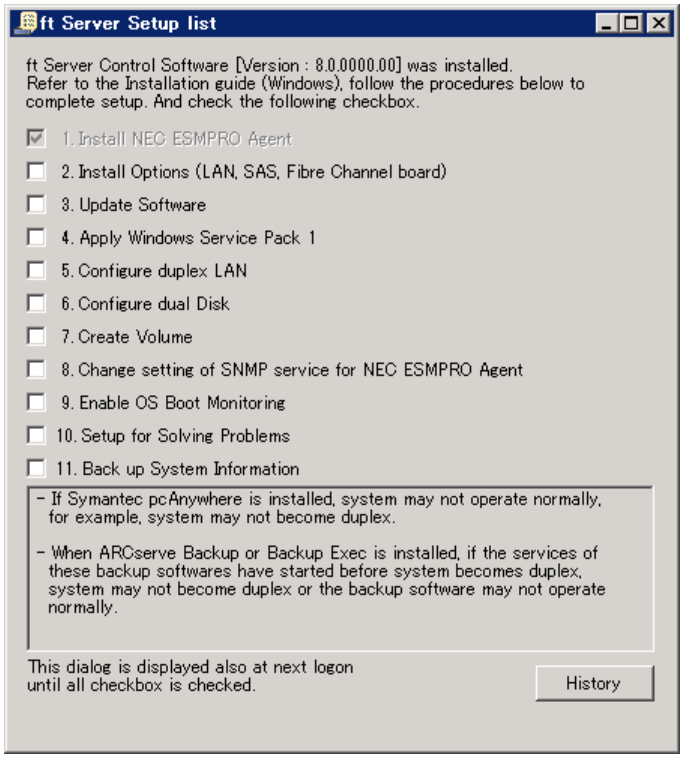
The server has a factory-installed feature that displays Setup Checklist during installation to support configuration work. This feature starts after ft Server Control Software is installed at re-installation.

Using this checklist, you can proceed setup work while viewing the items required for setup.

(1) Displaying setup list

When you logon the system with builtin Administrator account, **ft Server Setup list** automatically appears. The checklist appears everytime you logon the system unless you specify not to display at next logon.

The first line of dialog shows the version of ft Server Control Software.
The version number depends on the time of shipment and software upgraded status.



Setup Check List

The following items are checked automatically, and if installation of them are finished, they are dimmed.

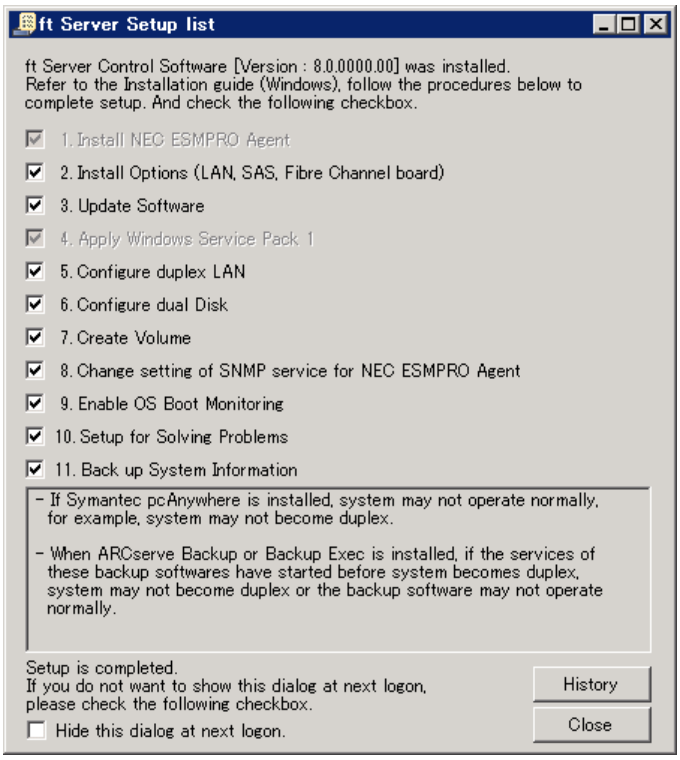
1. Install NEC ESMPRO Agent
4. Apply Windows Service Pack 1

For the other items, click the checkbox to check it when you have finished setup of relevant item.

If you put a mouse onto check item, a help window that shows the page where detailed information is described in User's Guide or Installation Guide.

In addition, read precautions on setup shown in the box below the list.

If all items are checked, a checkbox "Hide this dialog at next logon" appears at bottom of dialog. If you do not want to display this checklist, click the checkbox and close dialog.



When all items are checked:

This checklist is not displayed during update of ft Server Control Software.

(2) Re-displaying setup checklist

If you want to open the dialog again, logon the system with built-in Administrator account, and run the following file.

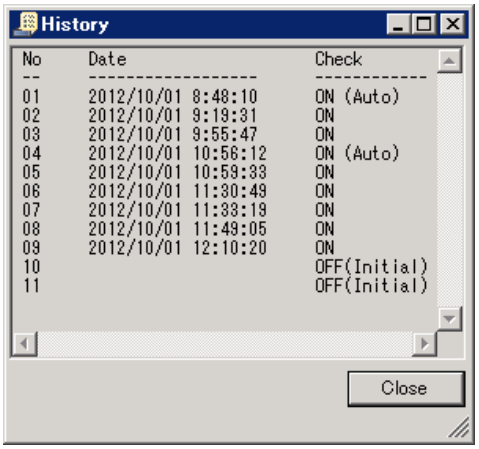
C:\Program Files\NEC\HAS_SW\ftServerSetuplist

ftServerSetupList.exe

Only the user having built-in Administrator account can open this checklist, and can start only one at a time.

(3) Displaying check history

Click the **History** button to confirm the date and time each item was checked.



Check history

Check column displays:

ON:	Item that was checked
ON (Auto):	Item that was checked automatically
OFF (Initial):	Item that is not checked yet
OFF:	Item that was checked once but unchecked later

5. Setup for Solving Problems

This section describes the features that must be set up in advance so that the server can recover from any trouble immediately and precisely.

5.1 Memory Dump (Debug Information)

The following describes the procedures for collecting a memory dump (debug information).

Important

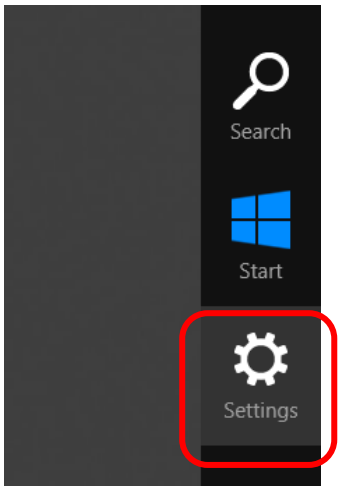
- **Memory dumps must be collected by a staff member from the maintenance service company. Customers only need to specify the settings for the memory dump.**
- **If any trouble occurs after specifying the settings below and you attempt to restart the system to save the memory dump, a message informing you that the system is short of virtual memory might appear. However, this message can be ignored and you can proceed with the restart. If you restart the system a second time, the memory dump might not be stored normally.**

5.1.1 Windows Server 2012

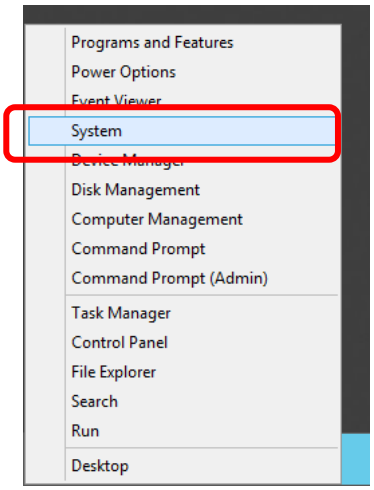
Follow the procedure below to specify the memory dump settings.

1. On the Charms bar, click **Settings**.
   To go to step 5 directly, right-click the left bottom of the screen, and then click **System**.

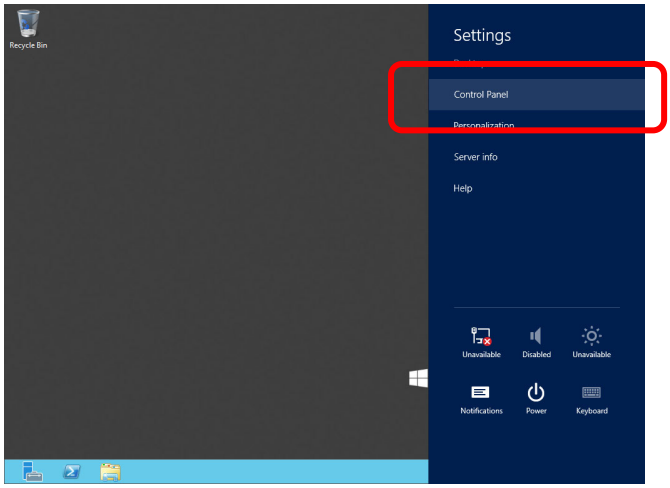
<Select **Settings**>



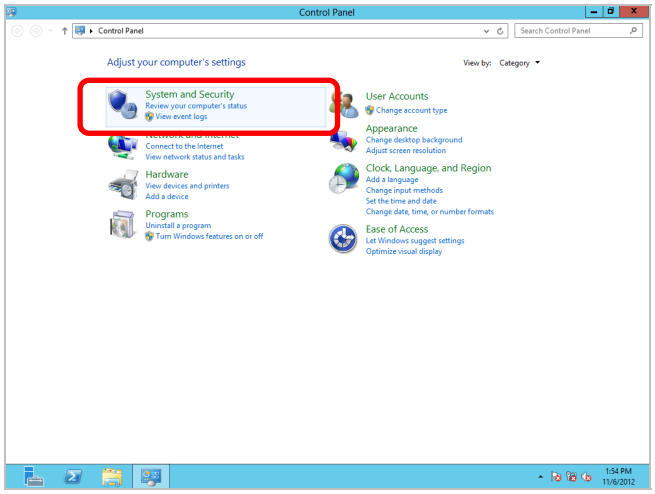
<Select **System**>



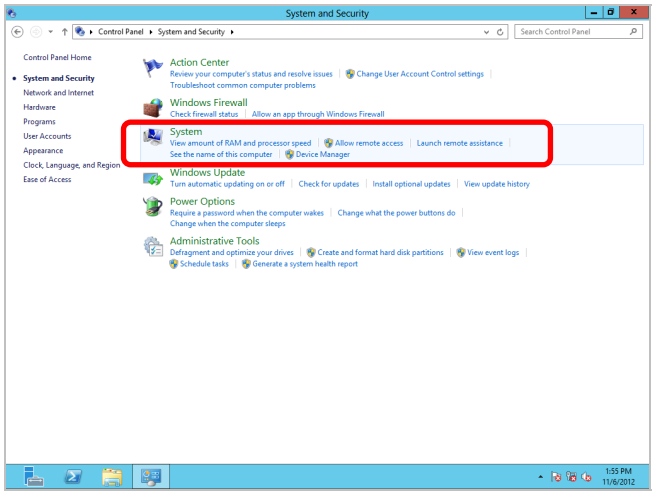
2. In **Settings**, click **Control Panel**.



3. In **Control Panel**, click **System and Security**.

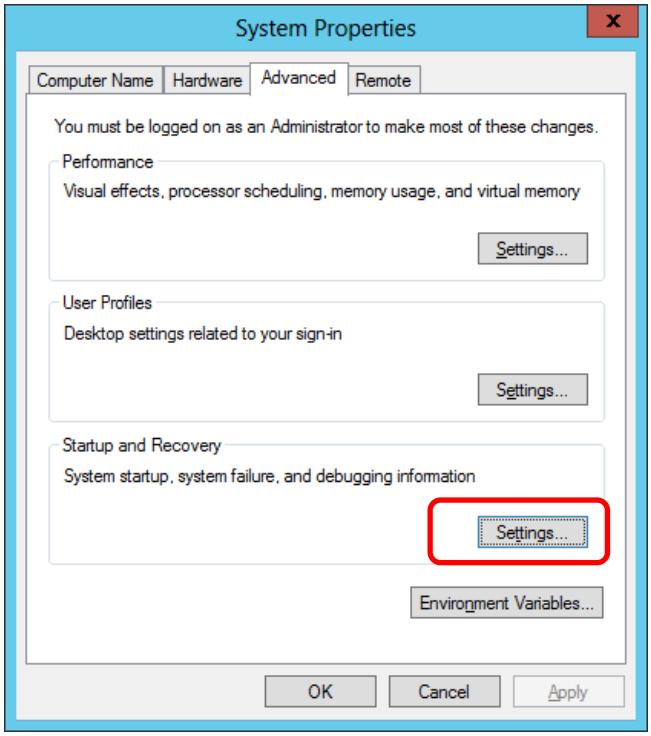


4. In **System and Security**, click **System**.



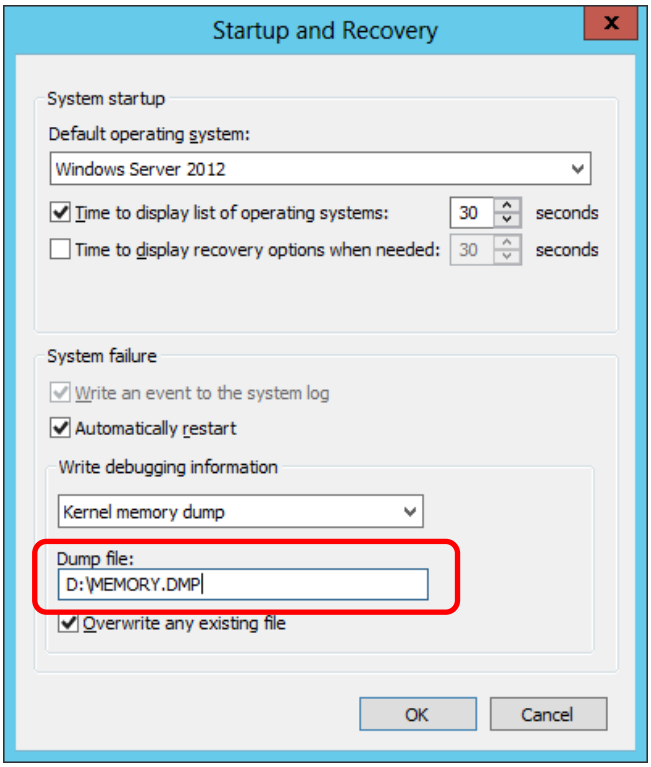
5. In **System**, click **Advanced system setting**.
   The **System Properties** dialog box appears.

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



7. Type a file name to save the debug information in **Dump file**, and then click **OK**.

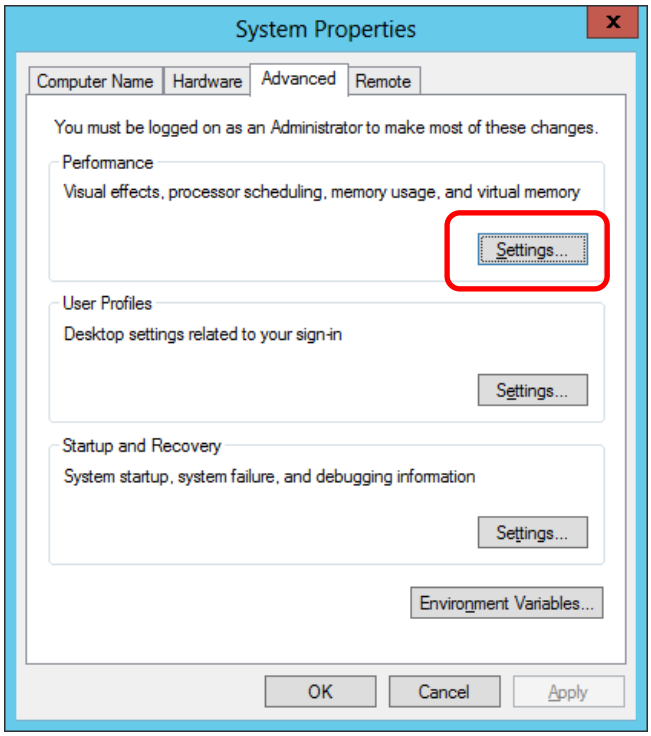
   For example: <Save information in drive D: with the file name "MEMORY.DMP">



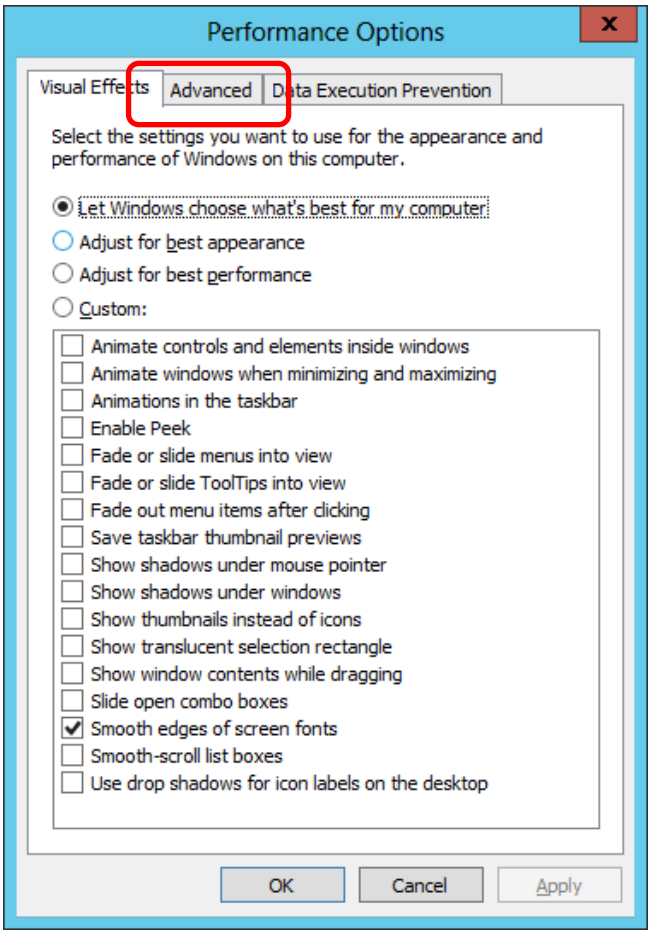
Note the following when specifying a dump file:

- We recommend you specify 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.
- Do not remove checkmark (uncheck) from **Automatically restart** check box.

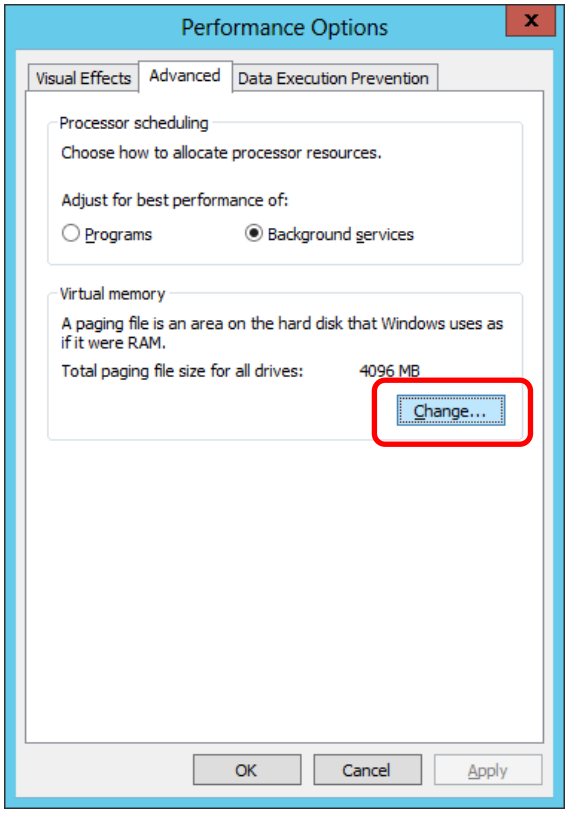
8. In **Performance**, click **Settings**.
   The **Performance Options** window appears.



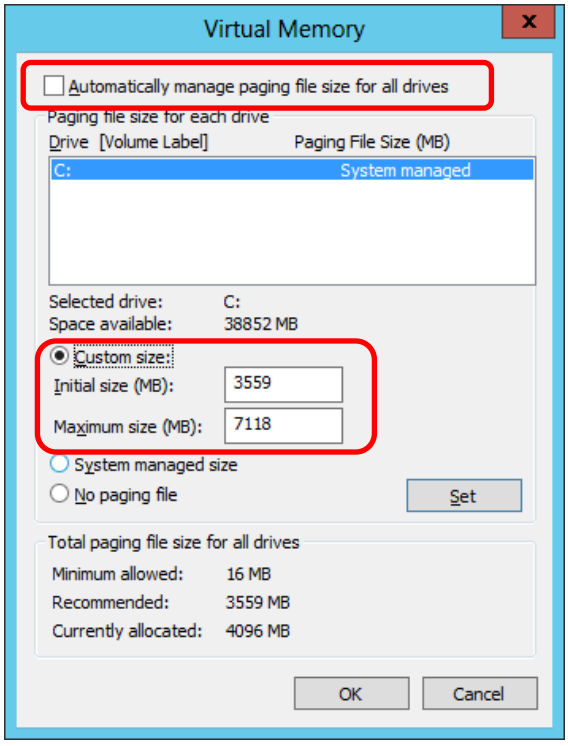
9. Click the **Advanced** tab on the **Performance Options** window.



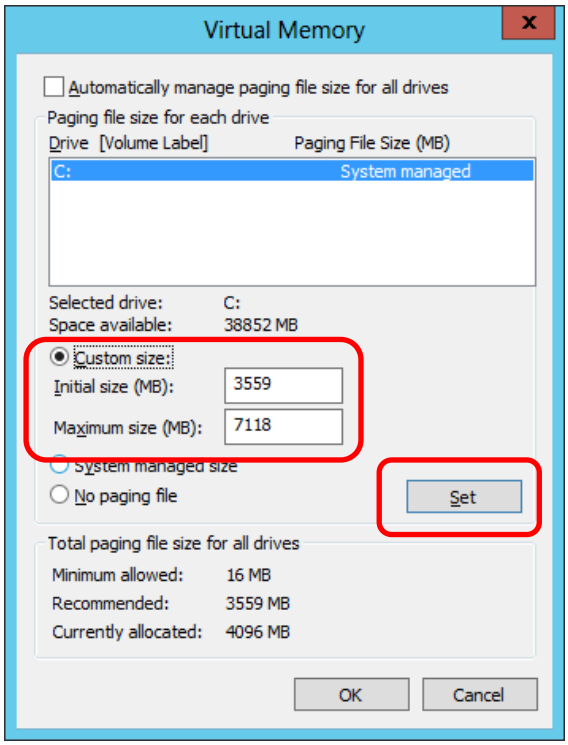
10. In **Virtual memory**, click **Change…**.



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



12. 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 boot volume (usually created in drive C:) 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. Specify "Total capacity of physical memory mounted + 400MB" or larger size.
- Make sure to specify a sufficient paging file size (recommended size: Total capacity of physical memory mounted * 1.5 or more) for entire system.
- See "System Partition" in *Chapter 1* (*3.1 Before Starting Setup*) for recommended value.
- When DIMM is added, re-specify the paging file according to the increased memory size.

13. Click **OK**.
14. If a message to restart Windows appears, restart the system according to on-screen message.

Specification of the memory dump settings is now complete.

5.1.2 Windows Server 2008 R2

Follow the procedure below to specify the memory dump settings.

1. Select **Control Panel** from the **Start** menu.

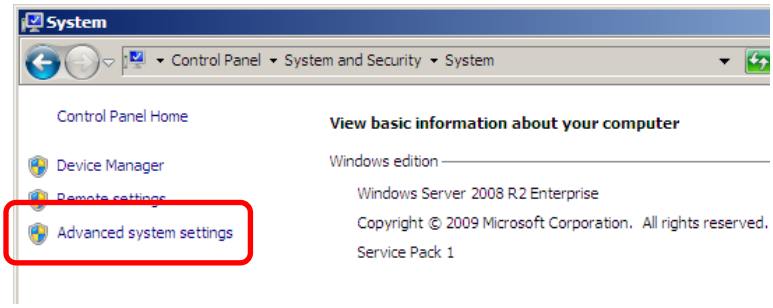
   The **Control Panel** window appears.

2. Click **System and Security** on the Control Panel window.

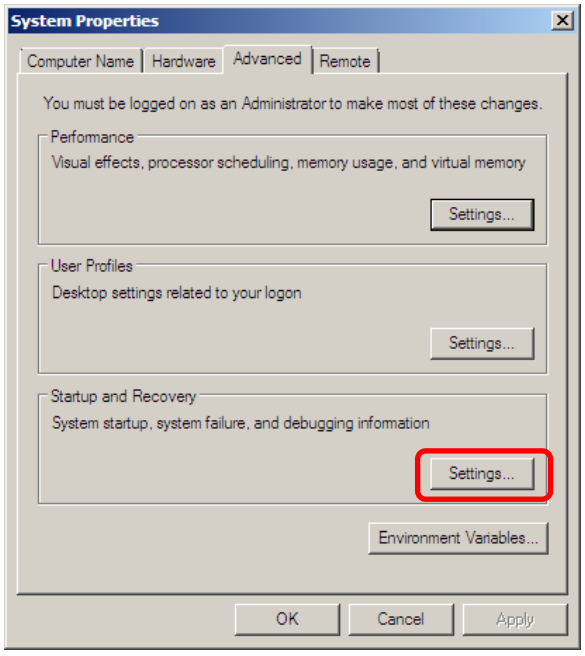
Tips If **View by** is not **Category**, select **System** from **Control Panel** directly.

3. Click **System**.
4. Click **Advanced system settings**.

   The System Properties dialog box appears.

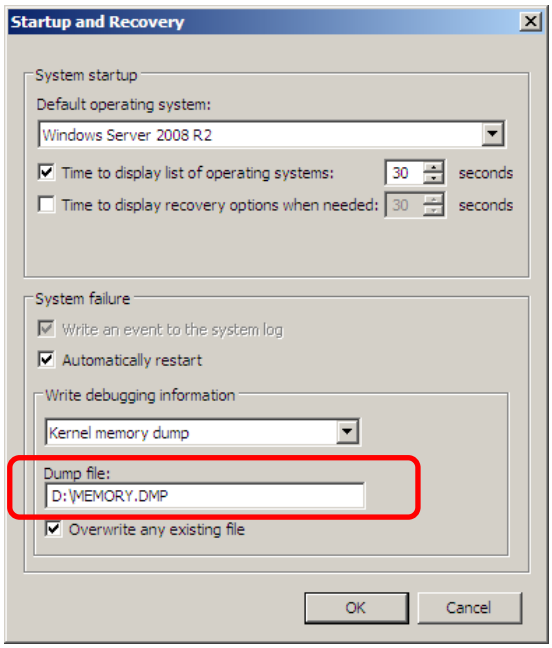


5. Click **Settings** under **Startup and Recovery**.



6. Specify the folder to store the debug information in the **Dump file:** text box and click **OK**.

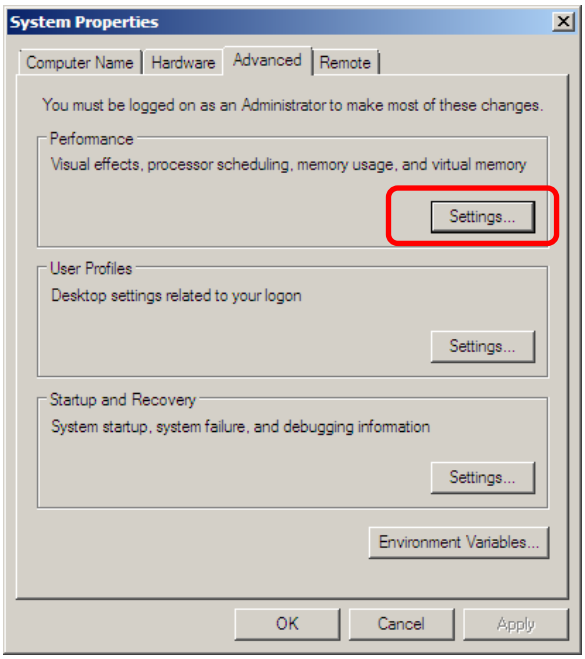
   Example: To store the debug information in D drive under the file name `MEMORY.DMP`:



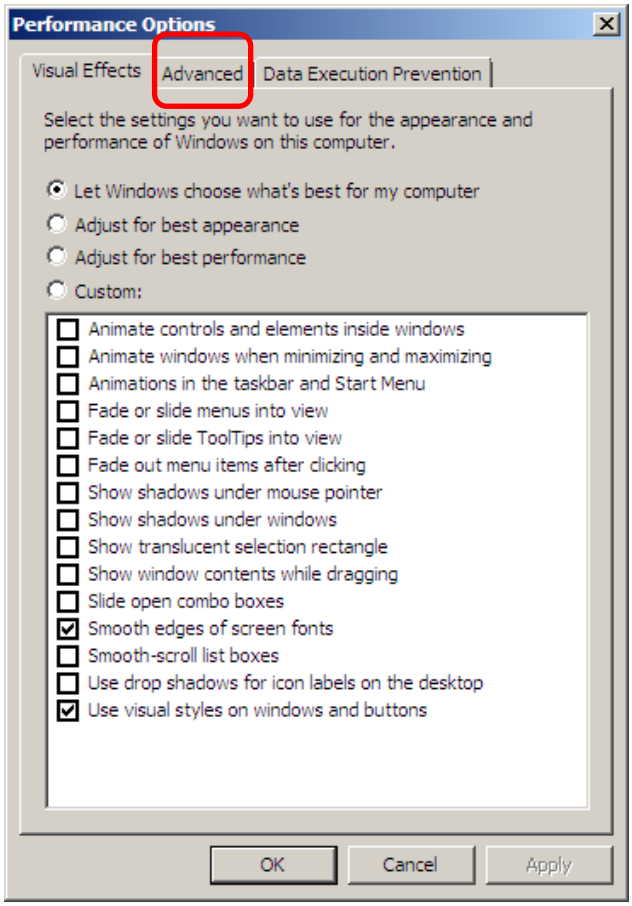
   Note the following when specifying a dump file.

   - For the **Write debugging information** drop-down list, we recommend specifying **Complete memory dump**. If the mounted memory size is greater than 2 GB, however, **Complete memory dump** cannot be specified because it is not displayed on the drop-down list. In this case, specify **Kernel memory dump** instead.
   - Specify a drive that has a free space of at least "the memory capacity mounted on the server + 300 MB".
   - The size of the debug information (memory dump) to be collected changes if memory is added. Make sure that the free space of the drive to store the debug information (memory dump) is sufficient. If you attempt to add memory that will cause the mounted memory size to exceed 2 GB, specify Kernel memory dump.
   - Do not remove checkmark (uncheck) from **Automatically restart** check box.

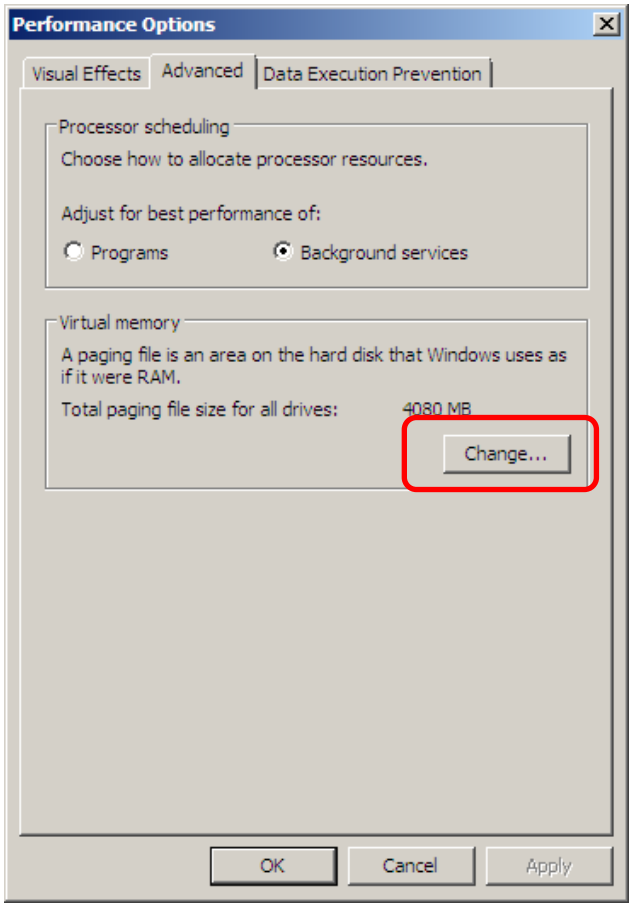
7. Click **Settings** under **Performance**.
   The **Performance Options** dialog box appears.



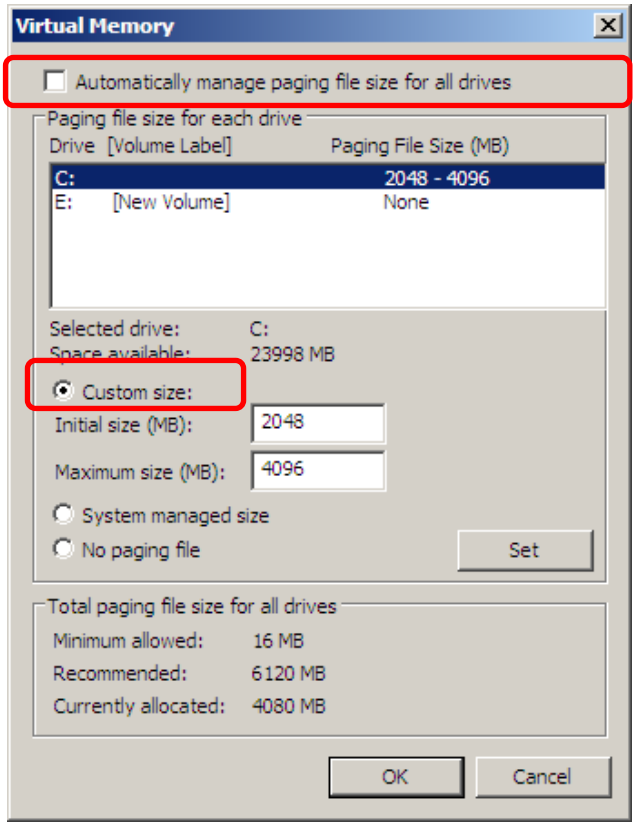
8. Click the **Advanced** tab on the **Performance Options** dialog box.



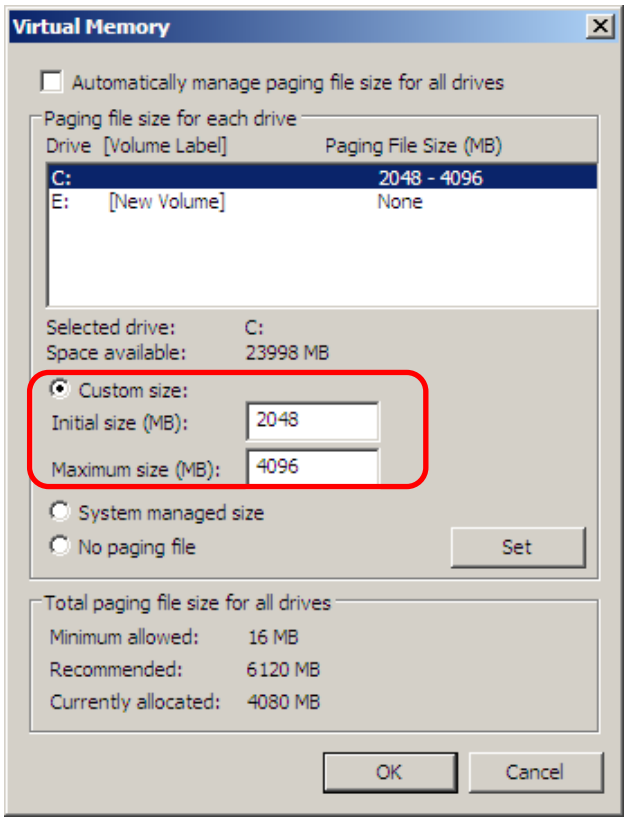
9. Click **Change** under **Virtual memory**.



10. Clear the **Automatically manage paging file size for all drives** check box, and then select the **Custom size** option button.



11. In the **Paging file size for each drive** group box, specify as follows:
    For the **Initial size** text box, specify a value equal to or greater than the **Recommended** value shown in the **Total paging file size for all drives** area.
    For the **Maximum size** text box, specify a value equal to or greater than the value specified in the **Initial size** text box.
    After specifying the above values, click **Set**.



Note the following when specifying a paging file size.

- 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 to set a sufficient paging file size. If the paging file size is insufficient, correct debug information might not be able to be collected due to a shortage of virtual memory.
- For details about the Recommended value in the Total paging file size for all drives area, see *System partition size* in *Chapter 1 (4.1 Before Starting Setup)*.
- When memory is added, re-specify the paging file according to the increased memory size.

12. Click **OK**.
13. A message to restart the system might appear, depending on the modifications made.
    In this case, restart the system.

Specification of the memory dump settings is now complete.

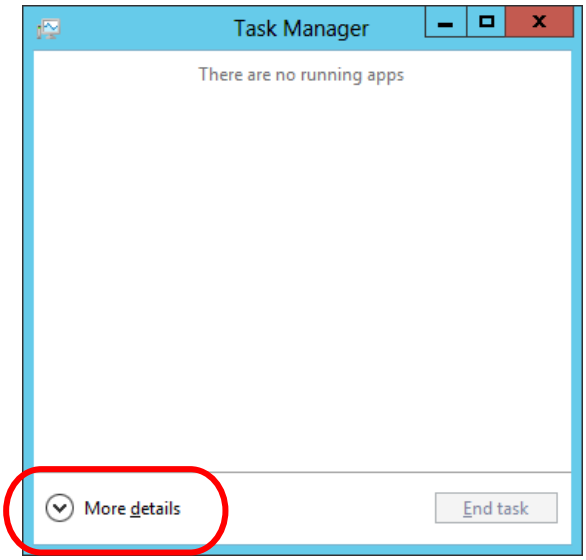
5.2 How to Create a User-mode Process Dump File

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

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

5.2.1 Windows Server 2012

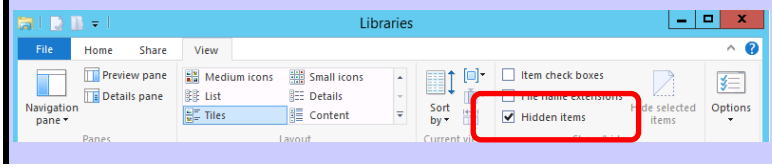
1. Right-click the left bottom of screen and then click **Task Manager** or press <Ctrl> + <Shift> + <Esc> keys to start **Task Manager**.
2. Click **More details**.



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.



Obtain the user-mode process dump file from the folder shown in step 5.

5.2.2 Windows Server 2008 R2

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 the **Processes** tab.
3. Right-click the name of the process that you want to obtain dump information for, and then click **Create Dump File**.
4. A dump file for the process is created in the following folder:
   `C:\Users\`*`user name`*`\AppData\Local\Temp`

Tips

The folder above may be treated as a hidden folder.

If the folder is not displayed, perform the following:

- For Windows Server 2008 R2:
  Open Explorer, click **Organize** and then **Folder and search options**. Click the **View** tab and then select the **Show hidden files, folders, and drives** check box.

5. Once the user-mode process dump file has been created, obtain the file from the folder in step 4.

User-mode process dump file creation is now complete.

5.3 Installing Network Monitor

Using Network Monitor helps you investigate and manage network troubles.

(OS of Windows Server 2012 or later does not support network monitor.)

(1) Setting up Network Monitor

Tips

Windows Server 2008 R2 does not provide Network Monitor.

To capture network traces on Windows Server 2008 R2, Microsoft Network Monitor must be installed using the procedure described below.

1. Download Network Monitor from the following Microsoft web page:

   http://support.microsoft.com/kb/933741/en-us

2. Run the downloaded file to start the installer.

   Follow the onscreen instructions to install Network Monitor.

Tips

If the Security Alert message appears, click **Run**.
In the setup format selection window, select **Complete**.

Network Monitor installation is now complete.

Tips

To uninstall Network Monitor, use **Programs and Features**.

(2) Capturing network traces

Described below are procedures to capture network traces by Microsoft Network Monitor 3.4. The procedures might be changed according to specification change in the future.

1. Select **Microsoft Network Monitor** from the **Start** menu to start Network Monitor.
2. On the **Start Page** tab, click **Create a new capture tab...** . Or, select **New** from the **File** menu, and then click **Capture…**.
   A new tab for capturing network traces is created.
3. Click **Capture Settings** on menu to open **Capture Settings** dialog.
   On the **Select network adapters to capture:** pane, select the network whose traces are to be captured.
4. Select **Start** from the **Capture** menu to start capturing the network traces.
5. Select **Stop** from the **Capture** menu to stop capturing the network traces.
6. Select **Save As…** from the **File** menu.
   The Save As dialog box appears. Select **All captured frames** from **Frame selection**, and then enter the folder and file names.

Tips

The default folder is as follows:
`C:\Users\<User name>\Documents\Network Monitor 3\Captures`

7. Click **Save**.
   The network trace file is created in the folder specified in Step 6.

The setup for capturing network traces is now complete.

6. Windows OS Parameter File

This section describes a parameter file for Windows OS.

6.1 Creating Windows OS Parameter File

If a parameter file is used when performing Setup with EXPRESSBUILDER, the settings from the previous installation can also be used when re-installing the system.

It is therefore recommended to use a parameter file to set up the server.

6.1.1 How to create a parameter file

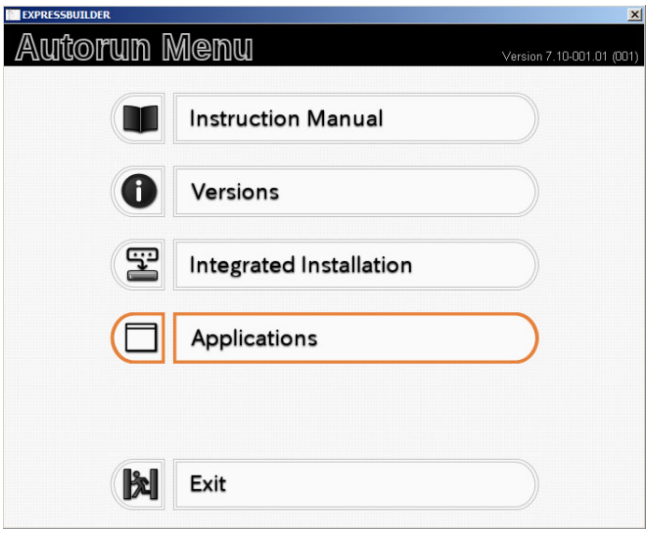
Follow the procedure described below to create a parameter file.

Note Do not remove EXPRESSBUILDER DVD from the drive while creating a parameter file.

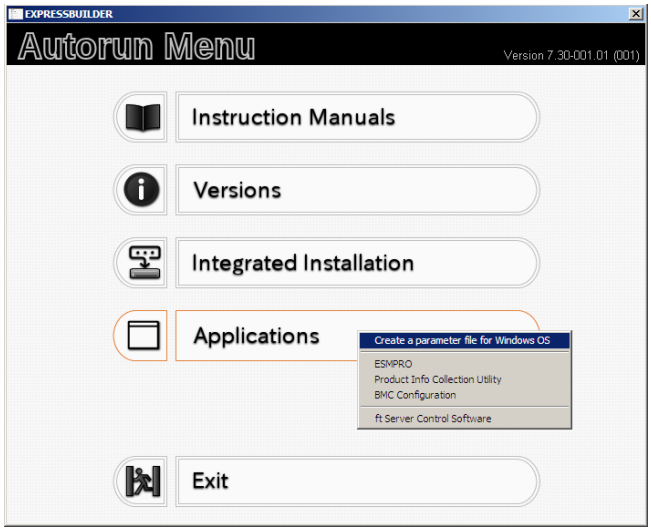
Tips Use Internet Explorer 7 or later version for creating a parameter file.

1. Start Windows OS.
2. Insert the supplied EXPRESSBUILDER DVD into the optical disk drive.

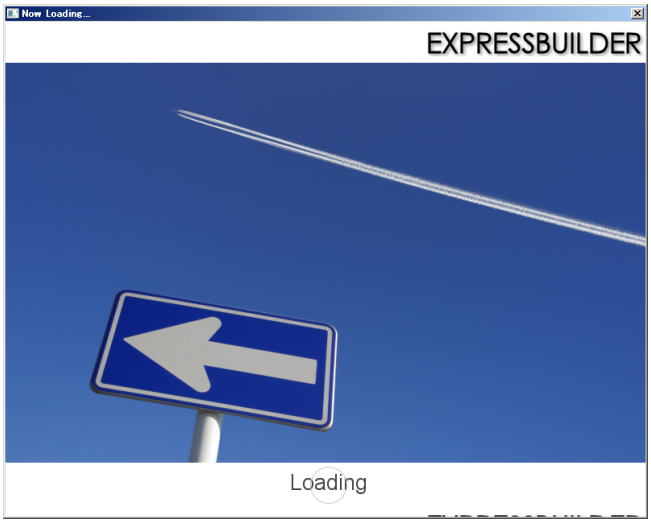
   Run the program by using autorun feature of Windows.
3. Click **Applications**.



4. Click **Create a parameter file for Windows OS**.

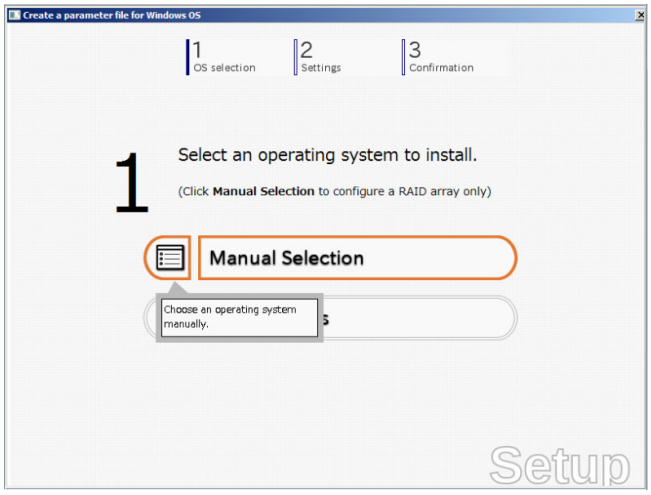


The following window appears.

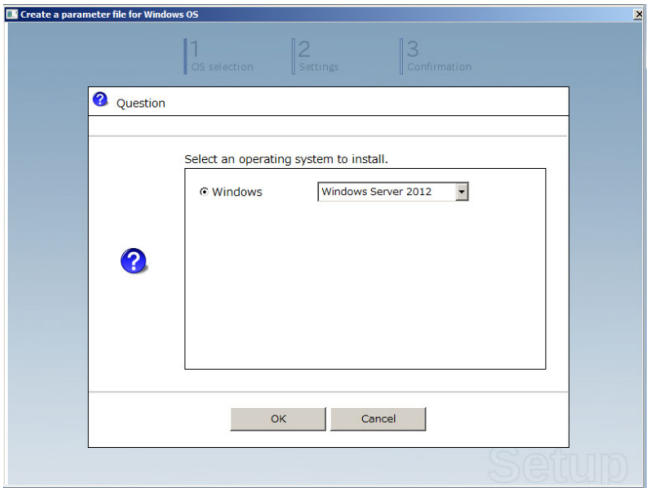


5. On the **OS selection** menu, select either of the following:
   - ☐ When creating a parameter file: Go to Step 6.
   - ☐ When editing a parameter file: Go to Step 7.

6. Click **Manual Selection**.

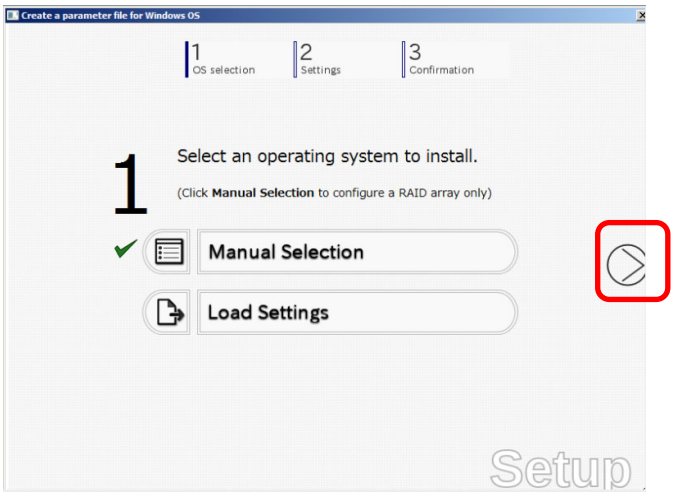


From the menu, select an operating system to install, and then click **OK**.

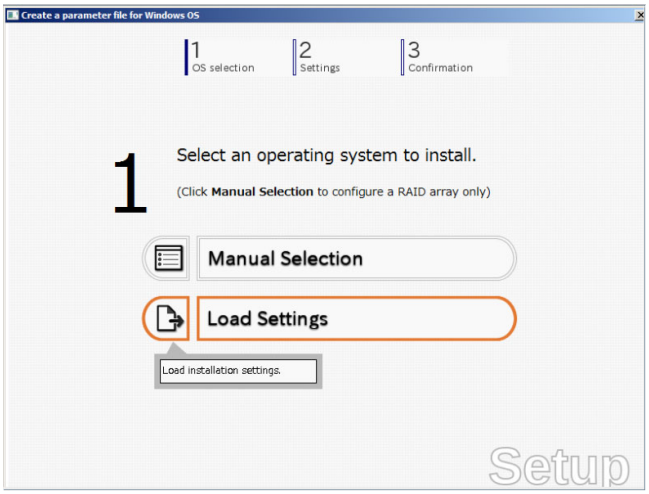


Click ▷ on the right side of the screen.

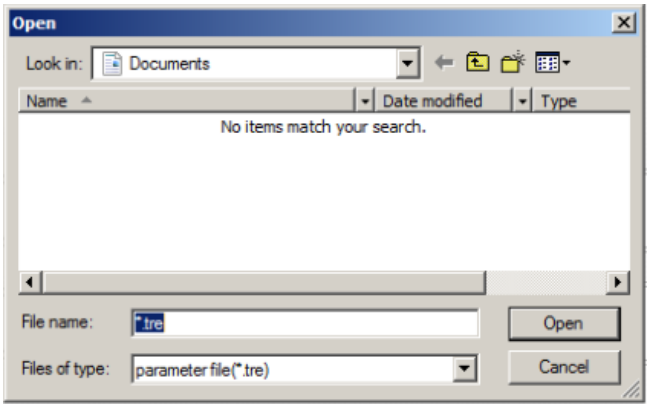
→ Go to step 8.



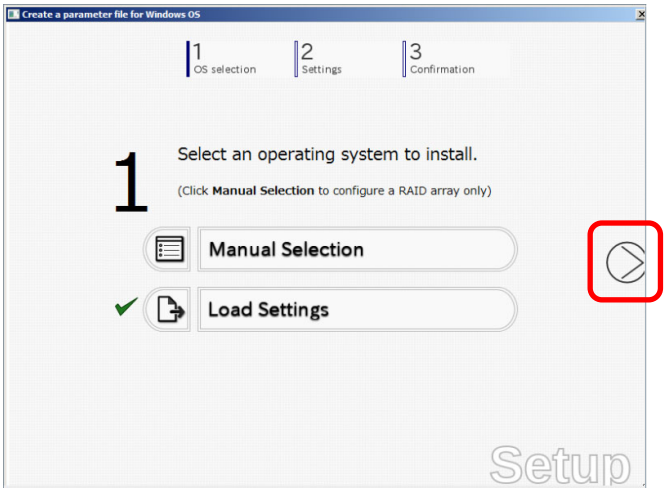
7. When *editing* the parameter file, click **Load Settings**.



Follow the on-screen instruction to load the parameter file (*.tre).

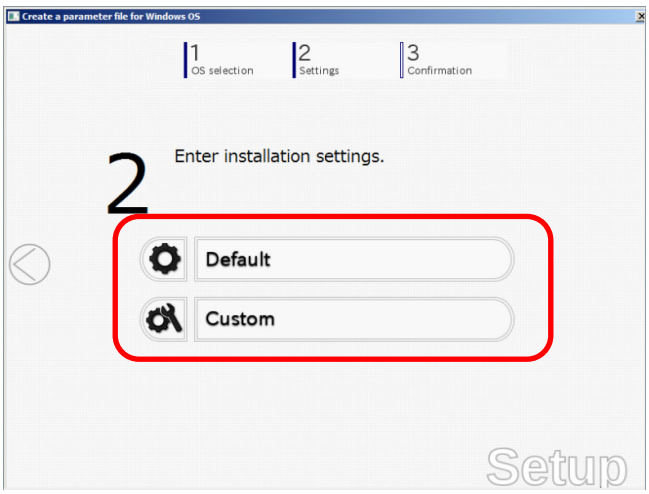


Click ▷ on the right side of the screen.



→ Go to step 9.

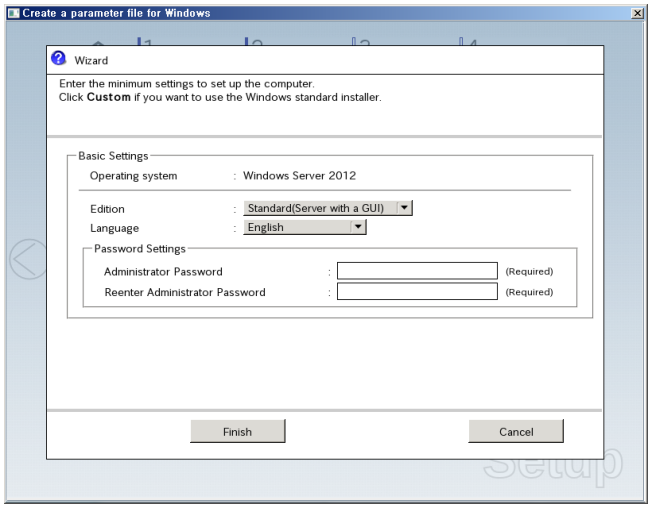
8. Specify the parameters by using either of the following methods:



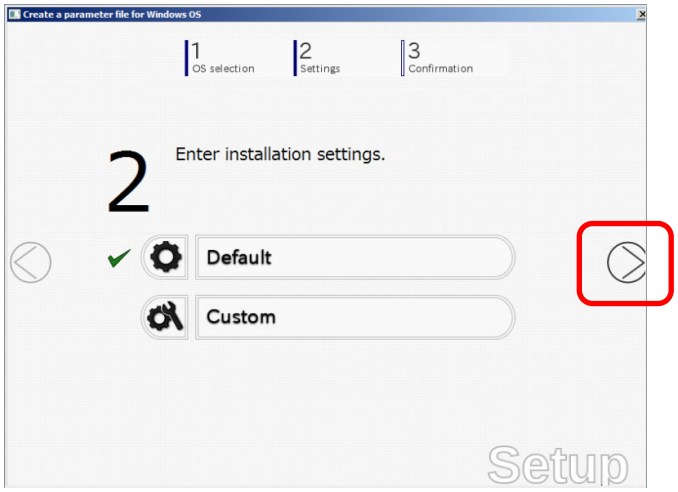
Use Default:

(1) Click **Default**.

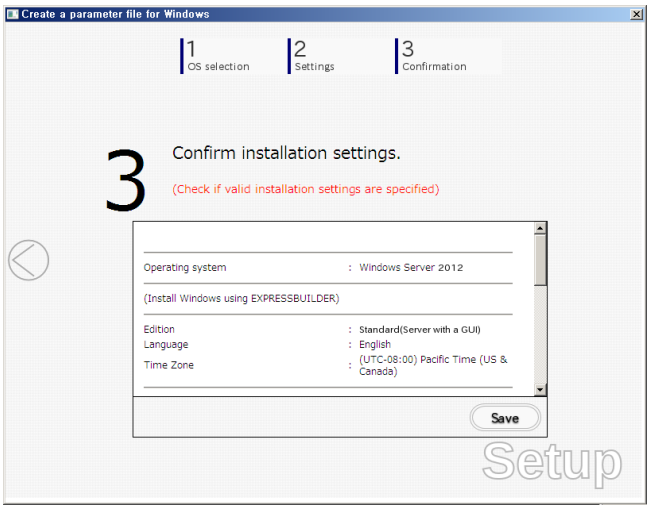
(2) Type the password, and then click **Finish**.



(3) Click ⓒ on the right side of the screen.



(4) Check the settings, and then click **Save**.
Save the file according to the on-screen instructions.

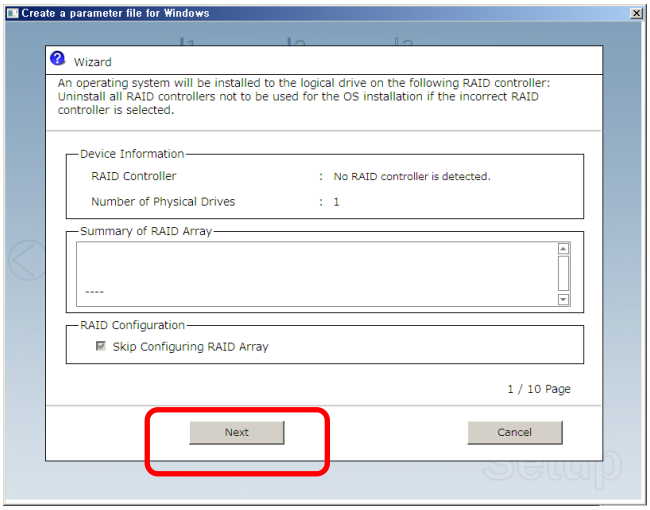


→ Go to step 10.

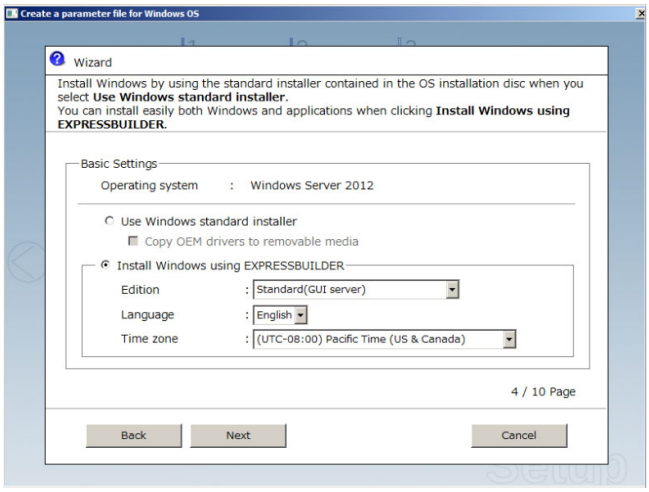
Use Custom:

(1) Click **Custom**.

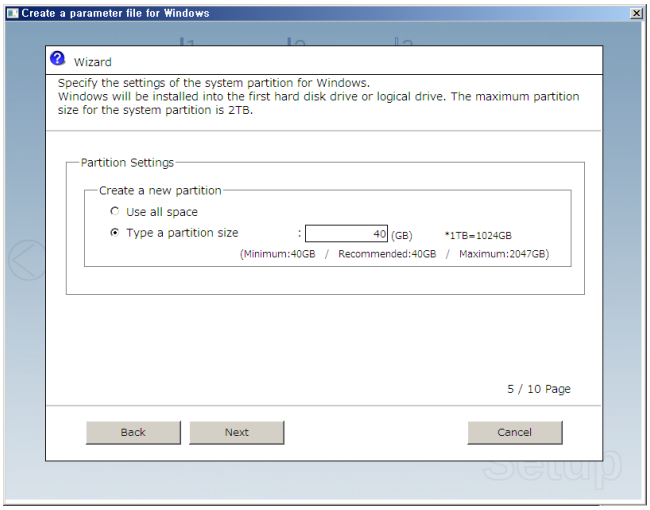
(2) RAID Configuration is unavailable on this server. Click **Next**.



(3) Check the settings specified for **Basic Settings**.
Modify the settings as needed, and then click **Next**.



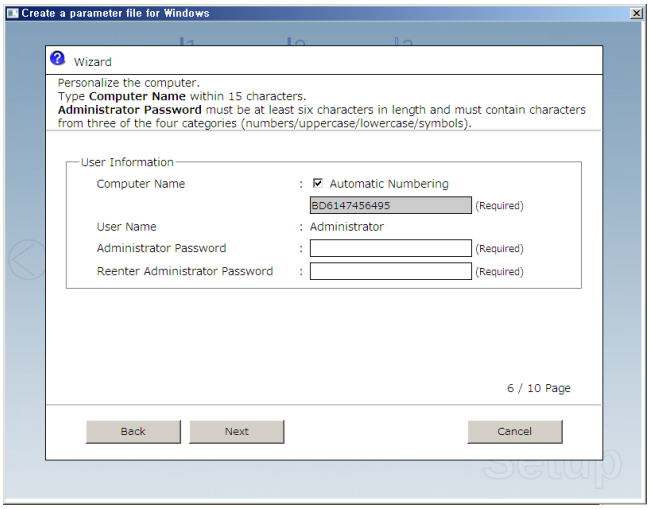
(4) Check the settings specified for **Partition Settings**.
Modify the settings as needed, and then click **Next**.



Important

- **Backing up user data, as needed, is recommended.**
- **Partition size**
  - **Specify a partition size larger than the minimum required for installing the operating system. (See *Chapter 1 (4.1 Before Starting Setup)*.**
  - **Specify a partition size not exceeding 2,097,152MB.**
- **The entire contents of the hard disk drive will be erased.**

(5) Enter the user information, and then click **Next**.



Note

Computer name and Administrator Password are required parameters.

Enter Administrator Password that satisfies the following conditions:

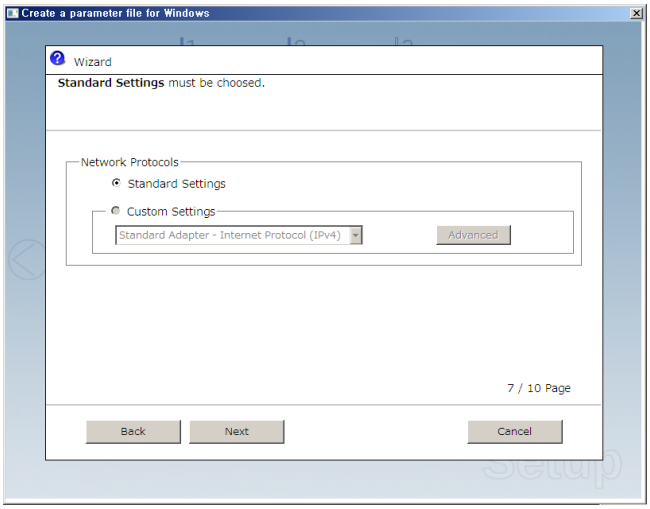
- Contains 6 or more characters
- Contains characters from at least three of the following categories: numbers, uppercase alphabetic characters, lowercase alphabetic characters, and symbols.

Tips

- The Computer name has been assigned by automatic assignment function. If you need to assign another computer name, remove the checkmark from **Automatic Numbering**, and enter the desired computer name.
- If a parameter file is used for setup or if you return to a previous screen, •••••• is displayed in the Administrator password and Confirm Administrator password text boxes even if no value has been entered.

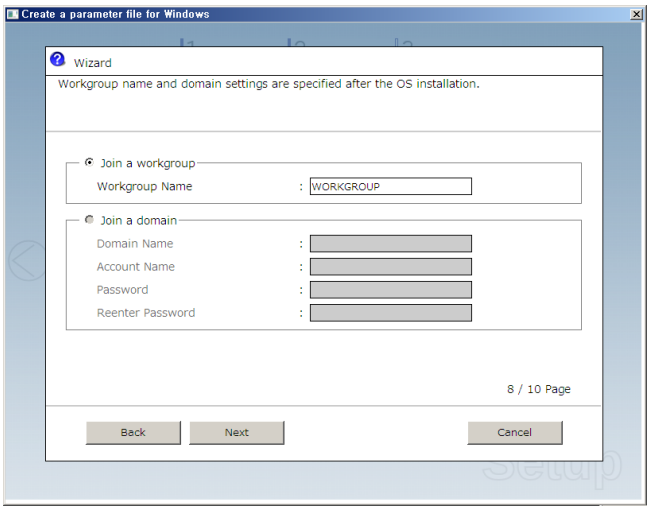
(6) **Network Protocols** is unavailable on this server.

Click **Next**.



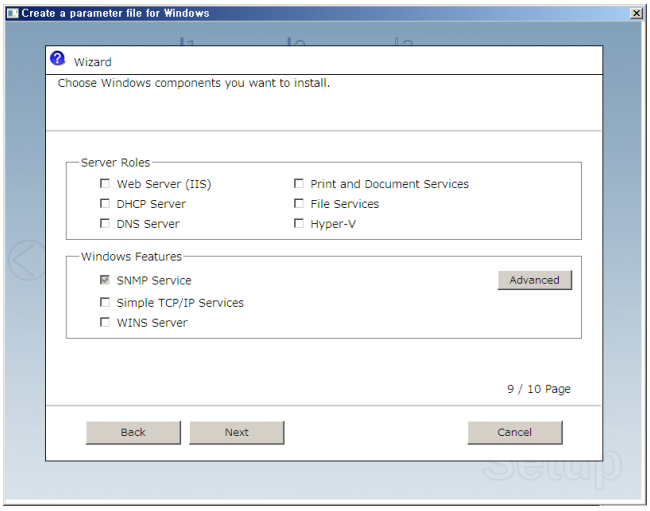
(7) Specifying domain or workgroup is unavailable on this server.

Click **Next**.



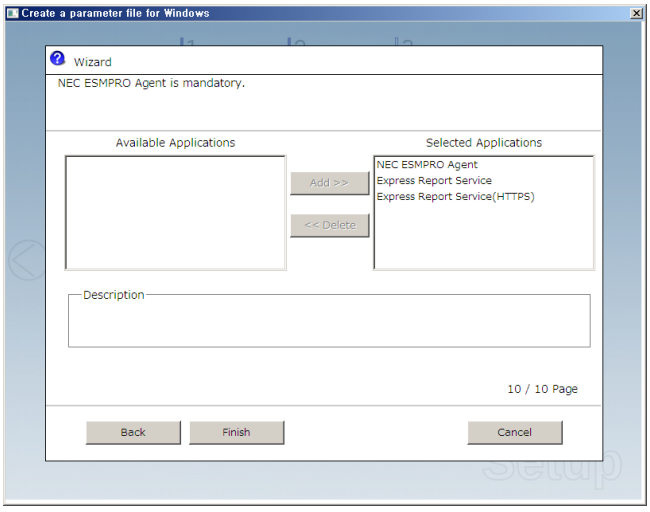
(8) Check the settings of Windows components.

Modify the settings as needed, and then click **Next**.

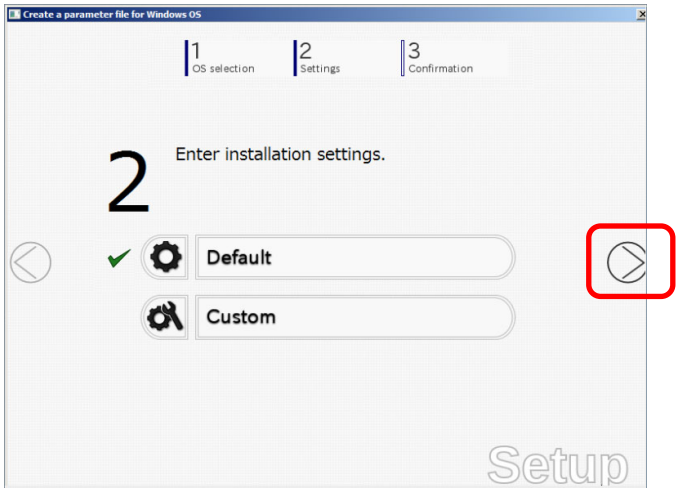


(9) Check the settings of applications.

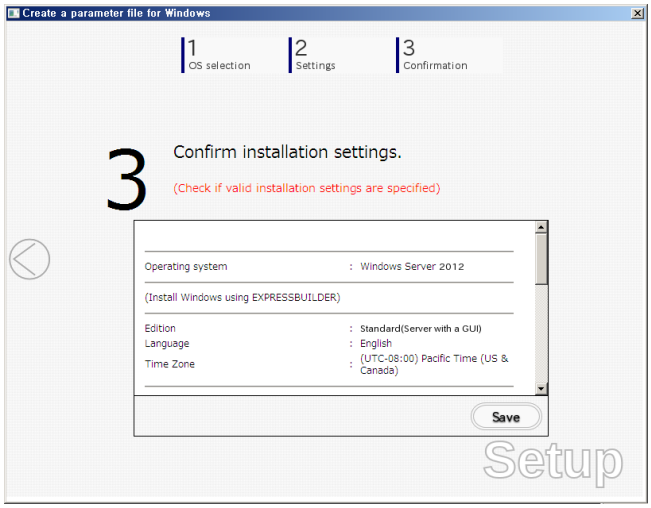
Click **Finish**.



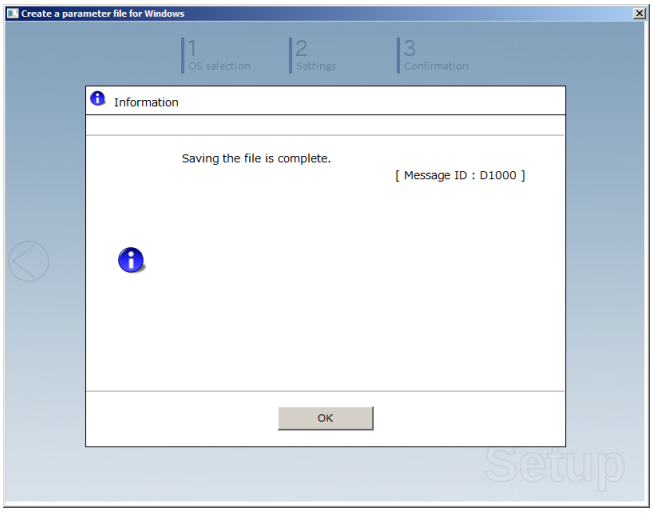
On the screen as shown below, click ▷ on the right side of the screen.



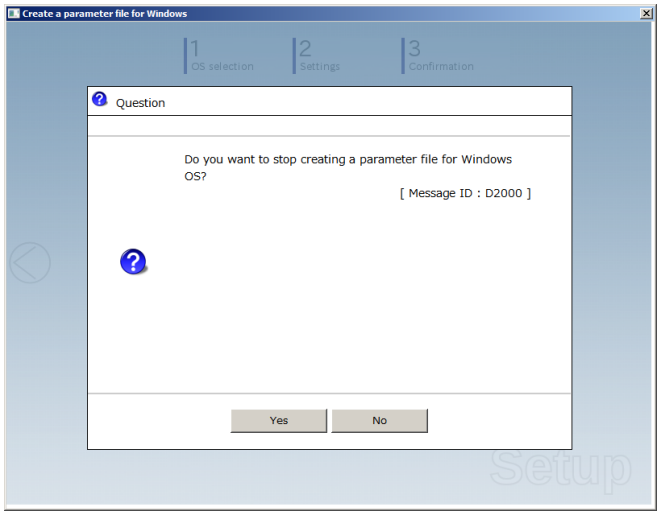
9. Check the settings, and then click **Save**.
   Save the parameter file according to on-screen instructions.



10. Click **OK**.



11. Click **Yes** to close the window.



Creation of parameter file is now complete.

7. Backing Up System Information

When replacing the server, system information including system-specific information, BIOS configuration, and/or BMC configuration data can be inherited to the new server. Refer to *"BMC Configuration User's Guide"* for how to backup the system information.

Note

Backup/restore process must be performed on duplex system configuration. If it is performed on simplex system configuration, the information may not be inherited correctly. Refer to *Chapter 1* (*4. Names and Functions of Components*) in *User's Guide* for how to verify the duplex system configuration.

8. Precautions for Using Hyper-V

Express5800/ft series supports Hyper-V feature.

This section describes precautions for using Hyper-V with Express5800/ft series.
Refer to the URL below for precautions other than those described in this section.

- **Windows Server 2012**

  http://www.58support.nec.co.jp/global/download/w2012/hyper-v/hyper-v-ws2012.html

- **Windows Server 2008 R2**

  http://www.58support.nec.co.jp/global/download/w2k8r2/hyper-v/hyper-v-v2.html

8.1 System Down Time Caused by Duplexing CPU Module

In the duplex process of CPU modules, a memory copy is performed to duplex memory on both the CPU modules. The system does not respond for a longer period of time during the duplex process of CPU modules as compared to when Hyper-V is not used. The following are the reference values of each model.

Important

- **Starting a memory copy does not cause OS shutdown. However, a process that was running before copying is interrupted, and it does not respond for a certain period of time. The interrupted process will be resumed after the memory copy is completed.**
- **The time required for copying increases in proportion to the installed memory size.**
- **When a large amount of memory is installed, non-responding time will become longer and the connection from a client may time out. Adjust the timeout values of TCP/IP, etc., on the client side as necessary.**

Model/Memory Size	8GB	16GB	64GB	128GB	256GB
Express5800/R320c-E4 Express5800/R320d-E4	2 sec	3 sec	10 sec	18 sec	36 sec
Express5800/R320c-M4 Express5800/R320d-M4	2 sec	3 sec	8 sec	14 sec	27 sec

Use the above memory copy time as a guide when no load is applied to OS. The actual time may differ depending on the status of use.

8.2 Virtual Network Setting and Active Upgrade

Active Upgrade process allows you to upgrade system and application software with minimum required downtime while the Express5800/ft series system is online and available to users.

A team assigned to the virtual network by Hyper-V Virtual Network Manager cannot be used in Active Upgrade. To use Active Upgrade, at least one team that is not assigned to virtual network is required.

NEC Express5800 Series
Express5800/R320c-E4, R320c-M4, R320d-E4, R320d-M4

2

Installing Bundled Software

This chapter provides brief explanation of bundled software and how to install them.

1. Bundled Software for the Server
   Describes the bundled software to be installed in the server system.

2. Bundled Software for "PC for Management"
   Describes the bundled software to be installed in "PC for management" that is used to monitor and manage the server system.

1. Bundled Software for the Server

This section introduces the software bundled in the server package. For details, refer to the software documents.

1.1 NEC ESMPRO Agent (for Windows)

NEC ESMPRO Agent (for Windows) is an application used to monitor the server.

It is automatically installed when a Windows OS is installed by using EXPRESSBUILDER.

When installing NEC ESMPRO Agent (for Windows) individually, refer to *NEC ESMPRO Agent Installation Guide (Windows)* in EXPRESSBUILDER.

1.2 NEC ESMPRO Agent Extension

NEC ESMPRO Agent Extension allows you to manage this server remotely by the server's BMC connecting in linkage with NEC ESMPRO Manager.

For details about how to install NEC ESMPRO Agent Extension, refer to *NEC ESMPRO Agent Extension Installation Guide* in EXPRESSBUILDER.

1.3 RDR

Express5800/ft series duplexes disks to secure data by using "Rapid Disk Resync (RDR) function".

The software is installed along with the ft Server Control Software, however, you need to duplex disks in manual mode.

1.4 BMC Configuration

BMC Configuration enables you to specify configurations to this server's BMC.

It is automatically installed when a Windows OS is installed by using EXPRESSBUILDER.

When installing BMC Configuration individually, refer to *BMC Configuration User's Guide* in EXPRESSBUILDER.

1.5 Active Upgrade

Active Upgrade technology allows you to upgrade or install system and application software on an Express5800/ft series system with minimal downtime. (Windows Server 2012 does not support Active Upgrade.)

Active Upgrade is an optional software. To use this feature, you need prepare the following option separately.
"Active Upgrade option for ft series"

This section describes the overview of Active Upgrade process, the procedure and prerequisites necessary for preparing the system for the upgrade process, and configuring and performing the upgrade process with Active Upgrade Console.

1.5.1 Overview

Active Upgrade technology allows you to upgrade system and application software on an Express5800/ft series system with minimal downtime.

The features of Active Upgrade are as follows:

- Install software updates with minimal disruption to your applications.

  The applications required for the server operation continue to run on one CPU/IO module while you upgrade or install software on the other CPU/IO module. There is only a brief disruption when you are finished installing updates, as your applications are restarted on the upgraded software. (The time required to stop or restart applications depends on the application type. Active Upgrade does not shorten time to stop or restart applications.)

- Test the latest software updates in your environment before making the updates permanent.

  After your applications are restarted on the upgraded software, you can verify the success of your software updates. If you want to keep the changes, there is no additional downtime. Otherwise, as quickly as your system can restart, you can abort the upgrade to go back to the original version of your software.

- Abort the upgrade process before you commit the changes.

  If you are not satisfied with an upgrade, you can abort the upgrade session to return the system to its original state. Nothing is permanent until you choose to commit the changes. Also, there is no disruption to your applications if you abandon the upgrade in the split mode.

- Risks during Active Upgrade process

  When one of the CPU/IO module is upgrading software (in split mode), the other CPU/IO module is running user application. If a device failure occurs before two systems are merged, a system down will occur.

  RDR resynchronization process starts to restore the duplex configuration after the upgrade was committed or upgrade was aborted before commitment. The internal disks loses redundancy until resynchronization completes.

(1) Active Upgrade Process

The Active Upgrade process involves the following basic steps:

1. Preparing for Active Upgrade process
   - Managing Applications during the Upgrade Process
   - Configuring Remote Desktop Connection
   - Configuring Remote KVM Console
   - Preparing an IP address to assign to the Upgrade Side
   - Installing the Active Upgrade Console
   - Configuring Windows Firewall for the Active Upgrade Process
   - Copying Software Upgrade Packages to the System
2. Configuring Active Upgrade process
   - Creating a Configuration File
   - System IP Configuration on the Upgrade Side
   - Selecting Disks to Upgrade
   - Selecting Other Configurations to Include
   - Selecting Application Services to Control
   - Selecting Event Log Files to Back Up
   - Configuring Custom Actions
   - Programming Notes for Custom Actions
   - Providing a Description for a Configuration File
3. Performing Active Upgrade process
   - Performing a Readiness Check
   - Splitting the System
   - Verifying the Upgrade Side Before Merging the System
   - Merging the System
   - Verifying the Upgrade Side Before Committing the Upgrade
   - Committing the Upgrade
   - Finishing the Upgrade
   - Aborting the Upgrade (if necessary)
   - Viewing Active Upgrade Process Status

(2) System operation during upgrade

Active Upgrade splits the system into two independently running systems (split mode).

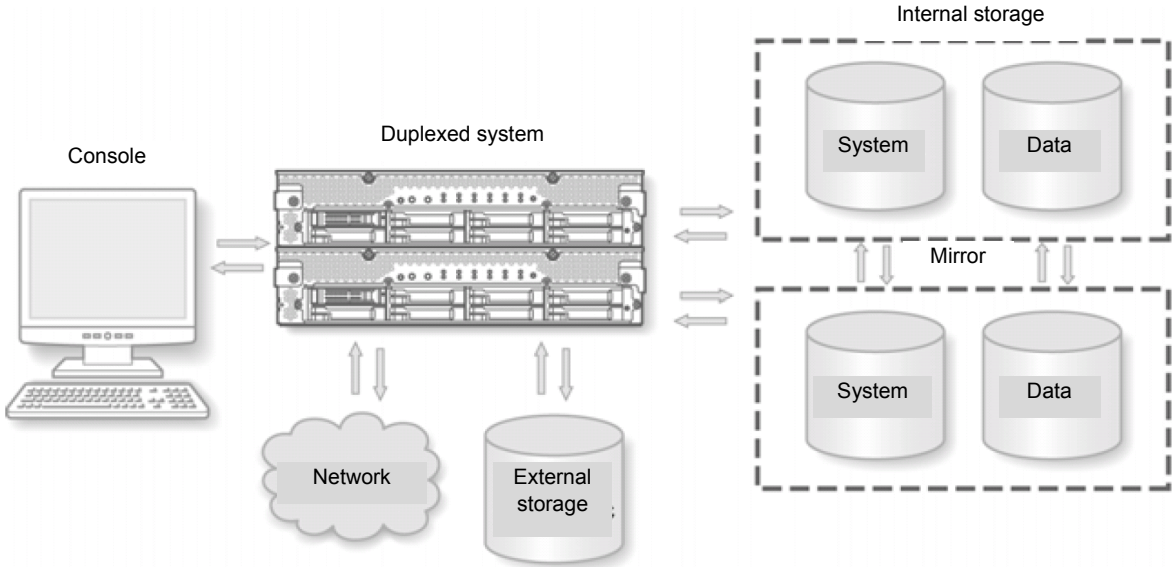
During upgrade, one side of system (CPU/IO module) continues to run application (Production Side), while the other side of system (CPU/IO module) upgrades software (Upgrade Side).

Upon completion of software upgrade, the Production Side system runs synchronously with the Upgrade Side (merge mode).

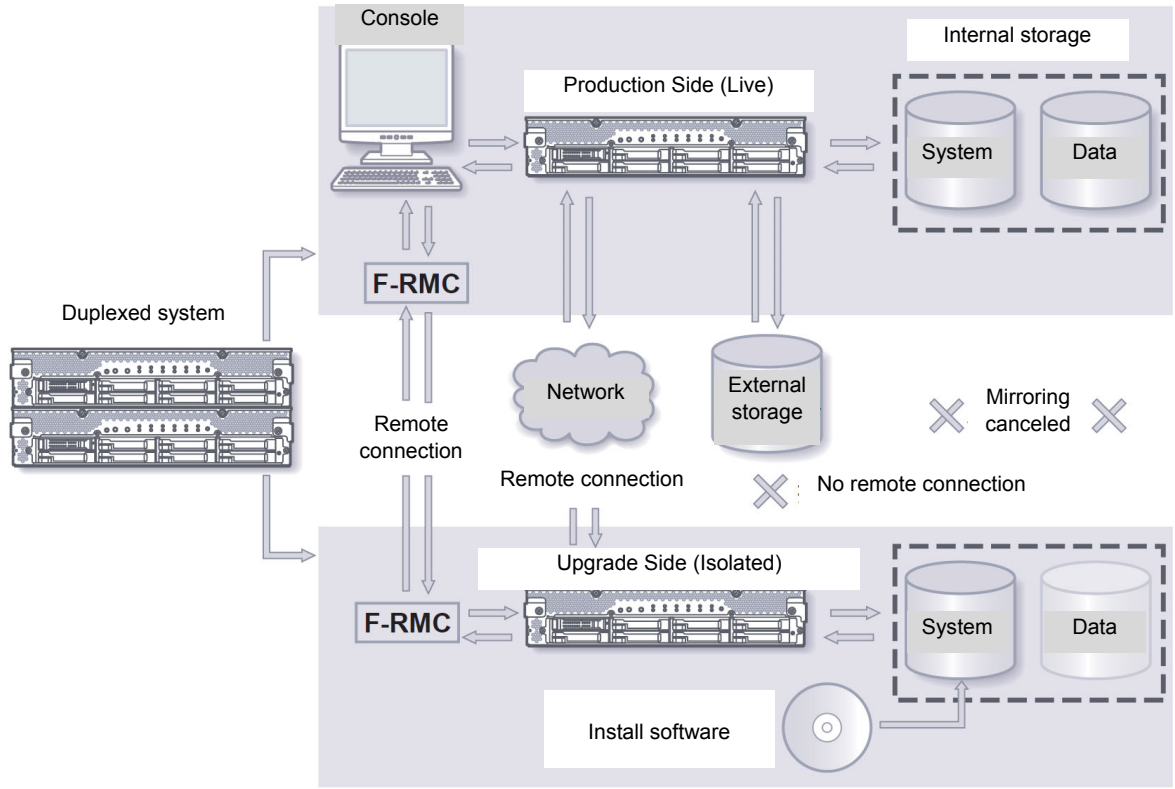
Details of these actions are described below.

(a) Splitting the system

You start the upgrade process by initiating split mode, which divides the fault-tolerant, duplexed system into two independent, simplexed systems — a Production Side, which continues to run your applications, and an Upgrade Side, on which you can run software installation packages. If there are any problems during upgrade, you can abort the upgrade to return the system to its original state.



Duplexed System



Splitting the System

Data disk

When you split the system, the Active Upgrade Console disables any Rapid Disk ReSync (RDR) mirroring between the internal disks in each CPU/IO module enclosure and isolates the Upgrade Side from system resources such as the user-specified application data disks, and any external PCI resources (such as external storage). The network can communicate with Production side only. It also disables user-specified applications and services on the Upgrade Side so they cannot restart if you restart the Upgrade Side.
Meanwhile, the Production Side retains access to system resources and continues to run your applications uninterrupted.

Keyboard and mouse operation at Upgrade Side

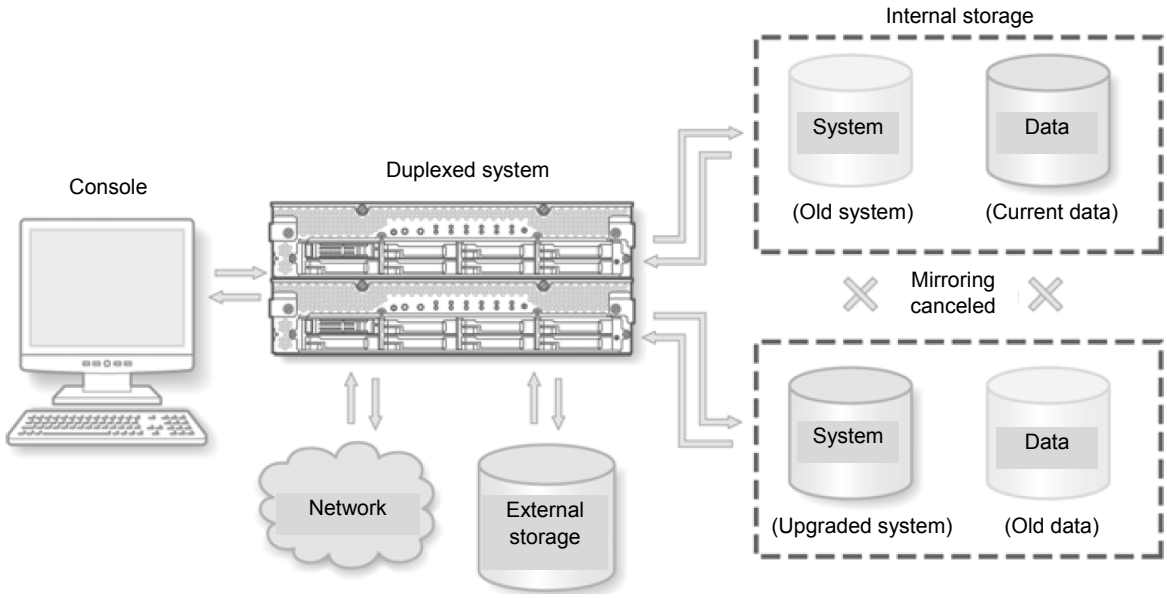
After the system successfully enters split mode, you establish a remote connection to the Upgrade Side of the system through the private network that exists between management LAN ports and between internal LANs in each CPU/IO module enclosure.
Using this remote connection, you can perform any of the following upgrade tasks on the Upgrade Side:

- Run software updaters
- Restart the operating system, if necessary.
- Perform testing of the installed updates
  (the Upgrade Side has no access to the user-specified data disk, external storage, or network).

(b) Merging System

When you are finished installing software on the Upgrade Side, you disconnect the remote connection to the Upgrade Side and initiate the *merge* process.

When you merge the system, the Active Upgrade Console stops your applications on the Production Side and unmounts any data disks to ensure that pending disk updates are flushed to disk. It then merges system resources so that the network, external storage, and data disks become available to the whole system again. With the exception of the internal disks, all system resources return to duplex mode (see the figure below).



Merged System

Finally, the system restarts user-specified applications from the Upgrade Side system disk. A brief downtime is incurred before the application starts.

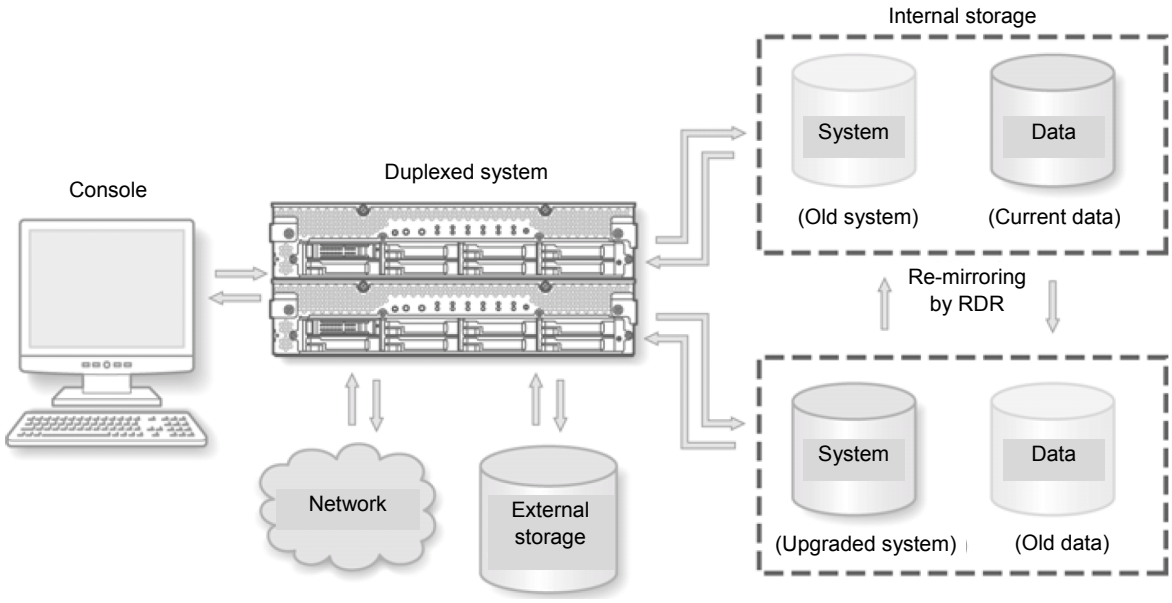
If you discover a problem, you can still abort the upgrade process and restore the system to its previous state, because the original copy of your system disk (on the Production Side) has not been overwritten yet

(c) Committing the Upgrade

When you are certain that the upgrade(s) were successful, you can *commit* the changes to make them permanent.

When you commit the changes, the Active Upgrade Console resynchronizes the RDR disks in your system by overwriting the original Production Side system disk and stale Upgrade Side data disks with their partner disks, which are up-to-date (see the figure below).

Important **Because the original version of your system disk is erased during the commit process, you cannot abort an upgrade session after initiating the commit process.**



Committing the Upgrade

When the RDR disk resynchronization is finished, all system resources are running in duplex mode, and the Active Upgrade process is complete. You do not need to restart the system. Also, because your application is already running on the upgraded software, there is no additional downtime.

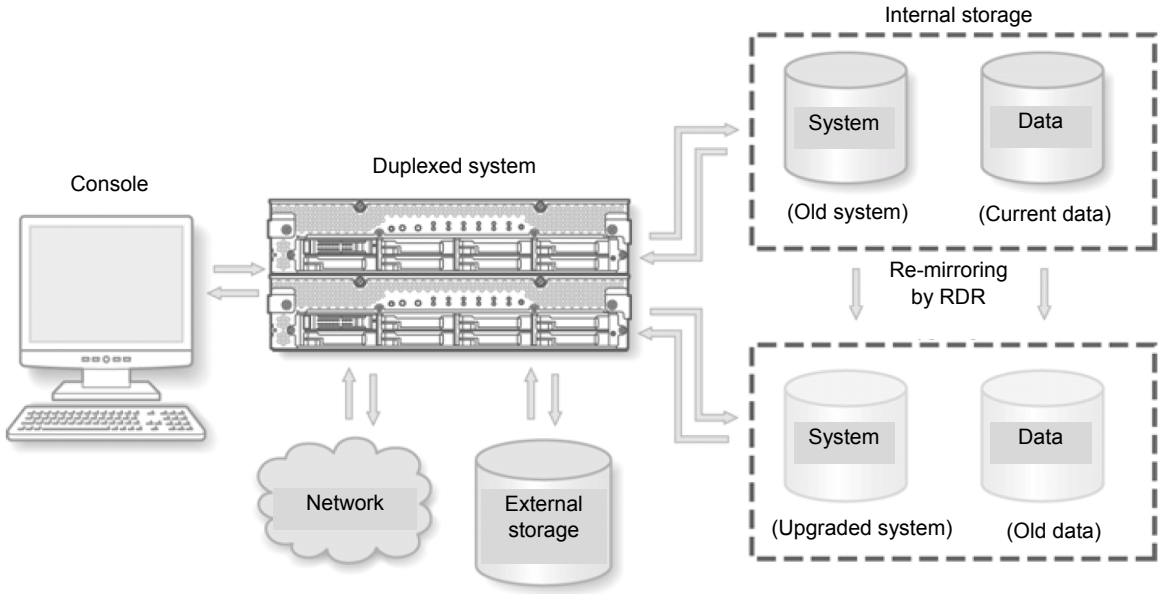
(d) Aborting the Active Upgrade Process

Important **You can abort the Active Upgrade process and restore the system to its original state before committing the upgrade. You cannot abort the upgrade process after you commit an upgrade.**

If you abort the upgrade session while the system is in split mode, no downtime is incurred. Your applications continue to run on the Production Side while the Active Upgrade Console restores the system to duplex mode.

If you abort the upgrade session while the system is in merge mode, a short period of downtime is incurred while the Active Upgrade Console initiates a system restart. The Active Upgrade Console shuts down the Upgrade Side and restarts the system from the Production Side, which automatically restarts your applications from the Production Side. The period of downtime is only as long as it takes your system and applications to restart.

In either case, the abort process uses RDR resynchronization to restore the internal disks to their original state by overwriting the Upgrade Side system disk and stale Upgrade Side data disks with their original partner disks (see the figure below).



Aborting the Upgrade

After you abort the Active Upgrade process, you can start another Active Upgrade session as soon as the RDR disk resynchronization is complete.

1.5.2 Preparing for the Active Upgrade Process

Preparing for the Active Upgrade process involves the following tasks:

1. Learning about the prerequisites for your Express5800/ft series system.
   - Software Upgrade Support
   - Prerequisites
   - Recommendations
2. If necessary, plan for the brief downtime associated with restarting your applications while merging the system.
   - Managing Applications during the Upgrade Process
3. Configure Remote Desktop Connection if necessary.
   Either one of remote desktop connection or remote KVM must be enabled so that the Production Side can communicate with Upgrade Side during upgrade.
   - Configuring Remote Desktop Connection
4. Verify the prerequisites to use Remote KVM Console and configure if required.
   Either one of remote desktop connection or remote KVM must be enabled so that the Production Side can communicate with Upgrade Side during upgrade.
   - Configuring Remote KVM Console
5. Prepare the IP address to allocate to the Upgrade Side's system.
   - Preparing an IP address to assign to the Upgrade Side
6. Install the Active Upgrade Console
   - Installing the Active Upgrade Console
7. If necessary, enable the exception for Active Upgrade Console in Windows Firewall properties
   - Configuring Windows Firewall for the Active Upgrade Process
8. If necessary, copy any required software installation packages to the system.
   - Copying Software Upgrade Packages to the System
9. Verify if your system is prepared for Active Upgrade process.
   - Verifying preparation
10. When you are finished preparing for the upgrade, start the Active Upgrade Console.
    - Starting and Exiting the Active Upgrade Console

(1) Software Upgrade Support

Active Upgrade technology supports the installation or upgrade of application software that meets the following criteria:

- The application's executable files, configuration files, and temporary files (for example, cache files) reside on internal system disks that are mirrored with RDR.
- The application's data files reside on data disks.
  Data volumes that reside on the same physical disk as a system volume are not supported.
- The application's installation or upgrade utility does not involve changes to files or data on the data disks while performing upgrade (the system is in split mode).
  The Upgrade Side has no access to the data disks while the system is split.
- You must download the software upgrade package to the system before initiating split mode. Network connection is disabled during upgrade because the system is in split mode.
- BIOS, BMC firmware updates are unavailable.

(2) Prerequisites

To use Active Upgrade, the following conditions must be satisfied:

(a) Prerequisites on Express5800/ft series

- In the environment where the backup software such as ARCServe and BackupExec is installed, ensure to stop the backup software service before performing Active Upgrade.
- When BackupExec is installed, Upgrade Side must be restarted after Split is completed.
- The CPU/IO modules must be duplexed, and running in duplex mode prior to starting the upgrade process.
- Embedded LAN must be duplexed.
  Embedded LANs must be duplexed between LAN ports of each CPU/IO module, and must have an active network link in each CPU/IO module.
- You do not need to duplex optional LAN cards, but it is recommended. The readiness check in Active Upgrade Console will display a warning for each non-duplexed LAN cards, but the warnings will not prevent you from proceeding with the Active Upgrade process.

Important

- **To use Active Upgrade, a duplexed LAN not assigned to the virtual network by Hyper-V is required.**
- **If you need to modify duplexed LAN that are actively providing network connectivity, this could affect network connectivity and should be scheduled to minimize impact to your applications.**

Tips

See *Chapter 1 (4.9 Duplex LAN Configuration)* for more information.

- Has one new IP address for Active Upgrade ready.
  You need to prepare one IP address to communicate between the Production Side and the Upgrade Side via LAN during the Split. The IP address is allocated to the Upgrade Side system with the Split status.
- Do not use the devices connected with USB except the keyboard, mouse, and server switch unit.
  In Active Upgrade, if you are using the devices connected with USB other than the keyboard, mouse, and server switch unit, be sure to remove them physically before performing Active Upgrade.

- Setting for the remote management function is completed.
  By using the remote management function, the connection between the Production Side and the Upgrade Side by the remote KVM becomes possible during the Active Upgrade process. The setting of the management LAN required for using the remote management function needs to be completed.
- **Restrict each user to a single session** is cancelled.
  By OS default settings, the connection is restricted to one session per user. When you access the Upgrade Side from the Production Side using a remote desktop under the split mode, the connection may fail due to this restriction.

  1. Select **Administrative Tools** – **Remote Desktop Services** – **Remote Desktop Session Host Configuration** – **Restrict each user to a single session**.
  2. Clear the check box from the **Restrict each user to a single session** property to cancel the restriction.
- Can tolerate running in simplex mode for a brief period during the upgrade.
  Because each side of the system runs in simplex mode during the upgrade, an interruption on the side that is actively running your applications can result in downtime.

Important

- **You cannot restart the operating system on the Production Side during an upgrade (though you can restart the Upgrade Side as many times as necessary.)**
- **Also, it is unsafe to pull an enclosure from a split-mode, simplexed system because doing so terminates all processes running on that enclosure.**

- Can tolerate a potential decrease in performance during the upgrade.
  For example, if load balancing is configured for LAN, there might be a decrease in network performance when the system is split because the network adapters on the Upgrade Side lose access to the network.

(b) Storage requirements

- Mirror volume (RAID-1)/RAID-5 volume are not configured in dynamic disk.
- All internal hard disks must be configured with Rapid Disk Resync (RDR) and must be duplexed (synchronized) before the Active Upgrade process starts.
- The operating system boot volume and all active Windows operating system components must be located on internal RDR disks.
  This includes any volumes that contain paging (virtual memory) files for the operating system.
- Any disk that contains software you want to upgrade cannot contain persistent data files for your applications (those applications that will continue to run during the Active Upgrade process). Data file must not reside on the same physical disk as a paging file.
  You must store your data files on separate data disks.
- Do not upgrade software on external storage devices.
  External storage devices are always considered data disks. You cannot upgrade software on external storage devices, as these devices not available to the Upgrade Side of the system while the system is in split mode.

(3) Recommendations

When preparing your system for the Active Upgrade process, also consider the following recommendations:

- Use static IP addresses for duplexed LAN.
- If your system is protected by Windows Firewall, enable the exception for Active Upgrade Console as shown in *Chapter 2 (1.5.2 (9) Configuring Windows Firewall for the Active Upgrade Process)*. If Windows Firewall is running, and the exception for Active Upgrade Console is not enabled, communication between the Production Side and Upgrade Side might fail during the Active Upgrade process.

(4) Managing Applications during the Upgrade Process

The Active Upgrade Console enables to specify how applications are started and stopped during the Active Upgrade process.

If your Express5800/ft series system runs business-critical applications, such as Microsoft Exchange Server or SQL Server, these applications can run on only one side of the system—the Production Side—when you split the system. They must be stopped on the other side—the Upgrade Side—to prevent resource conflicts and to allow you to proceed with upgrade tasks. Furthermore, when you merge the system, the same applications must be stopped on the Production Side and restarted on the Upgrade Side, so you can test the applications with the newly-upgraded system disk, and possibly commit the upgrade.

If necessary, plan for the brief downtime associated with restarting your applications while merging the system.

(a) Restarting applications

In general, applications are launched and exited automatically by the operating system. In most cases, to minimize downtime, the Active Upgrade Console executes upgrade operations, like split and merge, without restarting the operating system. Active Upgrade Console provides two methods for controlling your applications during the upgrade process.

- Application services

  If your application runs as a standard service that already accounts for interdependencies (with other services) and requires no special handling, you can specify it on the **Application Services** page of the Active Upgrade Console during the configuration process. On the **Application Services** page, you can select each service you want to manage from the list of services on your system, and, when you start the upgrade process, the Active Upgrade Console will automatically start and stop these services at the appropriate times.

Tips See *Chapter 2 (1.5.3 (5) Selecting Application Services to Control)* for more information.

- Custom actions

  If you have special executables that start and stop these applications, you can specify the executables on the **Custom Actions** page of the Active Upgrade Console during the configuration process. Using the controls on the **Custom Actions** page, you can specify when your executables will run during the upgrade process.

Tips Using the controls on the **Custom Actions** page, you can specify when your executables will run during the upgrade process, and, if you have several executables, you can specify the order in which they will run. See *Chapter 2 (1.5.3 (7) Configuring Custom Actions*) for more information.

(5) Configuring Remote Desktop Connection

In the setup window of Remote Desktop Connection, enable the remote connection. For more information, see the Windows online Help.

If the remote connection is not enabled, the Production Side with Remote Desktop Connection cannot access the Upgrade Side in split mode.

(6) Configuring Remote KVM Console

Configure Remote KVM Console function.

Tips

Refer to *Chapter 3 (3. EXPRESSSCOPE Engine 3)* in *User's Guide* for details of remote management feature.

If remote KVM console feature is not enabled, the Production Side cannot access the Upgrade Side using remote KVM feature.

(7) Preparing an IP address to assign to the Upgrade Side

Prepare one IP address that meets the conditions below for Active Upgrade.

You need this IP address to connect to the Upgrade side via LAN while the system is in split mode.

- A network address that is the same as the one assigned to the duplexed LAN
- An unassigned, unused IP address

For how to configure IP address, see *Chapter 2 (1.5.3 (2) System IP Configuration on the Upgrade Side)*.

(8) Installing the Active Upgrade Console

Important

- **Your login account must be in the Administrators group to install the Active Upgrade Console.**
- **If you use Windows Firewall, install the Active Upgrade when the Windows Firewall service is running. If you install it when the service is not running, the Windows Firewall exceptions will not be added properly.**

To install the Active Upgrade Console, do the following:

1. Insert the Active Upgrade CD-ROM into the optical disk drive.
2. In the DVD file listing, double-click **install.exe** to start the installation utility.

   The Active Upgrade Software Setup Wizard is displayed.
3. Click **Next** to view the end-user license agreement.
4. If you agree to the terms of the license, click the radio button for **I accept the terms in License Agreement** and click **Next**.
5. Click **Install** to install the files.
6. Click **Finish** to close the wizard.

The setup process installs the Active Upgrade Console and associated files in C:\Program Files\ftsys\ActiveUpgrade.

It also creates **Active Upgrade Console** under **ftSys** of Start menu items under ftsys and a shortcut on your desktop.

(9) Configuring Windows Firewall for the Active Upgrade Process

The Active Upgrade Console requires network access to:

- Communicate with system components and underlying services in the ft control Software.
- Allow communication between the Production Side and the Upgrade Side while the system is split, so you can perform upgrade tasks.

If you have enabled Windows Firewall to protect your system, it might prevent you from using some of the features of Active Upgrade Console. Therefore, you should enable the exception for the Active Upgrade Console in your Windows Firewall settings.

Important **Install the Active Upgrade software while the Windows Firewall service is running. If the Windows Firewall service is not running, the installation process does not add an entry for the Active Upgrade Console to the list of Windows Firewall exceptions. In this case, uninstall Active Upgrade once, and install it again while the Windows Firewall service is running.**

(10) Copying Software Upgrade Packages to the System

When the system runs in split mode, the Upgrade Side has no access to the network, external storage, or data disks. You need to put the software upgrade package to be used on Upgrade Side on system disk before you split the system.

Tips If your software upgrade packages are on CD-ROM\/DVD, no action is necessary. You can access the DVD-ROM drive on the upgrade side while the system is in split mode.

(11) Verifying preparation

Before you start configuring the Active Upgrade process on your system, considering the following items:

- Did you decide the IP address for the Active Upgrade?
  This IP address should be the same network address that is allocated to duplexed LAN and should be a new one.
- After you complete this upgrade, will you ever want to run the same type of upgrade again?
  Save the configuration file so that you can use it again at a later upgrade process.
- Do you intend to incorporate other existing configuration files into the current configuration?
  You can use more than one configuration file at a time by nesting them.
- Which disks in your system contain the software you want to upgrade?
- Is there any disk that cannot or should not be upgraded?
  See *Chapter 2 (1.5.2 Preparing for the Active Upgrade Process*).
- Did you prepare the software upgrade packages you are going to run during the Active Upgrade process?
  You need to copy the software upgrade package to the system before initiating split mode.
- Do any of software upgrade packages require access to the network or data disks during the upgrade?
  If so, you cannot use them with Active Upgrade process.
- How do you start and stop applications on the system you want to upgrade?
  Use Application Services or Custom Actions (executables such as .bat, .exe, .vbs) to start and stop your applications at the appropriate times during the upgrade process. See *Chapter 2 (1.5.2 (4) Managing Applications during the Upgrade Process)* for details.
- Do you want to preserve event log entries that are generated on the Production Side while the system is running in split mode?
  These log entries are lost during the commit process, when the system resynchronizes RDR disks. If you want to save the files, see *Chapter 2 (1.5.3 (6) Selecting Event Log Files to Back Up)*.

When you finish confirmation, you can use the worksheet on the next page to record your configuration information.

Active Upgrade Process Worksheet

Item	Comment
IP address for Active Upgrade	
Configuration files to use	
Disks to upgrade	
Disks that cannot be upgraded	
Software installation utilities to run	
Application services to start/stop	
Custom actions to run	
Log files on Production Side to back up	

(12) Starting and Exiting the Active Upgrade Console

Important

- **Your login account must be in the local Administrators group to run the Active Upgrade Console.**
- **The Active Upgrade Console is not supported over remote connections. To start the Active Upgrade Console, disable remote connections, and then perform.**

Follow steps below to start or exit Active Upgrade Console.

(a) Starting Active Upgrade

To start the Active Upgrade Console, do one of the following:

- Double-click the **Active Upgrade Console** icon on your system's desktop.
- On the **Start** menu, click **All Programs**, select the **ftSys** folder, and click **Active Upgrade Console**.

(b) Exiting Active Upgrade

If you need to exit the Active Upgrade Console, click the close button ( ) in the upper right-hand corner of the window.

Important

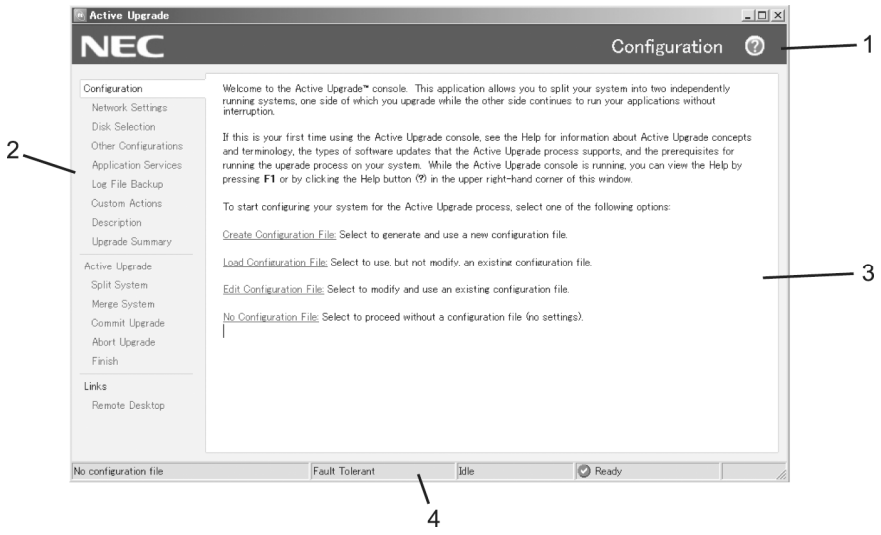
If you are currently editing a configuration file, save the file before exiting the Active Upgrade Console.

Tips

If you exit the Active Upgrade Console by mistake during an upgrade task, the program maintains its state. For example, if you exit the Active Upgrade Console while you are in the process of splitting the system, the split process continues to run in the background. You can safely restart the Active Upgrade Console to continue where you left off.

(13) Understanding the Active Upgrade Console Interface

The Active Upgrade Console window (see the figure below) is divided into four major parts: a title bar, a navigation bar, a main window, and a status bar.



Active Upgrade Console

1 Title bar

2 Navigation bar

3 Main window

4 Status bar

(a) Title Bar

The title bar displays the name of the current page of the Active Upgrade Console.

(b) Navigation Bar

The navigation bar displays your current location in the Active Upgrade Console.

If you are creating or editing a configuration file, the navigation bar also allows you to skip between configuration pages by clicking any item under the **Configuration** heading (see the figure below), or by clicking **Active Upgrade** to start a readiness test.

Navigation Bar: Opening a Configuration Page

After you initiate an upgrade (by clicking **Split** on the **Active Upgrade** page), the navigation bar reverts to a static mode, in which it only indicates where you are in the upgrade process and does not allow you to skip between pages. You must follow the upgrade steps (split, merge, commit, and finish) in order to complete the upgrade process, or you can abort the process altogether.

Menu items in navigation bar

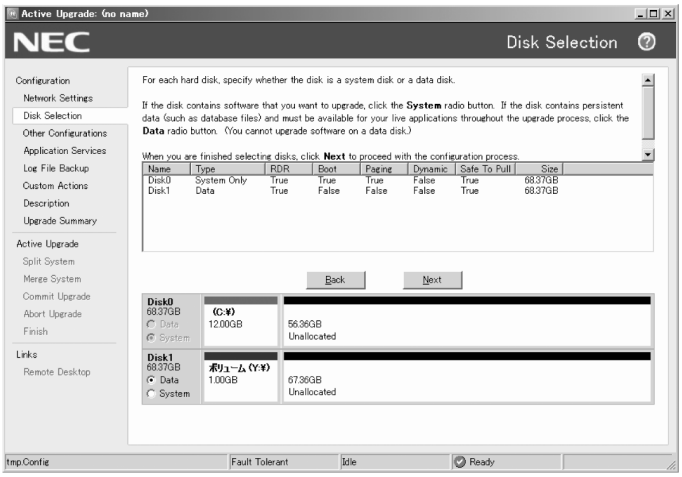
Menu item	Description
Configuration	Allows you to create, open an existing configuration file, or modify it.
Network Settings	Allows you to verify the system network configuration and to configure IP address of the Upgrade Side. **Important** **When you execute Active Upgrade for the first time, be sure to configure IP address of the Upgrade Side.**
Disk Selection	Allows you to select the disks that contain the software you want to upgrade.
Other Configurations	Allows you to select other configuration files that will be incorporated into the current configuration.
Application Services	Allows you to select the application services that need to be stopped and restarted during the upgrade process.
Log File Backup	Allows you to select the Event Log files from the Production Side that the Active Upgrade Console will preserve upon merging the system. (Otherwise, any event logs generated on the Production Side while the system is in split mode are lost when you commit the upgrade).
Custom Actions	Allows you to specify executables that the Active Upgrade Console can use to stop and start your applications.
Description	Allows you to specify a title and comments for the current configuration file.
Upgrade Summary	Displays a summary of the current upgrade configuration.
Active Upgrade	Allows you to perform a readiness test and, if applicable, to split the system for an upgrade.
Split System	Indicates that the system is entering split mode, and allows you to merge system resources (or abort the upgrade) after you finish running installation packages.
Merge System	Indicates that the system is entering merge mode, and allows you to commit (or abort) the upgrade after you have tested your changes.
Commit Upgrade	Indicates that the system is committing the upgrade, and allows you to finish the process by cleaning up ft series system resources.
Abort Upgrade	Indicates that the upgrade process has been aborted, and allows you to finish the process by cleaning up ft series system resources. (You can abort the upgrade process at the split mode or the merge mode prior to committing the upgrade.)
Finish	Indicates that the upgrade process is complete and allows you to save a copy of the activity log to a file, and exit the Active Upgrade Console.
Links:	– Remote Desktop Allows you to establish a Remote Desktop Connection session to the Upgrade Side while the system is split to perform upgrade tasks. – Remote KVM Allows you to set a **Remote KVM** session on the Upgrade Side while the system is split to perform upgrade tasks.

(c) Main Window

The main window allows you to configure and run the Active Upgrade process.

- Main Window: Configuring the Active Upgrade Process

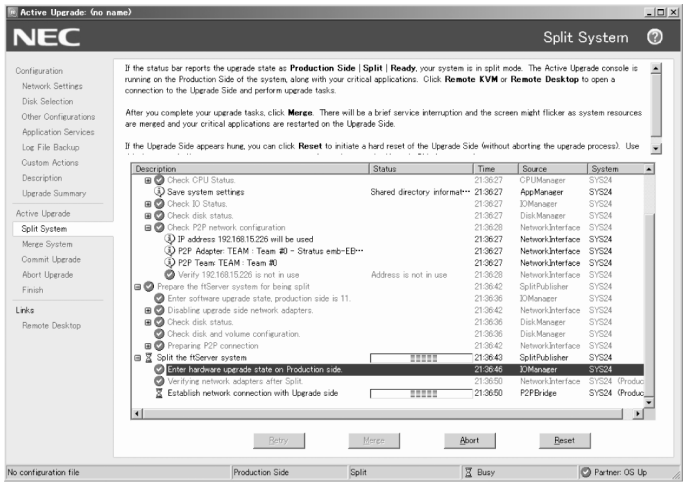
  During the configuration phase, main window allows you to specify settings for your system (see the figure below),
  The settings you have made can be saved in configuration file.



Main Window: Configuring the Active Upgrade Process

- Main Window: Activity Log

  When you perform a readiness test and begin the upgrade process, the configuration settings in the main window are replaced with an activity log (see the figure below) that allows you to track the progress and success of the Active Upgrade process.



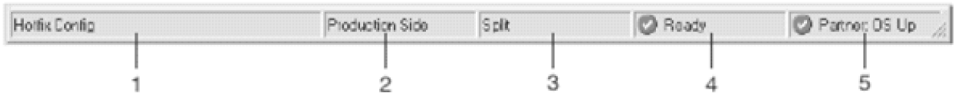
Main Window: Activity Log

Tips

For more information on viewing and interpreting items in the activity log, see *Chapter 2 (1.5.4 (9) Viewing Active Upgrade Process Status)*.

(d) Status Bar

The status bar (shown below), which is located at the bottom of the Active Upgrade Console window, reports a quick summary of the status of the upgrade.



Status Bar

1	Configuration file name	4	Operational State
2	Hardware State	5	Partner State
3	Upgrade State		

Tips

For more information about interpreting items in the status bar, see *Chapter 2 (1.5.4 (9) Viewing Active Upgrade Process Status)*.

1.5.3 Configuring the Active Upgrade Process

Configuring the Active Upgrade process involves the following tasks:

1. Creating and managing configuration files
2. Configuring the IP address for the Upgrade Side
3. Selecting disks to upgrade
4. Selecting other configuration files to include
5. Selecting application services to control
6. Selecting Event Viewer log files to back up
7. Configuring custom actions
8. Creating custom actions
9. Providing a description for a configuration file

(1) Creating and Managing Configuration Files

You can save settings for Active Upgrade process in configuration file.

If you frequently upgrade your system, you can create a configuration file to preserve your settings so you can perform similar upgrades as often as necessary. If applicable, you can create multiple configuration files.

In addition, you can call one or more existing configuration files from the configuration file you are currently editing, so that the settings from the called files will also apply to the file you are editing. This is called *nesting*.

You can save a configuration file in any folder.

Tips

The default location for Active Upgrade configuration files is:
c:\Program Files\ftsys\ActiveUpgrade\User Configurations

Active Upgrade Console accesses the folder which the user specified last when opening the file browser at the next time.

Important

You can save a configuration file to any disk – system or data, internal or external. The Active Upgrade Console automatically copies configuration files to a staging area before beginning the upgrade to ensure that they are available throughout the upgrade process.

(a) Creating a Configuration File

You can save settings for Active Upgrade process in configuration file.

To create a configuration file

1. On the **Configuration** page, click **Create Configuration File**.
2. In the **Create Configuration File** dialog box, specify a file name for the new file.

   When you save the file, a **.config** extension is automatically appended to the file name.
3. Select a directory to save the configuration file.
   You can specify any directory on the system.
   By default, \Program Files\ftsys\ActiveUpgrade\User Configurations is specified. When a new configuration directory is selected, the Active Upgrade console uses the new directory when a user creates or opens a file next time.
4. Determine the destination to save the configuration file and start editing the configuration file.

After you create a configuration file, the configuration process opens on the **Network Settings** page.

(b) Loading a Configuration File

Loading a configuration file allows you to open an existing configuration file for use. After you load a configuration file, you can view the **Upgrade Summary**, and, if applicable, proceed with the upgrade as configured, but you cannot modify the configuration.

Important

- **To modify a configuration file, use the Edit Configuration File option.**
- **The disk number might be changed in the ft server when CPU/IO module is switched. If the disk number differs from that assigned at creation of configuration file, the disk for the upgrade might be recognized incorrectly. Therefore, do not perform Active Upgrade with the loaded configuration file.**

To load a configuration file

1. On the **Configuration** page, click **Load Configuration File**.
2. Do one of the following to select the configuration file:
   - Enter the full path name and file name of the configuration file in the **Configuration File** field of the **Locate Configuration File** dialog box. (The .**config** file extension must be included).
   - Click **Browse** to specify the configuration file and click **Open**.
3. In the **Locate Configuration File** dialog box, click **Load** to open the configuration file.
   When you load a configuration file, the file opens on the **Upgrade Summary** page.

Tips

You can also drag a configuration file onto the **Configuration** page of the Active Upgrade Console window to load it.

(c) Editing an Existing Configuration File

You can open and edit a configuration file that you have previously saved. After you edit the configuration file, you can view the **Upgrade Summary**, and, if applicable, proceed with the upgrade as configured.

Important **The disk number might be changed in the ft server when CPU/IO module is switched. If the disk number differs from that assigned at creation of configuration file, the disk for the upgrade might be recognized incorrectly. Therefore, select a disk appropriately on Disk Selection window before performing Active Upgrade.**

To edit a configuration file

1. On the **Configuration** page, click **Edit Configuration File**.
2. Do one of the following to select the configuration file:
   - Enter the full path name and file name of the configuration file in the **Configuration File** field of the **Locate Configuration File** dialog box. (The .**config** file extension must be included).
   - Click **Browse** to specify the configuration file and click **Open**.
3. In the **Locate Configuration File** dialog box, click **Load** to open the configuration file.
   When you select a configuration file, the file opens on the **Network Settings** page.

(d) Performing an Upgrade with No Configuration File

If the upgrade you want to perform does not require any special settings, you can proceed without a configuration file.

Important **When you execute the Active Upgrade for the first time, you need to use the configuration file to update. You can upgrade without the configuration file only when you have executed the Active Upgrade with the configuration file before.**

For example, if you have only one system disk, and you just want to split the system briefly to test how an upgrade would affect the operating system without committing the changes, you might not need a configuration file.

To proceed without a configuration file

1. Open **Configuration** page.
2. Click **No Configuration File** on the **Configuration** page.
   The Active Upgrade Console immediately displays the **Active Upgrade** page and runs a readiness test.

Tips If your system meets the prerequisites for the Active Upgrade process, you can split the system at this time.

(e) Saving a Configuration File

The Active Upgrade Console automatically prompts you to save your configuration file if you leave the Configuration section of the application, or exit the application.

To save the configuration file, click **Yes**,

Otherwise click **No** or **Cancel**.

You can also optionally click **Save** or **Save As** on the **Upgrade Summary** page, as described in the following procedure.

To save the current configuration file

1. Click **Upgrade Summary** in the navigation bar.
2. On the **Upgrade Summary** page, do one of the following:
   - Click **Save** to save the configuration file with the name and path name you previously specified. Your file is saved.
   - Click **Save As** to save the configuration file with a new file name or path name. Continue to step 3.
3. In the **Save Configuration File** dialog box, specify a name for the new file. When you save the file, a .Config extension is automatically appended to the file name.
4. Select the directory in which to save the configuration file, and save the file.

(2) System IP Configuration on the Upgrade Side

Assign an IP address for Upgrade side of the system in split mode.

1. Open **Network Settings** page.

   Verify the configuration by checking the dual LAN configuration, status and the allocated IP address that appear on **Network Settings** screen.
2. In **Upgrade-side IP address** field in **Network Settings** page, enter the IP address for the Upgrade Side.

Important

- **Team adapter name or network adapter name may not be displayed appropriately in Name field of Network Settings screen. This has no effect on the Active Upgrade's operation.**
- **Available IP address for the Upgrade side system is as follows:**
  - IP address that belongs to the same network address as the one allocated to the duplexed LAN.
  - An unused IP address.

(3) Selecting Disks to Upgrade

In split mode, specify the disk that contains software you want to upgrade.

Use the **Disk Selection** page to select the disks that contain the software you want to upgrade with the Active Upgrade process.

On **Disk Selection** page, only disks mirrored with RDR are displayed.

Important

- **You cannot use a system disk for storing persistent data (for example, database files) related to your applications. Any new data written to the original system disk by the Production Side while the system is in split mode is overwritten when you commit the upgrade.**
- **You cannot upgrade software on a data disk.**
- **All external storage devices are automatically considered data disks.**

- System disk

  A disk that contains the system or application software you want to upgrade. Only disks marked as **System** will be available to the Upgrade Side while the system is split.

- Mandatory system disks

  The Active Upgrade Console automatically marks some disks as system disks. These mandatory system disks contain either boot files or paging files (virtual memory files) that are currently in use by the running operating system.

- Data disk

  A disk that contains persistent data for your applications. Any disk marked as **Data** will be available only to the Production Side while the system is split.

See *Chapter 2 (1.5.2 (2) Prerequisites)* for the Active Upgrade process for additional restrictions.

Volumes on the **Disk Selection** page are color-coded as described in the table below.

Hard Disk Color Coding

Color	Description
Black	Unassigned disk space
Blue	Data disk
Light Green	System disk
Dark Green	Mandatory system disk
Red	Disk is currently simplexed because it is being resynchronized with RDR

For more information about any volume, move your cursor over the volume to display ToolTip help.

(a) To select system and data disks

- For any disk you want to mark as a system disk, click the **System** radio button.
- For any disk you want to mark as a data disk, click the **Data** radio button.
- When you are finished selecting disks, you can click **Next** to proceed with the next configuration step.

Tips

Volumes can span multiple physical disks, and physical disks can contain multiple volumes. If a volume spans two or more disks, and you mark one of the disks that contains that volume as a system disk, any disk that contains a part of that volume automatically becomes a system disk.

(4) Selecting Other Configurations to Include

Use the **Other Configurations** page to optionally call one or more existing configuration files into the configuration file you are currently editing, so that the settings from the called files will also apply to the file you are editing. This is known as nesting files, or creating nest files.

The configuration files that you call into the current configuration file are *child configurations*, and the file from which you call the child configurations is the *parent configuration*.

(a) Potential uses for the nest files include:

- You create separate configuration files, each for upgrading a different application, which you can enable or disable as necessary in your parent configuration.
- You create a configuration file for an application that runs on several of your systems and call that file into a parent configuration file that is specific to each system.

The following restrictions apply to the nest files:

- Child configuration files must be located in the same directory as the call target files.
  When you select configuration files in the Active Upgrade Console, only the files in the current working directory are displayed.
- If a call-target configuration files have more than one child configuration files, they also become a part of your configuration.
- If a setting in a child configuration conflicts with a setting in the parent configuration, the Active Upgrade Console uses the setting in the parent configuration; the parent configuration always ignores IP address setting and disk selections from child configurations.
- If you call a configuration created on a different system, configuration items (such as application services and custom actions) must be present and applicable on the current system; otherwise, the parent configuration will fail the readiness test.

(b) To call a child configuration file into the current file

1. On the **Other Configurations** page, select the check box next to the configuration file(s) you want to call into the current file.
2. Check the setting at the bottom of the page and verify that you have selected the correct configuration files.
3. When you are finished editing the current configuration, save the configuration file.

   To remove a child configuration file from the current configuration, clear the check box next to that configuration file. (If you need to remove a child configuration from another configuration file, you must edit that configuration file separately.)

When you have finished specifying child configuration files, you can click **Next** to proceed with the next configuration step.

(5) Selecting Application Services to Control

Use the **Application Services** page to select the application services you want the Active Upgrade Console to automatically stop and restart during the upgrade process.

If you select a service on the **Application Services** page, the Active Upgrade Console controls the service as follows:

- When the system is split, the console stops the service on the Upgrade Side, saves its current **StartupType**, and changes the **Startup Type** to **Disabled**. This helps to prevent application errors associated with the Upgrade Side losing access to data disks and the network while the system is split.
- When the system is merged, the console stops the service on the Production Side, restores the previous Startup Type for the service on the Upgrade Side, and starts the service on the Upgrade Side. This ensures continuous availability of the service, enables comprehensive testing on the Upgrade Side, and prevents any conflicts associated with two instances of a service running at the same time.
- When an upgrade is aborted, and if the system is in merge mode, the console shuts down the Upgrade Side to stop the service automatically. The console automatically restarts the Production Side based on its default **Startup Type**. This restores the system to its previous, fault-tolerant state.

Important

- **Standard operating system services do not require control during the Active Upgrade process. Select only services that are related to your applications (such as Exchange Server or SQL Server).**
- **The Active Upgrade Consol never changes the default Startup Type for a service on the Production Side. Maintaining the default Startup Type on the Production Side ensures that a service will always be able to restart on the Production Side if the upgrade process is aborted or failed.**

Each service on **Application Services** page has a checkbox to indicate three states as shown below:

Selection of Application Services

Check Box State	Description
Cleared	Not selected.
Checked	Selected in the current configuration file.
Checked (Gray)	Selected in a child configuration file. If applicable, you can edit the child configuration to deselect it.

(a) To select a service for the Active Upgrade Console to control

1. On the **Application Services** page, find a service you want to stop and start.
2. Click the check box to the left of the service name.
3. Repeat these steps for each service you want to stop and restart.

   To deselect a service, clear the check box to the left of the service name.

(By default, the services on the **Application Services** page are listed alphabetically. If you prefer to sort them by other criteria, click on one of the column headings. For example, if you want to group services by those you have selected and not selected, click the heading above the check boxes.)

When you have finished selecting services to control, or if you have no services to control, you can click **Next** to proceed with the next configuration step.

(6) Selecting Event Log Files to Back Up

Use the **Log File Backup** page to optionally preserve Windows Event log files from the Production Side of your system before committing an upgrade.

When you commit an upgrade, the system reestablishes the RDR mirrors of any system disks by overwriting the Production Side disks (which contain the old version of your software) with the newer Upgrade Side disks (which contain your newly-upgraded software). Because the event log files on the Production Side are lost during this process, you might want to preserve them for future reference. These log files will contain the only record of log messages your live applications generated while the system was split.

The **Log File Backup** page allows you to select from all event logs available in the Windows Event Viewer.

Tips

For information about creating a Custom Action that preserves other files from the Production Side system disk, see *Chapter 2 (1.5.3 (7) Configuring Custom Actions)*.

(a) Saving Event log files

1. Specify a directory in which to save the files by doing one of the following:
   - In the **Staging Directory** dialog box, type the full path name of the directory.
   - Click **Browse**. Click the folder to save the file and click **OK**.

Important

- **You must save the files to a disk that is available to the Production Side while the system is split — either a data disk or an external disk. Do not save the files to a system disk or network disk.**
- **There is no default directory. You must specify a directory, otherwise, the Active Upgrade Console displays a warning message.**

2. Click the check box to the left of the log name to preserve the file.

   When you have finished selecting Event log files to preserve, or if you have no event log file to save, you can click **Next** to proceed with the next configuration step.

(7) Configuring Custom Actions

Use the **Custom Actions** page to customize the way that the Active Upgrade process will run in your environment. You can create custom actions to perform the following types of tasks:

- Start or stop the application by using special executables during the Active Upgrade process.

  If you use special executables to start and stop your applications, you can use the controls on Custom Actions page to specify when these executables will run during the upgrade process.

  If you have several executables, you can specify the order to run.

- Check if a certain condition exists before starting the Active Upgrade process.

  You can verify if the critical backup has completed, or if the system load on the system is acceptable.

- Backup files during the upgrade process.

  Any files that are modified on the Production Side system disks while the system is in split mode are lost during the commit process, when the RDR mirrors are resynchronized. If applicable, you can write a program to save copies of important files before you commit an upgrade. For example, you can save a copy of an application-specific log file that does not appear in the system Event Viewer. (For information about saving Event Viewer logs, see *Chapter 2 (1.5.3 (6) Selecting Event Log Files to Back Up)*.

By default, the **Custom Actions** page supports executables that are batch files (.bat) or application files (.exe). If you want to use a Visual Basic script (.vbs), see *Chapter 2 (1.5.3 (8) Programming Notes for Custom Actions)* for special instructions.

Important

- **Custom actions run consecutively when called. If one action fails to terminate, it might prevent the next action from executing, and, ultimately, prevent the upgrade process from continuing. When you specify an executable for a custom action, verify that it runs successfully outside of the Active Upgrade process, and ensure that it completes in a timely manner.**
- **Executables for custom actions must be located on a system disk. If an executable is located on an external or network disk, the Upgrade Side will lose access to the executable while the system is in split mode.**
- **For information about writing your own programs for custom actions, see *Chapter 2 (1.5.3 (8) Programming Notes for Custom Actions)*.**

(a) To configure a custom action

1. On the **Custom Actions** page, do one of the following:
   - In the **File** field, type the full path name and file name of the executable file you want to run. (The file must already exist on the system disk.)
     Example: C:\bin\mybatchfile.bat
   - Click **Browse** to select the executable file, and click **Open**.
2. Next to **Arguments**, type any arguments that you need to run with your executable.
   See *Chapter 2 (1.5.3 (8) Programming Notes for Custom Actions)* for information about passing optional Active Upgrade environment variables to your executable.
3. In the drop-down list for **Control type**, select the option that best describes when the Active Upgrade Console will execute your custom action, as discussed in the below table.

Control Types for Custom Actions

Control Type	Purpose
Start Application	Executes the custom action whenever the Active Upgrade Console needs to start applications. For example, the console needs to restart applications on the Upgrade Side when you merge the system.
Stop Application	Executes the custom action whenever the Active Upgrade Console needs to stop applications. For example, the console needs to stop applications on the Upgrade Side when you split the system. It also stops applications on the Production Side when you merge the system.
Readiness Check	Executes the custom action once during the readiness check, before you initiate the Active Upgrade process. This control type allows you to build your own verifications into the readiness check.
Advanced	Executes the custom action during every step of the Active Upgrade process, including interim steps such as PrepareSplit and PrepareMerge, which occur prior to the Split and Merge operations. This control type allows you to have more precise control over a custom action. Your executable will run each time the Active Upgrade process switches states, but you can write a program with conditional statements based on Active Upgrade environment variables to specify exactly when and where particular tasks should be executed. For example, you can write a conditional statement that will trigger only on the Upgrade Side if the system is in merge mode. See *Chapter 2 (1.5.3 (8) (b) Using Active Upgrade Environment Variables)*. If you have more than one custom action, the Advanced control type also allows you to control the order in which the custom actions are executed (Timing drop-downn list).
Backup	Executes the custom action when the system is merged, allowing you to back up files that were modified on the Production Side system disk while the system was in split mode (before these files are lost during the commit process).

If you selected the **Advanced** control type, optionally select an item from the **Timing** drop-down list which best describes the order in which you want this custom action to run with your other custom actions. The below table, "Timing for the Advanced Control Type", describes the timing options. If the timing does not matter, keep the **Default** setting.

Important **The Timing will not affect the order in which custom actions run with other Active Upgrade tasks. Use this option only if you want to ensure that one custom action runs before or after another custom action.**

Timing for the Advanced Control Type

Timing	Purpose
Default	Executes the custom action in the default, consecutive order.
Before	Executes the custom action early in the list of custom actions, before items marked as Default or After.
After	Executes the custom action early in the list of custom actions, after items marked as Before or Default.

Tips Your custom actions will run consecutively according to their timing options. Subsequent custom actions will not start until the current custom action terminates.

4. Click **Add** to determine the custom action.

   If the **Add** button is inactive, ensure that you typed the **File** path name and executable name correctly.

You can view the custom actions you have created at the bottom of the **Custom Actions** page. If you want to remove a custom action from the list, select it and click **Remove**.

When you have finished specifying custom actions to run, or if you have no custom actions to specify, you can click **Next** to proceed with the next configuration step.

(8) Programming Notes for Custom Actions

The following topics describe some of the features available for programming and monitoring custom actions:

- *Starting and stopping applications ((8) (a))*
- *Using Active Upgrade Environment Variables ((8) (b))*
- *Generating Exit Values ((8) (c)*
- *Viewing Standard Output and Error Stream ((8) (d))*
- *Executing Visual Basic Scripts ((8) (e))*

(a) Starting and stopping applications

If you need to start or stop an application during the upgrade process, write a batch program to control a application.

If necessary, change the **Startup Type** setting to Disabled, or restore the default **Startup Type** setting. If you do not disable the default startup type for an application, it might interfere with or override your custom action.

During the upgrade process, ensure that your program not only stops and starts the application at the appropriate times, but also **disables** and **enables** the default startup mechanism for the application (for example, the default **Startup Type** setting in the Services Control Manager or a startup item in the system registry).

Tips See *Chapter 2 (1.5.3 (5) Selecting Application Services to Control)* for information about how the Active Upgrade Console changes the **Startup Type** for application services.

(b) Using Active Upgrade Environment Variables

You can optionally use the environment variables specified in the below table in any executable that you write for a custom action. These environment variables are useful if you want to write a conditional statement in your executable that, for example, runs only on a particular side of the system or only during a particular stage of the Active Upgrade process.

Environment Variables for Custom Actions

Environment Variable	Description
ACTIVE_UPGRADE_SIDE	Describes the side of the system on which the program is running. Values: Production, Upgrade
ACTIVE_UPGRADE_STATE	Describes the current upgrade state. Values: Idle, PrepareSplit, Split, PrepareMerge, Merge, Commit, Abort
ACTIVE_UPGRADE_REQUEST	Describes the next upgrade task that the Active Upgrade Console will execute. Values: Idle, CheckReadiness, PrepareSplit, ExecuteSplit, PrepareMerge, ExecuteMerge, Commit, Abort, Start, Stop, Backup
ACTIVE_UPGRADE_HW_SPLIT	Describes whether or not the ft series system is running in split mode. Values: Yes, No

If you want these environment variables to be available to your executables, you must pass the variables to each executable in which you will use them.

For example, to pass only the ACTIVE_UPGRADE_SIDE variable to an executable, append the following string to the **Arguments** for the custom action on the **Custom Actions** page:

%ACTIVE_UPGRADE_SIDE%

To pass multiple variables, add a space between each variable, as follows:

%ACTIVE_UPGRADE_SIDE% %ACTIVE_UPGRADE_REQUEST%

(c) Generating Exit Values

An exit value of 0 indicates that the executable exited normally.

Any other exit value indicates that there was an error, which will prevent the Active Upgrade process from continuing with the current upgrade request. If this happens, you must correct the problem and click **Retry** in the Active Upgrade Console to retry the current upgrade request (which also runs the custom action again). The Active Upgrade process will not continue until the executable for your custom action runs successfully.

(d) Viewing Standard Output and Error Stream

After your program executes, you can view standard output and error output from the program in the Active Upgrade Console, as follows:

1. In the activity log, expand an **Execute custom actions** node.

   There can be more than one **Execute custom actions** node, depending on the types of custom actions you have created. Find the node for the upgrade stage in which your custom action was set to run.

2. Double-click a specific custom action to display more information about it.

3. In the detail window, view the output for your program under **Status**.

   If necessary, scroll down in the **Status** box to see the full output. Or move your cursor over the **Status** box to view the output as **ToolTip** help.

Tips

If you save the activity log to a file, you can also view the output in that file. Refer to *Chapter 1 (8.11 (1) Saving the Activity Log to a File)* in *Maintenance Guide* for more information.

(e) Executing Visual Basic Scripts

By default, the **File** field on the **Custom Actions** page accepts only batch files (.bat) and application files (.exe). If you want to use a Visual Basic script (.vbs) on the **Custom Actions** page, you need to specify the command-line based script host (cscript.exe) in which the executable will run.

When performing the procedure in *Chapter 2 (1.5.3 (7) Configuring Custom Actions)*, do the following:

- Next to **File**, type:

  %SystemRoot%\system32\cscript.exe

  (%SystemRoot% is an environment variable that automatically inserts your system root directory, typically C:\WINDOWS.)

- Next to **Arguments**, type the full path name and file name of the executable. For instance:

  C:\bin\myvbscript.vbs

If applicable, you can type additional arguments that are specific to your script file or options that are specific to the cscript session.

For example, you might want to specify the //T option for the cscript session to control the maximum amount of time your executable is allowed to run:

C:\bin\myvbscript.vbs //T:30

The preceding example would terminate the executable and cscript session after 30 seconds. Setting this type of time limit is a useful way of ensuring that your executable will not delay the upgrade process.

For more information about the cscript command, open a **Command Prompt** session and enter **cscript /?**

(9) Providing a Description for a Configuration File

Use the **Description** page to specify a title and comments for your configuration file.

These items appear on the **Other Configurations** page, the **Upgrade Summary** page, and in the **Locate Configuration File** dialog box when you are selecting a configuration file to load or edit.

Type a brief summary next to **Title**, and type additional details next to **Comments**.

When you have finished providing a description for the configuration file, you can click **Next** to proceed with the next configuration step.

(a) Displaying the Upgrade Summary

When you finish creating a new configuration file, or when you load or edit an existing configuration file, you can display a summary of the upgrade configuration that the file contains.

To display the upgrade summary, click **Upgrade Summary** in the navigation bar of the Active Upgrade Console. The summary window displays information including:

- Configuration file name, title and description
- The IP address to add to the upgrading system
- Disks you selected for the upgrade
- Other configuration files called by the current file
- Application services to launch and exit
- Custom actions to run
- Event log files to back up

If applicable, you can also save the current configuration file from the **Upgrade Summary** page.

When you are finished viewing the Upgrade Summary, and, if necessary, saving the configuration file, you can click **Next** to proceed with the Active Upgrade process.

If you have changed your configuration file since you last saved it, the Active Upgrade Console displays a message indicating that you should save the file. To save the file, click **Yes**, otherwise click **No** or **Cancel**.

In the next step, the Active Upgrade Console runs a readiness check to verify that your system meets the prerequisites for upgrade. If necessary, you can abort the process before you split the system (or at the split mode or the merge mode until you commit the upgrade).

1.5.4 Performing the Upgrade

Performing the Active Upgrade process can involve the following tasks:

1. Performing a Readiness Check
2. Splitting the System
3. Verifying the Upgrade Side Before Merging the System
4. Merging the System
5. Verifying the Upgrade Side Before Committing the Upgrade
6. Committing the Upgrade
7. Finishing the Upgrade
8. Aborting the Upgrade (if necessary)
9. Viewing Active Upgrade Process Status

(1) Performing a Readiness Check

Before you can initiate split mode on a system, the system must pass a readiness check.

(a) Check items

The readiness check verifies that your system meets the prerequisites for the Active Upgrade process. For example, the readiness check ensures that:

- The system is currently running in the duplex mode.
- The disks you selected as the system disks are present and are mirrored with RDR.
- The embedded LAN in your system are duplexed.
- The IP address configured to the system of the Upgrade Side must be an unused one, and this IP address is the same network address as the one duplexed LAN.
- The application services you specified for control are currently running, and can be exited when necessary.
- The executables for any custom action are present on the system disk and are ready to run.

(b) Checking method

To perform a readiness test, choose to do **one** of the following:

- Click **Next** on the **Upgrade Summary** page (if you are using a configuration file).
- Click **Active Upgrade** on the navigation bar (the readiness test starts automatically if you have recently opened or changed your configuration).
- Click **No Configuration File** on the **Configuration** page.

The activity log reports the overall results of the readiness check as well as the results for each individual test. The below list describes the general meaning of the activity log entries.

Activity Log Entries

Icon	Text Color	Severity	Description
	Green	Success	Task completed without error
	Black	Pending	Task is in progress
	Black	Information	Task information, no action necessary
	Black	Warning	A problem that should be addressed, but will not block an upgrade
	Red	Error	A problem that must be corrected before continuing with upgrade

The status bar at the bottom of the window will indicate one of the following states for the current operation:

Status bar indication

Icon	State	Description
	Busy	A readiness check is in progress. Allow time for the task to complete.
	Ready	The system meets the prerequisites for the Active Upgrade process. You can proceed with the upgrade process by splitting the system.
	Broken	One or more components in the system does not meet the prerequisites for the Active Upgrade process. You must resolve the problem before you can continue with the upgrade.

For more information about interpreting Active Upgrade status, see *Chapter 2 (1.5.4 (9) Viewing Active Upgrade Process Status)*.

Countermeasure

- When readiness check finishes successfully

  If the check is successful, you can click **Split** to proceed with splitting the system. See *Chapter 2 (1.5.4 (2) Splitting the System)*.

- When readiness check fails

  If one of the readiness tests fails, you must resolve the problem, then click **Retry** to run the readiness test again. When the problem is resolved, you can click **Split** to proceed with splitting the system.

(2) Splitting the System

Splitting an Express5800/ft series system divides it into two independently-functioning systems: the Production Side, which continues to run your applications, and the Upgrade Side, which you can safely upgrade.

Splitting the system:

- Disables RDR mirroring between the internal disks in each CPU/IO module enclosure
- Detach the Upgrade Side from system resources such as the network, any user-specific application data disks, and any external PCI resources (such as an external storage).
- Disables any user-specified applications and services on the Upgrade Side so they cannot restart if you restart the operating system on the Upgrade Side.

You can split a system only if it meets the prerequisites for the Active Upgrade process and has passed the readiness check.

(a) Notes on Splitting the System

- If you need a network resource to obtain any software installation packages you intend to run, put the software on one of the system disks **before** you initiate split mode.
  When in split mode, the Upgrade Side has no access to the network; the Upgrade Side can only access to the system disk.
- Do not stop DHCP Client service.
  Splitting the System fails if DHCP Client service stops.
- Split the system only when you are sitting at the Active Upgrade console.
- To start the Active Upgrade Console, disable remote connections, and then perform.
  The Active Upgrade Console is not supported over remote connections.
- Do not perform any hardware maintenance, including the removal of either CPU/IO module, after you have initiated the Active Upgrade process.

(b) To split the system

1. Ensure that you have addressed any errors or warnings that were indicated by the readiness check.
2. Exit any non-essential applications.
3. Click **Split** on the **Active Upgrade** page.

Important

Do not select Abort to interrupt the Active Upgrade process. The interruption could fail and the duplex may not complete. If the interruption failed, finish the interruption normally according to the following procedures.

1. **Select the Upgrade Side's PCI module on the ft server utility.**
2. **Verify if Status of the Upgrade Side's PCI module is Terminate.**
3. **Select Boot to start the Upgrade Side's PCI module.**
4. **Select Retry on the Active Upgrade console to finish the interruption process.**

When the system successfully enters split mode:

- Active Upgrade Console continues to run on the Production Side of the system.
- The Active Upgrade Console switches to the **Split System** page.
- The upgrade state, reported in the status bar, is **Production Side\Split\Ready**, indicating that the system is currently split and ready to be merged after your software installation.
- Manage upgrade tasks on the Upgrade Side.
- Verify the Upgrade Side before merging the system.

Important

- **Throughout the upgrade process, icons will appear and disappear in the system tray as PCI devices, such as LAN card, are reconfigured or disabled for the current upgrade operation. This is normal. Do not attempt to enable or reconfigure any of these PCI devices while the upgrade session is in progress.**
- **If your system is running EMC® PowerPath® software for an external storage system, you might experience a brief delay (10-15 seconds) when the system splits, as PowerPath reroutes storage operations through the Production Side.**
- **If the Firewall setting is not appropriate, the split process could fail. If this occurs, select Abort to terminate Active Update. After the Active Upgrade is finished, automatic duplex processing is executed. When this duplex processing is completed, execute the Active Upgrade again.**

When the system fails to enter split mode:

- If the split process fails the first time, you can click **Retry** to try again.
- If the problem persists, you can click **Abort** to abort the upgrade process
  Refer to *Chapter 1 (8. Troubleshooting)* in *Maintenance Guide* for information about resolving the problem.

To perform upgrade tasks, you must establish a remote connection to the Upgrade Side, as explained in *Chapter 2 (1.5.4 (2) (c) Managing Upgrade Tasks on the Upgrade Side)*.

Tips

After you establish a connection to the Upgrade Side, you can check the status of your application services on the Upgrade Side, to verify that they have been stopped by the Active Upgrade Console. Refer to *Chapter 1 (8.11 (2) Verifying the Status of Application Services)* in *Maintenance Guide*.

(c) Managing Upgrade Tasks on the Upgrade Side

While the system is in split mode, you can perform any of the following upgrade tasks on the Upgrade Side:

- Run software installers and updaters (see *Chapter 2 (1.5.4 (2) (g) Running Software Installers)* and *Chapter 2 (1.5.2 (1) Software Upgrade Support)* for restrictions).
- Restart the operating system, if necessary (see *Chapter 2 (1.5.4 (2) (h) Restarting the Upgrade Side)*).
- Perform limited testing of the installed updates (see *Chapter 2 (1.5.4 (3) Verifying the Upgrade Side Before Merging the System)*).

Because the Active Upgrade Console itself runs on the Production Side of the system, you need to establish a remote connection to the desktop on the Upgrade Side before you can complete any of these upgrade tasks, as explained in *Chapter 2 (1.5.4 (2) (d) Connecting to the Desktop on the Upgrade Side)*.

If necessary, you can also abort the upgrade process from the Active Upgrade Console on the Production Side.

(d) Connecting to the Desktop on the Upgrade Side

While the system is in split mode, the Active Upgrade Console runs on the Production Side of the system. To perform upgrade tasks, you must establish a remote connection to the Upgrade Side.

You can access the Upgrade Side using one of two methods:

- Remote KVM

  Allows you to transfer the Upgrade Side's console to the Production Side's browser with BMC remote KVM console. Allows you the complete access from the Production Side to the Upgrade Side using the video, keyboard and mouse.

- Remote Desktop

  Allows you to control the keyboard, video and mouse of the Upgrade Side through the Windows Remote Desktop component. You might prefer this option if you are more familiar with it, or if it runs faster in your environment.

Tips

See the following topics for more information.

- *1.5.4 (2) (e) Connecting to the Upgrade Side with Remote KVM*
- *1.5.4 (2) (f) Connecting to the Upgrade Side with Remote Desktop*

Important

- **Before connecting to the Upgrade Side from the Production Side by using Remote Desktop or Remote KVM, you need to complete the Split operation appropriately and check no error is output on the activity log. If Remote Desktop or Remote KVM is used during the Split operation, the connection may fail. If this occurs, retry the connection after the Split.**
- **Active Upgrade Console that appears on the Upgrade Side is just for monitoring the status such as Remote Activity Log under Active Upgrade Operation Check – Activity Log in many cases. However, the Active Upgrade Console looks like the console of the Production Side in some cases. In such a case, you need to care following issues.**
  Never select any buttons (such as Abort or Merge) or any links (such as Remote Desktop) on the Active Upgrade Console of the Upgrade Side when in split mode. If you inappropriately select any of them, you may face an error or will not be able to refer to the data drive after the merge is completed. When this kind of trouble occurs, you need to take following procedures.
  - **When operation is unavailable because of the error, execute the same operation again from the Active Upgrade Console of the Production Side.**
  - **When the data drive cannot be referred to the merge status, select Retry button and execute merge operation again. If you can't refer data drive after retrying the merge, select Abort button to exit the Active Upgrade, then again execute the Active Upgrade.**

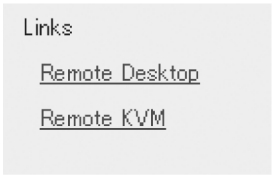
(e) Connecting to the Upgrade Side with Remote KVM

Connecting to the Upgrade Side with Remote KVM allows you to control the keyboard, video, and mouse of the Upgrade Side using the BMC remote console feature.

To initiate a Remote KVM session with the Upgrade Side

Important **When you use Remote KVM session, you need to prepare the setting of the Remote KVM before starting the Active Upgrade. Refer to *Chapter 3 (3. EXPRESSSCOPE Engine 3)* in *User's Guide* for the Remote KVM settings.**

1. Click **Remote KVM** on the navigation bar of the Active Upgrade console on the Production Side.



2. If a warning indicating that the Web site is being blocked is displayed, click **Add**. In the **Trusted Sites** dialog box, add the Web site to the Trusted Sites. If a warning is displayed when adding to the trusted sites, click **Close** or **OK** to close the warning.
3. After logging in, select **Remote Device** and select **Remote KVM**.
4. When the login screen for the Upgrade Side system is displayed, click the **Ctrl-Alt-Del** button on the Remote KVM Console window and log in to the system.

To terminate a Remote KVM session with the Upgrade Side

1. Verify that the install processing is completed as well as the install program is all finished.
2. Select **X** on the upper right-hand side of the Remote KVM console to close the window.
3. Select **Logout** on the upper right of the main window and log out from the main window.
4. Close the browser window with login page.

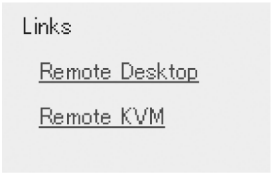
Tips Terminating the Remote KVM is not mandatory. You can merge the system while maintaining the Remote KVM connection.

(f) Connecting to the Upgrade Side with Remote Desktop

Remote Desktop allows you to control the keyboard, video and mouse of the Upgrade Side through the Windows Remote Desktop component.

To establish a Remote Desktop Connection to the Upgrade Side

1. Click **Remote Desktop** in the navigation bar of the Active Upgrade Console on the Production Side. The system opens a **Remote Desktop Connection** window.



2. When the window displays the login screen for the remote system, enter your administrative username and password and click **OK**.

   The Upgrade Side desktop is displayed.

For more information on what you can do, such as on the Upgrade Side after establishing the remote connection, and how to merge the system after completing the upgrade process, each connection, see the related topics.

If you maximize the Remote Desktop connection window, its title bar (which displays the IP address of the Upgrade Side as well as minimize, maximize and exit buttons), might disappear from view. Only the Upgrade Side desktop will be displayed, as if it is your local desktop.

Tips

The Remote Desktop title bar is a helpful reminder that you are using the Upgrade Side desktop. If you have maximized the window for Remote Desktop and you want the title bar to be displayed for the duration of your connection, click the pin button (pushpin) on the left side of the title bar. (The pin button is displayed only when the window is maximized.)

For more information about managing a Remote Desktop session, refer to the Windows online Help.

To terminate a Remote Desktop Connection to the Upgrade Side

1. Verify that all your software upgrades are complete.
2. From the **Start** menu of your remote session, select **Disconnect**.

Tips

If you are about to merge the system, you can remain logged on to maintain the current desktop session. After the merge, you will be using the Upgrade Side desktop.

(g) Running Software Installers

The following topics describe how to run software installers on the Upgrade Side while the system is split:

Important **Before installing any software, ensure that you are working on the Upgrade Side desktop (through a remote connection). Do not install software on the Production Side.**

Tips To review the types of upgrades that Active Upgrade technology supports, see *Chapter 2 (1.5.2 (1) Software Upgrade Support)*.

Windows Automatic Updates

If you are using Windows Automatic Updates, and you previously downloaded all of the required software updates, the Automatic Updates icon should be present in the system tray, and it should report that updates are ready for your computer.

To apply the downloaded updates

1. Click on the Automatic Updates icon in the Upgrade Side system tray to display the **Automatic Updates** dialog box.
2. Select the radio button for **Custom Install** and click **Next**.
   The next page displays a list of the updates you downloaded and allows you to select which ones will be installed at this time.
3. Select only the updates that you previously checked for compatibility with your Express5800/ft series system, then click **Install**.
   During the installation process, the **Automatic Updates** dialog box minimizes to the system tray. When the installation is complete, you can display the dialog box again. It should report that all updates were successfully installed.

Some updates might require you to restart the operating system on the Upgrade Side.

You can restart the Upgrade Side as many times as necessary to complete the installation; however, you might want to avoid restarting until you have run additional installers to reduce the total number of times you need to restart.

Other Installation Packages

If you previously downloaded individual software installers to a system disk, open the Upgrade Side folder that contains those installer files. Run each installer one at a time.

Some installers might require you to restart the operating system on the Upgrade Side. You can allow these installers to restart the Upgrade Side automatically, or you can manually restart later.

(h) Restarting the Upgrade Side

When the system is running in split mode, if necessary, you can restart the operating system on the Upgrade Side at any time. You can either allow a software installer to restart the system automatically or you can perform the following procedure to restart the system manually.

Important **Before you restart the system, ensure that you are working on the Upgrade Side desktop (through a remote connection). Do not restart the Production Side.**

To manually restart the Upgrade Side

1. On the Upgrade Side, click **Shut Down** in the Start menu.
2. In the **Shut Down Windows** dialog box, select **Restart** from the drop-down menu and click **OK**.

When using Remote KVM

If you are using **Remote KVM**, the session will remain connected while the Upgrade Side is restarting; however, you must log on again when the Upgrade Side is finished restarting.
To send the Ctrl-Alt-Del key sequence necessary for login, use a virtual keyboard.

When using Remote Desktop

If you are using **Remote Desktop Connection**, the connection to the Upgrade Side is terminated, and the Production Side desktop is displayed. While the Upgrade Side is restarting, you can view its status in the activity log and the status bar of the Active Upgrade Console. When the console displays the message **Partner: OS Up**, you can click **Remote Desktop** to log on to the Upgrade Side again.

Important **When you restart the Upgrade Side, the following activity log may be displayed on the Active Upgrade Console:**


Partner（Upgrade）state is now Hung: Unknown.


Unexpected state transition in Split state.

There may be an output of these activity logs even when the Upgrade Side's restart completed normally.

If the following activity logs are displayed after about five minutes, select Retry to retry the split process so that you can continue the Active Upgrade.


Partner (Upgrade) state is now Running OS.


Reestablished network connection with Upgrade side.

If there is no output of those activity logs, select Abort to interrupt the Active Upgrade.

Tips Though the Active Upgrade Console reports that the Upgrade Side operating system is up, it might take another minute or two for all services to finish loading and for login to be possible.

(i) Resetting the Upgrade Side Hardware

If the Upgrade Side system hangs up while the system is operating with the Split mode, you can reset the Upgrade Side hardware by clicking **Reset** button.

By resetting the Upgrade Side hardware, the system recovers.

Important

- **Do not reset the Upgrade Side hardware on the following cases:**
  - **When the Upgrade Side does not reboot properly.**
  - **When the remote connection from Production Side to the Upgrade Side does not set up properly.**
  - **When the Upgrade Side hangs up.**
- **If you reset the hardware while the Upgrade Side is working properly, the Upgrade side may not launch properly. If this occurs after resetting the hardware, press Abort button to interrupt the Active Upgrade, then retry the Active Activate from the start.**
- **Do not reset the hardware while split. If the hardware is reset while split, the spilt may fail. If this occurs, select Abort button to interrupt the Active Upgrade, then retry the Active Upgrade.**

(j) Managing Your Applications on the Production Side

- While the system is split, you can continue to access and use your applications on the Production Side

Important

- **You must avoid doing any of the following on the Production Side desktop:**
  - **Installing or upgrading software.**
  - **Creating or modifying any files on the system disk, including the system registry.**
  - **Restarting the operating system.**
- **Any changes you make to files on the Production Side system disks will be lost during the commit process, because the system overwrites these system disks (which contain the old version of your software) with the newer Upgrade Side disks to complete the upgrade. If you need to preserve files from the original system disks, you can save them to a data disk.**
- **Be careful when switching between the Production Side desktop and the remote connection to the Upgrade Side desktop. When you resume software installation or restart the system, always ensure that you are on the Upgrade Side.**

(3) Verifying the Upgrade Side Before Merging the System

After you have upgraded or installed software on the Upgrade Side, you can perform limited testing on the Upgrade Side system disks.

Important **Before merging system, the following resources are unavailable on Upgrade Side. You can perform limited testing on the Upgrade Side system disks, as long as your activities do not require access to the following resources, which are currently unavailable:**
– Network
– External storage
– Data disks

Verification before merging system

- Verify the presence and version number of each software package
  (Refer to *Chapter 1 (8.11 (3) Verifying the Status of Installed Software)* in *Maintenance Guide*.
- If possible, verify that you can start the applications you installed or upgraded.
- If possible, configure the settings for any applications you installed or upgraded.

If you are satisfied:

- You can merge the system to stop your applications on the Production Side and restart them on the Upgrade Side for final verification.

If there are any problems:

- You can abort the upgrade to return the system to its original state.
  Aborting the upgrade while the system is in split mode will not incur downtime, because your applications are still running on the Production Side.

(4) Merging the System

After finishing to perform the upgrade tasks on the Upgrade Side of the system, you can merge the system to verify your changes before you permanently commit them.

Merging the system:

- Stops your applications and services on the Production Side.
- Merges system resources so that the network, external storage, and data disks become available to the Upgrade Side.
- Restarts your applications (including the Active Upgrade Console) from the Upgrade Side.

Important **If you are using Backup Exec, perform merge process after the system is split and the OS restarts.**

If you do not restart the OS on the Upgrade Side, merge process may fail. If it failed, press Abort to finish the Active Upgrade. After the Active Upgrade, the duplex process will be done automatically; after the duplex process is done, retry the Active Upgrade.

(a) To merge the system

1. Verify that all upgrade processes are complete, and that you have exited any installer programs.
2. Optionally, terminate any Remote KVM or Remote Desktop sessions.

Important

- **If you terminate the Remote Desktop, "Disconnect" instead of "Logoff".**
  If you exit the remote desktop connection to the Upgrade Side with logoff, or if you exit the remote KVM connection to the Upgrade Side, the following error message might appear on the Active Upgrade Console of the Production Side while merging the system.
  A user must be logged into the upgrade-side console for this operation to complete.
  When this error message appears, complete the merge by following the below procedure:
  1. **Click the Remote Desktop link and login to the Upgrade Side.**
  2. **Select Retry button on the Active Upgrade Console of the Production Side and retry the merge operation.**
- **You can remain logged on to the Upgrade Side if you want to maintain the current desktop session. After the merge, you will be using the Upgrade Side desktop.**

3. Verify that the upgrade state, as reported in the status bar, is **Production Side\Split\Ready**.
   If the status is Busy, you must wait until the current task to complete and the status to become **Ready**. If it is **Broken**, you might need to abort the upgrade.
4. Click **Merge**.

Important

- **Your screen might flicker and you might briefly lose control of your keyboard and mouse as the system is merged.**
- **Do not select Abort button to interrupt the Active Upgrade during the merge. The disk may not be recognized from the OS. When the disk isn't recognized from the OS, go to Disc Management then execute Disk Rescan. If the disk status becomes missing or offline, right click the disk and select Disk Reactivation to verify the disk status becomes online.**
- **If you select Abort to abort the Active Upgrade process after merge process is finished, the abort process will be performed after restart of OS. If this abort process fails, select Retry to perform abort process.**
- **Do not shut down or restart the server when the merge process is completed. If you shut down or restart the server under the merged status, the system may hang during the shutdown process. If the hang occurs due to shutdown or restart, do the following:**
  1 **Press and hold the power button to stop the power**
  2. **Press the power button to start the server.**
     The suspension process of the Active Upgrade process is performed
  3. **Start over the Active Upgrade.**

Depending on the complexity of your applications and the upgrade you performed, it may take a certain time period before the application restarts or becomes ready for access.

After the merge process completes, the upgrade state is **Fault Tolerant\Merge\Ready**, indicating that the system is currently merged and the upgrade is ready to be committed. You can test your applications to verify that the upgrade was successful.

If the merge process fails the first time, you can click **Retry** to try again. If the problem persists, you can click **Abort** to abort the upgrade process, or refer to *Chapter 1 (8. Troubleshooting)* in *Maintenance Guide* for information about resolving the problem.

(5) Verifying the Upgrade Side Before Committing the Upgrade

After you have merged the system, your applications (including the Active Upgrade Console) are running from the software on the Upgrade Side system disks. At this point, you can test the software you installed and verify the general health of the system with full access to the system's resources.

Tips

The following resources are available after the system is merged:

- Network resources
- External storage
- Data disks

For example, you might want to perform the following tasks before you commit the upgrade:

- Verify that all of your applications have restarted on the Upgrade Side (refer to *Chapter 1 (8.11 (2) Verifying the Status of Application Services)* in *Maintenance Guide*).
- Verify that you have access to your network, external storage, and data disks.
- Verify that client systems can reach all of the services that you Express5800/ft series system provides.
- Verify that the presence and the version number of each software package (refer to *Chapter 1 (8.11 (3) Verifying the Status of Installed Software*) in *Maintenance Guide*.
- Verify that you can launch and run any applications that you have installed or upgraded.
- Verify the configurations for your applications and the operating system, which could have been altered by software installation.

If you are satisfied that everything is working correctly, you can commit the upgrade to make the changes permanent.

If there are any problems, you can abort the upgrade to return the system to its original state. However, **aborting the upgrade while the system is in merge mode will incur downtime**, because the Active Upgrade Console must stop your applications on the Upgrade Side before it can restart them on the Production Side.

(6) Committing the Upgrade

When you are finished testing your applications on the merged system, and you are satisfied that everything is working correctly, you can commit the upgrade to make it permanent.

Committing the upgrade

- Rebuild the mirror of any internal RDR system disk by overwriting the original partner disk with its newer, upgraded partner disk.
- Rebuild the mirror of any internal RDR data disk by overwriting the stale partner disk with its newer, activated disk.
- The primary LED on Production Side goes off, and the primary LED on Upgrade Side goes on.
- Does not restart your applications, as they are already running on the upgraded system. There is no additional downtime.

Important **You cannot abort the upgrade process after you commit an upgrade because the original state of the system is lost (overwritten) as a result of completing the upgrade process. Ensure that your system is working as expected before clicking Commit.**

(a) How to commit the upgrade

1. Close all non-essential applications.
2. Verify that the upgrade state, as reported in the status bar, is **Fault Tolerant\Merge\Ready**.
3. Click **Commit**.

Important **Your screen might flicker and you might briefly lose control of your keyboard and mouse as the system commits the upgrade.**

After the commit process completes, the upgrade state is **Fault Tolerant\Commit\Ready**. You can click **Finish** to clean up ft series resources, as described in *Chapter 2 (1.5.4 (7) Finishing the Upgrade)*.

If the commit process fails the first time, you can click **Retry** to try again. If the problem persists, refer to *Chapter 1 (8. Troubleshooting)* in *Maintenance Guide* for information about resolving the problem.

(7) Finishing the Upgrade

To complete the Active Upgrade process and clean up ftServer system resources after committing or aborting an upgrade, click **Finish** on the **Commit Upgrade** page or **Abort Upgrade** page.

When the process completes, the upgrade state is **Fault Tolerant\Idle\Ready**.

If the finish process fails the first time, you can click **Retry** to try again. If the problem persists, refer to *Chapter 1 (8. Troubleshooting)* in *Maintenance Guide* for information about resolving the problem.

On the **Finish** page, upon successful completion of the Active Upgrade process, you can:

- Click **Exit** to close the Active Upgrade Console.
- Click **Save Log** to save the activity log to a file.
- Click **Active Upgrade** in the navigation bar to initiate another readiness test and upgrade with the same configuration.
- Click **Configuration** in the navigation bar to create, edit, or load another configuration file.

Important **Though the Active Upgrade process is complete, your RDR disks continue to resynchronize in the background. If you intend to initiate another upgrade process, you must wait for the resynchronization to complete before you do so. Refer to *Chapter 1 (8.11 (4) Verifying If RDR Disks Are Resynchronizing*) in *Maintenance Guide* for more information.**

(8) Aborting the Upgrade

If necessary, you can abort the Active Upgrade process and restore the system to its original state at the split mode or the merge mode of the upgrade process prior to committing the upgrade.

Important **You cannot abort the upgrade process after you commit an upgrade because the original state of the system is lost (overwritten) as a result of completing the upgrade process.**

When you abort an upgrade, the Active Upgrade Console:

- Cancels the current Active Upgrade operation.
- If your system is in the merge state, shuts down the Upgrade Side and restarts the system from the Production Side, which automatically restarts your applications from your Production side system disks.
- Reestablishes the mirror of any internal RDR system disk by overwriting the upgraded partner disk with the original partner disk.

To abort an upgrade, click the **Abort** button on the **Active Upgrade** page, the **Split System** page, or the **Merge System** page.

Important **Your screen might flicker and you might briefly lose control of your keyboard and mouse as the system recovers its original state.**

When the process completes, the upgrade state is **Fault Tolerant\Abort\Ready**. You can click **Finish** to clean up ftServer resources, as described in Chapter 2 (*1.5.4 (7) Finishing the Upgrade)*.

If the abort process fails the first time, you can click **Retry** to try again. If the problem persists, refer to *Chapter 1 (8. Troubleshooting)* in *Maintenance Guide* for information about resolving the problem.

(9) Viewing Active Upgrade Process Status

You can view the status of the Active Upgrade process at any point during the upgrade.

The Active Upgrade Console indicates status in two ways:

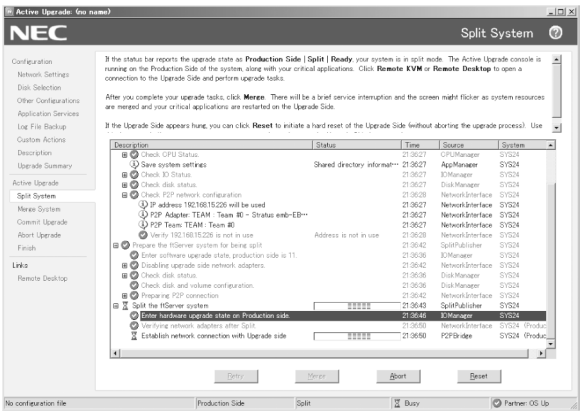
- Activity Log
- Status Bar

(a) Activity Log

The activity log shown below, reports details about each upgrade operation.

Activity Log

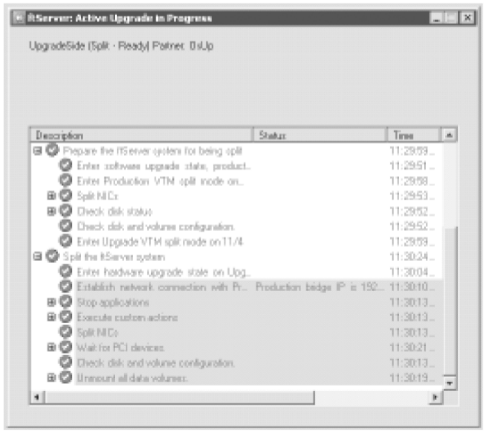
The activity log is displayed in the main window of the Active Upgrade Console after you have initiated a readiness test or upgrade session.



Activity Log (in Active Upgrade Console)

Remote Activity Log

If you want to check the status of the upgrade process when you are logged on to the Upgrade Side of the system (while in split mode), you can also double-click the Active Upgrade icon ( ) in the system tray to open the remote activity log shown below.



Remote Activity Log

Tips You can only view status in this window. To control the remaining steps of the Active Upgrade process, you must use the Active Upgrade Console on the Production Side.

Activity Log Detail

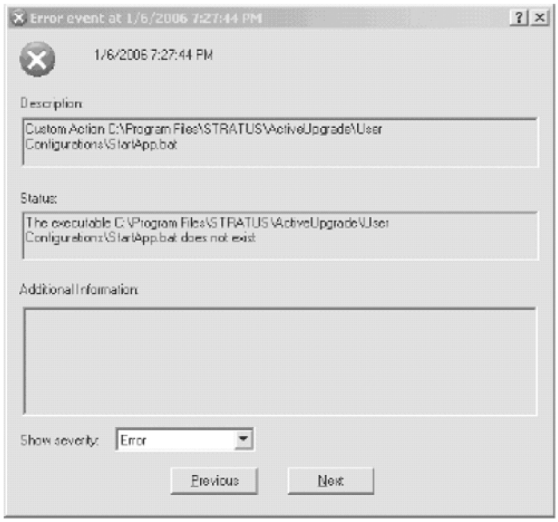
Table below describes the general meaning of activity log entries that appear in the local and remote activity logs.

Activity Log Entries

Icon	Text Color	Severity	Description
	Green	Success	Task completed without error
	Black	Pending	Task is in progress
	Black	Information	Task information, no action necessary
	Black	Warning	A problem that should be addressed, but will not block an upgrade
	Red	Error	A problem that must be corrected before continuing with upgrade

Some upgrade items are collapsed into a single line. To display all of the associated items, click on the expand (+) button to the left of the item. To collapse them again, click on the collapse (-) button to the left of the item.

Double-click on any item in the activity log to open a detail window with more information about that item.



Activity Log Detail

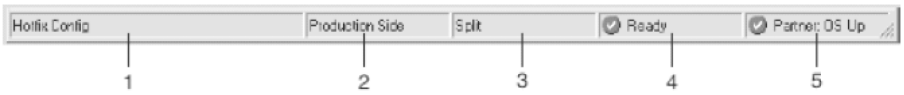
In the detail window, you can click the **Previous** and **Next** buttons to review other items of the same severity. For example, if you are viewing an error, you can click **Next** to see the next error item. To change the severity level of the items you want to review, select an option from the **Show severity** pulldown menu. (A severity type will be unavailable if there are currently no items of that severity in the activity log).

Saving Activity Log

If necessary, you can save the items from the activity log in the Active Upgrade Console to a file.

(b) Status Bar

The status bar (below figure), which is located at the bottom of the Active Upgrade Console window, reports a quick summary of the status of the upgrade.



Status Bar

1 Configuration file name

2 Hardware State

3 Upgrade State

4 Operational State

5 Partner State

Configuration file name

Shows configuration file name to be upgraded.

Hardware State

The Hardware State reports hardware state and where your applications are running.

Status: Hardware State

Hardware State	Description
Fault-tolerant	The system is duplexed.
Production Side	The system is currently running in split mode, and your applications are running from the Production Side (the original copy of your software). The Upgrade Side is available for upgrade tasks.

Upgrade State

The Upgrade State reports the progress of upgrade process.

Status: Upgrade State

Upgrade State	Description
Idle	The current upgrade session is idle. The Active Upgrade process has just finished, or it has not been initiated yet.
Prepare Split	The Active Upgrade Console is preparing to split the system.
Split	If the operational state is **Ready**, the system is running in split mode. Otherwise, the Active Upgrade Console is in the process of initiating split mode.
Prepare Merge	The Active Upgrade Console is preparing to merge the system.
Merge	If the operational state is **Ready**, the system is merged. Otherwise, the Active Upgrade Console is in the process of merging the system.
Commit	The Active Upgrade Console is in the process of committing your changes (making them permanent).
Abort	The upgrade process has been aborted, and the Active Upgrade Console is in the process of restoring the system to its previous state.

Operational State

The Operational State reports the status of the last operation that was performed.

Status: Operational State

Operational State	Description
Ready	The previous operation has been completed successfully. The Active Upgrade process is ready to enter the next upgrade state.
Busy	The current operation is still in progress. Allow time for the operation to complete.
Broken	The Active Upgrade Console could not complete the current operation. Check the activity log for errors. You must correct the errors and click **Retry** to complete the operation, or click **Abort** to abort the current upgrade session.

Partner State

The Partner State reports the status of the partner system. For example, while the system is in split mode, the Active Upgrade Console is running on the Production Side, this field reports the status of the Upgrade Side of the system.

Status: Partner State

Partner State	Description
DC On	The partner system operating system is shutdown, but the system still has standby (housekeeping) power.
DC Off	The partner system operating system is shutdown and standby power is off.
BIOS POST	The partner system is performing a BIOS Power On Self Test (POST).
Hung: BIOS POST	The partner system hung in the BIOS POST.
OS Booting	The partner operating system is booting.
Hung: OS Booting	The partner system hung in the boot process.
OS Up	The partner operating system is up. (However, the system might not be available for use until other system resources finish loading.)
Hung: OS Up	The partner operating system is hung.
OS Rebooting	The partner operating system is rebooting.
Hung: OS Rebooting	The partner system hung while rebooting.
OS Shutting Down	The partner operating system is shutting down.
Hung: OS Shutting Down	The partner system hung while it was shutting down.
OS Crashed	The partner operating system crashed.
OS Shut Down	The partner operating system finished shutting down, but the system is still powered on.

1.6 ExpressUpdate Agent

NEC ExpressUpdate Agent enables you to manage and update the versions of the firmware and software installed in this server.

By using NEC ExpressUpdate, you can install the downloaded packages easily.

For details about how to install NEC ExpressUpdate Agent, refer to "*NEC ExpressUpdate Agent Installation Guide*" in EXPRESSBUILDER.

Tips

Updates are available for some firmware and software that do not support NEC ExpressUpdate. Refer to the following website to install these packages:

http://www.nec.com/global/prod/express/index.html

1.7 Express Report Service / Express Report Service (HTTPS)

To avoid system failures or to maintain the server quickly, Express Report Service / Express Report Service (HTTPS) informs the support center of the failure information, preventive maintenance information by E-Mail or modem. If you want to use this service, contact your sales representative and install NEC ESMPRO Agent before using this service.

You can install Express Report Service / Express Report Service (HTTPS) with Windows OS installation when using EXPRESSBUILDER.

For details about Express Report Service / Express Report Service (HTTPS), refer to "*Express Report Service / Express Report Service (HTTPS) Installation Guide"* in EXPRESSBUILDER.

1.8 NEC Product Info Collection Utility

NEC Product Info Collection Utility can collect various logs related to the server all at once.

This utility allows you to collect server information (Product Info) for maintenance.

You can install this utility from EXPRESSBUILDER in the following procedure.

1.8.1 Installation

You can install this utility by using the following steps.

1. Log on to Windows, and then insert EXPRESSBUILDER into the optical disk drive.
   Run <EXPRESSBUILDER>:\autorun\dispatcher_x64.exe.
2. From the autorun menu, select **Set up Software** and then **Product Info Collection Utility**.
   Installation of this utility starts. After this, follow the instructions in the dialog boxes until installation is complete. (By default, this utility is installed in the *C:\ezclct* folder.)

Tips

- Log on to the system with an account that has administrator privilege.
- The installation drive requires a free space of at least 2.5 GB.

1.8.2 Uninstallation

From **Control Panel**, select **Add/Remove Programs** and then **Product Info Collection Utility (Vx.x.x)**.
After this, follow the instructions in the dialog boxes until uninstallation is complete.

2. Bundled Software for "PC for Management"

This section describes the bundled software required to configure "PC for Management" used to manage the server system.

2.1 NEC ESMPRO Manager

NEC ESMPRO Manager remotely controls and monitors the server hardware.

To use these features, install the bundled software such as NEC ESMPRO Agent on the server.

For details about the system requirements of NEC ESMPRO Manager and how to install it, refer to "*NEC ESMPRO Manager Installation Guide*" in EXPRESSBUILDER.