ExpressCluster® X SingleServerSafe 3.1
for Windows

Installation Guide

12/10/2012
4th Edition

Revision History

Edition	Revised Date	Description
First	10/11/2011	New manual
2nd	3/31/2012	Corresponds to the internal version 11.13.
3rd	9/30/2012	Corresponds to the internal version 11.15.
4th	12/10/2012	Corresponds to the internal version 11.17.

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Table of Contents

Preface

Who Should Use This Guide

The *ExpressCluster X SingleServerSafe for Windows Installation Guide* is intended for system engineers who intend to introduce a system using ExpressCluster X SingleServerSafe and system administrators who will operate and maintain the introduced system. It describes how to install ExpressCluster X SingleServerSafe.

How This Guide Is Organized

Chapter 1 "About ExpressCluster X SingleServerSafe": Explains the functions and requirements of ExpressCluster X SingleServerSafe.

Chapter 2 "Installing ExpressCluster X SingleServerSafe": Describes how to install ExpressCluster X SingleServerSafe.

Chapter 3 "Upgrading, uninstalling or reinstalling": Describes how to upgrade ExpressCluster X SingleServerSafe, uninstall and reinstall ExpressCluster X SingleServerSafe, and upgrade to ExpressCluster X.

Chapter 4 "Latest version information": Provides the latest information about ExpressCluster X SingleServerSafe.

Chapter 5 "Additional information": Provides tips on installing ExpressCluster X SingleServerSafe.

Chapter 6 "Notes and Restrictions": Provides notes and restrictions you need to know before starting the actual operation of ExpressCluster X SingleServerSafe.

Appendix

Appendix A "Troubleshooting": Describes problems you might experience when installing or setting up ExpressCluster X SingleServerSafe and how to resolve them.

Appendix B "Index"

Terms Used in This Guide

ExpressCluster X SingleServerSafe, which is described in this guide, uses windows and commands common to those of the clustering software ExpressCluster X SingleServerSafe to ensure high compatibility with ExpressCluster X SingleServerSafe in terms of operation and other aspects. Therefore, cluster-related terms are used in parts of the guide.
The terms used in this guide are defined below.

Term	Explanation
Cluster, cluster system	A single server system using ExpressCluster X SingleServerSafe
Cluster shutdown, reboot	Shutdown or reboot of a system using ExpressCluster X SingleServerSafe
Cluster resource	A resource used in ExpressCluster X SingleServerSafe
Cluster object	A resource object used in ExpressCluster X SingleServerSafe
Failover group	A group of group resources (such as applications and services) used in ExpressCluster X SingleServerSafe

ExpressCluster X SingleServerSafe Documentation Set

The ExpressCluster X SingleServerSafe manuals consists of the five guides below. The title and purpose of each guide is described below:

ExpressCluster X SingleServerSafe Installation Guide

This guide is intended for system engineers who intend to introduce a system using ExpressCluster X SingleServerSafe and describes how to install ExpressCluster X SingleServerSafe.

ExpressCluster X SingleServerSafe Configuration Guide

This guide is intended for system engineers who intend to introduce a system using ExpressCluster X SingleServerSafe and system administrators who will operate and maintain the introduced system. It describes how to set up ExpressCluster X SingleServerSafe.

ExpressCluster X SingleServerSafe Operation Guide

This guide is intended for system administrators who will operate and maintain an introduced system that uses ExpressCluster X SingleServerSafe. It describes how to operate ExpressCluster X SingleServerSafe.

ExpressCluster X Integrated WebManager Administrator's Guide

This guide is intended for system administrators who manage a cluster system using ExpressCluster with ExpressCluster Integrated WebManager and for system engineers who are introducing the Integrated WebManager. Details about items required when introducing a cluster system are described in accordance with actual procedures.

ExpressCluster X WebManager Mobile Administrator's Guide

This guide is intended for system administrators who manage cluster systems using ExpressCluster with ExpressCluster WebManager Mobile and for system engineers who are installing the WebManager Mobile. In this guide, details on those items required for installing the cluster system using the WebManager Mobile are explained in accordance with the actual procedures.

Conventions

In this guide, **Note**, **Important**, **Related Information** are used as follows:

Note:
Used when the information given is important, but not related to the data loss and damage to the system and machine.

Important:
Used when the information given is necessary to avoid the data loss and damage to the system and machine.

Related Information:
Used to describe the location of the information given at the reference destination.

The following conventions are used in this guide.

Convention	Usage	Example
Bold	Indicates graphical objects, such as fields, list boxes, menu selections, buttons, labels, icons, etc.	In **User Name**, type your name. On the **File** menu, click **Open Database**.
Angled bracket within the command line	Indicates that the value specified inside of the angled bracket can be omitted.	`clpstat –s[-h host_name]`
Monospace (courier)	Indicates path names, commands, system output (message, prompt, etc), directory, file names, functions and parameters.	`c:\Program files\EXPRESSCLUSTER`
Monospace bold (courier)	Indicates the value that a user actually enters from a command line.	Enter the following: **`clpcl -s -a`**
Monospace italic (courier)	Indicates that users should replace italicized part with values that they are actually working with.	`clpstat –s [-h host_name]`

Contacting NEC

For the latest product information, visit our website below:

http://www.nec.com/global/prod/expresscluster/

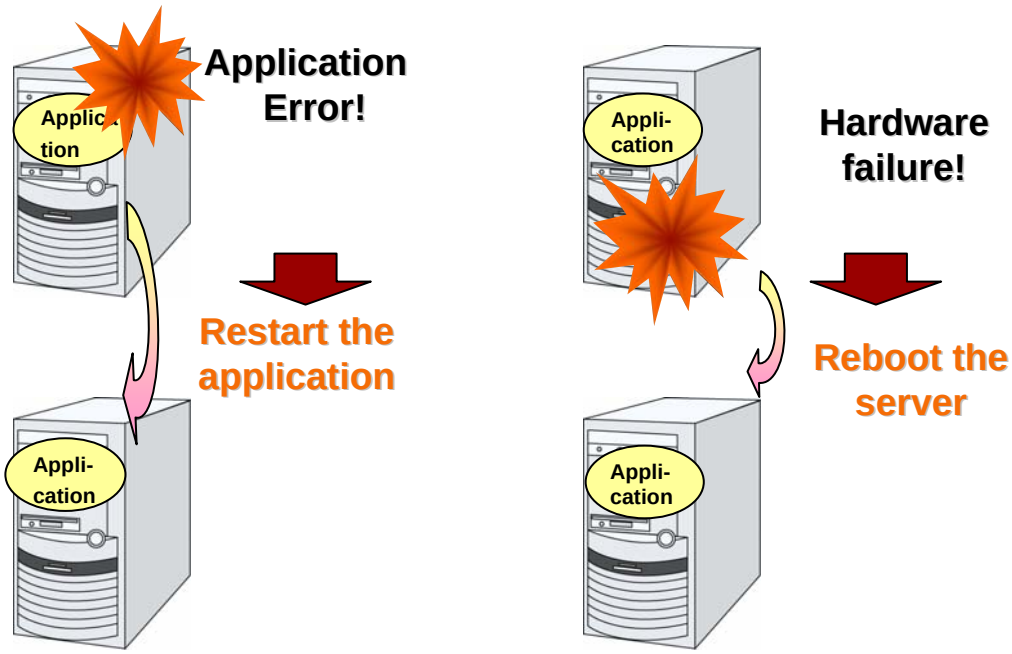
Chapter 1 About ExpressCluster X SingleServerSafe

This chapter describes the functions and requirements of ExpressCluster X SingleServerSafe.

This chapter covers:

What is ExpressCluster X SingleServerSafe?

ExpressCluster X SingleServerSafe is set up on a server. It monitors for application errors and hardware failures on the server and, upon detecting an error or failure, restarts the failed application or reboots the server so as to ensure greater server availability.



ExpressCluster X SingleServerSafe software configuration

ExpressCluster X SingleServerSafe consists of following three software applications:

- ExpressCluster Server

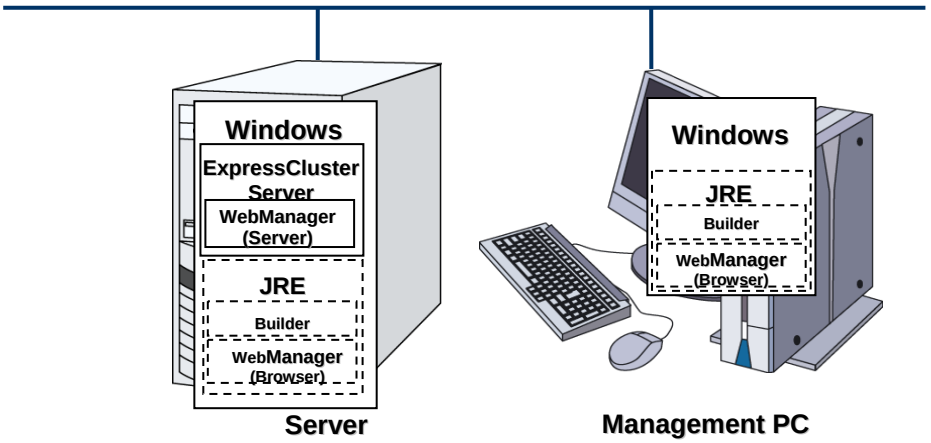
  This is a main module of ExpressCluster X SingleServerSafe. Install it on the server.

- ExpressCluster WebManager

  This is a tool to manage ExpressCluster X SingleServerSafe operations.
  It uses a Web browser as a user interface. The WebManager is incorporated into the ExpressCluster Server and therefore does not have to be installed.

- ExpressCluster Builder (Builder)

  This is a tool for creating the configuration data of ExpressCluster X SingleServerSafe. There are two versions. The online version Builder runs in the configuration mode of the WebManager, and the offline version Builder is installed individually in a management terminal. The online version Builder is incorporated in the WebManager. The Builder also uses a Web browser as a user interface the same way as the WebManager.



The ExpressCluster X Builder and the WebManager are Java applets that run on Java VM. They can run on any machine in which the Java Runtime Environment (JRE) is installed.
In other words, once you install the JRE on a server on which ExpressCluster X SingleServerSafe is installed, you can use the Builder and WebManager on that server.

Checking system requirements for ExpressCluster X SingleServerSafe

Check the configuration and operation requirements below for each machine to be used.

ExpressCluster X Server	
Machine on which the WebManager can be installed	PC that supports one of the following operating systems.
Supported operation systems	**IA-32 version** Microsoft Windows Server 2003, Standard Edition Service Pack 2 Microsoft Windows Server 2003, Enterprise Edition Service Pack 2 Microsoft Windows Server 2003, Standard Edition R2 Service Pack 2 Microsoft Windows Server 2003, Enterprise Edition R2 Service Pack 2 Microsoft Windows Server 2008 Standard Service Pack 1 Microsoft Windows Server 2008 Enterprise Service Pack 1 Microsoft Windows Server 2008 Standard Service Pack 2 Microsoft Windows Server 2008 Enterprise Service Pack 2 **x86_64 version** Microsoft Windows Server 2003, Standard Edition Service Pack 2 Microsoft Windows Server 2003, Enterprise Edition Service Pack 2 Microsoft Windows Server 2003, Standard Edition R2 Service Pack 2 Microsoft Windows Server 2003, Enterprise Edition R2 Service Pack 2 Microsoft Windows Server 2008 Standard Service Pack 1 Microsoft Windows Server 2008 Enterprise Service Pack 1 Microsoft Windows Server 2008 Standard Service Pack 2 Microsoft Windows Server 2008 Enterprise Service Pack 2 Microsoft Windows Server 2008 R2 Standard Microsoft Windows Server 2008 R2 Enterprise Microsoft Windows Server 2008 R2 Datacenter Microsoft Windows Server 2008 R2 Standard Service Pack 1 Microsoft Windows Server 2008 R2 Enterprise Service Pack 1 Microsoft Windows Server 2008 R2 Datacenter Service Pack 1 Microsoft Windows Server 2012 Standard Microsoft Windows Server 2012 Datacenter
Memory size	**IA-32 version** User mode: 192 MB (*1) Kernel mode: 32MB **x86_64 version** User mode: 256 MB (*1) Kernel mode: 32MB
Disk Size	**IA-32 version** Initial size at installation: 34 MB Maximum size during operation: 1290 MB **x86_64 version** Initial size at installation: 41 MB Maximum size during operation: 1300 MB

(*1) excepting for optional products.

WebManager, Builder (online version)	
Machine on which the WebManager can be installed	PC that supports one of the following operating systems.
Supported operating systems	Microsoft Windows® XP Service Pack 2 Microsoft Windows® XP Service Pack 3 Microsoft Windows® Vista Service Pack 1 Microsoft Windows® Vista Service Pack 2 Micorsoft Windows® 7 Microsoft Windows® 7 Service Pack 1 Microsoft Windows® 8 Microsoft Windows® Server 2003 Service Pack 1 Microsoft Windows® Server 2003 Service Pack 2 Microsoft Windows® Server 2003 R2 Microsoft Windows® Server 2003 R2 Service Pack 2 Microsoft Windows® Server 2008 Service Pack 1 Microsoft Windows® Server 2008 Service Pack 2 Microsoft Windows® Server 2008 R2 Microsoft Windows® Server 2008 R2 Service Pack 1 Microsoft Windows® Server 2012
Supported browsers	**Browsers supporting Java 2** Windows® XP: Microsoft® Internet Explorer 6.0 SP2 or later Windows® Vista™: Microsoft® Internet Explorer 7.0 Windows® 7: Microsoft® Internet Explorer 7.0 Microsoft® Internet Explorer 8.0 Microsoft® Internet Explorer 9.0 Windows® 8: Microsoft® Internet Explorer 10.0 Firefox 15 Windows® Server2003: Microsoft® Internet Explorer 6.0 SP1 or later Windows® Server2008: Microsoft® Internet Explorer 7.0 Windows® Server2008 R2: Microsoft® Internet Explorer 8.0 Microsoft® Internet Explorer 9.0 Microsoft Windows® Server 2012 Microsoft® Internet Explorer 10.0 Firefox 15
Java Runtime Environment	To use the WebManager, a Java runtime environment is required. Java™ Runtime Environment Version 6.0 Update 21 (1.6.0_21) or later. Version 7 Update 2 (1.7.0_2) or later.
Memory size	User mode 40 MB
Disk size (excluding the size required for Java runtime environment)	0.3 MB

Note:
To use the Builder on x86_64 machines, it is necessary to use a 32-bit browser.
For the latest information about the supported browsers, visit our website below:
http://www.nec.com/global/prod/expresscluster/

Note:
When you access to http://<IP_address>:29003 using Internet Explorer 9, you should add the IP address to Local intranet site.

<table>
<tr><th colspan="3">Builder (offline version)</th></tr>
<tr><td>Machine on which the WebManager can be installed</td><td colspan="2">PC that supports one of the following operating systems.</td></tr>
<tr><td>Supported operating systems</td><td colspan="2">Microsoft Windows® XP Service Pack 2
Microsoft Windows® XP Service Pack 3
Microsoft Windows® Vista Service Pack 1
Microsoft Windows® Vista Service Pack 2
Micorsoft Windows® 7
Microsoft Windows® 7 Service Pack 1
Microsoft Windows® 8
Microsoft Windows® Server 2003 Service Pack 1
Microsoft Windows® Server 2003 Service Pack 2
Microsoft Windows® Server 2003 R2
Microsoft Windows® Server 2003 R2 Service Pack 2
Microsoft Windows® Server 2008 Service Pack 1
Microsoft Windows® Server 2008 Service Pack 2
Microsoft Windows® Server 2008 R2
Microsoft Windows® Server 2008 R2 Service Pack 1
Microsoft Windows® Server 2012</td></tr>
<tr><td>Supported browsers</td><td colspan="2">Browsers supporting Java 2
Windows® XP:
Microsoft® Internet Explorer 6.0 SP2 or later
Windows® Vista™:
Microsoft® Internet Explorer 7.0
Windows® 7:
Microsoft® Internet Explorer 7.0
Microsoft® Internet Explorer 8.0
Microsoft® Internet Explorer 9.0
Windows® 8:
Microsoft® Internet Explorer 10.0
Firefox 15
Windows® Server2003:
Microsoft® Internet Explorer 6.0 SP2 or later
Windows® Server2008:
Microsoft® Internet Explorer 7.0
Windows® Server2008 R2 :
Microsoft® Internet Explorer 8.0
Microsoft® Internet Explorer 9.0
Microsoft Windows® Server 2012
Microsoft® Internet Explorer 10.0
Firefox 15</td></tr>
<tr><td>Java Runtime Environment</td><td colspan="2">Java Runtime Environment is required for the Builder.
Java™ Runtime Environment
Version 6.0 Update 21 (1.6.0_21) or later .
Version 7 Update 2 (1.7.0_2) or later.</td></tr>
<tr><td>Memory size</td><td colspan="2">User mode: 32 MB</td></tr>
<tr><td>Disk size (excluding the size required for the Java runtime environment)</td><td colspan="2">5 MB</td></tr>
<tr><td>Supported version</td><td>Builder version</td><td>ExpressCluster Server internal version</td></tr>
<tr><td></td><td>3.1.0-1</td><td>11.10</td></tr>
<tr><td></td><td>3.1.1-1</td><td>11.11</td></tr>
<tr><td></td><td>3.1.3-1</td><td>11.13</td></tr>
<tr><td></td><td>3.1.4-1</td><td>11.14</td></tr>
</table>

	3.1.5-1	11.15
		11.16
	3.1.7-1	11.17

Note:
To use the Builder on x86_64 machines, it is necessary to use a 32-bit browser.
For the latest information about the supported browsers, visit our website below:
http://www.nec.com/global/prod/expresscluster/

Note:
When you access to http://<IP_address>:29003 using Internet Explorer 9, you should add the IP address to Local intranet site.

Operation environment for SNMP linkage functions

ExpressCluster with SNMP Service of Windows is validated on following OS.

IA32 version

OS	ExpressCluster version	Remarks
Microsoft Windows Server 2003 Service Pack 2	11.10 or later	
Microsoft Windows Server 2003 R2 Service Pack 2	11.10 or later	
Microsoft Windows Server 2008 Service Pack 2	11.10 or later	

x86_64 version

OS	ExpressCluster version	Remarks
Microsoft Windows Server 2003 x64 Edition Service Pack 2	11.10 or later	
Microsoft Windows Server 2003 x64 Edition R2 Service Pack 2	11.10 or later	
Microsoft Windows Server 2008 Service Pack 2	11.10 or later	
Microsoft Windows Server 2008 R2 Service Pack 1	11.10 or later	
Microsoft Windows Server 2012	11.17 or later	

Note:
SNMP Service of Windows Server 2003 does not support IPv6.

Operation environment for JVM monitor

The use of the JVM monitor requires a Java runtime environment.

Java™ Runtime Environment
Version6.0 Update 21 (1.6.0_21) or later

Java™ Runtime Environment
Version7.0

The use of the JVM monitor load balancer linkage function (when using BIG-IP Local Traffic Manager) requires a Microsoft .NET Framework runtime environment.

Microsoft .NET Framework 3.5 Service Pack 1

The tables below list the load balancers that were verified for the linkage with the JVM monitor.

IA32 version

Load balancer	ExpressCluster version	Remarks
Express5800/LB400h	11.10 or later	
BIG-IP v11	11.13 or later	
MIRACLE LoadBalancer	11.13 or later	
CoyotePoint Equalizer	11.13 or later	

x86_64 version

Load balancer	ExpressCluster version	Remarks
Express5800/LB400h	11.10 or later	
BIG-IP v11	11.13 or later	
MIRACLE LoadBalancer	11.13 or later	
CoyotePoint Equalizer	11.13 or later	

Operation environment for system monitor or function of collecting system resource information

The use of the System Resource Agent requires the Microsoft .NET Framework environment.

Microsoft .NET Framework 3.5 Service Pack 1

Note:
The version of Microsoft .NET Framework must be 3.5.

Installation procedure under Windows Server 2008 R2

From the **Start** menu, select **Administrative Tools** and then **Server Manager**.

The **Server Manager** window appears. From the **Operation (A)** menu, select **Add Features**.

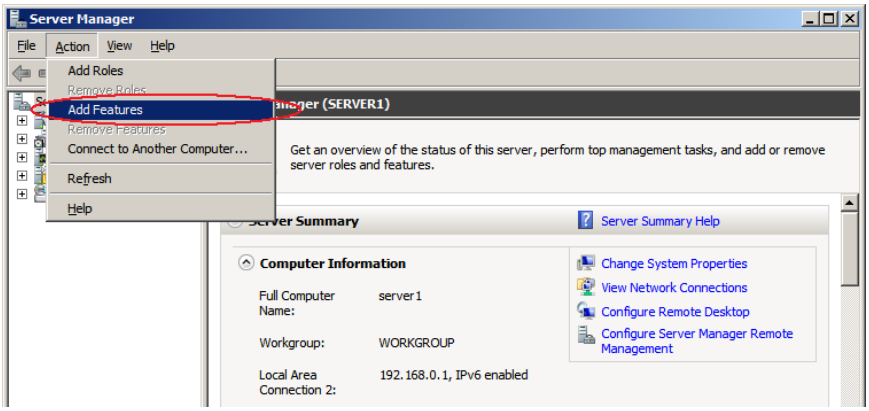


Figure 1: Server Manager window

The **Add Features Wizard** appears. Select the **.Net Framework 3.5.1 Features** checkbox, and then follow the instructions that appear in the window to perform installation.

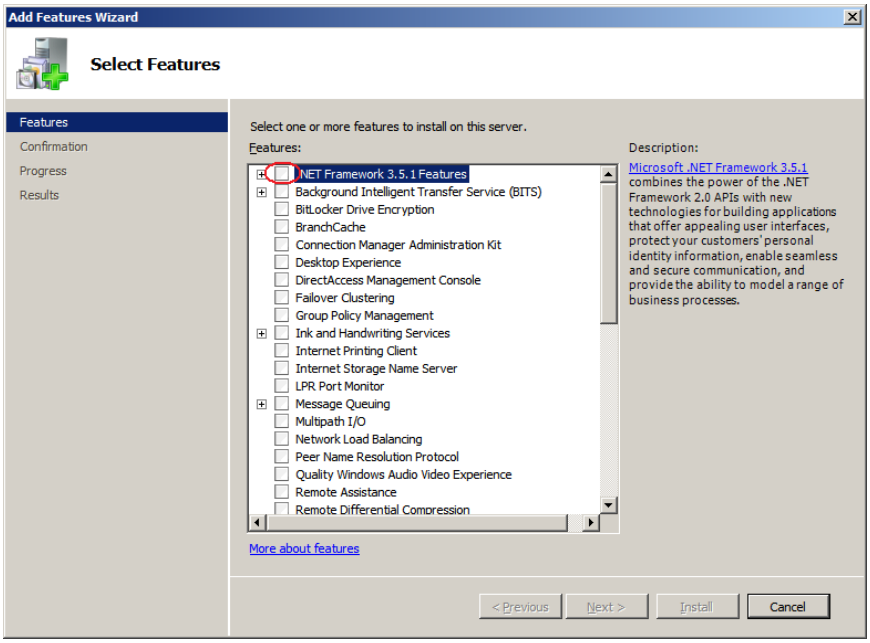


Figure 2: Add Features Wizard

You can check whether .Net Framework 3.5 has been installed by using the **Remove Features Wizard**.

In the **Server Manager** window, select **Remove Features** from the **Operation (A)** menu. The window shown below appears.

If you can select the **.Net Framework 3.5.1 Features** checkbox, .Net Framework 3.5 has been installed.

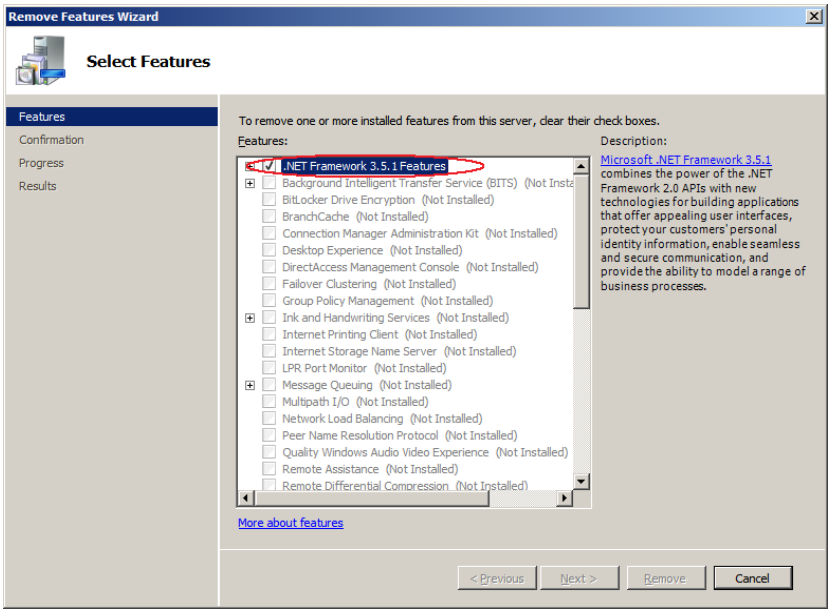


Figure 3: Remove Features Wizard

To install the System Resource Agent under Windows Server 2008 R2, you must first apply the following patch provided by Microsoft:

Patch number: KB981314

Download the patch from the following URL, and then apply it:

http://support.microsoft.com/kb/981314/

Installation procedure under Windows Server 2012

If the server is not connectable to the Internet, prepare the OS installation medium. If connectable, the installation medium is not required.

Start **Server Manager,** and select **QUICK START** in the **Dashboard** window.

Select **2 Add roles and features** from the displayed menu to open the **Add Roles and Features Wizard**.

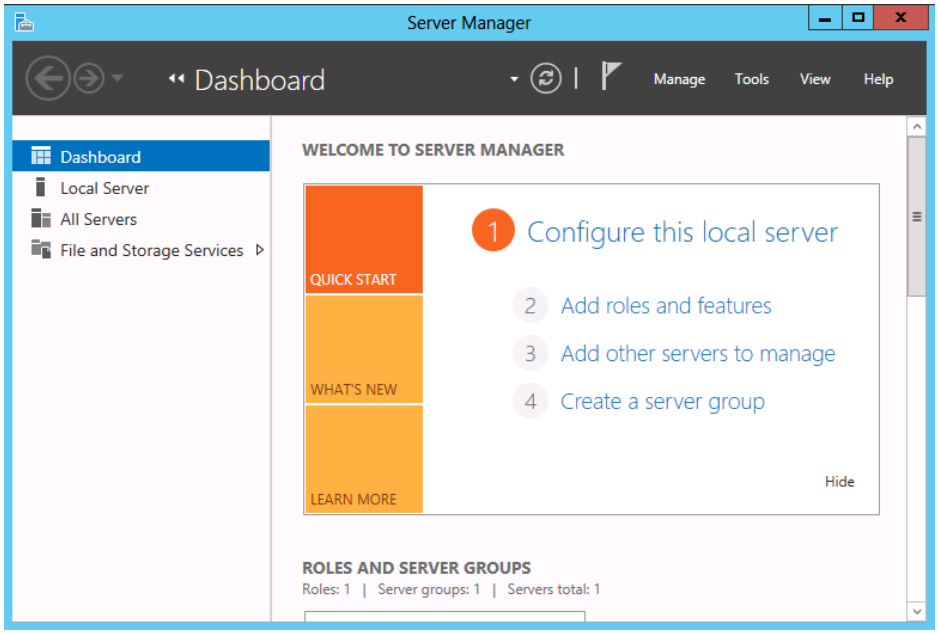


Figure 4: Server Manager

If the **Before You Begin** window appears, click **Next**.

In the **Installation Type** window, select **Role-based or feature-based installation** and click **Next**.

In the **Select Server** window, check **Select server from server pool**, select the target server from the list, and then click **Next**.

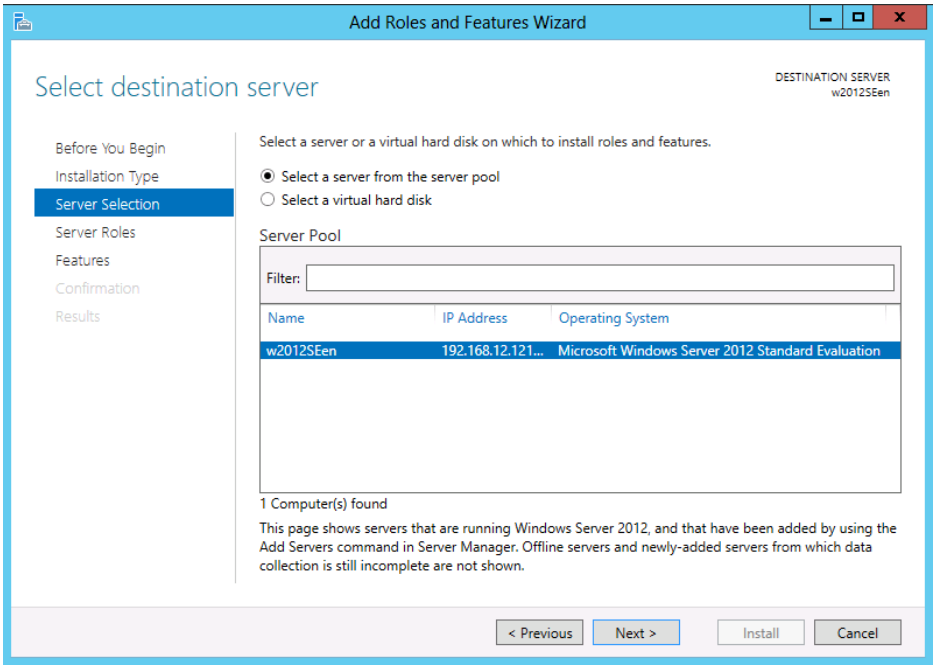


Figure 5: Select Server

Click **Next** in the **Server Roles** window.

In the **Features** window, select **.Net Framework 3.5 Features** and click **Next**.

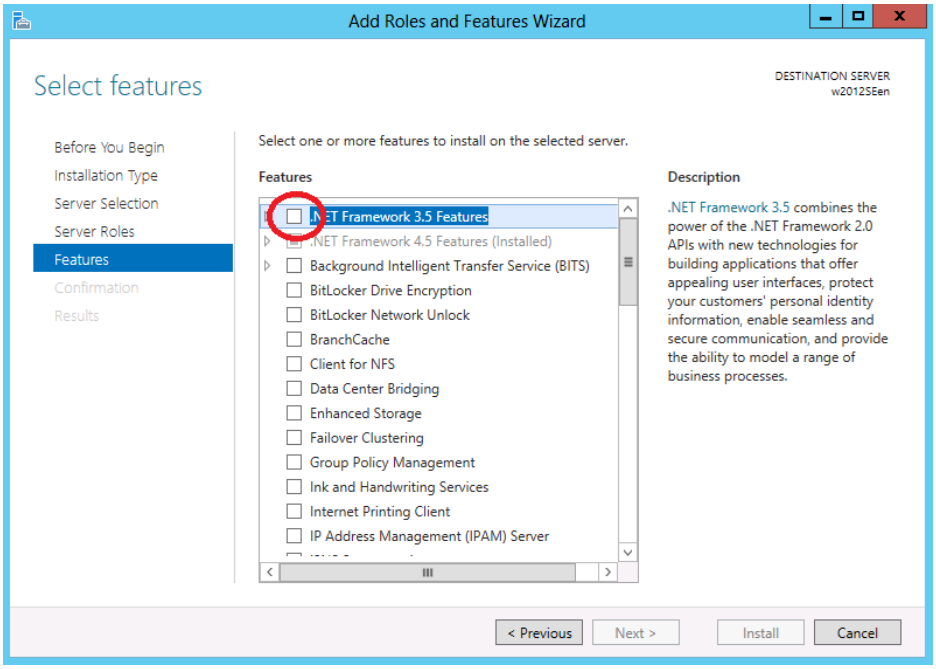


Figure 6: Select Features

If the server is connected to the Internet, click **Install** in the **Confirm installation selections** window to install .Net Framework 3.5.

If the server is not connectable to the Internet, select **Specify an alternative source path** in the **Confirm installation selections** window.

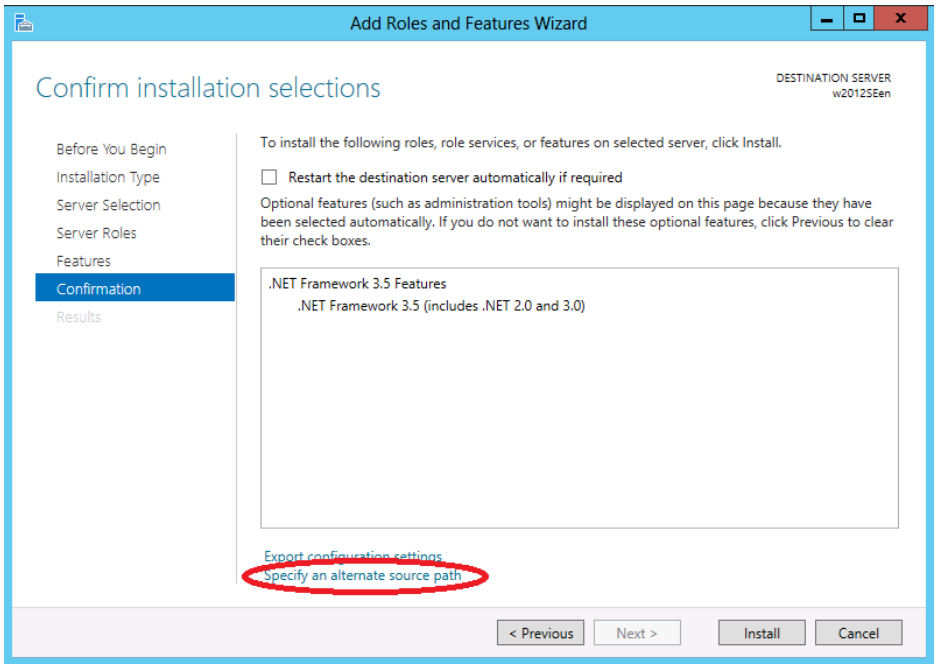


Figure 7: Confirm Installation Options

Specify the path to the OS installation medium in the **Path** field while referring to the explanation displayed in the window, and then click **OK**. After this, click **Install** to install .Net Framework 3.5.

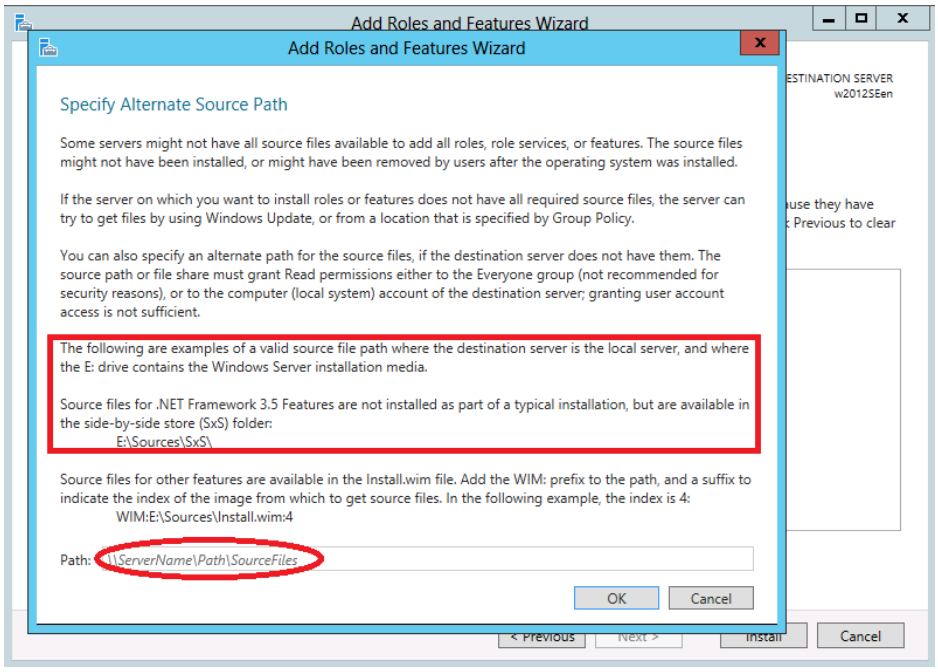


Figure 8: Specify Alternative Source Path

Preparing and verifying the server environment before installation

After installing the hardware, verify the following:

1. Verification of the network settings (Required)
2. Verification of the firewall settings (Required)
3. Power saving function – OFF (Required)

1. Verifying the network settings (Required)

Check the network settings by using the ipconfig and ping commands.

- IP Address
- Host name

2. Verifying the firewall settings (Required)

By default, ExpressCluster X SingleServerSafe uses the port numbers below. You can change these port numbers by using the Builder. Do not access any of these port numbers from a program other than ExpressCluster X SingleServerSafe. When setting up a firewall, set up ExpressCluster X SingleServerSafe so that it can access the port numbers below.

Internal processing in the local server					
From			**To**		**Remarks**
Server	Automatic allocation	→	Server	29001/TCP	Internal communication
Server	Automatic allocation	→	Server	29002/TCP	Data transfer
Server	Automatic allocation	→	Server	29003/UDP	Alert synchronization
Server	29106/UDP	→	Server	29106/UDP	Heartbeat (kernel mode)

From the WebManager to the server					
From			**To**		**Remarks**
WebManager	Automatic allocation	→	Server	29003/TCP	http communication

From the server connected to the Integrated WebManager to the target server					
From			**To**		**Remarks**
Server connected to the Integrated WebManager	Automatic allocation	→	Server	29003/TCP	http communication
Server to be managed by the Integrated WebManager	29003	→	Client	29010/UDP	UDP communication

Others			
From		**To**	**Remarks**

Server	Automatic allocation	→	Server	Management port number set by the Builder	JVM monitor
Server	Automatic allocation	→	Monitoring target	Connection port number set by the Builder	JVM monitor
Server	Automatic allocation	→	Server	Management port number for Load Balancer Linkage set by the Builder	JVM monitor
Server	Automatic allocation	→	Server	Communication port number set by the Builder	JVM monitor

Note:
An available port number at the time is automatically assigned.

3. Turning off the power saving function (Required)

For ExpressCluster X SingleServerSafe, the power saving function (for example, standby or hibernation) cannot be used with the OnNow, ACPI, or APM function. Make sure to turn off the power saving function by following the procedures below:

1. Click **Control Panel**, and select **Power Options**.
2. Click the **Power Schemes** tab, and then do the following:
   Select **Always On** under **Power schemes**.
   In **Settings for Always On power scheme**, specify **Never** to **Turn off monitor** and **Turn off hard disks**.
   Specify **Never** to **System standby**.

   Note:
   Nothing needs to be specified if there is no option to specify for **Turn off monitor**, **Turn off hard disks**, and **System standby**.

3. Click the **Hibernation** tab, and then do the following:
   In **Hibernation**, clear the **Enable hibernation** check box.
4. Click **OK** and check if the status does not become OnNow.

Chapter 2 Installing ExpressCluster X SingleServerSafe

This chapter describes how to install ExpressCluster X SingleServerSafe. To install ExpressCluster X SingleServerSafe, install the ExpressCluster Server, which is the main module of ExpressCluster SingleServerSafe. If you have a separate machine for setting up SingleServerSafe, install the Builder on that machine.

This chapter covers:

Installing the ExpessCluster Server

Install the ExpressCluster Server, which is the main module of ExpressCluster X SingleServerSafe, on the server machine in the system.

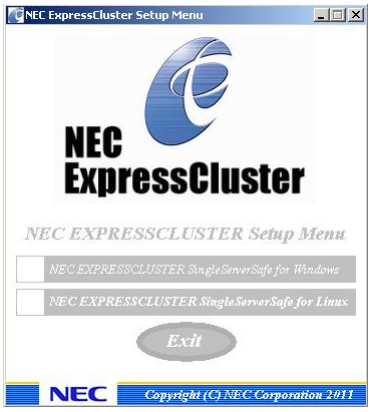
License registration is required in installing the Server. Make sure to have the required license file or license sheet.

Installing ExpressCluster X SingleServerSafe for the first time

To install ExpressCluster X SingleServerSafe, follow the procedure below.

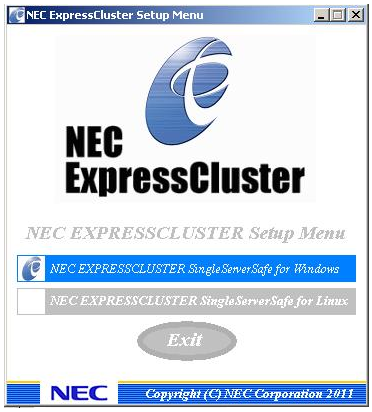
Note 1:
To install ExpressCluster X SingleServerSafe, use an account that has administrator privileges.
Note 2:
Installing ExpressCluster X SingleServerSafe disables the Windows media sense function that deactivates an IP address if a link failure occurs due to disconnecting the LAN cable or some other reason.
Note 3:
If the Windows SNMP Service has already been installed, the SNMP linkage function will be automatically set up when the ExpressCluster Server is installed. If, however, the Windows SNMP Service has not yet been installed, the SNMP linkage function will not be set up.
When setting up the SNMP linkage function after installing the ExpressCluster Server, refer to "Setting up the SNMP linkage function manually".

1. Insert the Installation CD-ROM to the CD-ROM drive.
2. The menu screen for installation is displayed.



Note:
If the menu screen does not open automatically, double-click menu.exe in the root folder of the CD-ROM.

3. Select **NEC ExpressCluster® SingleServerSafe for Windows**.

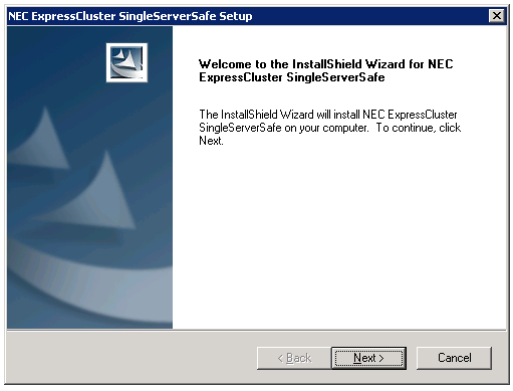


Note:
If you click the **Exit** button without selecting either, the menu screen is closed.

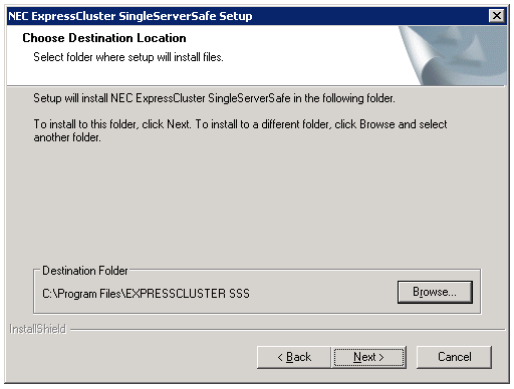
4. Select **NEC ExpressCluster® X SingleServerSafe 3.1 for Windows**.

Note:
If you click the **Exit** button without selecting either, the previous menu screen is displayed.

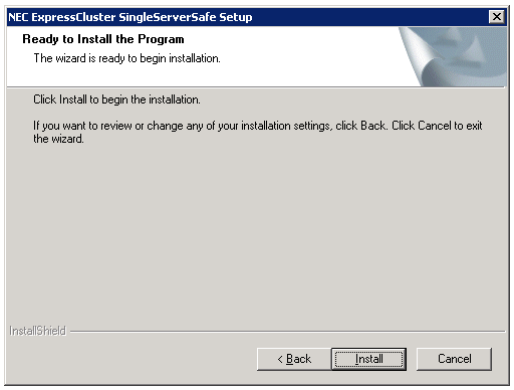
5. [Welcome to the InstallShield Wizard for NEC ExpressCluster SingleServerSafe] is displayed. Click **Next**.



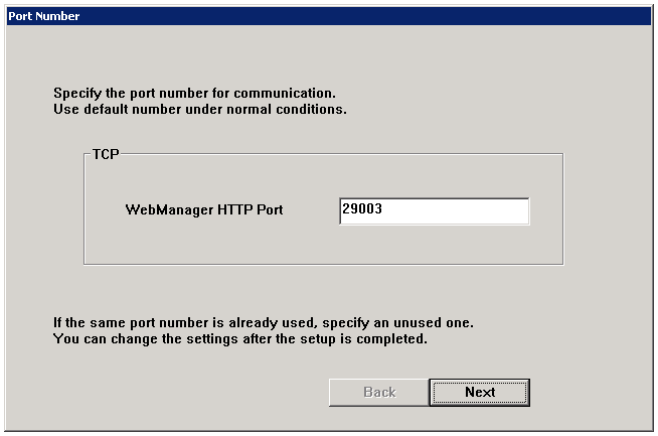
6. The **Choose Destination Location** dialog box is displayed. When changing the install destination, click **Browse** to select a directory. Click **Next**.



7. The **Ready to Install the Program** dialog box is displayed. Click **Install** to start the installation.

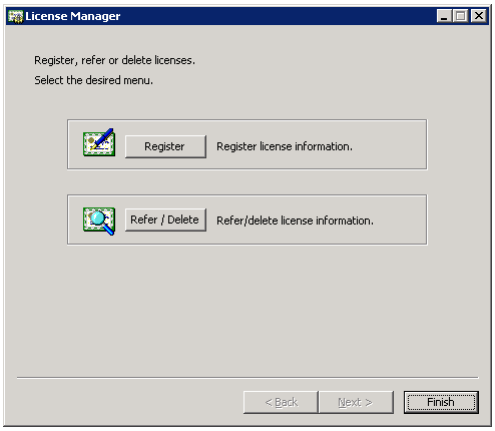


8. When the installation successfully finishes, the **Port Number** dialog box is displayed. Normally, click **Next** without changing the default setting.

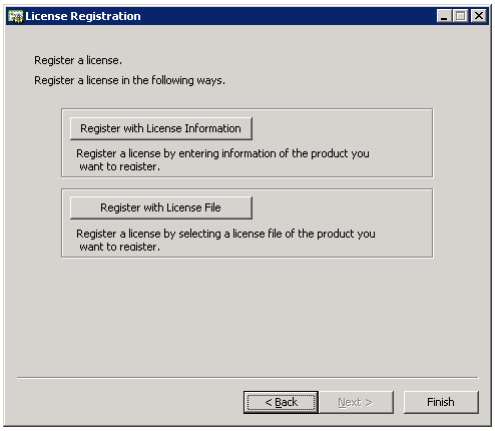


Note:
The port number configured here needs to be configured again when creating the configuration data. For details on port number, refer to "Cluster Properties" in Chapter 6 "Other setting details" in the *Configuration Guide*.

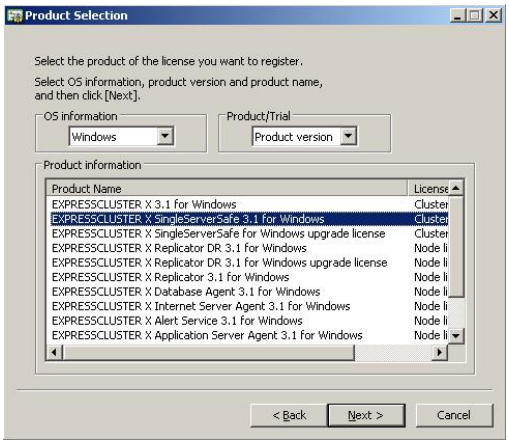
9. **License Manager** is displayed. Click **Register**.



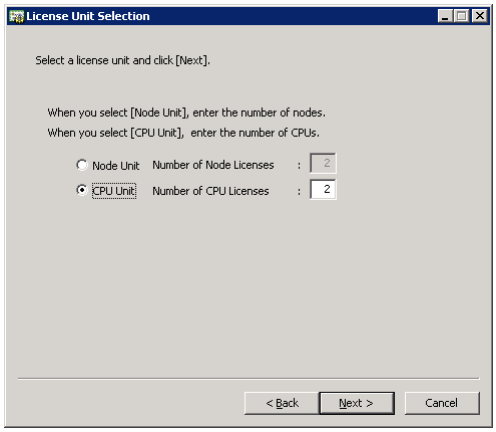
10. Click **Register with License Information** to register the license.



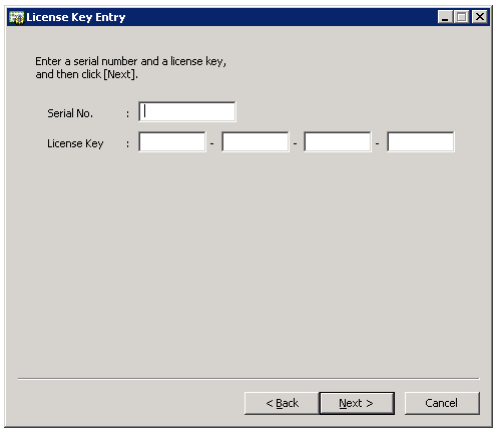
11. Based on the license sheet, select appropriate items for **OS information**, **Product/Trial** and **Product Name**, and then click **Next**.



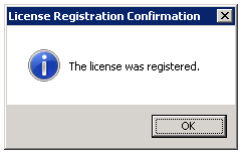
12. Based on the license sheet, enter the license unit and number of licenses, and click **Next**.



13. Based on the license sheet, enter the serial number and license key, and then click **Next**.

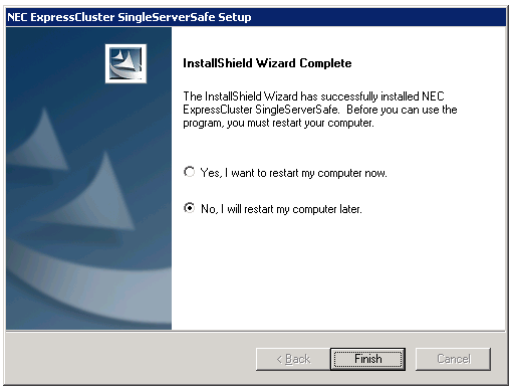


14. When the **License Registration Confirmation** dialog box is displayed, check its content, and then click **Next**. A confirmation message is displayed.



15. The initial **License Manager** dialog box is displayed again, as in step 9. Register the licenses of optional products in the same way. After registering all the required licenses, click **Finish** to close the **License Manager** dialog box.

16. [InstallShield Wizard Complete] is displayed. Select [Yes, I want to restart my computer now.] and click **Finish** to restart the server. If you want to restart the server later, select [No, I will restart my computer later.] and click **Finish**.



Note:
By default, **No, I will restart my computer later** is selected.

Installing the offline version of the ExpressCluster Builder

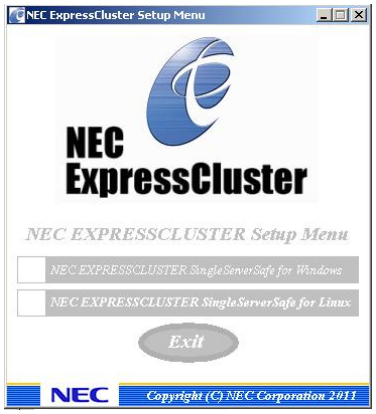
It is not necessary to install the offline version of the ExpressCluster Builder on the server on which ExpressCluster X SingleServerSafe is installed. If you will create or modify the configuration data of ExpressCluster X SingleServerSafe by using a machine that cannot access ExpressCluster X SingleServerSafe through a Web browser, you need to install the offline version of the ExpressCluster Builder on that machine.

Installing the offline version of the ExpressCluster Builder

Follow the procedures below to install the offline version of the ExpressCluster Builder.

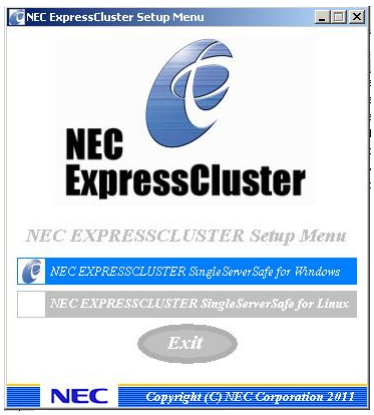
Note:
Install the ExpressCluster Builder with the administrator privilege.

1. Insert the Installation CD-ROM to the CD-ROM drive.
2. The menu screen for installation is displayed.



Note:
If the menu screen does not open automatically, double-click menu.exe in the root folder of the CD-ROM.

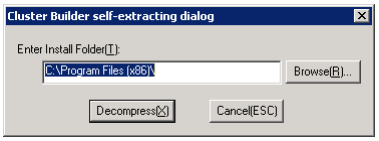
3. Select **NEC ExpressCluster® SingleServerSafe for Windows**.



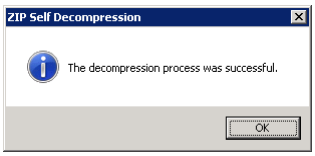
4. Select **NEC ExpressCluster® SingleServerSafe Accessories**.

5. Select **NEC ExpressCluster® SingleServerSafe Builder**.

6. Select where to install in the **Cluster Builder self-extracting dialog** and click **Decompress**.



7. Click **OK** in the ZIP Self Decompression dialog box. Installation is completed.



Starting the Builder

The online version of the Builder runs on a machine (including the local server) capable of connecting to the server that uses ExpressCluster X SingleServerSafe over the network. The Builder started without a network connection is called the offline version of the Builder. While what you see and specify on the screen are the same for both versions, the way you start the Builder and how the settings are applied differ.
The procedure for each version is described below.

Starting the online version of the Builder

To start the online version of the ExpressCluster Builder, follow the procedure below.

1. Start the WebManager. Start your browser, and then enter the IP address and port number of the server where ExpressCluster X SingleServerSafe is installed in the Address bar.

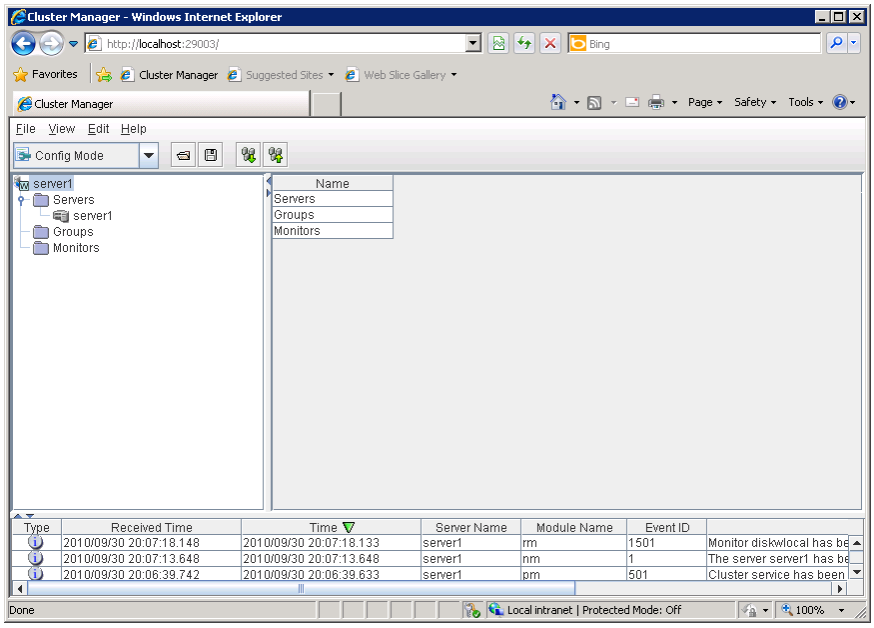
   http://192.168.0.1:29003/

   The port number for the WebManager specified at installation. (Default value 29003).

   Specify the IP address of the server on which ExpressCluster X SingleServerSafe is installed. For the local server, the IP address may be localhost.

Note:
You cannot start the WebManager unless you restart the server after installing ExpressCluster X SingleServerSafe. Be sure to restart the server.
Note:
Starting the WebManager requires the JRE. Do not forget to install the JRE.

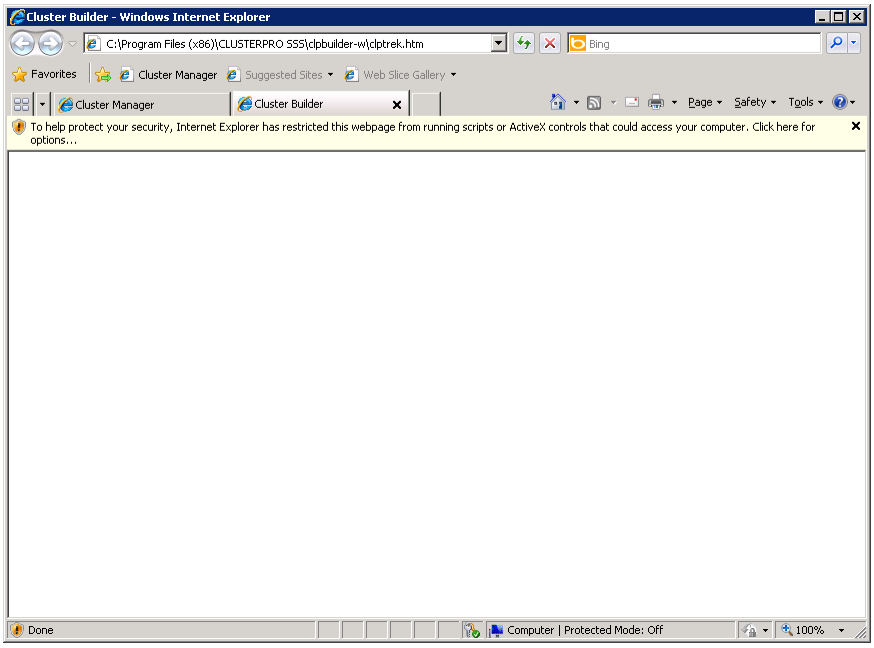
2. Select **Config Mode** from the **View** menu or click the button on the toolbar to change to the configuration mode (online version of the Builder).



Starting the offline version of the Builder

To start the offline version of the ExpressCluster Builder, follow the procedure below.

1. Double-click the HTML file "clptrek.htm", which is for Builder window display and is in the installation folder.
2. Start Web browser that ExpressCluster Builder supports.
3. If a security warning is displayed, click information bar and allow the blocked content.



Note:
Starting the Builder requires the JRE. Do not forget to install the JRE.

Setting up the SNMP linkage function manually

To handle information acquisition requests on SNMP, the Windows SNMP Service must be installed separately and the SNMP linkage function must be registered separately.

If the Windows SNMP Service has already been installed, the SNMP linkage function will be automatically registered when the ExpressCluster Server is installed. If, however, the Windows SNMP Service has not been installed, the SNMP linkage function will not be registered.

When the Windows SNMP Service has not been installed, follow the procedure below to manually register the SNMP linkage function.

Note:
Use an Administrator account to perform the registration.

1. Install the Windows SNMP Service.
2. Stop the Windows SNMP Service.
3. Register the SNMP linkage function of ExpressCluster with the Windows SNMP Service.

   3-1. Start the registry editor.

   3-2. Open the following key:

   HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\
   Services\SNMP\Parameters\ExtensionAgents

   3-3. Specify the following to create a string value in the opened key:

   Value name :mgtmib
   Value type :REG_SZ
   Value data :SOFTWARE\NEC\EXPRESSCLUSTER\
   SnmpAgent\mgtmib\CurrentVersion

   3-4. Exit the registry editor.
4. Start the Windows SNMP Service.

Chapter 3 Upgrading, uninstalling or reinstalling

This chapter describes how to upgrade to the latest version of ExpressCluster X SingleServerSafe and uninstall or reinstall ExpressCluster X SingleServerSafe. Also, this chapter describes how to upgrade ExpressCluster X SingleServerSafe to ExpressCluster X.

This chapter covers:

Upgrading ExpressCluster X SingleServerSafe

This section describes how to upgrade from the old version of ExpressCluster X SingleServerSafe to the latest version of it.

Upgrading from the old ExpressCluster X SingleServerSafe version

Before starting the upgrade, read the following notes.

- You can upgrade from ExpressCluster X SingleServerSafe 1.0, 2.0, or 2.1 for Windows to ExpressCluster X SingleServerSafe 3.1 for Windows. Upgrading from other versions is not possible.
- To upgrade from ExpressCluster X SingleServerSafe 1.0, 2.0, or 2.1 for Windows to ExpressCluster X SingleServerSafe 3.1 for Windows, you need the license of ExpressCluster X SingleServerSafe 3.1 for Windows (including the licenses of optional products, if used).
- You cannot use the cluster configuration data that was created by using ExpressCluster X higher than ExpressCluster X in use.
- The cluster configuration data that was created by using ExpressCluster X 1.0, 2.0, 2.1, 3.0, or 3.1 for Windows is available for ExpressCluster X in use.

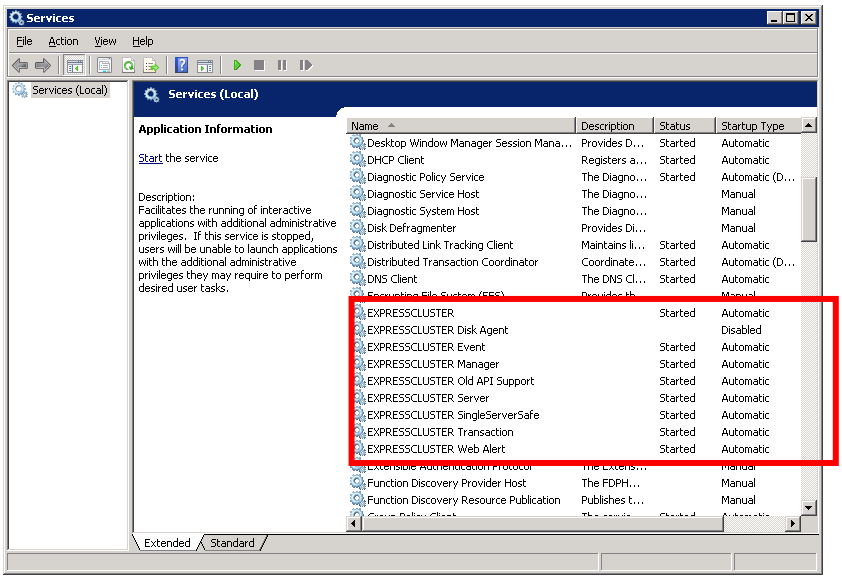
The following procedure describes how to upgrade from ExpressCluster X SingleServerSafe 1.0, 2.0, or 2.1 for Windows to ExpressClustere X SingleServerSafe 3.1 for Windows.

Note:
To upgrade, use an account that has administrator privileges.

1. Make sure that the server and all the resources are in the normal status by using the WebManager or **clpstat** command.

2. If there is an active failover group on the server, stop the group by using the WebManager.

3. Set **Startup Type** to **Manual** for the ExpressCluster X SingleServerSafe services.

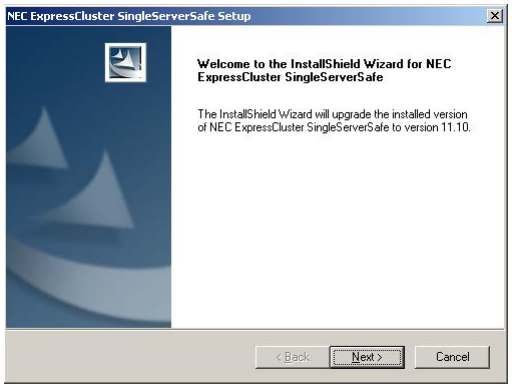


Note:
The **Startup Type** of the ExpressCluster Disk Agent Service must be **Disable**. Do not change it.

4. Restart the server by shutting down the cluster using the WebManager or by specifying the relevant command.

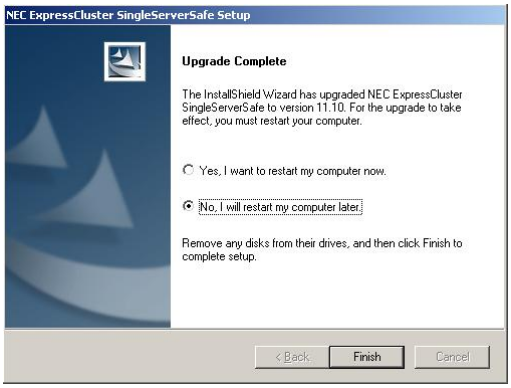
5. After the system restarts, stop the SNMP service. (This only applies when the SNMP service exists and is running.)

6. Start the ExpressCluster Server installer by following steps 1 to 4 of Chapter 2, “Installing ExpressCluster X SingleServerSafe for the first time”. Select **Next** to start the upgrade.

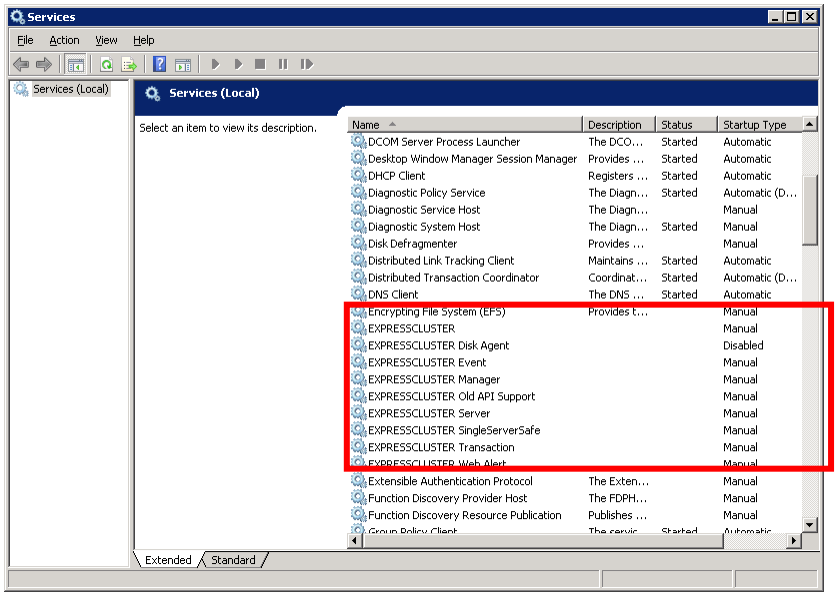


7. After file replacement, **License Manager** is started. Register the required licenses.

8. After the licenses are registered, [Upgrade Complete] is displayed. [InstallShield Wizard Complete] is displayed. Select [No, I will restart my computer later.] and click **Finish**.



9. Set **Startup type** of the following services to **Automatic**.



Note:
The **Startup Type** of the ExpressCluster Disk Agent service must be **Disable**. Do not change it.
When upgrading from X 1.0, ExpressCluster Alert service is removed, because the ExpressCluster Alert function is provided as general execution file (*.exe) for X 3.1

10. Restart the server.

11. Upgrading completes. Confirm that the internal version is "11.10" or later by using WebManager or clpstat command.

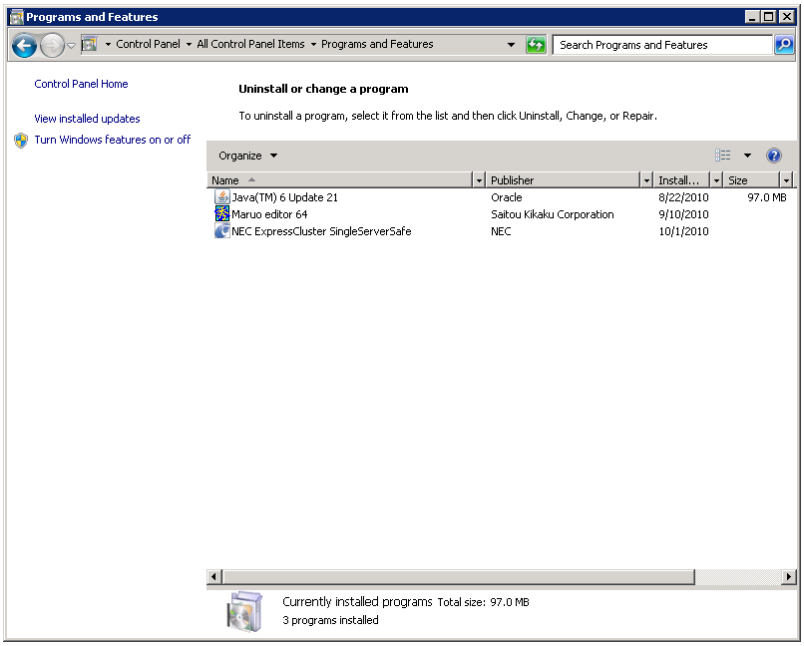
Uninstalling ExpressCluster X SingleServerSafe

Uninstalling ExpressCluster X SingleServerSafe

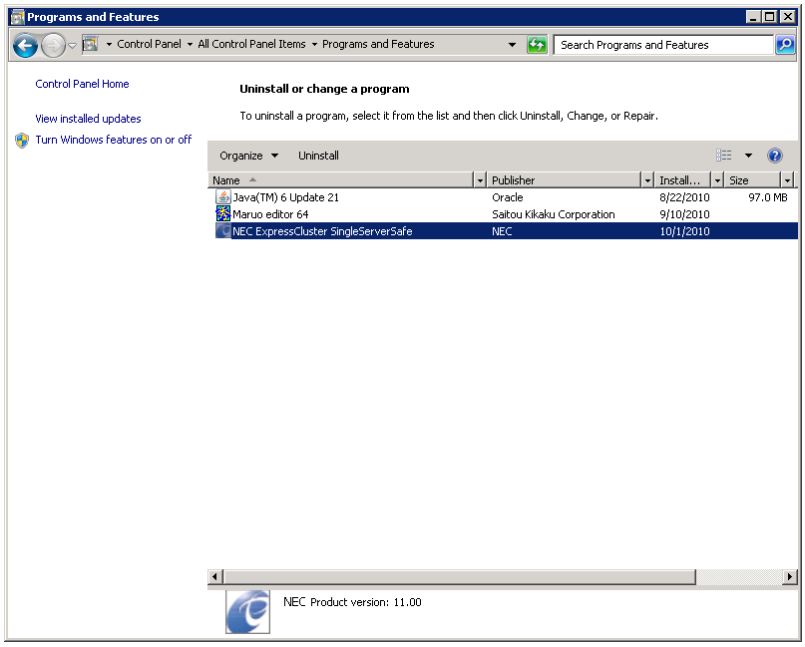
Note:
You must log on as an Administrator to uninstall ExpressCluster X SingleServerSafe.

To uninstall ExpressCluster X SingleServerSafe, follow the procedure below.

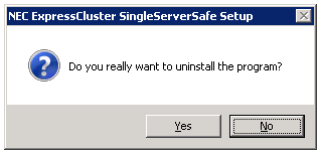
1. Select **Service** in **Administrative Tool** in OS, and set following service **Startup Type** to Manual.
   - ExpressCluster
   - ExpressCluster Event
   - ExpressCluster Manager
   - ExpressCluster Old API Support
   - ExpressCluster Server
   - ExpressCluster SingleServerSafe
   - ExpressCluster Transaction
   - ExpressCluster Web Alert
2. Reboot the server.
3. When using the ExpressCluster X Alert service, click the ExpressCluster reporting icon in the task tray.
4. For Windows Server 2003 environment, click **Add or Remove Programs** in **Control Panel**. For Windows Server 2008 environment, click **Program and Features** in **Control Panel**.



5. Select NEC ExpressCluster SingleServerSafe, and then click **Uninstall**.

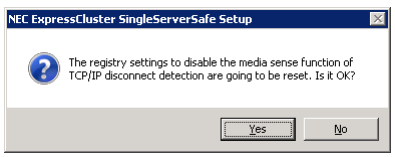


6. Click **Yes** in the uninstallation confirmation dialog box. If you click No, uninstallation will be canceled.

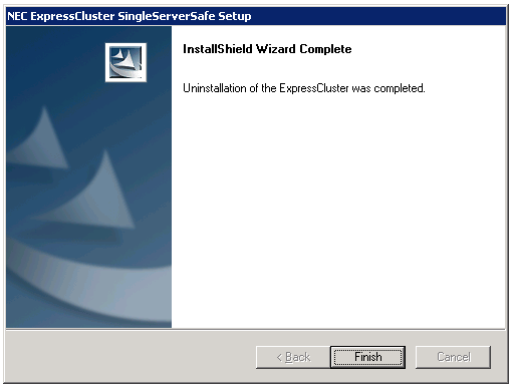


7. If the SNMP service is started, the message to confirm to stop the SNMP service is displayed. Click Yes. If you click No, uninstallation will be canceled.

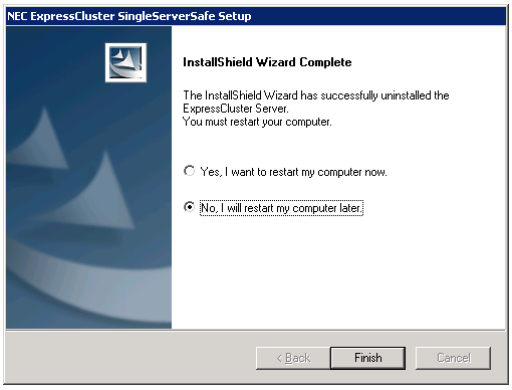
8. A message is displayed asking whether to return the media sense function (TCP/IP disconnection detection) to the state it was in before installing the ExpressCluster Server. Click **Yes** to return to the state it was in before installing the ExpressCluster Server. If you click **No**, the ExpressCluster Server will be uninstalled with the media sense function disabled.



9. [InstallShield Wizard Complete] is displayed. Click **Finish**.



10. The confirmation message whether to restart the computer is displayed. Select **Yes, I want to restart my computer** or **No, I will restart my computer later.** And click **Finish**. Uninstallation of the ExpressCluster Server is completed.



Note:

If you uninstall ExpressCluster with CPU frequency changed by using CPU Frequency Control of ExpressCluster, the CPU frequency does not return to the state before changing. In this case, return the CPU frequency to the defined value by the following way.

Windows Server 2003:
Execute the following command at a command prompt.

```
# powercfg /X "always on" /processor-throttle-ac none
```

The character string to be specified with /X option is the name selected in the current setting of **Power Options** -> **Power Schemes** in **Control Panel**.

Windows Server 2008:
Select **Balanced** in **Power Options** -> **Select a power plan** in **Control Panel**.

Uninstalling the offline version of the ExpressCluster Builder

To uninstall the ExpressCluster X Builder, follow the procedures below:

1. Exit from all Web browsers (confirm that the JavaVM icon is no longer in the task tray).
2. Delete the ExpressCluster X Builder installation folder from Windows Explorer. The default installation folder is "C:\Program Files\EXPRESSCLUSTER SSS".

Reinstalling ExpressCluster X SingleServerSafe

Reinstalling the ExpressCluster X SingleServerSafe

To reinstall the ExpressCluster X SingleServerSafe, prepare the configuration data created using the Builder (or the latest data if you changed the configuration).

After changing the configuration, make sure to save the latest configuration data. In addition to saving it to the Builder after creation, you can back up the configuration data by using the clpcfctrl command. For details, see “Backing up configuration data” in Chapter 2, “ExpressCluster X SingleServerSafe command reference” in the *ExpressCluster X SingleServerSafe 3.1 for Windows Operation Guide*.

To reinstall the ExpressCluster X SingleServerSafe, follow the procedures below:

1. Back up the configuration data.
2. Uninstall the ExpressCluster X SingleServerSafe.
   If reinstalling the OS, it is not necessary to uninstall the ExpressCluster X SingleServerSafe. However, when reinstalling in the folder in which the ExpressCluster X SingleServerSafe was formerly installed, the files in the installation folder must be deleted.
3. Shut down the OS when uninstalling the ExpressCluster X SingleServerSafe is completed.
4. Install the ExpressCluster X SingleServerSafe and register the license as necessary. Shut down the OS when installing ExpressCluster X SingleServerSafe completed.
5. Apply the configuration data to the server.
   To apply the configuration data, load the backup data by using the Builder, and then upload it. For details, see "Applying configuration data" in Chapter 2, “Creating configuration data” in the *ExpressCluster X SingleServerSafe 3.1 for Windows Configuration Guide*.

Upgrading to ExpressCluster X

When upgrading ExpressCluster X SingleServerSafe to ExpressCluster X, you can migrate the configuration data created using the Builder (or the latest data if you changed the configuration).

In this case, save the latest configuration data before starting the upgrade. In addition to saving it to the Builder after creation, you can back up the configuration data by using the clpcfctrl command. For details, see “Backing up configuration data” in Chapter 2, “ExpressCluster X SingleServerSafe command reference” in the *ExpressCluster X SingleServerSafe 3.1 for Windows Operation Guide*.

To upgrade ExpressCluster X SingleServerSafe to ExpressCluster X, follow the procedure below.

1. Back up the configuration data.
2. Uninstall ExpressCluster X SingleServerSafe from the server for which to perform the upgrade. For details about the uninstallation procedure, see "Uninstalling ExpressCluster X SingleServerSafe" in this guide.
3. Shut down the OS when uninstalling the ExpressCluster X SingleServerSafe is completed.
4. Install ExpressCluster X, and set up its environment. You can use the backup configuration data for this process. For details about how to set up ExpressCluster X, see the ExpressCluster X manual.

Note:
For ExpressCluster X, register the following licenses:
* ExpressCluster X SingleServerSafe (two-CPU license)
* ExpressCluster X SingleServerSafe upgrade license
These licenses can be used for ExpressCluster X (two-CPU license).

Chapter 4 Latest version information

The latest information on the upgraded and improved functions is described in details.

This chapter covers:

Latest version

As of December 2012, the latest internal version of ExpressCluster X SingleServerSafe 3.1 for Windows is 11.17.
For the latest information, please refer to the latest manual on ExpressCluster website.

Check the internal version of ExpressCluster X SingleServerSafe by using the WebManager.
You can display the internal version of a server by selecting the icon for the server in the tree view of the WebManager.

If the internal version is 11.16 or earlier, you can update it to 11.17 by applying the update CPRO-XW430-11. For the update application procedure and the failure information that is modified by the update, refer to the update procedure.

Function upgrade information

Upgrade has been performed on the following minor versions.

Number	Version	Upgraded section
1	11.00	It is now possible to operate both the WebManager and Builder from the same browser window.
2	11.00	A function has been implemented to check set IP address when uploading configuration data.
3	11.00	clprexec command has been implemented which notifies failure from other servers or monitoring tools other than ExpressCluster to the cluster servers and message receive monitor resource has been implemented which runs recovery action to notified failure.
4	11.00	User mode process dump of Oracle monitor process can now be acquired when monitor process timed out.
5	11.00	Detailed information about an Oracle database can now be acquired when Oracle monitor resource detected any error.
6	11.00	The Hyper-V guest OS can now be treated as a resource.
7	11.00	The termination code of an activated application executed by the application resource and a batch file executed by the script resource can now be identified by the existence of abnormity and then used to trigger for recovery operation.
8	11.02	Different values can now be specified for **Normal Return Value** of the start and stop script of the script resources.
9	11.02	The options to display and reset the recovery operation count have been added to the `clpmonctrl` command.
10	11.10	The number of group and resource has been doubled.
11	11.10	Waiting for startup or stopping a faiover group has been enabled.
12	11.10	A function whereby the WebManager and the clpmonctrl command can be used to trigger a Dummy Failure for a monitor resource has been implemented.
13	11.10	WebManager that can be connected from an Android terminal has been implemented.
14	11.10	The MIB of ExpressCluster has been defined.
15	11.10	An SNMP trap transmission function has been added.
16	11.10	Information acquisition requests on SNMP are now supported.
17	11.10	A function has been implemented to execute a specified script to recover a monitor resource. In addition, script execution has been enabled prior to reactivation or failover.
18	11.10	A function has been implemented to disable recovery action caused by monitor resource error.

19	11.10	Database monitoring functions have been enhanced.
20	11.10	Some environment variables have been added for use in scripts.
21	11.10	Script setting has been simplified by the use of script templates.
22	11.10	The display of the configuration mode screen has been corrected for the 800*600 screen size.
23	11.10	Logs can be downloaded even if the browser is set to block popups.
24	11.10	Functions for which licenses have not been installed are no longer displayed during setup.
25	11.10	The number of monitor resources that are automatically registered has been increased.
26	11.10	The default command timeout value for the clprexec command has been changed from 30 seconds to 180 seconds.
27	11.10	Process name monitor resource (psw) has been added.
28	11.10	JVM monitor resource (jraw) has been added.
29	11.10	System monitor resource (sraw) has been added.
30	11.10	A function has been added to acquire a list of the services, when configuring service resources, that are installed on the cluster server.
31	11.11	The conditions to wait for the group stop can now be specified. (Cluster stop, server stop)
32	11.11	The view of the recovery action control function popup window that is displayed at the end of the Cluster Generation Wizard is improved.
33	11.11	The number of disks of which size is to be monitored by System Resource Agent has been changed from 10 to 26.
34	11.13	A function for displaying time information has been added to WebManager.
35	11.13	A function for automatically starting or resuming the cluster after reflecting the configuration data has been added.
36	11.13	A function has been added to prevent a Web browser from being terminated or reloaded when the configuration data is edited in WebManager **Config Mode**.
37	11.13	WebManager can now set and display physical machines and virtual machines separately.
38	11.13	The setting that assumes that a diskfull detection is not an error has been added to the disk RW monitor resource.
39	11.13	A function for monitoring the number of processes has been added to the process name monitor resource.
40	11.13	The Oracle monitor resource has been improved so that a specific error (ORA-1033) which occurs when Oracle is being started is regarded as the normal state.
41	11.14	WebManager now supports Java SE Runtime Environment 7.

42	11.15	Windows Server 2012 is now supported.
43	11.15	The license information list can be now viewed from WebManager.
44	11.15	The shortcut icon for WebManager is now created on the desktop when ExpressCluster is installed.
45	11.15	The Websphere monitor resource now supports WebSphere 8.0.
46	11.15	The load balancer link function for the JVM monitor resource now supports BIG-IP LTM.
47	11.15	The JVM monitor resource now supports WebOTX ESB 8.5, MasterScope/NEC Storage SVF for PDF 9.1, MasterScope/NEC Storage Report Director Enterprise 9.1, and MasterScope/NEC Storage Universal Connect/X 9.1.
48	11.15	A mode to monitor disk monitor resources by using write through has been added.
49	11.15	A command that can be used for capacity planning (clpprer) has been added. This command can estimate future values based on time-series data indicating system resource usage.
50	11.15	A function to collect system resource information that can be used to easily determine the cause of a failure resulting from a shortage of system resources has been added.
51	11.15	The restriction that the OS authentication setting could not be specified for Oracle monitor resources in the UAC environment of Windows Server 2008 or later has been lifted.
52	11.17	PostgreSQL monitor now supports PostgreSQL9.2.
53	11.17	The SNMP linkage function now supports Windows Server 2012.

Chapter 5 Additional information

This chapter provides tips on installing ExpressCluster X SingleServerSafe.

This chapter covers:

ExpressCluster X SingleServerSafe services

ExpressCluster X SingleServerSafe consists of the system services listed below.

System Service Name	Explanation
ExpressCluster	ExpressCluster
ExpressCluster Disk Agent	Not used for ExpressCluster X SingleServerSafe
ExpressCluster Event	Event log output
ExpressCluster Java Resource Agent	Java Resource Agent
ExpressCluster Manager	WebManager Server
ExpressCluster Old API Support	Compatible API process
ExpressCluster X Server	ExpressCluster Server
ExpressCluster SingleServerSafe	SingleServerSafe process
ExpressCluster System Resource Agent	System Resource Agent
ExpressCluster Transaction	Communication process
ExpressCluster Web Alert	Alert synchronization

Using the License Manager

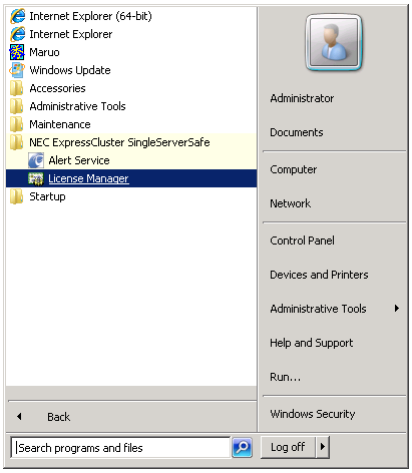
The **Start** menu contains the menu for ExpressCluster SingleServerSafe. You can start the License Manager from this menu.

Registering a license by specifying a license file

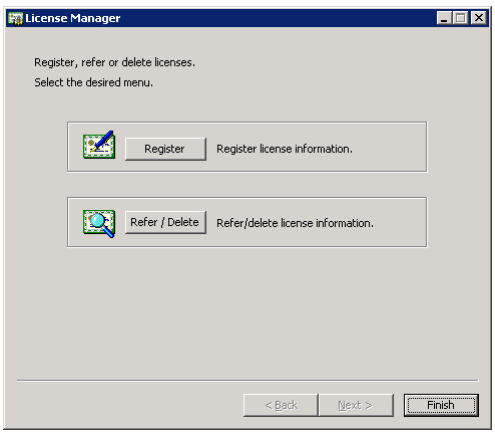
When using a trial license, obtain a license file instead of a license sheet. The following procedure describes how to register a license by specifying a license file.

Note:
To register a license, use an account that has administrator privileges.

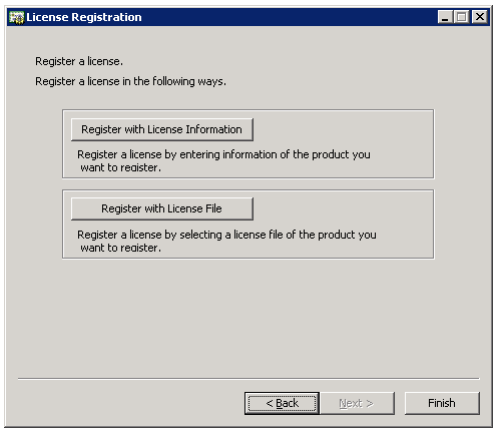
1. On the **Start** menu, click **Programs** and then **License Manager of NEC ExpressCluster SingleServerSafe**.



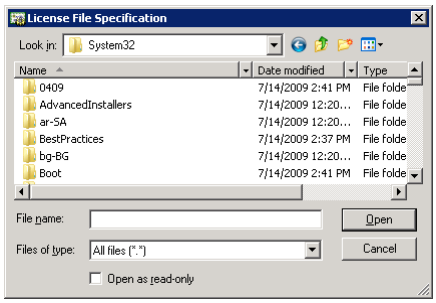
2. The **License Manager** dialog box is displayed. Click **Register**.



3. A dialog box is displayed for selecting the license registration method. Click **Register with License File**.



4. The **License File Specification** dialog box is displayed. In the **License File Specification** dialog box, select the license file to be registered and then click **Open**.



5. The message confirming registration of the license is displayed. Click **OK**.

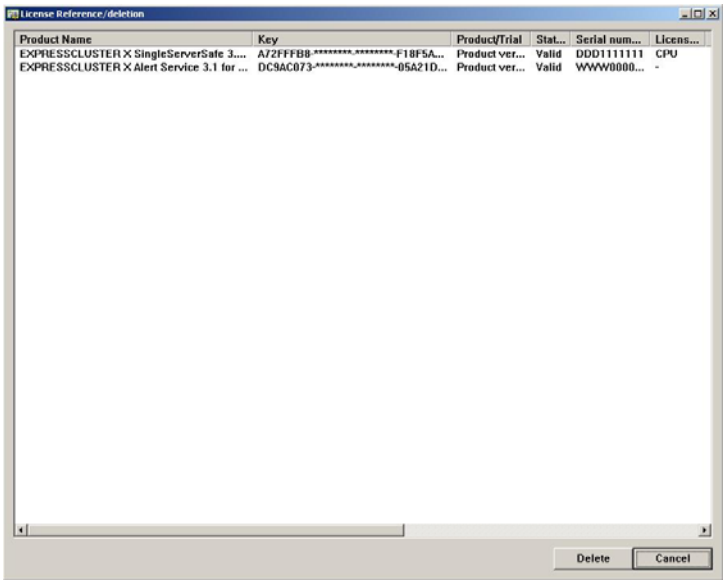
6. Click **Finish** to close the license manager.

For the license registration to take effect, shut down the server by using the shutdown command of your OS and reboot it.

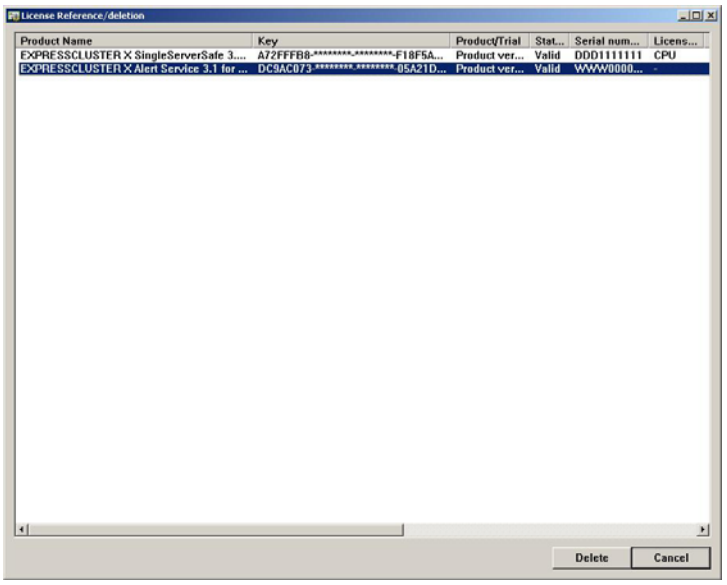
Referencing or deleting a registered license

The following procedure describes how to refer to and delete the registered license.

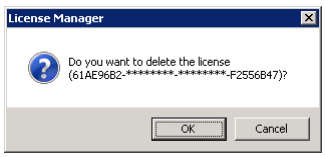
1. On the **Start** menu, click **Programs** and then **License Manager** of **NEC ExpressCluster SingleServerSafe**.
2. The **License Manager** dialog box is displayed. Click **Refer/Delete**.
3. The registered licenses are listed.



4. Select the license to delete and click **Delete**.



5. The confirmation message to delete the license is displayed. Click OK.



Switching from the trial license to the product license

When registering the official license to a server running with the trial license, you can add the official license without deleting the trial license. When you list the registered licenses, both the official and trial licenses are shown, but there is no problem.

Chapter 6 Notes and Restrictions

This chapter provides information on known problems and how to troubleshoot the problems.

This chapter covers:

Information about installing ExpressCluster X SingleServerSafe

Consideration after installing an operating system, when configuring OS and disks are described in this section.

File system

Use NTFS as the file system for the partition on which to install the OS.

WebManager

After updating ExpressCluster X SingleServerSafe, close the Web browser, clear the Java cache, and then open the browser again.

ExpressCluster Disk Agent Service

The ExpressCluster Disk Agent service is not used for ExpressCluster X SingleServerSafe. Do not start this service.

Appendix

- Appendix A Troubleshooting
- Appendix B Index

Appendix A Troubleshooting

When installing ExpressCluster X SingleServerSafe

Behavior and Message	Cause	Solution
Setup has failed. Error code : %x %x: error code	Refer to the given error code.	Refer to the action for the error code.
Less than 9.0 has been installed. After uninstalling, reinstall it again.	The old version of the ExpressCluster has been installed.	Uninstall the old version of the ExpressCluster and install the current version.
Failed to set up (%d) Error code : %x Please reboot the system, and then try again. %d: Internal code %x: Error code	Refer to the explanation of the given error code.	Refer to the action for the given error code.

Troubleshooting for licensing

Behavior and Message	Cause	Solution
When the cluster was shut down and rebooted after distribution of the configuration data created by the Builder to all servers, the following message was displayed on the WebManager's alert view, and the cluster stopped. "The license is not registered. Product name:%1" %1:Product name	The cluster has been shut down and rebooted without its license being registered.	Register the license from the server.
When the cluster was shut down and rebooted after distribution of the configuration data created by the Builder to all servers, the following message appeared on WebManager's alert view, but the cluster is working properly. "The license is insufficient. The number of registered licenses is %1. There are %2 too few licenses. Product name: %3" %1: Number of registered licenses %2: Number of licenses still needed %3: Product name	Licenses are insufficient.	Obtain a license and register it.
While the cluster was operated on the trial license, the following message is displayed and the cluster stopped. "The license of trial expired by %1, %2 and %3. Product name:(%4)" %1: Trial end year %2: Trial end month %3: Trial end day %4: Product name	The license has already expired.	Ask your sales agent for extension of the trial version license, or obtain and register the product version license.

Appendix B Index