EXPRESSCLUSTER X for Windows
Quick Migration Guide for Microsoft Exchange Server 2013
Migration from a single-node configuration to a two-node mirror disk cluster

Version 1
NEC EXPRESSCLUSTER X 3.x for Windows
Quick Migration Guide for Microsoft Exchange Server 2013
Migration from a single-node configuration to a two-node mirror disk cluster

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Contents

Using this guide .......................................................................................................................... 5
Where to go for more information ............................................................................................ 6
1 Overview .................................................................................................................................. 7
2 System Requirements and Planning ....................................................................................... 8
  2.1 System Requirements .......................................................................................................... 8
  2.2 System Planning .................................................................................................................. 9
3 System Setup Preparation ....................................................................................................... 11
  3.1 Set up the Standby Server (Machine 2) .............................................................................. 11
  3.2 Additional setup on Primary Server (Machine 1) and Standby Server (Machine 2) ......... 11
4 EC X Server Installation ......................................................................................................... 12
  4.1 Install EC X on the Primary Server (Machine 1) .............................................................. 12
  4.2 Install EC X on the Standby Server (Machine 2) ........................................................... 12
  4.3 Restart the Primary and Standby Servers (Machines 1 & 2) ......................................... 12
5 Base Cluster Setup ................................................................................................................ 13
  5.1 Install Java Runtime Environment (JRE) ......................................................................... 13
  5.2 Start the EC X Cluster Manager ....................................................................................... 13
  5.3 Create a cluster .................................................................................................................. 13
  5.4 Create a failover group ...................................................................................................... 14
  5.5 Create Mirror Disk Resource ........................................................................................... 14
  5.6 Upload the cluster configuration and initialize the cluster .............................................. 14
6 Preparing Servers to Execute Scripts .................................................................................. 16
  6.1 Set Powershell’s Script Execution Policy ......................................................................... 16
  6.2 Create Copy of RemoteExchange.ps1 and Modify the Copy ........................................... 16
7 Microsoft Exchange Server 2013 Cluster Setup ................................................................ 17
  7.1 Move the Mailbox Database from Default Location to Data Partition ......................... 17
  7.2 Configure services on the Primary Server (Machine 1) .................................................. 18
  7.3 Copy and configure failover scripts ............................................................................... 18
  7.4 Adding Application Resources to Control a Mailbox Database ..................................... 18
  7.5 Upload the cluster configuration and start the cluster .................................................. 20
8 Test Cluster and Verify Functionality ................................................................................... 22
9 Common Maintenance Tasks ................................................................................................. 23
  9.1 Start Cluster Manager ....................................................................................................... 23
  9.2 Shutdown/Reboot one or all cluster servers .................................................................... 23
  9.3 Startup/stop/move failover groups .................................................................................. 23
  9.4 Isolate a server for maintenance ..................................................................................... 24
  9.5 Return an isolated server to the cluster .......................................................................... 24
    9.5.1 Automatic Recovery ................................................................................................. 24
    9.5.2 Manual Recovery ..................................................................................................... 24
  9.6 Rebuild a mirror disk ......................................................................................................... 24
Appendix A: EC X Server Uninstallation ................................................................................ 25
Appendix B: Example System Planning Worksheet ............................................................... 26
About this Guide

**Using this guide**

This guide provides a hands-on “Quick Migration” set of instructions to install and configure EXPRESSCLUSTER X (EC X) for Windows with Microsoft Exchange Server 2013 CU8. 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 Exchange. It is also assumed that the user has a minimal Exchange Server 2013 environment with the Mailbox and Client Access Roles on two separate servers. The server with the Mailbox Role will be clustered with EC X on a third server.

This guide covers the following topics:

**Chapter 1:** Overview – describes the general steps of 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:** System Setup – describes the configurations required for each system before installing target application.

**Chapter 4:** EC X Server Installation – describes EC X installation on the Primary and Standby Servers.

**Chapter 5:** Base Cluster Setup – describes the process of generating a cluster, creating a failover group, and uploading a configuration.

**Chapter 6:** Preparing Servers to Execute Scripts – describes configuration steps for preparing cluster nodes to execute EC X PowerShell failover scripts.

**Chapter 7:** Microsoft Exchange Server 2013 Cluster Setup – describes required configuration to enable full cluster functionality.

**Chapter 8:** Test Cluster and Verify Functionality – describes steps to verify and test the cluster and complete the deployment on a Primary and a Standby Server.

**Chapter 9:** 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:

- **Getting Started Guide** – 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 EC X on two servers (referred to as Primary and Standby) with Microsoft Exchange Server 2013, Mailbox role only, consists of the following major steps:

1. Perform system planning to determine requirements and specify configuration settings prior to the start of actual system installation and configuration.
2. Prepare the Standby Server, including OS installation and configuration with Exchange Server 2013 Mailbox role installation and configuration.
3. Install and configure EC X on the Primary and Standby Servers.
4. Create and configure the EC X failover group to enable continuous protection and automatic recovery for mailbox database.
5. 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

Machine 1: Primary Server (with Exchange Server 2013 Mailbox role)
Machine 2: Standby Server (with Exchange Server 2013 Mailbox role)
Machine 3: Test Client (a machine with an email client)

<table>
<thead>
<tr>
<th></th>
<th>Machine 1 Primary Server</th>
<th>Machine 2 Standby Server</th>
<th>Machine 3 Test Client</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Memory</strong></td>
<td>8GB or more</td>
<td></td>
<td>1GB or more</td>
</tr>
<tr>
<td><strong>Disk</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OS partition</strong></td>
<td>1 physical disk</td>
<td></td>
<td>1 physical disk with 30GB or more space available</td>
</tr>
<tr>
<td><strong>Cluster partition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Data partition</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>OS</strong></td>
<td>Windows Server 2012 R2 (Standard or Datacenter) with the latest Service Pack</td>
<td>Windows 7 or newer</td>
<td></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>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: Example System Planning Worksheet for an example worksheet. This is useful when creating the cluster later.

Machine 1: Primary Server (with Mailbox role of Exchange Server 2013)
Machine 2: Standby Server (with Mailbox role of Exchange Server 2013)
Machine 3: Test Client (a machine with an email 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>

Mailbox Database Name: ____________

Floating IP (FIP) address:
Web Management Console FIP: ____________

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:</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, and log files for a given Microsoft Exchange Server 2013 installation to meet current and expected future needs.
<table>
<thead>
<tr>
<th>Computer/Account</th>
<th>Login</th>
<th>Password</th>
</tr>
</thead>
<tbody>
<tr>
<td>Machine 1 Administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine 2 Administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Machine 3 Administrator</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Domain Administrator</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3 System Setup Preparation

3.1 Set up the Standby Server (Machine 2)

1. If necessary, install hardware components, OS, and Service Packs identical to the Primary Server (Machine 1).
2. Install and configure Exchange Server 2013 with the latest cumulative update and only with the Mailbox Role.

3.2 Additional setup on Primary Server (Machine 1) and Standby Server (Machine 2)

Network Interface

1. The network interface to which the two servers should be connected to a network will be referred to as **Public**. If possible, set up a second network interface on both servers to be used for internal EC X management and data mirroring network communication between these two servers. This second network interface will only be shared by these two servers and will be referred to as **Interconnect**.
2. In the Network connections windows of each server, change the network interface binding order so that the **Public** network is in the first position.

Data Disk (Mirror Disk)

1. Make sure the disk device or LUN is initialized as a Windows Basic disk device.
2. Create a mirrored disk cluster partition for EC X management on the disk which is 17MB or greater. Assign a drive letter to the partition, but do NOT format (refer to Table 2: System OS and Disk Configuration). The size MUST be the same on both servers.
3. Create a mirrored disk data partition on the disk. Assign a drive letter to the partition and format to NTFS (refer to Table 2: System OS and Disk Configuration). The size MUST be the same on both servers.
4. Verify the mirrored disk cluster and data partitions are visible in Windows Explorer under their assigned drive letters.
4 EC X Server Installation

4.1 Install EC X on the Primary Server (Machine 1)

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

4.2 Install EC X on the Standby Server (Machine 2)

Perform all of the steps in Section 4.1 on the Standby Server.

4.3 Restart the Primary and Standby Servers (Machines 1 & 2)

First restart the Primary Server, and then restart the Standby Server.
5 Base Cluster Setup

5.1 Install Java Runtime Environment (JRE)
Verify JRE Version 6.0 Update20 or newer is installed on a machine to be used for
class management. Also install on the nodes (Machine1 and Machine2) if they might
be used for cluster management. If necessary, install JRE by performing the following
steps:

1. Run jre-<build and platform version>.exe (a compatible JRE distribution is in the
   jre folder on the EXPRESSCLUSTER CD).
2. In the License Agreement window, verify the default Typical setup option button is
   selected. Click Accept.

5.2 Start the EC X Cluster Manager
Start by accessing port 29003 of the Primary Server from the Web browser of the
cluster management machine, using the Primary Server’s IP address. Example:
http://10.1.1.1:29003. When the security warning window displays, select the Always
trust content from this publisher check box. Click Run.

5.3 Create a cluster
For all of the steps below, refer to Table 1: System Network Configuration for the IP
addresses and server names.

1. When the cluster manager is opened for the first time, there is a pop-up window with
two options. Click Start cluster generation wizard.
3. In the new window, type a cluster name. (Example: cluster).
4. Type the Management IP address, and click Next.
5. In the next window, to add another server to the cluster, click Add.
6. Type the hostname or the IP address of the Standby Server, and then click OK.
7. Both servers are now on the list. If the Primary Server is not in the top (Master
   Server) position, then move it up. Click Next.
8. EC X automatically detects the IP addresses of the servers. Select the network to
   use the Heartbeat path in the Kernel Mode type. The primary network is for
   mirroring the data; set Type to Mirror Communication and the MDC as mdc1. Click
   Next.
9. In the NP Resolution window, click Next.
5.4 Create a failover group
For all of the steps below, refer to Table 1: System Network Configuration 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: Exchange_Failover), click Next, and then click Next. (Two times total).
3. Select the default options for the Group Attribute Settings, and then click Next.

5.5 Create Mirror Disk Resource
1. In the Group Resource section of the Cluster Generation Wizard, to add a resource, click Add.
2. In the next window, Click Get License Info to retrieve the active license for replication. (Note that there is no visible indication that it was successful)
3. To add a mirror disk resource (md), from the drop-down menu, select mirror disk resource, and then click Next.
4. Verify the Follow the default dependency box is selected, and then click Next.
5. Verify the default options are correct, and then click Next.
6. Click Add to add the first server.
7. Click Connect to populate the server partitions.
8. Select the data and cluster partitions. Click OK.
9. Repeat steps 6-8 for the second server.
10. Click Finish.
11. Click Finish, and then click Next.
12. Click Finish.
13. Click Yes to enable recovery action when an error occurs in a monitor resource.

5.6 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 from Config Mode to 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. When the cluster tree displays after a few seconds, in the left pane of the Cluster Manager window, expand the %failover group% section, right click %mirror disk%, and click Details to monitor the disk synchronization progress. Mirror disk copy starts automatically, replicating data from the Primary Server to the Standby Server.
Note
This step 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**.
7. In the Cluster Manager window, all icons in the tree view are now green. Refer to the figure below.

8. Confirm that the cluster is functioning. Move the failover group to the **Standby Server** and then move the failover group back to the **Primary Server** (See Section 9.3).

Note
This test does not affect server functionality. It verifies that the mirror disks on each server in the cluster are functioning properly. The mirror disk is now controlled by ECX and is only accessible from the active server.
6 Preparing Servers to Execute Scripts

6.1 Set Powershell’s Script Execution Policy

1. Launch PowerShell on the Primary Server.
2. Use Get-ExecutionPolicy to check the current script execution policy.
3. Set the execution policy to RemoteSigned or Unrestricted using Set-ExecutionPolicy in order to run EC failover scripts.

```
PS> Set-ExecutionPolicy RemoteSigned
```
4. Repeat this process on the Standby Server.

6.2 Create Copy of RemoteExchange.ps1 and Modify the Copy

1. Navigate to the Exchange ‘Bin’ folder (e.g. C:\Program Files\Microsoft\Exchange Server\V15\Bin) on the Primary Server.
2. Copy RemoteExchange.ps1 to the same folder and rename the copy to RemoteExchange-ECX.ps1.
3. Edit RemoteExchange-ECX.ps1 by adding the line \ControlMailboxDatabase.ps1 to the section where the functions are called. Comment out get-banner and get-tip in this section. Also add the error handling code as shown in the example below.

```
## now actually call the functions

#get-exbanner
#get-tip

$ErrorControlMailboxDatabase = 90
\ControlMailboxDatabase.ps1
$bRet = $?
if ($bRet –eq $False)
{
    exit $ErrorControlMailboxDatabase
}
```
4. Repeat this process on the Standby Server.
7 Microsoft Exchange Server 2013 Cluster Setup

To configure the Microsoft Exchange Server 2013 cluster, move the mailbox database to the data partition and change the path using the Exchange Management Shell on the Primary Server (Machine 1).

7.1 Move the Mailbox Database from Default Location to Data Partition

1. Create a folder (Mailbox Folder) on the Data Partition (example: X:\Mailbox Folder).
2. Before moving the Mailbox Database and LogFolderPath, make a backup copy of all files.
3. Once the backup is made, launch the Exchange Management Shell.
4. Run the following command at the prompt:

   `Move-DatabasePath –Identity <Mailbox database name> -EdbFilePath <new path to .edb file> -LogFolderPath <new path to folder>`

   Example: `Move-DatabasePath –Identity “Mailbox01” –EdbFilePath “X:\Mailbox Folder\Mailbox01.edb” –LogFolderPath “X:\Mailbox Folder”`

   Refer to the figure below:

   ![Exchange Management Shell](image)

   Note: This is a good opportunity to rename the mailbox database from the default name if not done previously.

5. Run the following command at the prompt:

   `Set-MailboxDatabase –Identity <Mailbox database name> –MountAtStartup $False`

6. To verify the change, run the command (using mailbox name in example above):

   `Get-MailboxDatabase <Mailbox database name> | fl Name,*Path*,MountAtStartup`

7. Run the command below if the mailbox database needs to be mounted:

   `Mount-Database –Identity <Mailbox database name>`
7.2 Configure services on the Primary Server (Machine 1)
1. Right-click Start and then click Run.
2. Type services.msc and click OK to open the Services management console.
3. Right-click on the service Microsoft Exchange Search Host Controller and then select Properties.
4. Set the Startup type to Disabled and then Stop the service.
5. Repeat this process on the Standby Server (Machine 2).

7.3 Copy and configure failover scripts
1. Download the script files from NEC web site;
2. Copy all script files to the EXPRESSCLUSTER bin folder (example. C:\Program
   Files\EXPRESSCLUSTER\bin) on the Primary Server.
3. Open SetEnvironment.bat with a text editor and change the parameters to match your environment.
4. Repeat the previous two steps on the Standby Server.

Note
One of the scripts requires that the Active Directory module for Windows PowerShell feature is installed. Verify this on both servers before continuing by accessing: Remote Server Administration Tools > Role Administration Tools > AD DS and AD LDS Tools > Active Directory Module for Windows PowerShell

7.4 Adding Application Resources to Control a Mailbox Database
1. Start the EC X Cluster Manager.
2. In the Cluster Manager window, change to Config Mode.
3. Right-click on the %failover group%, and then click Add Resource to add the first application resource.
4. From the drop down list, select application resource for Type, and give a name to the resource (example: appli-check-service). Click Next.
5. Uncheck Follow the default dependency and click Next.
6. Click Next if the default values are acceptable. Make changes to Retry Count or Failover Threshold first if necessary.
7. Check Non-Resident and set the following parameter for Start Path.
   Start Path : CheckExchangeServices01.bat
   Stop Path : (NULL)
8. Click **Tuning** and set 0 for **Normal Return Value** and set a **Timeout** value of at least 3600 for **Start** on the **Parameter** tab (see Note below). Click **OK** and then click **Finish**.

**Note**
The 1st application resource (example: appli-check-service) uses the following parameters in *SetEnvironment.bat* to wait for all Exchange services to be running.

- **RetryCount**: 30
- **RetryInterval**: 60

By default, the application resource waits 1800 (= RetryCount x RetryInterval) seconds for all Exchange services to be running. If any services are not running, the application resource starts them and waits 1800 seconds for them to be running. Services can take up to 3600 seconds to start. It is **recommended to set the Timeout value to 3600 or longer** (= RetryCount x RetryInterval + some buffer).

9. Right-click on the %failover group%, and then click **Add Resource** to add the second application resource.

10. From the drop down list, select **application resource** for **Type**, and give a name to the resource (example: appli-control-AD). Click **Next**.

11. Uncheck **Follow the default dependency**. Click the first application resource (example: appli-check-service) and click **Add**. Click **Next**.

12. Click **Next** if the default values are acceptable. Make changes to **Retry Count** or **Failover Threshold** first if necessary.

13. Check **Non-Resident** and set the following parameter for **Start Path**.

   - **Start Path**: ControlActiveDirectory01.bat <Mailbox database name>
   - **Stop Path**: (NULL)

14. Click **Tuning** and set 0 for **Normal Return Value** of **Start** on the **Parameter** tab.

15. Click the **Start** tab and set the following parameters.

   - **Domain**: your domain name
   - **Account**: a user belonging to the **Schema Admins** group
   - **Password**: password for the above user

16. Click **OK** and then click **Finish**.

17. Right-click the mirror disk resource (md) and click **Properties**.

18. Select the **Dependency** tab and uncheck **Follow the default dependency**. Click the second application resource just created (example: appli-control-AD) and click **Add**. Click **OK**.

19. Right-click on the %failover group%, and then click **Add Resource** to add the third application resource.

20. From the drop down list, select **application resource** for **Type**, and give a name to the resource (example: appli-control-DB). Click **Next**.
21. Uncheck **Follow the default dependency**. Click the mirror disk resource and click **Add**. Click **Next**.

22. Click **Next** if the default values are acceptable. Make changes to **Retry Count** or **Failover Threshold** first if necessary.

23. Check **Non-Resident** and set the following parameters for **Start Path** and **Stop Path**.
   - **Start Path**: ControlMailboxDatabase01.bat &lt;Mailbox database name&gt; Mount
   - **Stop Path**: ControlMailboxDatabase01.bat &lt;Mailbox database name&gt; Dismount

24. Click **Tuning** and set 0 for **Normal Return Value** of both **Start** and **Stop** on the **Parameter** tab.

25. Click the **Start** tab and set the following parameters.
   - **Domain**: your domain name
   - **Account**: a user belonging to the **Organization Management** group
   - **Password**: password of the above user

26. Click the **Stop** tab and set the following parameters.
   - **Domain**: your domain name
   - **Account**: a user belonging to the **Organization Management** group
   - **Password**: password of the above user

27. Click **OK** and then click **Finish**.

28. Click the **Entire Dependency** tab in the right pane and check the dependencies. See example below.

<table>
<thead>
<tr>
<th>Depth</th>
<th>Resource</th>
<th>Name</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>1&lt;sup&gt;st&lt;/sup&gt; application resource</td>
<td>appli-check-service</td>
</tr>
<tr>
<td>1</td>
<td>2&lt;sup&gt;nd&lt;/sup&gt; application resource</td>
<td>appli-control-AD</td>
</tr>
<tr>
<td>2</td>
<td>Mirror disk resource</td>
<td>md</td>
</tr>
<tr>
<td>3</td>
<td>3&lt;sup&gt;rd&lt;/sup&gt; application resource</td>
<td>appli-control-DB</td>
</tr>
</tbody>
</table>

7.5 **Upload the cluster configuration and start the cluster.**

1. First dismount the mailbox database using **Exchange Administrative Center** or the following command in the **Exchange Management Shell** before starting the cluster.

   Dismount-Database –Identity &lt;Mailbox database name&gt;

2. Then in the **Cluster Manager** window, click the **File** menu, and then **Apply the Configuration File**. Click **OK**. Click **OK**.

---

1 The Organization Management group belongs to Microsoft Exchange Security Group.
3. After the upload is complete, change to the **Operation Mode**.
4. Right-click on the `%failover_group%` and select **Start**. Select the **Primary Server** to start the group on and click **OK**. The mailbox database will mount on this server. If the cluster is not running, click the **Service** menu, and then click **Start Cluster**. Click **OK**.

**Note**
There is no need to make changes to Microsoft Outlook or OWA.
8 Test Cluster and Verify Functionality

1. Verify the **Primary Server** is running with mailbox database mounted and the **Standby Server** is also running, but with no mailbox database mounted. The status can be checked by using **Exchange Administrative Center** or the following command in the **Exchange Management Shell**.

   Get-MailboxDatabase -Status -Identity <Mailbox database name> | FL -Property Name,Mounted,MountedOnServer

2. With the cluster started on the **Primary Server**, try accessing the mailbox database from an email client such as Microsoft Outlook or OWA.

   **Test 1: Move Failover Group to Standby Server**
   
   1. Move the failover group to the **Standby Server** (refer to 9.3). Monitor the failover process in the **Cluster Manager** window. Verify that email clients are still able to connect to the mailbox database.

   2. Move back the failover group to the **Primary Server** (refer to 9.3). Verify that email clients are still able to connect to the mailbox database.

   **Test 2 (Optional): Force Failover to Standby Server**

   1. Shutdown the **Primary Server** (refer to 9.2). This will initiate a failover to the **Standby Server**. Email clients should still be able to connect to the mailbox database. The default setting for server recovery is to automatically rejoin the cluster. If manual recovery is preferred, refer to 9.4 to change this setting. Return the **Primary Server** to the cluster by turning on the power (refer to 9.5). Move Failover Group back to **Primary Server**.
9 Common Maintenance Tasks

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

Start Internet Explorer or any other supported Java enabled Web browser.

Method 1: Type the URL with the IP address of an active EC X clustered server; a colon (:); and then the cluster server port number.
Example: http://10.1.1.1:29003/
Use during or after the initial setup.

Method 2: Type the URL with the Management IP which was set up during EC X installation; a colon (:); and then the cluster server port number.
Example: http://10.1.1.3:29003/
Use after the initial setup and while the cluster is running.

9.2 Shutdown/Reboot one or all cluster servers
Start Cluster Manager (refer to 9.1) and do the following action.

- 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 one server
  Right-click the %machine name%, and then click Reboot.

- Reboot all servers
  Right-click the %cluster name%, and then click Reboot.

9.3 Startup/stop/move failover groups
1. Start Cluster Manager (refer to 9.1).
2. Under Groups, right-click %failover group% and then click Start/Stop/Move.
3. In the Confirmation window, click OK.
9.4 Isolate a server for maintenance

1. Start Cluster Manager (refer to 9.1).
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 (refer to 9.2). The server is now isolated and ready for maintenance tasks.

9.5 Return an isolated server to the cluster

Refer to 9.4 for setting recovery options.

9.5.1 Automatic Recovery

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

9.5.2 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.

9.6 Rebuild a mirror disk

1. Start Cluster Manager (refer to 9.1).
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 name of the destination server to copy files to [Standby Server (Machine 2)].
5. Click the Execute button. In the Confirmation window, click OK.
Appendix A: EC X Server Uninstallation

1. In the EC X Cluster Manager window of the web browser click the Service menu, and then click Stop Cluster.
2. Close the web browser with Cluster Manager.
3. Stop all EC X services on the server where the uninstall process will be run. To stop all services, follow the steps below:
   a. On the Start menu, point to Administrative Tools, and then click Services. Click the Stop button.
   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, click Control Panel. Click Uninstall a program.
5. In the Uninstall or change a program window, under the list of Currently installed programs, click NEC EXPRESSCLUSTER Server. Click Uninstall.
6. To start the uninstall process, in the Confirmation window, click Yes.
7. In the next window, click Yes to reset the registry settings to disable the media sense functions of TCP/IP disconnect detection.
8. In the first Install Wizard Complete window, click Finish.
9. On 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 system.

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

After the installation 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 (Exchange Server 2013 with Mailbox Role)
Machine 2: Standby Server (Exchange Server 2013 with Mailbox Role)
Machine 3: Test Client (a machine with an email 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>10.1.1.1 192.168.1.1</td>
<td>255.255.255.0</td>
<td>10.1.1.5</td>
<td>10.1.1.5</td>
</tr>
<tr>
<td>2</td>
<td>Standby</td>
<td>Public Interconnect</td>
<td>10.1.1.2 192.168.1.2</td>
<td>255.255.255.0</td>
<td>10.1.1.5</td>
<td>10.1.1.5</td>
</tr>
<tr>
<td>3</td>
<td>Test Client</td>
<td>Public</td>
<td>10.1.1.6</td>
<td>255.255.255.0</td>
<td>10.1.1.5</td>
<td>10.1.1.5</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>Std. Ed. or later</td>
<td>Size: 75GB</td>
<td>Size: 24MB</td>
</tr>
<tr>
<td></td>
<td>Std. Ed. or later</td>
<td>Size: 75GB</td>
<td>Size: 50GB</td>
</tr>
<tr>
<td>3</td>
<td>Win 7 or later</td>
<td>C: 30GB</td>
<td></td>
</tr>
</tbody>
</table>

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

Mailbox Database Name: Mailbox01

Floating IP (FIP) address: 10.1.1.3

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>admin1234</td>
</tr>
<tr>
<td>Machine 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Administrator</td>
<td></td>
<td>admin1234</td>
</tr>
</tbody>
</table>