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About this Guide

Using this guide
This guide provides a hands-on "Quick Start" set of instructions to install and configure EXPRESSCLUSTER X (EC X) for Windows with Microsoft SharePoint Server. The guide assumes users have Microsoft Windows system administration knowledge and skills with experience in installation and configuration of Microsoft Windows operating systems, networks, and SharePoint Server.

This guide covers the following topics:

Chapter 1: Overview – describes the general steps of the setup procedures.

Chapter 2: System Requirements and Planning – describes the overall system and network requirements, and includes a set of tables for planning the installation and configuration.

Chapter 3: Base System Setup – describes the configurations required for each system before installing target application.

Chapter 4: IIS and SQL Server Installation – describes the installation of IIS and SQL Server on the Primary and Standby Servers.

Chapter 5: EC X Server Installation – describes EC X installation on the Primary and Standby Servers.

Chapter 6: Base Cluster Setup – describes the process of generating a cluster, creating a failover group, and uploading a configuration.

Chapter 7: SharePoint 2007 Installation – describes the installation of SharePoint on the Primary and Standby Servers.

Chapter 8: SharePoint Cluster Setup – describes required configurations to enable full cluster functionality.

Chapter 9: Final Deployment in a LAN Environment – describes steps to verify the cluster and complete the deployment on a Primary and a Standby Server.

Chapter 10: Common Maintenance Tasks – describes how to perform common maintenance tasks using the EC X Manager.
Where to go for more information
Refer to additional documentation under the "documentation" directory on the
EC X distribution CD.

For more information, go to: http://www.nec.com/expresscluster

Other EC X guides are at:

- **GettingStartedGuide** – General cluster concepts and overview of EC X functionality.

- **Installation and Configuration Guide** – EC X installation and configuration procedures.

- **Reference Guide** – Commands for EC X scripts and maintenance commands to execute from the command prompt.

Contact: info@expresscluster.jp.nec.com
1 Overview

The general procedure to deploy SharePoint 2007 with EC X on two servers (Primary and Standby) consists of the following major steps:

1. Perform system planning to determine requirements and specify configuration settings prior to start of actual system installation and configuration.
2. Prepare the Primary and Standby Servers, including OS installation and configuration.
3. Install, configure, and verify SharePoint, IIS, and SQL Server on the Primary and Standby Servers.
4. Install and configure EC X on the Primary and Standby Servers.
5. Create and configure the EC X failover group to enable continuous protection and automatic recovery for SharePoint Server.
6. Upload the configuration file and start the cluster to complete deployment in the mirror disk configuration.
## 2 System Requirements and Planning

### 2.1 System Requirements

<table>
<thead>
<tr>
<th></th>
<th>Machine 1 Primary Server</th>
<th>Machine 2 Standby Server</th>
<th>Machine 3 Test Machine</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CPU</strong></td>
<td>Pentium 4 – 3.0 GHz or better</td>
<td>Pentium 4 – 3.0 GHz or better</td>
<td></td>
</tr>
<tr>
<td><strong>Memory</strong></td>
<td>2GB or more</td>
<td>1GB or more</td>
<td></td>
</tr>
<tr>
<td><strong>Disk</strong></td>
<td>1 physical disk</td>
<td>1 physical disk with 20GB or more space available</td>
<td></td>
</tr>
<tr>
<td><strong>OS partition</strong>:</td>
<td>15GB or more space available (to include the installation of SharePoint and SQL)</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cluster partition</strong>:</td>
<td>Partition of 17 MB or more, available for ECX management - the same size for each server system</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Data partition</strong>:</td>
<td>enough partition space to store SQL data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OS</strong></td>
<td>Windows Server 2008 (Standard or Enterprise) with latest service pack</td>
<td></td>
<td>Windows XP or later</td>
</tr>
<tr>
<td><strong>Software</strong></td>
<td>Java Version 6.0 Update 20 (or later) enabled web browser</td>
<td>Java Version 6.0 Update 20 (or later) enabled web browser</td>
<td></td>
</tr>
<tr>
<td><strong>SQL Server 2005</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>SharePoint 2007 standard or enterprise</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>IIS version 7</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Network</strong></td>
<td>2 – 100Mbit or faster Ethernet network interface cards</td>
<td>1 – 100Mbit or faster Ethernet network interface card</td>
<td></td>
</tr>
</tbody>
</table>
2.2 System Planning

Review the requirements from the last section and then fill in the tables of the worksheet below. Refer to Appendix B for an example worksheet.

Machine 1: Primary Server
Machine 2: Standby Server
Machine 3: Test Client

Table 1: System Network Configuration

<table>
<thead>
<tr>
<th>Machine</th>
<th>Host name</th>
<th>Network Connection</th>
<th>IP Address</th>
<th>Subnet Mask</th>
<th>Default Gateway</th>
<th>Preferred DNS Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Public:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interconnect:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Public:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Interconnect:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Floating IP (FIP) address:
Web Management Console FIP: (1) __________
Cluster FIP: (2) __________

Table 2: System OS and Disk Configuration

<table>
<thead>
<tr>
<th>Machine</th>
<th>OS</th>
<th>Disk 0 (OS Disk)</th>
<th>Disk 1 (Data Disk)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Boot Partition:</td>
<td>Cluster Partition:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drive Letter:</td>
<td>Drive Letter:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Size:</td>
<td>Size (&gt;20MB):</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Boot Partition:</td>
<td>*Data Partition:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Drive Letter:</td>
<td>Drive Letter:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Size:</td>
<td>Size:</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* The size must be large enough to store all data for a given SharePoint Server to meet current and expected future needs.
**Table 3: System Logins and Passwords**

<table>
<thead>
<tr>
<th>Computer/Account</th>
<th>Login</th>
<th>Password</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrator</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3 Base System Setup

3.1 Setup the Primary Server (Machine 1)

1. If necessary, install hardware components, OS, and Service Packs (refer to Chapter 2).

2. Verify the basic system boot and administrator login functionality, and availability of required hardware components (refer to Chapter 2).

3. Configure network interface names:
   a. Rename the network interface for network communication with client systems to Public.
   b. Rename the network interface for internal EC X management and data mirroring network communication between servers to Interconnect.

4. Configure the Network interface TCP/IP settings:
   a. In the Network Connections window, right-click Public, and then click Properties.
   b. In the Properties window, double-click Internet Protocol (TCP/IP).
   c. Click the Use the following IP address: option button.
   d. Type the IP address, Subnet mask, and Default gateway (refer to section 2.2).
   e. Click the Use the following DNS server addresses: option button and then type the address of the Preferred DNS server (refer to section 2.2).
   f. Go back to the Network Connections window. Right-click Interconnect and then click Properties.
   g. In the Properties window, double-click Internet Protocol (TCP/IP).
   h. Click the Use the following IP address: option button.
   i. Type the IP address and Subnet mask (refer to section 2.2).
   j. Click OK. Click OK. (Two times total).
5. Configure the network interface binding order:
   a. In the **NetworkConnections** window, click the **Advanced** menu, and click **Advanced Settings**. If the menu bar is not visible, press the Alt key.
   b. On the **Adapters and Bindings** tab, under **Connections:**, use the up and down arrow buttons to move **Public** to the first (top) position. Click **OK**.
   c. Close the **Network Connections** window.

6. Connect the network interfaces:
   a. Connect the network interface **Interconnect** to the **Cluster Interconnect Network** and verify there is a healthy physical link status.
   b. Connect the network interface **Public** to the **Public Network** and verify connectivity to the Test Client (Machine 3).

7. Configure the Data Disk:
   a. Verify the disk device or LUN is initialized as a Windows Basic disk device.
   b. Create a mirrored disk cluster partition on the disk and verify it is 20MB or larger.
      Assign a drive letter to the partition, but do *not* format (refer to Table 2).
   c. Create a mirrored disk data partition on the disk. Assign a drive letter to the partition and format to NTFS (refer to Table 2). The drive letter ‘O’ is an example in this document.
   d. Verify the mirrored disk cluster and data partitions are visible in Windows Explorer under their assigned drive letters.

3.2 Setup the Standby Server (Machine 2)
Perform steps 1-8 in Section 3.1 on the Standby Server (Machine 2).
4 IIS and SQL Server Installation

4.1 IIS Installation

1. Starting on the Primary Server (Machine 1), on the Windows desktop, click Start, point to Administrative Tools, and then click Server Manager.
2. In the left pane, select Roles.
3. In the right pane, click Add Roles.
4. Select Web Server (IIS). If the Add Roles Wizard window displays, click Add Required Features, and then click Next.
5. Click Next. Continue with setup, selecting all of the defaults.
6. Click Next.
7. In the confirmation window, click Install.
8. After the installation is complete, click Close.

4.2 SQL Server 2005 Installation

1. Insert the SQL Server 2005 CD into a disc drive on the Primary Server (Machine 1).
2. If the splash screen does not display, on the Windows desktop, click Start, and then select Run. In the Run window, for the disc drive, browse to find splash.hta.
3. Under Install, click Server components, tools, Books Online, and samples.
4. After the Program Compatibility Assistant window displays, click Run Program.
5. In the End User License Agreement window, select the I accept the licensing terms and conditions check box. Click Next.
6. In the Installing Prerequisites window, click Install.
7. In the next window, click Next.
8. In the Welcome to the Microsoft SQL Server Installation Wizard window, click Next.
9. In the System Configuration Check window, click Next.
10. In the Registration Information window, type the Name, Company, and Product Key. Click Next.
11. In the Components to Install window, select the SQL Server Database Services check box, and then click the Advanced button.
12. In the Feature Selection window, from the drop-down menu of Database Services, select Entire feature will be installed on local hard drive. Expand Client Components, and from the drop-down menu of Management Tools, select Entire feature will be installed on local hard drive. Click Next.
13. In the Instance Name window, select the Default instance option button, and then click Next.
14. In the Service Account window, select the Use the built-in System account option button. From the drop-down list, select Local System. Below Start services at the end of setup, select the SQL Server check box. Click Next.
15. In the Authentication Mode window, select the Mixed Mode option button. Type a password, and then type again for Confirm password. Click Next.
16. In the Collation Settings window, select the SQL collations option button. Click Next.
17. In the Error and Usage Report Settings window, clear the two check box options. Click Next.
18. In the Ready to Install window, Click Install.
19. After all of the Setup Progress items finish, click Next.
20. In the Completing Microsoft SQL Server 2005 Setup window, Click Finish.
21. Reboot the computer.
22. Once the installation is complete, click Start, point to All Programs, point to Microsoft SQL Server 2005, point to Configuration Tools, and then click SQL Server Configuration Manager.
23. In the SQL Server Configuration Manager window, expand SQL Server Network Configuration, and then click Protocols for MSSQLSERVER.
24. Right-click Named Pipes and then click Enable. In the next window, click OK.
25. Verify TCP/IP is enabled. Verify the VIA protocol is disabled.
26. Reboot the Primary Server (Machine 1).

4.3 Install IIS and SQL Server 2005 on the Standby Server (Machine 2)
Perform all of the steps in Sections 4.1 and 4.2 on the Standby Server.

Note
5 EC X Server Installation

5.1 Install EC X on the Primary Server (Machine 1)
1. Insert the EXPRESS CLUSTER X CD-ROM into a CD-ROM drive on the server.
2. In the License Agreement window, click I Agree.
3. In the pop-up window, click NEC EXPRESSCLUSTER for Windows.
4. Click NEC EXPRESS CLUSTER X 3.0 for Windows.
5. In the Welcome window, click Next.
6. In the Choose Destination Location window, click Next.
7. In the next window, click Install.
8. In the Port Number window, if necessary, modify the default port numbers. Click Next.
10. In the Confirmation window, click Yes.
11. In the License Manager window, click Register.
12. In the License Registration window, click Register with License Information.
13. In the Product Selection window, select the OS and Product/Trial types. For Product Name, click EXPRESSCLUSTER X 3.x for Windows. Click Next.
14. In the License Unit Selection window, depending on the type of license, enter the number of CPU or Node Units. Click Next.
15. In the License Key Entry window, enter the Serial No. and License Key. Click Next.
16. In the License Registration Confirmation window, confirm the information entered is correct. Click Next.
17. Click OK. If the license registration fails, start again from step 11.
18. Repeat steps 11-17 again for the EXPRESSCLUSTER X Replicator 3.x for Windows product license. Select EXPRESSCLUSTER X Replicator 3.x for Windows as the Product Name in step 13.
19. In the next window, click Finish.
20. On the InstallShield Wizard Complete window, click the No, I will restart my computer later option button, and then click Finish.
21. In the next window, click Exit. Click Exit. (Two times total).

5.2 Install ECX on the Standby Server (Machine 2)
 Perform all of the steps in Section 5.1 on the Standby Server.

5.3 Restart the Primary and Standby Servers (Machines 1 & 2)
First restart the Primary Server, and then restart the Standby Server.
6 Base Cluster Setup

6.1 Install Java Runtime Environment (JRE)
Verify JRE Version 6.0 Update 20 or newer is installed on the Test Client (Machine 3). If necessary, install JRE:
1. Run `jre-<build and platform version>.exe` (a compatible JRE distribution is in the jre folder on the EC X CD).
2. In the License Agreement window, verify the default Typical setup option button is selected. Click Accept.
3. In the Installation Completed window, click Finish.

6.2 Start the cluster manager
From the web browser of the Primary or Standby Server (Machine 1 or 2), access port 29003. (Example: `http://localhost:29003`). When the security warning window displays, select the Always trust content from this publisher check box. Click Run.

6.3 Create a cluster
For all of the steps below, refer to Table 1 for the IP addresses and server names.
1. When the cluster manager opens for the first time, there is a pop-up window with three options. Click Start cluster generation wizard.
2. In the new window, type a Cluster Name. (Example: cluster).
3. Type the Management IP address and click Next.
4. In the next window, to add another server to the cluster, click Add.
5. Type the hostname or the IP address of the Standby Server (Machine 2) and then click OK.
6. Both servers are now on the list. If the Primary Server (Machine 1) is not in the top (Master) Server position, then move it up. Click Next.
7. EC X automatically detects the IP addresses of the servers. Select the networks to use the Heartbeat path in the Kernel Mode type. The primary network is for mirroring the data; set the MDC as mdc1. Click Next.
8. In the NP Resolutions Resources window, click Next.

6.4 Create a failover group
For all of the steps below, refer to Table 1 for the IP addresses and server names.
1. To add a group, in the Cluster Generation Wizard, in the Group section, click Add.
2. In the next window, select failover for group type. Name the group (Example: SharePoint_Failover), click Next, and then click Next (Two times total).
3. Select the default options for the Group Attribute Settings and then click Next.

6.5 Enter floating IP address & mirror resources and select data & cluster partitions
1. In the Group Resources section of the Cluster Generation Wizard, to add a resource, click Add.
2. In the next window, to add a Floating IP Resource (FIP), from the drop-down menu, select **floating ip resource**, and then click **Next**.
3. By default, the FIP resource is not dependent on any other resource. Click **Next**.
4. Verify the default options are correct and then click **Next**.
5. Type a floating IP address that is not used by any other network and then click **Finish**.
6. To **Add** a mirror disk resource (MD), click **Add**.
7. In the next window, from the drop-down menu, select **mirror disk resource**, and then click **Next**.
8. Verify the **Follow the default dependency** check box is selected and then click **Next**.
9. Verify the default options are correct and then click **Next**.
10. Click **Add** to add the first server.
11. Click **Connect** to populate the server partitions.
12. Select the data and cluster partitions. Click **OK**.
13. Repeat steps 10-12 for the Standby Server (Machine 2).
14. Click **Finish**.
15. Click **Add** to add a virtual computer name resource.
16. In the next window, from the drop-down menu, select virtual **computer name resource**. Give a name to the resource (Example: vcom). Click **Next**.
17. By default, the **Follow the default dependency** check box is selected. Click **Next**.
18. In the next window, verify that the default options are correct, and click **Next**.
19. Enter a Virtual Computer Name (Example: vshare). From the Target FIP Resource Name drop-down menu, select the recently created %fip resource%. Click **Next**.
20. Click **Finish** and then click **Next**.
21. In the **Monitor Resource** section, click **Add**.
22. Select **floating ip monitor** and then click **Next**.
23. In the **Target Resource** box, click **Browse**. Select the %fip resource% and then click **OK**. Click **Next**. Click **Next** (Two times total).
24. In the **Recovery target** box, click **Browse**.
25. Click %failover group% (Example: SharePoint_Failover) and then click **OK**.
26. To add the FIP monitor, click **Finish**.
27. Click **Finish**.

### 6.6 Upload the cluster configuration and initialize the cluster
1. In the **Cluster Manager** window, click the **File** menu, and then **Apply the Configuration File**. Click **OK**. Click **OK**. (Two times total).
2. After the upload is complete, change to the **Operation Mode**.
3. Restart **Cluster Manager**. Click the **Service** menu and then click **Restart Manager**. Click **OK**.
4. Click the **Service** menu and then click **Start Cluster**. Click **OK**.

5. Right-click **Servers** and select **Mirror Disks**. Click **Details** to monitor MD replication. Mirror disk copy starts automatically, replicating data from the Primary to the Standby Server. Refer to the figure below.

![](image1.png)

**Note**
Mirror disk copy may take a while, depending on the size of the data in the mirrored disk data partition.

6. After the copy completes, in the **Mirror Disk Helper** window, click **Close**. Refer to figure below.

![](image2.png)
7. In the **Cluster Manager** window, all icons in the tree view are now green. Refer to the figure below.
7 SharePoint 2007 Installation

7.1 SharePoint Pre-Install Steps on Primary Server
1. On the Windows desktop, click Start, point to All Programs, Administrative Tools, and double-click Server Manager.
2. In the left pane, select Features. In the right pane, click Add Features.
4. After Introduction to Web Server (IIS) displays, click Next.
5. Click Next (a second time).
6. Click Install. After completion, click Close.

7.2 SharePoint Installation on Primary Server
1. Double-click Setup. After a security warning window opens, click Run (if Autoplay is enabled).
2. Type the Product Key and click Continue.
3. Select the I accept the terms of this agreement check box. Click Continue.
4. In the Choose the installation you want window, click Advanced.
5. Select the Complete – Install all components option button and then click Install Now.
6. In the next window, verify the Run the SharePoint Products and Technologies Configuration Wizard now check box is selected, and then click Close.
7. In the Welcome to SharePoint Products and Technologies window, click Next.
8. In the next window, click Yes.
9. In the Connect to a server farm window, select the No, I want to create a new server farm option button, and then click Next.
10. In the Specify Configuration Database Settings window, in the text box next to Database server, type vshare.
11. In the text box next to Database name, verify the default is SharePoint_Config.
12. Type a Username (Example: d:\\administrator) and Password, and then click Next.
13. In the Configure SharePoint Central Administration Web Application window, verify the Specify port number check box is not selected. Select the Negotiate (Kerberos) option button. Click Next.
14. In the next window, click Yes.
15. In the Completing the SharePoint Products and Technologies Configuration Wizard, verify the configuration settings are correct, and then click Next.
16. In the Configuration Successful window, click Finish.
7.3 SharePoint Installation on Standby Server

Repeat all steps from 7.1 on the Standby Server. Then repeat steps 1 - 8 from 7.2 on the Standby Server. Continue with the following steps:

1. In the Connect to a server farm window, select Yes, I want to connect to an existing server farm.
2. In the Specify Configuration Database Settings window, in the text box next to Database server, type vshare. Click the Retrieve Database Names button. The Database name and Username fields are then populated.
3. Verify the Database name is SharePoint_Config and the Username is correct. Enter the Password and click Next. The Username and Password will match those created during installation on the Primary Server.
4. In the Completing the SharePoint Products and Technologies Configuration Wizard, verify the configuration settings are correct and click on the Advanced Settings button.
5. In the Advanced Settings window, select Use this machine to host the web site. Click OK.
6. Click Next.
7. Click Finish.

Note
Configure server farm using SharePoint Central Administration.
8 SharePoint Cluster Setup

8.1 Move the MSSQL Master and Resource Database Files to the Data Partition on the Primary Server

1. On the Windows desktop, click Start, point to Run, and then type services.msc. Click OK.
2. Right-click SQL Server (MSSQL) and click Stop.
3. Run Windows Explorer. Create the folder structure for SQL Server data on the mirror disk. Example: %Data partition drive letter%: \MSSQL \DATA.
4. Use copy and paste to move the master.mdf, mastlog.ldf, and all SharePoint database files to the mirror disk. The default path of the data file is C:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\DATA.
5. On the Windows desktop, click Start, point to All Programs, point to Microsoft SQL Server 2005, point to Configuration Tools, and then click SQL Server Configuration Manager.
6. Select the SQL Server 2005 Services node, in the right pane, right-click SQL SERVER (MSSQLSERVER), and click Properties.
7. In the SQL Server (MSSQLSERVER) Properties window, click the Advanced tab.
8. Edit the Startup Parameters values to point to the planned location for the master database data and log files. Change the path of master.mdf and mastlog.ldf to the mirror disk drive. Click OK. Click OK (a second time). Optional: Move the error log file path.

The parameter value for the data file must follow the –d parameter; the value for the log file must follow the –l parameter.

Example The parameter values for the default locations of the master data and log files:

-dC:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\DATA\master.mdf
-eC:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\LOG\ERRORLOG
-lC:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\DATA\mastlog.ldf

The planned relocation for the master data and log files is on the mirror disk: %Data Partition drive letter%: \MSSQL\DATA.
Change the following parameter values:
-d %Data Partition drive letter%:\MSSQL\DATA\master.mdf
-e C:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\LOG\ERRORLOG
-l: %Data Partition drive letter%:\MSSQL\DATA\mastlog.ldf

9. Start the SQL Server (MSSQLSERVER) instance: right-click the instance name and select Start.

8.2 Move the MSSQL Master Database File Location to the Data Partition on the Standby Server
1. Move the SharePoint_Failover group from Primary to Standby Server: In the web browser, open the Cluster Manager, right-click the %failover group%, and then click Move. Select the Standby Server and click OK.
2. On the Windows desktop, click Start, point to All Programs, point to Microsoft SQL Server 2005, point to Configuration Tools, and then click SQL Server Configuration Manager.
3. In the SQL Server 2005 Services node, in the right pane, right-click SQL SERVER (MSSQLSERVER), and then click Properties.
4. In the SQL Server (MSSQLSERVER) Properties window, click the Advanced tab.
5. Edit the Startup Parameters values to point to the planned location for the master database data and log files. Change the path of master.mdf and mastlog.ldf to the mirror disk drive. Click OK. Click OK (a second time). Optional: Move the error log file path.

The parameter value for the data file must following the –d parameter; the value for the log file must follow the –l parameter.

Example  The parameter values for the default locations of the master data and log files:
-dC:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\DATA\master.mdf
-eC:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\LOG\ERRORLOG
-lC:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\DATA\mastlog.ldf
The planned relocation for the master data and log files is on the mirror disk: 
%Data Partition drive letter%:
\MSSQL\DATA

Change the following parameter values:
-d%Data Partition drive letter%:\MSSQL\DATA\master.mdf
-eC:\Program Files\Microsoft SQL Server\MSSQL.1\MSSQL\LOG\ERRORLOG
-l:%Data partition drive letter%:\MSSQL\DATA\mastlog.ldf

6. Stop the SQL Server (MSSQLSERVER) instance: right-click the instance name and select stop.
7. Start the SQL Server (MSSQLSERVER) instance: right-click the instance name and select start.
8. Close the SQL Server Configuration Manager.

8.3 Attach the Replicated MSSQL Resource Database File to the Standby Server
1. On the Windows desktop of the Standby Server, click Start, point to All Programs, point to Microsoft SQL Server 2005, and then click SQL Server Management Studio.
2. Change the Server name to VCOM name (vshare), and click Connect.
3. Expand the Databases container. Delete all SharePoint databases: right click on each database and then click Delete. After a pop-up window opens, click OK.
4. Attach the SharePoint replicated databases: right-click on the Databases container and then click Attach.
5. A pop-up window opens. Click Add. Browse to find the path of the data partition (%Data partition drive letter%:\MSSQL\DATA). Select the SharePoint_Config.mdf file.
6. Click OK to add the database. Click OK. (a total of two times).
7. Right-click on the Databases container and then click Attach. A pop-up window opens.
8. Click Add. Browse to find the path of the data partition. Select the SharePoint_AdminContent_XXXXXX.mdf file.
9. Click OK to add the database. Attach any additional databases following the same steps as above.

8.4 Binding SharePoint Application with attached SharePoint Database on the Standby Server
1. On the Windows desktop, click Start, click Run, and then type cmd. Click OK.
2. Change the directory path by typing cd “C:\Program Files\Common Files\microsoft shared\Web Server Extensions\12\BIN”.
3. Type the following: `stsadm.exe -o setconfigdb -connect -databaseserver target_sql_server -databasename databasename -farmuser farm_sql_account -farmpassword farm_sql_password

target_sql_server: the FIP or VCOM name.
Databasename: the name used during SharePoint installation.
farm_sql_account: the domain account used during SharePoint installation
farm_sql_password: the password used during SharePoint installation.

Example: stsadm.exe -o setconfigdb -connect -databaseserver vshare -databasename SharePoint_config -farmuser dc\administrator -farmpassword <pwd>

4. On the Windows desktop, click Start, point to Administrative Tools, and then click SharePoint 3.0 Central Administration. Verify the website opens with the name of the Primary Server.

8.5 Change the Alternate Access Mappings of SharePoint URL on the Primary Server
1. Move the SharePoint_Failover group from the Standby to Primary Server: In the web browser, open the Cluster Manager. Right-click the %failover group% and then click Move. Select the Primary Server and click OK.
2. On the Windows desktop of the Primary Server, click Start, point to Administrative Tools, and then click SharePoint 3.0 Central Administration.
3. After the pop-up window opens, type the domain administrator User name and Password.
4. In the Central Administration window, click the Operations tab. Under Global Configuration, click Alternate access mappings. Click the Internal URL and edit the hostname URL. Change the Primary Server name to the VCOM name (vshare). Click OK. Close the window.
5. On the Windows desktop, click Start, point to Administrative Tools, and then click SharePoint 3.0 Central Administration. Verify the website opens with the VCOM name (vshare). Close the window.
6. Move the SharePoint_Failover group from Primary to the Standby Server: Refer to 8.5, step 1.
7. On the Windows desktop, click Start, point to Administrative Tool, and then click SharePoint 3.0 Central Administrator. Verify the website points to the VCOM name (vshare). This time the website does not open.
8.6 Export IIS Data from Primary Server and Import to Standby Server

1. Move the SharePoint_Failover group from the Standby to Primary Server: Refer to 8.5, step 1.
2. Open Windows Explorer and create a folder on the mirror disk data partition. Example: %Data partition drive letter%: \inetpub.
3. On the Primary Server, on the Windows desktop, open IIS Manager. Click Start, click Run, and then type inetmgr. Click OK.
4. In the IIS Manager window, expand the server node. Under Management, go to Shared Configuration, and in the right pane, click Export Configuration.
5. Type the path of the data partition and set an encryption key password.
6. Move the %failover group% to the Standby Server. Refer to 8.5, step 1.
7. Open the IIS Manager. Refer to 8.6, step 3.
8. In the IIS Manager window, in the left pane, expand and then select the server node. Scroll down the middle pane until the Management section is visible. Under Management, double-click Shared Configuration, and then select the Enable shared configuration check box. For the Physical path, type (or browse to) the location (Example: %Data partition drive letter%: \inetpub), and then in the right pane, click Apply.
9. After the prompt for the encryption password, type the password set during export on the Primary Server. Click OK. Click OK. Click OK (a total of three times).
10. Reset the IIS services. Click Start and click Run.
11. At the command prompt type iisreset /restart and press the Enter key.
12. After resetting IIS, go back to the Shared Configuration window and clear the Enabled shared configuration check box. Click Apply. After the pop-up window opens, click Yes and OK. Close IIS Manager.
13. Stop all IIS, SharePoint, and MSSQL services on the Primary and Standby Servers. Copy the Inetpub folder from the Primary Serve. Paste it to the Standby Server, overwriting the existing files.
14. Start all IIS, SharePoint, and MSSQL services on the Primary and Standby Servers.

8.7 Move IIS Data from the OS to Data Partition on the Primary and Standby Servers

1. On the Windows desktop of the Standby Server, click Start, click Run, and then type notepad.exe.
2. Copy the contents in the box below into Notepad. Save as moveiis7root.bat on the C:\ drive.

```
REM PLEASE BE AWARE: SERVICING (I.E. HOTFIXES AND SERVICE PACKS) WILL STILL REPLACE FILES
REM IN THE ORIGINAL DIRECTORIES. THE LIKELIHOOD THAT FILES IN THE
INETPUB DIRECTORIES HAVE
```
REM TO BE REPLACED BY SERVICING IS LOW BUT FOR THIS REASON
DELETING THE ORIGINAL DIRECTORIES
REM IS NOT POSSIBLE.

@echo off
IF "%1" == "" goto err
setlocal
set MOVETO=%1:

REM simple error handling if drive does not exist or argument is wrong
IF NOT EXIST %MOVETO% goto err

REM Backup IIS config before start changing config to point to the new path
%windir%\system32\inetsrv\appcmd add backup beforeRootMove

REM Stop all IIS services
iisreset /stop

REM Copy all content
REM /O - copy ACLs
REM /E - copy sub directories including empty ones
REM /l - assume destination is a directory
REM /Q - quiet

REM echo on, because user will be prompted if content already exists.
echo on
xcopy %systemdrive%\inetpub %MOVETO%inetpub /O /E /I /Q
@echo off

REM Move AppPool isolation directory
reg add HKLM\System\CurrentControlSet\services\WAS\Parameters /v ConfigIsolationPath /t REG_SZ /d %MOVETO%inetpub\temp\appPools /f

REM Move logfile directories
%windir%\system32\inetsrv\appcmd set config -section:system.applicationHost/sites -
siteDefaults.traceFailedRequestsLogging.directory:"%MOVETO%inetpub\logs\FailedReqLogFiles"
REM Move config history location, temporary files, the path for the Default Web Site and the custom error locations
%windir%\system32\inetsrv\appcmd set config -section:system.applicationHost/configHistory -path:%MOVETO%inetpub\history
%windir%\system32\inetsrv\appcmd set config -section:system.webServer/asp-cache.disktemplateCacheDirectory:"%MOVETO%inetpub\temp\ASP Compiled Templates"
%windir%\system32\inetsrv\appcmd set config -section:system.webServer/httpCompression -directory:"%MOVETO%inetpub\temp\IIS Temporary Compressed Files"
%windir%\system32\inetsrv\appcmd set vdir "Default Web Site/" -physicalPath:%MOVETO%inetpub\wwwroot
%windir%\system32\inetsrv\appcmd set config -section:httpErrors
/[statusCode='401'].prefixLanguageFilePath:%MOVETO%inetpub\custerr
%windir%\system32\inetsrv\appcmd set config -section:httpErrors
/[statusCode='403'].prefixLanguageFilePath:%MOVETO%inetpub\custerr
%windir%\system32\inetsrv\appcmd set config -section:httpErrors
/[statusCode='404'].prefixLanguageFilePath:%MOVETO%inetpub\custerr
%windir%\system32\inetsrv\appcmd set config -section:httpErrors
/[statusCode='405'].prefixLanguageFilePath:%MOVETO%inetpub\custerr
%windir%\system32\inetsrv\appcmd set config -section:httpErrors
/[statusCode='406'].prefixLanguageFilePath:%MOVETO%inetpub\custerr
%windir%\system32\inetsrv\appcmd set config -section:httpErrors
/[statusCode='412'].prefixLanguageFilePath:%MOVETO%inetpub\custerr
%windir%\system32\inetsrv\appcmd set config -section:httpErrors
/[statusCode='500'].prefixLanguageFilePath:%MOVETO%inetpub\custerr
%windir%\system32\inetsrv\appcmd set config -section:httpErrors
/[statusCode='501'].prefixLanguageFilePath:%MOVETO%inetpub\custerr
%windir%\system32\inetsrv\appcmd set config -section:httpErrors
/[statusCode='502'].prefixLanguageFilePath:%MOVETO%inetpub\custerr

REM Make sure Service Pack and Hotfix Installers know where the IIS root
directories are
reg add HKLM\\Software\\Microsoft\inetstp /v PathWWWRoot /t REG_SZ /d %MOVETO%inetpub\wwwroot /f
reg add HKLM\\Software\\Microsoft\inetstp /v PathFTPRoot /t REG_SZ /d %MOVETO%inetpub\ftproot /f
REM Do the same for x64 directories
if not "%ProgramFiles(x86)%" == "" reg add HKLM\\Software\\Wow6432Node\\Microsoft\inetstp /v PathWWWRoot /t REG_EXPAND_SZ /d %MOVETO%inetpub\wwwroot /f
if not "%ProgramFiles(x86)%" == "" reg add HKLM\\Software\\Wow6432Node\\Microsoft\inetstp /v PathFTPRoot /t REG_EXPAND_SZ /d %MOVETO%inetpub\ftproot /f
REM Restart all IIS services
iisreset /start
echo.
echo.
==

echo Moved IIS7 root directory from %systemdrive% to %MOVETO%.
echo.
echo Please verify if the move worked.
echo If something went wrong restore the old settings via
echo "APPCMD restore backup beforeRootMove"
echo and
echo "REG delete HKLM\System\CurrentControlSet\Services\WAS\Parameters\ConfigIsolationPath"
echo reset the PathWWWRoot and PathFTPRoot registry values
echo in HKEY_LOCAL_MACHINE\Software\Microsoft\InetStp.
echo
==

echo.
echo.
endlocal
goto success
REM error message if no argument or drive does not exist
`:err
  echo.
  echo New root drive letter required.
  echo Here an example how to move the IIS root to the F:\ drive:
  echo.
  echo MOVEIISROOT.BAT F
  echo.
  echo.

  :success

3. On the Windows desktop, click **Start**, click **Run**, and then type **cmd**.
4. Change the directory to the location of **moveiis7root.bat**.
5. Type **moveiis7root.bat O** (Assuming that O is the Data partition drive letter).
6. If prompted to overwrite, type **A**.
7. Copy the **Microsoft Office Servers** folder from **C:\Programs Files** to the data partition.
8. On the Windows desktop, click **Start**, point to **Administrative Tools**, and select **Internet Information Services (IIS) Manager**.
9. Open `%local computer%` and expand **Sites**.
10. For each website listed, verify the default path. If the path is not pointing to the data partition, then change the default path: right-click each site and select **Manage Web Site**, and then click on **Advanced Settings**. For the **Physical Path**, type the new path of the data partition where the folder is copied after running the above script. Click **OK**.
11. Move the `%failover group%` to the Primary Server and follow 8.7, steps 1-10.

**Note**

a) Whenever a **root website** is created through a central administrator, set the **URL** name as the VCOM name and correct the **Path value** to the data partition. After creating the root website, verify the newly created website path in IIS Manager. If it is not pointing to correct path (data partition) then change.

b) In IIS Manager, click **Application pools**, right-click the newly created application pool, and then click **Advanced settings**. Verify the identity. If it is not pointing to the **Domain Account** (Domain Name\Domain Account), click on the **Identity** line and change the identity value by clicking the ellipses button. A new window opens. Click **Set** and enter the Domain username and Password. Click **OK**. Click **OK**. Click **OK** (a total of three times).

c) Follow the steps in 8.6 to export the IIS configuration from Primary Server and import to Standby Server.

8.8 Change the IIS, MSSQL and SharePoint Service Startup Types to Manual

1. After the IIS, MSSQL, and SharePoint Server setup is complete on both servers, set the startup type of **IISADMIN, W3SVC, MSSQLSERVER, SPAdmin, SPTimerV3**, and **SPTrace** services to manual. Verify each service is stopped.

2. To stop and change the startup type of the services: on the Windows desktop, click **Start**, click **Run**, and then type **services.msc**. Go to the services below; one-by-one, right-click each and select **Properties**. Stop each service and then change the **Startup type** to **Manual**.
   - IIS Admin Service
   - World Wide Web Publishing Service
   - SQL Server (MSSQLSERVER)
   - Windows SharePoint Services Administration
   - Windows SharePoint Services Timer
   - Windows SharePoint Services Tracing

8.9 Cluster Configuration Resource Setup

8.9.1 Stop the Cluster

1. Open the cluster: access port 29003 from the web browser of the Primary Server. (Example: http://localhost:29003).

2. Right-click the `%cluster name%`, select **Service**, and then click **Stop Cluster**. Or in the **Cluster Manager** menu, select **Service**, and then click **Stop Cluster**.

3. In the confirmation window, click **OK**.

4. From the drop-down list at the top left corner, click **Config Mode**.
8.9.2 Add MSSQLSERVER resource
1. Right-click %failover group% and click Add Resource.
2. From the drop-down list, select service resource, and enter service_sql (a name for the resource). Add optional comments (if required). Click Next.
3. Verify the Follow the default dependency check box is selected, and then click Next.
4. Click Next. Assume all default values are acceptable.
5. Enter MSSQLSERVER (the name of the service).
6. Click Tuning. Set the START and STOP timeouts. The default is 1800s.
7. Click OK and then click Finish.

8.9.3 Add SPAdmin resource
1. Right-click %failover group% and click Add Resource.
2. From the drop-down list, select service resource, and enter service_spadmin (a name for the resource). Add optional comments (if required). Click Next.
3. Clear the Follow the default dependency check box. Select the service_sql resource as a dependent resource, and click Add. Click Next.
4. Click Next (assume all default values are acceptable).
5. Enter SPAdmin (the name of the service).
6. Click Tuning. Set the START and STOP timeouts. The default is 1800s.
7. Click OK and then click Finish.

8.9.4 Add SPTimerV3 resource
1. Right-click %failover group% and click Add Resource.
2. From the drop-down list, select service resource, and enter service_sptimerv3 (a name for the resource). Add optional comments (if required). Click Next.
3. Clear the Follow the default dependency check box. Select the service_sql and service_spadmin resources as dependent resources, and click Add. Click Next.
4. Click Next. Assume all default values are acceptable.
5. Enter SPTimerV3 (the name of the service).
6. Click Tuning. Set the START and STOP timeouts. The default is 1800s.
7. Click OK and then click Finish.
8.9.5 **Add SPTrace resource**
1. Right-click `%failover group%` and click **Add Resource**.
2. From the drop-down list, select **service resource**, and enter `service_sptrace` (a name for the resource). Add optional comments (if required). Click **Next**.
3. Clear the **Follow the default dependency** check box. Select `service_sql`, `service_spadmin`, and `service_sptimerv3` resources as dependent resources, and click **Add**. Click **Next**.
4. Click **Next**. Assume all default values are acceptable.
5. Enter **SPTrace** (the name of the service).
6. Click **Tuning**. Set the **START** and **STOP** timeouts according to the requirements. The default is 1800s.
7. Click **OK** and then click **Finish**.

8.9.6 **Add IISADMIN resource**
1. Right-click `%failover group%` and click **Add Resource**.
2. From the drop-down list, select **service resource** and enter `service_iisadmin` (a name for the resource). Add optional comments (if required). Click **Next**.
3. Clear the **Follow the default dependency** check box. Select `service_sql`, `service_spadmin`, `service_sptimerv3`, and `service_sptrace` resources as dependent resources, and click **Add**. Click **Next**.
4. Click **Next**. Assume all default values are acceptable.
5. Enter **IISADMIN** (the name of the service).
6. Click **Tuning**. Set the **START** and **STOP** timeouts. The default is 1800s.
7. Click **OK** and then click **Finish**.

8.9.7 **Add W3SVC resource**
1. Right-click `%failover group%` and click **Add Resource**.
2. From the drop-down list, select **service resource** and enter `service_w3svc` (a name for the resource). Add optional comments (if required). Click **Next**.
3. Click to clear the **Follow the default dependency** check box. Select `service_sql`, `service_spadmin`, `service_sptimerv3`, `service_sptrace`, and `service_iisadmin` resources as dependent resources, and click **Add**. Click **Next**.
4. Click **Next**. Assume all default values are acceptable.
5. Enter **W3SVC** (the name of the service).
6. Click **Tuning**. Set the **START** and **STOP** timeouts. The default is 1800s.
7. Click **OK** and then click **Finish**.
8.9.8 **Add MSSQLServer monitor resource**
1. Right-click **Monitors**. Click **Add Monitor Resource**.
2. From the drop-down list, select **service monitor**, and enter **sql** (a name for the resource). Click **Next**.
3. In the **Target Resource** box, click **Browse**.
4. Select **service_sql** (the service resource). Click **OK**.
5. Set the **Monitoring Interval** and **Timeout**, and then click **Next**.
6. In the **Recovery Target** box, click **Browse**.
7. Select the **%failover group%** name (Example: SharePoint_Failover) and click **OK**. Click **Finish**.

8.9.9 **Add SPAdmin monitor resource**
1. Right-click **Monitors**. Click **Add Monitor Resource**.
2. From the drop-down list, select **service monitor**, and enter **SPAdmin** (a name for the resource). Click **Next**.
3. In the **Target Resource** box, click **Browse**.
4. Select **service_spadmin** (the service resource). Click **OK**.
5. Set the **Monitoring Interval** and **Timeout**, and then click **Next**.
6. In the **Recovery Target** box, click **Browse**.
7. Select the **%failover group%** name and click **OK**. Click **Finish**.

8.9.10 **Add SPTimerV3 monitor resource**
1. Right-click **Monitors**. Click **Add Monitor Resource**.
2. From the drop-down list, select **service monitor**, and enter **SPTimerV3** (a name for the resource). Click **Next**.
3. In the **Target Resource** box, click **Browse**.
4. Select **service_sptimerv3** (the service resource). Click **OK**.
5. Set the **Monitoring Interval** and **Timeout**. Click **Next**.
6. In the **Recovery Target** box, click **Browse**.
7. Select the **%failover group%** name and click **OK**. Click **Finish**.

8.9.11 **Add SPTrace monitor resource**
1. Right-click **Monitors**. Click **Add Monitor Resource**.
2. From the drop-down list, select **service monitor**, and enter **SPTrace** (a name for the resource). Click **Next**.
3. In the **Target Resource** box, click **Browse**.
4. Select **service_sptrace** (the service resource). Click **OK**.
5. Set the **Monitoring Interval** and **Timeout**. Click **Next**.
6. In the **Recovery Target** box, click **Browse**.
7. Select the **%failover group%** name and click **OK**. Click **Finish**.
8.9.12 Add IISADMIN monitor resource
   1. Right-click Monitors. Click Add Monitor Resource.
   2. From the drop-down list, select service monitor, and enter IISADMIN (a name for the resource). Click Next.
   3. In the Target Resource box, click Browse.
   4. Select service_iisadmin (the service resource). Click OK.
   5. Set the Monitoring Interval and Timeout. Click Next.
   6. In the Recovery Target box, click Browse.
   7. Select the %failover group% name and click OK. Click Finish.

8.9.13 Add W3SVC monitor resource
   1. Right-click Monitors. Click Add Monitor Resource.
   2. From the drop-down list, select service monitor, and enter W3SVC (a name for the resource). Click Next.
   3. In the Target Resource box, click Browse.
   4. Select service_s3svc (the service resource). Click OK.
   5. Set the Monitoring Interval and Timeout. Click Next.
   6. In the Recovery Target box, click Browse.
   7. Select the %failover group% name and click OK. Click Finish.

8.9.14 Upload the configuration file and start the cluster
   1. In the Cluster Manager window, click the File menu, and then Apply the Configuration File. Click Yes. Click OK.
   2. After the upload is complete, change to the Operation Mode.
   3. Restart Cluster Manager. Click the Service menu and then click Restart Manager. Click OK.
   4. Click the Service menu and then click Start Cluster. Click OK.
9 Final Deployment in a LAN Environment

1. Verify the connection between the Primary and Standby Servers meets the following requirements:
   • Two logically separate IP protocol networks: one for the Public Network and one for the Cluster Interconnect.
   • The Public Network must be a single IP subnet that spans the Primary and Standby servers to enable transparent redirection of the client connection to a single floating server IP address.
   • The Cluster Interconnect is a single IP subnet that spans the Primary and Standby Servers to simplify system setup.
   • A proper IP network between client and server machines on the Public Network on both the Primary and Standby Servers.

2. Verify the Primary Server is in active mode with a fully functional target application and the Standby Server is running in passive mode.

3. Ping both the Primary and Standby Servers from the Test Client, and verify that the Standby Server has all the target services in manual and stopped mode.

4. Start the cluster and try accessing the application from the Primary Server, and then move the cluster to the Standby Server. Verify the availability of the application on the Standby Server after failover. Deployment is complete.
10 Common Maintenance Tasks

10.1 Start Cluster Manager

There are two methods to start/access Cluster Manager through a supported Java enabled web browser.

**Method 1**

Through the IP address of the physical server running cluster management server application.
Use *during* the initial setup.

**Method 2**

Through the floating IP address for the cluster management server within a cluster.
Use *after* the initial setup.

1. Start **Internet Explorer** or any other supported Java enabled web browser.
2. **Method 1**: Type the URL with the IP address of the *active physical server*, a colon (:); and then the cluster server port number.
   Example: http://10.1.1.1:29003/

   **Method 2**: Type the URL with the IP address of the *cluster management server*, a colon (:); and then the cluster management server port number.
   Example: http://10.1.1.3:29003/

10.2 Shutdown/Reboot one or all servers

1. Start **Cluster Manager** (refer to 10.1).
2. Shutdown one server.
   Right-click the `%machine name%`, and then click **Shutdown**.

   Shutdown all servers
   Right-click the `%cluster name%`, and then click **Shutdown**.

   Reboot all servers
   Right-click `%cluster name%`, and then click **Reboot**.
10.3 **Startup/stop/move failover groups**

1. Start Cluster Manager (refer to 10.1)
2. Under Groups, right-click %failover group%, and then click Start/Stop/Move.
3. In the Confirmation window, click OK.

10.4 **Isolate a server for maintenance**

1. Start Cluster Manager (refer to 10.1).
2. In the Cluster Manager window, change to Config Mode.
3. Right-click the %cluster name%, and then select Properties.
4. Click the Auto Recovery tab. To manually return the server to the cluster, select Off for the Auto Return option. Otherwise, leave it set to On for automatic recovery when the server is turned back on. Click OK.
5. If a change was made, upload the configuration file.
6. Shut down the server to isolate for maintenance. The server is now isolated and ready for maintenance tasks.

10.5 **Return an isolated server to the cluster**

10.5.1 **Automatic Recovery**

1. Turn the machine back on.
2. Recovery starts automatically to return the server to the cluster.

10.5.2 **Manual Recovery**

1. Turn the machine back on and wait until the boot process is complete.
2. Start Cluster Manager.
3. In the Cluster Manager window, right-click the name of the isolated server, and then select Recover. The isolated server returns to the cluster.

10.6 **Rebuild a mirror disk**

1. Start Cluster Manager (refer to 10.1).
2. In the Cluster Manager window, in the left pane, right-click Servers, and then click Mirror Disks.
3. In the Mirror Disks window, click the Details button.
4. In the next window, click the button below the %machine name% of the machine to copy files from [Primary Server (Machine 1)], and then click the button below the %machine name% of the machine to copy files to [Standby Server (Machine 2)]. (The arrow indicates the direction of the copy).
5. Click the Execute button. In the Confirmation window, click OK.
Appendix A: ECX Server Uninstallation

1. On the Test Client (Machine 3), in Cluster Manager, click the Service menu, and then click Stop Cluster.
2. Close Cluster Manager.
3. On the server where starting the uninstall process, stop all ECX services:
   a. On the Start menu, point to Programs, point to Administrative Tools, and then click Services.
   b. In the right pane, scroll down and double-click the entry for EXPRESSCLUSTER. Click the Stop button.
   c. In the Stop Other Services window, click Yes. Click OK.
   d. Repeat step 3.b. above for the entry for EXPRESSCLUSTER EVENT, and then click OK.
4. On the Start menu, point to Settings, and click Control Panel. Double-click Add or Remove Programs.
5. In the Add or Remove Programs window, under Currently installed programs, click NEC EXPRESSCLUSTER Server. Click Uninstall.
6. In the Confirmation window, to start the uninstall process, click Yes.
7. In the next window, to reset the registry settings to disable the media sense functions of TCP/IP disconnect detection, click Yes.
8. In the first Install Shield Wizard Complete window, click Finish.
9. In the next Install Wizard Complete window, select the Yes, I want to restart my computer now option button. Click Finish. This completes the uninstall process for an individual server.

Note
To uninstall an ECX Server, you must be logged on as an administrator or have an account with administrator privileges.

After the uninstallation is complete, if any shared disks are in use, unplug all disk cables connected to the servers.
Appendix B: Example System Planning Worksheet

Machine 1: Primary Server
Machine 2: Standby Server
Machine 3: Test Client

Table 1: System Network Interfaces

<table>
<thead>
<tr>
<th>Machine</th>
<th>Host name</th>
<th>Network Connection</th>
<th>IP Address</th>
<th>Subnet Mask</th>
<th>Default Gateway</th>
<th>Preferred DNS Server</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Primary</td>
<td>Public Interconnect</td>
<td>10.1.1.1</td>
<td>255.255.255.0</td>
<td>10.1.1.5</td>
<td>10.1.1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>192.168.1.1</td>
<td>255.255.255.0</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Standby</td>
<td>Public Interconnect</td>
<td>10.1.1.2</td>
<td>255.255.255.0</td>
<td>10.1.1.5</td>
<td>10.1.1.5</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>192.168.1.2</td>
<td>255.255.255.0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2: System OS and Disks

<table>
<thead>
<tr>
<th>Machine</th>
<th>OS</th>
<th>Disk 0 (OS Disk)</th>
<th>Disk 1 (Data Disk)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Win XP SP1 or later</td>
<td>C: 20GB</td>
<td></td>
</tr>
</tbody>
</table>

* Must be a raw partition and larger than 17MB.

Floating IP (FIP) address:
Web Management Console FIP: (1) 10.1.1.3
Cluster FIP: (2) 10.1.1.4

Table 3: System Logins and Passwords

<table>
<thead>
<tr>
<th>Computer/Account</th>
<th>Login</th>
<th>Password</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine 1</td>
<td>Administrator</td>
<td>admin1234</td>
</tr>
<tr>
<td>Administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine 2</td>
<td>Administrator</td>
<td>admin1234</td>
</tr>
<tr>
<td>Administrator</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>