ExpressCluster® X *for Windows*

Configuration Guide
(Exchange Server 2003 / 2007)

October 15th, 2008

ExpressClusterX

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Contents

INTRODUCTION

Target Readers and Purpose

ExpressCluster® PP Guide is intended for administrators who set up systems, system engineers who provide user support, and maintenance personnel for cluster systems.
This document introduces the software of which operations have been checked for an ExpressCluster environment. The software descriptions and setup examples in this document are provided only as a reference, and the software operations are not guaranteed.

Described Versions

This document describes ExpressCluster X 1.0 for Windows and ExpressCluster X 2.0 for Windows.

Organization of This Manual

Chapter 1 Exchange Server 2003: This chapter descrives Exchange Server 2003.
Chapter 2 Exchange Server 2007: This chapter descrives Exchange Server 2007.

ExpressCluster Manuals

The four ExpressCluster manuals below are available. The title of each guide and a description of its role follows.

ExpressCluster X Getting Started Guide

This guide is intended for users of ExpressCluster and provides a product overview, a description of the operating environment, update information, and known problems.

ExpressCluster X Install and Configuration Guide

This guide is intended for system engineers who install cluster systems using ExpressCluster and for system administrators who maintain and operate installed cluster systems, and it describes requirements from for installing a cluster system using ExpressCluster to for preparing to start operation. This guide follows the actual procedure for installing a cluster system to describe how to design a cluster system using ExpressCluster, how to install and set up ExpressCluster, how to check the system after setting it up, and how to evaluate the system before starting operation.

ExpressCluster X Reference Guide

This guide is intended for system administrators and system engineers who use ExpressCluster to install cluster systems, and it provides information about ExpressCluster operating procedures, the features of each module, maintenance, and troubleshooting. This guide is a companion to the *Install and Configuration Guide*.

ExpressCluster X Alert Service Administrator's Guide

This guide is intended for system engineers who install the ExpressCluster Alert Service in a cluster system that uses ExpressCluster X 1.0 and system administrators who maintain and operate the cluster system after installation. This guide follows the actual procedure to detail requirements when installing a cluster system that uses the ExpressCluster X Alert Service.

Conventions

In this manual, the meanings of **Note**, **Important**, and **Related information** are as follows.

Note: This indicates information that is important but is not related to data loss or damage to the system or equipment.

Important: This indicates information that is necessary for avoiding data loss or damage to the system or equipment.

Related information: This indicates where to look for related information.

The following conventions are used in this document:

Notation	Meaning	Example
Square brackets ([ ])	These are used before and after command names and terms that appear on the GUI (including dialog boxes and menus).	Click [Start]. [Properties] dialog box
Square brackets ([ ]) within a command	These indicate that specifying the enclosed value is optional.	`clpstat -s[-h host_name]`
Monospace font (`courier`)	This indicates commands, functions, and parameters.	`clpstat -s`
Monospace bold font (**`courier`**)	This indicates text that the user actually enters at a command prompt.	Enter the following: **`clpcl –s -a`**
Monospace italic font (*`courier`*)	This indicates text that the user must replace with a valid value.	`clpstat -s[-h host_name]`

Obtaining the Latest Information

To obtain the latest product information, visit the following website.

http://www.nec.com/expresscluster

Chapter 1 Exchange Server 2003

Overview of Features

- The standby computer can provide services during a failover if data files (the transaction log and each store's database file) for Exchange Server 2003 Enterprise Edition (hereafter referred to as *Exchange2003/EE**) and Exchange Server 2003 Standard Edition (hereafter referred to as *Exchange2003/SE**) are placed in the switching partition.

* These are collectively referred to as *Exchange2003* in the description below unless there is a difference depending on the edition.

- The following Exchange2003 operation mode is supported:
  Two nodes: Active (active server)/Passive (standby server)

The active and passive operation for ExpressCluster is described below.

Active/passive configuration

If a server that provides services fails, the standby server takes over the server name and IP address of the active server and provides Exchange services by using the resources in the switching partition.

Figure 1 shows a configuration where server 1 and server 2 operate as the active server and the passive server, respectively, in an ExpressCluster environment.

A client establishes a connection by specifying the computer name of server 1.

The DNS assumes that the floating IP address (FIP) is assigned to server 1 in this configuration.

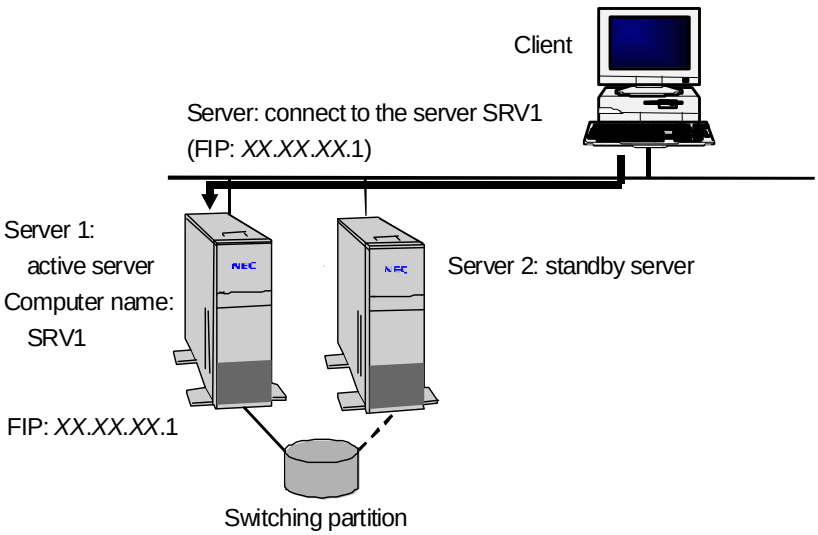


Figure 1 Normal Operation

When server 1 fails, the floating IP address moves as shown in Figure 2. When the failover is complete, Exchange services start on server 2 and the floating IP address and switching partition's resources move to server 2. Therefore, the client can establish a connection by using the same server name without having to know that the servers have been switched.

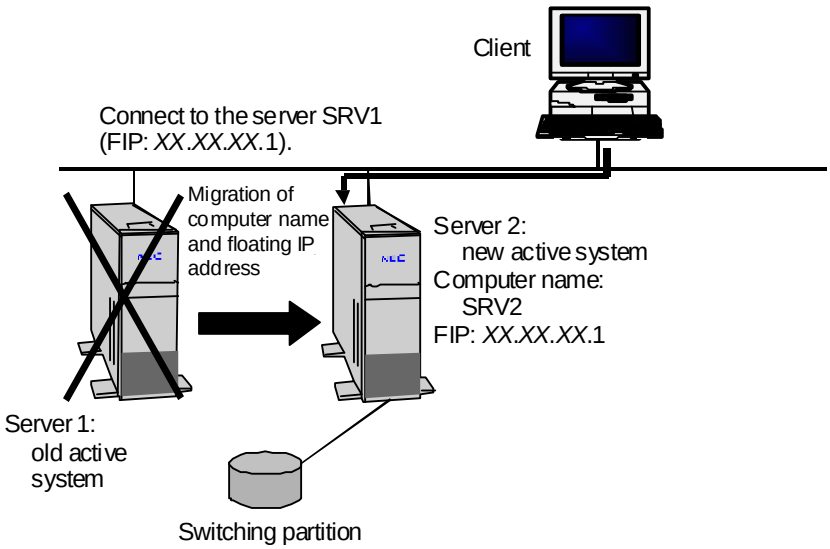


Figure 2 Failover

To move the failover group from server 1 to server 2 without shutting down the servers, (that is, to perform an online failover), use ExpressCluster Manager as shown in Figure 3. The floating IP address is also migrated.

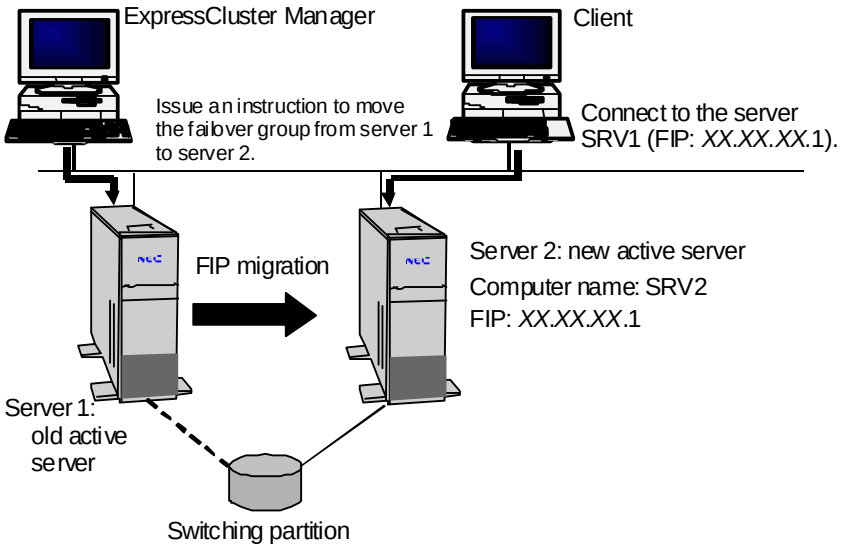


Figure 3 Online Failover

Functional Range

Exchange2003 supports the following functions in a cluster environment:

- Exchange Mail
- Public folders
- Connecting between routing groups
- Connecting between servers in the same routing group
- Internet mail services (POP3, SMTP, and IMAP4)
- LDAP
- Message Transfer Agent (MTA)

Note: Only one instance of Message Transfer Agent can be run in a cluster environment. If there are multiple failover groups, Message Transfer Agent is run in one of them.

Usually, this is the failover group where Exchange2003 was installed first.

Exchange2003 does not support the following functions in a cluster environment:

- Active Directory connector
- Calendar connector
- Exchange event service
- Connector to an external e-mail system (such as NOTES or x.400)
- NNTP
- Site replication service

Operating Environment

Exchange2003 runs in the following environments:

- Microsoft Windows Server 2003, Standard Edition
- Microsoft Windows Server 2003, Enterprise Edition

Exchange2003 runs only in an Active Directory environment.

Installation Procedure

Install this software in the local partitions on both servers. Note that the installation procedure differs somewhat from the normal procedure. Follow the installation procedure below.

(1) Setting up the network

- Specifying the network adapter's binding order
  Specify the binding order so that the network adapter references LANs in the following order:
  1. Public LAN
  2. Interconnect LAN

- Registering the interconnect DNS and disabling NETBIOS
  Delete the DNS reference destinations and NETBIOS settings under the network

properties for the interconnect LAN.

Note: For details about how to specify the above settings and other settings that must be considered, check the settings in *Cluster Requirements*, which is in the *Exchange Server 2003 Deployment Guide*.

Online Exchange Server 2003 Deployment Guide
http://www.microsoft.com/japan/technet/prodtechnol/exchange/2003/library/depguide.mspx (URL as of June 30th, 2008)

- Disabling public DNS registration
  Disable DNS registration under the network properties for the public LAN as follows:
  1. Open the public LAN properties.
  2. Select [Advanced] in [TCP/IP Properties].
  3. Clear the [Register this connection's Address with DNS] checkbox on the [DNS] tab.

(2) Creating failover groups
Create the following failover group for Exchange2003:
■ Resources

- Floating IP address (necessary to connect to an Outlook client or other Exchange Server)
- Switching partition (with enough capacity to store Exchange user data)
  In this guide, the switching partition is called the X: drive.
  Follow your configuration in an actual environment.

For details about how to create a failover group, see the *ExpressCluster X Install and Configuration Guide*.

Important: The failover group for Exchange2003 needs exactly one floating IP Address. Do not specify multiple floating IP Addresses for this failover group. The failover group for Exchange2003 does not support virtual IP Addresses. Use a floating IP Address.

(3) Setting up the ExpressCluster account
Create an account for Exchange2003 in ExpressCluster.
■ Setting

- Open the [Account] tab under cluster properties in Cluster Builder.
  Specify the Domain Administrator's account as the account to add. (This is usually "*parent_Active_Directory_domain_name*\administrator".)

(4) Setting up the DNS

a) Adding the computer name and floating IP address entries to the DNS

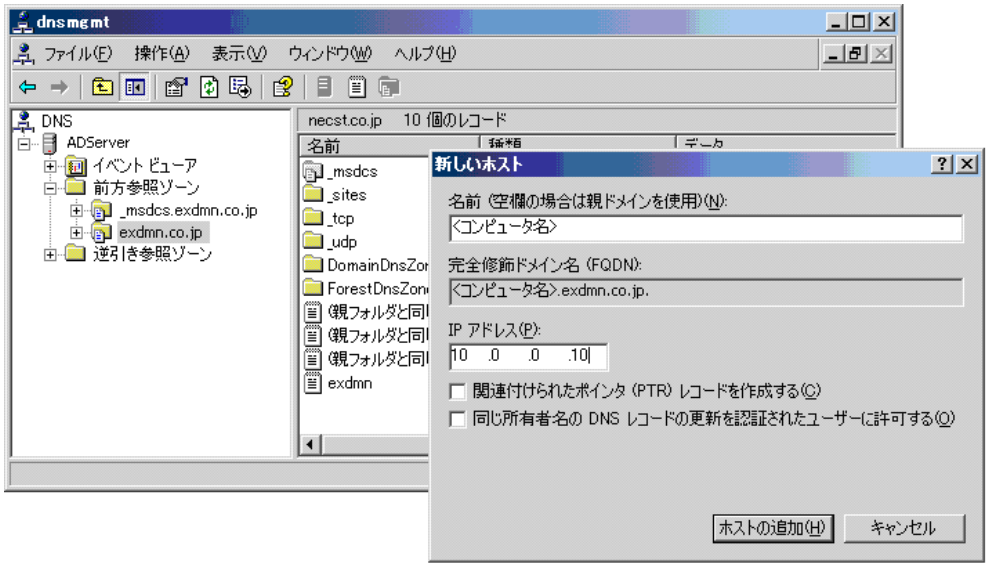
Open the DNS management console on the DNS server and add the combination of the active server's computer name and floating IP address.

The figure below shows a setting example where the floating IP address is 10.0.0.10.

Enter the active server's computer name under [Name] and the floating IP address under [IP Address].

Important: You might not be able to properly set up Exchange without this setting.

If the combination of the actual server name and the actual IP Address for each node is already registered to the DNS, delete such combinations.



b) Canceling dynamic updates

Open the DNS management console on the DNS server and specify the following settings:

- Right-click "DNS*domain_controller*\Forward lookup zone*domain*", and then open [Properties] from the shortcut menu that appears.
- Open the [General] tab and specify [No] for [Dynamic Update].
- Click [OK].

(5) Install Exchange2003 on both servers.

This step is the same as normal installation procedure.

Start the installer on the startup screen of Exchange2003 installation CD.

Important: Install Exchange2003 on each server.

Exchange2003 must be installed while ExpressCluster is running.

The Distributed Transaction Coordinator service must already be running.

Make sure that this service is running (that is, Status is Started) and that the Startup Type is Automatic by selecting [Administrative tools] and then [Services].

If installing Exchange2003 in an environment where Windows Server

2003 SP1 has been applied, the [Compatibility Warning] dialog box appears. If this dialog box appears, click [OK] to continue installation and apply the latest service pack for Exchange2003 after installation.

(6) Make sure that the Windows Server 2003 patch has been applied to each node.
The following hotfix is necessary to apply Exchange Server 2003 SP2.
If Windows Server 2003 SP2 is already applied, it is not necessary to apply this hotfix because the service pack includes this hotfix .

KB:898060 (http://support.microsoft.com/kb/898060/)
Apply Windows Server 2003 SP1 or the MS05-019 hotfix before applying this hotfix.
KB: 905214 (http://support.microsoft.com/kb/905214/)
There are no special notes on applying this hotfix.

(7) Apply Exchange2003 Server Service Pack 2 to both servers.
This step is the same as the normal installation procedure.

Important: Install Exchange2003 SP2 on each server.

(8) Create directories on the switching partition.
(Activate the failover group in the active server.)

- Select [Start], [Programs], [Accessories], and then Windows Explorer.
  - Create the X:\Exchsrv directory.
  - Create the X:\Exchsrv\mdbdata directory.
  - Create the X:\Exchsrv\vsi 1 directory.
  - Create the X:\Exchsrv\vsi 1\BadMail directory.
  - Create the X:\Exchsrv\vsi 1\Queue directory.

(9) Rename the mailbox store and public folder store as follows:

A) Start Exchange System Manager on the active server. (Select [Start], [Programs], Microsoft Exchange, and then System Manager.)
B) Right-click "*organization*\Server*server_name**storage_group**mailbox_store"*.
server_name is the server name of the active server.
C) Select [Rename].
D) Delete *server_name* from the mailbox store name.
E) Right-click
"*organization*\Server*server_name**storage_group**public_folder_store"*.
server_name is the server name of the active server.
F) Select [Rename].
G) Delete *server_name* from the public folder store name.
H) Start Exchange System Manager on the standby server.
I) Perform steps B through G.
In steps B through E above, *server_name* is the server name of the standby server.

(10) Add a replication destination server.
Add the standby server as the replication destination server for the following folders by using Exchange System Manager.

A) Public folder
1. Right-click "*organization*\Folders\Public Folders*public_folder_name"*, and then select [Properties].
2. Open the [Replication] tab, and then click [Add].

3. Select the standby server, and then click [OK].
4. Click [OK].

B) SCHEDULE+ FREE BUSY system folder
1. Right-click "*organization*\Folders\Public Folders*public_folder_name*", and then select [View System Folders].
2. Expand the SCHEDULE+ FREE BUSY folder.
3. Right-click "Ex:/o=*organization*/ou=*administrative_group*", and then select [Properties].
4. Open the [Replication] tab, and then click [Add].
5. Select the standby server, and then click [OK].
6. Click [OK].

C) OFFLINE ADDRESS BOOK system folder

1. Right-click "*organization*\Folders\Public Folders*public_folder_name*", and then select [View System Folders].
2. Expand OFFLINE ADDRESS BOOK.
3. Right-click "/o=*organization*/cn=addrlists/cn=oabs/cn=Default Offline Address List", and then select [All Tasks] followed by [Manage Settings].

   In step 3, [Manage Settings] might not be selectable immediately after Exchange2003 is installed.
   In this case, perform the following steps by using Exchange System Manager to make it selectable:

   3.1 Select "*organization*\Recipients\Offline Address Lists".
   3.2 Right-click [Default Offline Address List] on the list screen and execute [Rebuild].
   3.3 Confirm that subfolders such as OAB Version 2 are created under "/o=*organization*/cn=addrlists/cn=oabs/cn=Default Offline Address List".

4. The wizard screen opens. Click [OK].
5. Click the third option, [Overwrite setting], and then click [Next].
6. Check [Replicas], and then click [Next].
7. Click [Finish].

D) Properties of organizational forms folder
Perform the following steps when using the organizational form:
Right-click "*organization*\Folders\Public Folders*public_folder_name"*, and then select [View System Folders].
2. Expand EFORMS.
Subfolders are displayed under this folder when the organizational form is used.
Right-click the *organizational_form* folder, and then select [Properties].
4. Click the [Replication] tab, and then click [Add].
5. Select the standby server, and then click [OK].
6. Click [OK].

(11) Fail over the Exchange group.
Move the Exchange group to the standby server.

A) Start Cluster Manager on a server other than Exchange (such as the domain controller).
B) Right-click the Exchange group, and then select [Move].
C) Select the standby server, and then click [OK].

(12) Change the store storage location on the standby server.
A) Open Exchange System Manager on the standby server.
B) Right-click
"*organization*\Servers*standby_server_name**storage_group**mailbox_store"*.

C) Select [Properties].
D) Click the [Database] tab.
E) Click [Browse] under [Exchange database].
F) Change the storage location to X:\Exchsrv\mdbdata, which was created in step (8).
G) Click [Save].
H) Click [Browse] under [Exchange streaming database].
I) Change the storage location to X:\Exchsrv\mdbdata, which was created in step (8).
J) Click [Save].
K) Select [Database can be overwritten by restore].
L) Click [OK].
M) Click [Yes].
N) Click [OK].
O) Perform steps B through N for "*organization*\Servers*standby_server_name**storage_group**public_folder_store"*.

(13) Change the locations of the transaction log and system path on the standby server.

A) Open Exchange System Manager on the standby server.
B) Right-click "*organization*\Servers*standby_server_name**storage_group"*.
C) Select [Properties].
D) Click [Browse] under [Transaction log location].
E) Change the storage location to X:\Exchsrv\mdbdata, which was created in step (8).
F) Click [OK].
G) Click [Browse] under [System path location].
H) Change the storage location to X:\Exchsrv\mdbdata, which was created in step (8).
I) Click [OK].
J) Click [Yes].
K) Click [OK].

(14) Change the storage locations of invalid e-mails and queues on the standby server.

A) Open Exchange System Manager on the standby server.
B) Right-click "*organization*\Servers*standby_server_name*\Protocol\SMTP\default SMTP virtual server".
C) Click [Stop].
D) Right-click "*organization*\Servers*standby_server_name*\Protocol\SMTP\default SMTP virtual server".
E) Select [Properties].
F) Click the [Messages] tab.
G) Click [Browse] under [Badmail directory].
H) Change the storage location to X:\Exchsrv\vsi 1\BadMail, which was created in step (8).
I) Click [OK].
J) Click [Browse] under [Queue directory].
K) Change the storage location to X:\Exchsrv\vsi 1\Queue, which was created in step (8).
L) Click [OK].
M) Click [OK].
N) Right-click "*organization*\Servers*standby_server_name*\Protocol\SMTP\default SMTP virtual server".
O) Click [Start].

(15) Specify the settings for Exchange services on the standby server.
Set the following services to [Manual] to stop them on the standby server:
Microsoft Exchange Information Store
Microsoft Exchange Management
Microsoft Exchange MTA Stacks
Microsoft Exchange POP3
Microsoft Exchange Routing Engine
Microsoft Exchange System Attendant
Simple Mail Transfer Protocol (SMTP)

(16) Fail over the Exchange group.

A) Start Cluster Manager on a server other than Exchange (such as the domain controller).
B) Right-click the Exchange group, and then select [Move].
C) Select the active server, and then click [OK].

(17) Delete the following file in Windows Explorer:

- X:\Exchsrv\mdbdata*

(18) Change the store storage location on the standby server.

A) Specify the settings in step (12) on the active server.

(19) Change the locations of the transaction log and system path on the active server.

A) Specify the settings in step (13) on the active server.

(20) Change the storage locations of badmails and queues on the active server.

A) Specify the settings in step (14) on the active server.

(21) Specify the settings for Exchange services on the active server.

A) Specify the settings in step (15) on the active server.

(22) Stop the Exchange group.

A) Start Cluster Manager on a server other than Exchange (such as the domain controller).
B) Right-click the Exchange group, and then select [Stop].
C) Click [OK].

(23) Creating Exchange resources
Create the following resources for Exchange2003:
■ Resources

- Prepare the following scripts:
START.BAT: Start script
STOP.BAT: Stop script
W#EXCHG.BAT: Script for setting up environment variables
Exch.vbs: Script for setting up Active Directory

Note For details about how to create a resource, see the *ExpressCluster X Install and Configuration Guide*.

(24) Start the Exchange group.

A) Start Cluster Manager on a server other than Exchange (such as the domain

controller).

B) Right-click the Exchange group, and then select [Start].

C) Select the active server, and then click [OK].

Notes on Creating Scripts

Write scripts by following the samples below.
Otherwise, script execution might be interrupted when sharing or releasing a directory or stopping a service.

Sample scripts

Start script (START.BAT)

```
rem ************************************
rem *           START.BAT                *
rem *                                    *
rem * Title   : Exchange start option     *
rem * Date    : 2006.10.06               *
rem * Version : 1.0                      *
rem ************************************

rem ----------------------------------------
rem Set up environment variable used for batch processing.
rem ----------------------------------------
CALL W#EXCHG.BAT

rem ----------------------------------------
rem W# Environment variables specified in EXCHG.BAT
rem W#EXCHG1 : Domain administrator's account
rem W#EXCHG2 : Active directory server name
rem W#EXCHG3 : Primary server name
rem W#EXCHG4 : Backup server name
rem W#EXCHG5 : Flag indicating whether to output ARMLOG
rem          0-->No output
rem          1-->Output
rem ----------------------------------------


rem ----------------------------------------
rem Batch execution start processing
rem ----------------------------------------
IF "%W#EXCHG5%" == "0" GOTO NO_LOG_EXCHG1
ARMLOG "START START.BAT"

:NO_LOG_EXCHG1
rem ************************************
rem Change parameters to your environment
rem ************************************
SET DOMAIN_ADMIN_ACCOUNT=%W#EXCHG1%
SET AD_SERVER_NAME=%W#EXCHG2%
SET PRIMARY_SERVER_NAME=%W#EXCHG3%
SET BACKUP_SERVER_NAME=%W#EXCHG4%


rem ************************************
rem Check startup attributes
rem ************************************
IF "%CLP_EVENT%" == "START" GOTO NORMAL
IF "%CLP_EVENT%" == "FAILOVER" GOTO FAILOVER
IF "%CLP_EVENT%" == "RECOVER" GOTO EXIT

rem Cluster Server is not started
GOTO no_arm
```

```
rem ************************************
rem Normal and Failover Startup process
rem ************************************
:NORMAL
:FAILOVER

rem Check Disk
IF “%CLP_DISK%” == “FAILURE” GOTO ERROR_DISK

IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG2
ARMLOG “cd %CLP_SCRIPT_PATH%”

:NO_LOG_EXCHG2

cd %CLP_SCRIPT_PATH%

IF “%CLP_SERVER%” == “OTHER” GOTO ON_SECONDARY_SERVER

IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG3
ARMLOG “IF EXIST spn.ldf (ldifde -i -f spn.ldf -s %AD_SERVER_NAME% -v -k)”

:NO_LOG_EXCHG3

IF EXIST spn.ldf (
  ldifde -i -f spn.ldf -s %AD_SERVER_NAME% -v -k
)

:ON_SECONDARY_SERVER

IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG4
ARMLOG “ARMLOAD EXCHSCR /W /U %DOMAIN_ADMIN_ACCOUNT% cscript
exch.vbs %PRIMARY_SE
RVER_NAME% %BACKUP_SERVER_NAME% %CLP_PRIORITY%”

:NO_LOG_EXCHG4

ARMLOAD EXCHSCR /W /U %DOMAIN_ADMIN_ACCOUNT% cscript
exch.vbs %PRIMARY_SERVER_NAM
E% %BACKUP_SERVER_NAME% %CLP_PRIORITY%

IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG5
ARMLOG “ARMLOAD EXCHSA /S /A /R 1 MSEXCHANGESA”

:NO_LOG_EXCHG5

rem *** start exchange services ***
ARMLOAD EXCHSA /S /A /R 1 MSEXCHANGESA
ARMLOAD EXCHMGMT /S /A /R 1 MSEXCHANGEMGMT
ARMLOAD EXCHIS /S /A /R 1 MSEXCHANGEIS
ARMLOAD RESVC /S /A /R 1 RESVC
ARMLOAD EXCHMTA /S /A /R 1 MSEXCHANGEMTA
ARMLOAD SMTP /S /A /R 1 SMTPSVC
ARMLOAD POP3 /S /A /R 1 POP3SVC


GOTO EXIT


rem ************************************
rem Irregular process
rem ************************************

rem Process for disk errors
:ERROR_DISK
ARMBCAST /MSG “Failed to connect the switched disk partition” /A
GOTO EXIT
```

```
rem Cluster Server is not started
:no_arm
ARMBCAST /MSG “Cluster Server is offline” /A


rem ************************************
rem End processing
rem ************************************
:EXIT
rem ----------------------------------------
rem Batch execution end processing
rem ----------------------------------------
IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG_EXIT
ARMLOG “END   START.BAT”
:NO_LOG_EXCHG_EXIT
rem ----------------------------------------
rem End of batch
rem ----------------------------------------
```

Stop script (STOP.BAT)

```
rem ************************************
rem *           STOP.BAT                 *
rem *                                    *
rem * Title   : Exchange stop option     *
rem * Date    : 2006.10.06               *
rem * Version : 1.0                      *
rem ************************************

rem ----------------------------------------
rem Set up environment variable used for batch processing.
rem ----------------------------------------
CALL W#EXCHG.BAT

rem ----------------------------------------
rem W# Environment variables specified in EXCHG.BAT
rem W#EXCHG1 : Domain administrator’s account
rem W#EXCHG2 : Active directory server name
rem W#EXCHG3 : Primary server name
rem W#EXCHG4 : Backup server name
rem W#EXCHG5 : Flag indicating whether to output ARMLOG
rem          0-->No output
rem          1-->Output
rem ----------------------------------------


rem ----------------------------------------
rem Batch execution start processing
rem ----------------------------------------
IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG_START
ARMLOG “START STOP.BAT”


:NO_LOG_EXCHG_START
rem ************************************
rem Check startup attributes
rem ************************************
IF “%CLP_EVENT%” == “START” GOTO NORMAL
IF “%CLP_EVENT%” == “FAILOVER” GOTO FAILOVER

rem Cluster Server is not started
GOTO no_arm


rem ************************************
rem Normal and Failover Stop process
```

```
rem ***************************************
:NORMAL
:FAILOVER

IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG1
ARMLOG “ARMKILL POP3”

:NO_LOG_EXCHG1

ARMKILL POP3
ARMKILL SMTP
ARMKILL EXCHMTA
ARMKILL RESVC
ARMKILL EXCHIS
ARMKILL EXCHMGMT
ARMKILL EXCHSA


rem Check Disk
IF “%CLP_DISK%” == “FAILURE” GOTO ERROR_DISK


GOTO EXIT

rem ***************************************
rem Irregular process
rem ***************************************

rem Process for disk errors
:ERROR_DISK
ARMBCAST /MSG “Failed to connect the switched disk partition” /A
GOTO EXIT


rem Cluster Server is not started
:no_arm
ARMBCAST /MSG “Cluster Server is offline” /A


rem ***************************************
rem End processing
rem ***************************************
:EXIT
rem ----------------------------------------
rem Batch execution end processing
rem ----------------------------------------
IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG_EXIT
ARMLOG “END   STOP.BAT”
:NO_LOG_EXCHG_EXIT
rem ----------------------------------------
rem End of batch
rem ----------------------------------------
```

Script for setting up environment variables (W#EXCHG.BAT)

```
rem ************************************
rem *           W#EXCHG.BAT            *
rem *                                  *
rem * Title   : Exchange setting option   *
rem * Date    : 2006.10.06              *
rem * Version : 1.0                     *
rem ************************************

rem ----------------------------------------
rem W# Environment variables specified in EXCHG.BAT
rem W#EXCHG1 : Domain administrator's account
rem W#EXCHG2 : Active directory server name
rem W#EXCHG3 : Primary server name
rem W#EXCHG4 : Backup server name
rem W#EXCHG5 : Flag indicating whether to output ARMLOG
rem          0-->No output
rem          1-->Output
rem ----------------------------------------

SET W#EXCHG1=your_domain\administrator
SET W#EXCHG2=ad_server_name
SET W#EXCHG3=primary_server_name
SET W#EXCHG4=backup_server_name
SET W#EXCHG5=1
```

Script for setting up Active Directory (exch.vbs)

```
'=============================================================
' Purpose:      Execute all tasks required to failover Exchange server
' Authors:      Gary Pope and Jennifer Ricketts
' Date:         October 6, 2006
' Revised Date: October 6, 2006
'=============================================================

Option explicit
'On Error Resume Next
Err.number = 0


'=============================================================
' Variables and Constants
'=============================================================


' Declare variables
Dim strDNSDomain
Dim strPrimary, strBackup
Dim strOrg, strAdminGrp, strStrgGrp, strMBStorePub, strMBStore
Dim strRoutingGrp, strOfflineAddress
Dim strComputerCN, strPrimaryCN, strBackupCN, strUsersCN
Dim strPrimaryDNSHostName, strAttribute
Dim strHomeMDB, strHomeMTA, strMsExchHomeServerName
Dim strOrgClass, strAdminGrpClass, strStorageGrpClass
Dim strRoutingGrpClass, strOfflineAddressClass
Dim strMBStorePrivClass, strMBStorePubClass, strRUSClass
Dim objRootDSE
Dim objPrimary, objBackup
Dim objUsers, objUser
Dim intCounter
Dim conn
Dim flagFailOver
Dim strLdfFileName
```

```
‘ Declare Constants
Const ADS_PROPERTY_APPEND = 3
Const ADS_PROPERTY_DELETE = 4

Const ForReading = 1
Const ForWriting = 2

‘ Set Exchange variables
strPrimary = “CLG201”
strBackup = “CLG202”

If WScript.Arguments.Count <> 3 Then
    WScript.echo “Invalid parameters.”
    WScript.Quit
End If

strPrimary = WScript.Arguments(0)
strBackup = WScript.Arguments(1)
WScript.echo “Primary Server:” & strPrimary
WScript.echo “Backup Server:” & strBackup
If WScript.Arguments(2) = “1” Then
    flagFailOver = 0
    WScript.echo “failback”
Else
    flagFailOver = 1
    WScript.echo “failover”
End If


‘ Set Active Directory variables
strComputerCN = “CN=Computers,”
strUsersCN = “CN=Users,”
strPrimaryCN = “CN=“ & strPrimary & “,”
strBackupCN = “CN=“ & strBackup & “,”

‘ Variables set automatically in script
strOrgClass = “msExchOrganizationContainer”
strAdminGrpClass = “msExchAdminGroup”
strStorageGrpClass = “msExchStorageGroup”
strMBStorePrivClass = “msExchPrivateMDB”
strMBStorePubClass = “msExchPublicMDB”
strRUSClass = “msExchAddressListService”
strRoutingGrpClass = “msExchRoutingGroup”
strOfflineAddressClass = “msExchOAB”

strLdfFileName = “spn.ldf”


‘=================================================================
‘ Subroutines and Functions
‘=================================================================

‘ Error handling
Sub ErrorCheck(strError)
    If Err.Number <> 0 Then
  Wscript.Echo strError & vbCrLf _
            & “Error number: “ & Err.Number & “ “ & VbCrLf _
            & “Error source: “ & Err.Source & “ “ & vbCrLf _
            & “Error description: “ & Err.Description & vbCrLf _
            & VbCrLf & “Cancelling script now.”
  Err.Clear
  Wscript.Quit
    End If
End Sub

‘ Sets variables
Function GetObjectName (DNSDomainName,Attribute)
```

```
    Dim strLdapstring, rs1, objVar
    strLdapstring = "<LDAP://CN=Configuration," & DNSDomainName &
">;(&(objectClass=" & Attribute & "));adspath;subtree"
    Set rs1 = conn.Execute(strLdapstring)
    Set objVar = GetObject(rs1.Fields(0).Value)
    GetObjectName = objVar.cn
End Function

' Sets multiple RUS entries
Sub SetMultipleRUSEntries (DNSDomainName,Attribute)
    Dim strLdapstring, rs1, objVar
    strLdapstring = "<LDAP://CN=Configuration," & DNSDomainName &
">;(&(objectClass=" & Attribute & "));adspath;subtree"
    Set rs1 = conn.Execute(strLdapstring)
    Set objVar = GetObject(rs1.Fields(0).Value)
    While Not rs1.EOF
     Set objVar = GetObject(rs1.Fields(0).Value)
  Call ChgRUSServer(strOrg,objVar.cn)
  Call ErrorCheck("Error while setting RUS variable string.")
        rs1.MoveNext
    Wend
End Sub

' Mounts public stores
Sub MountStores(Organization, AdminGroup, Server, StorageGroup, MailboxStore)
    Dim objBase
    set objBase=GetObject("LDAP://CN=" & MailboxStore &_
    ",CN=" & StorageGroup & ",CN=InformationStore" &_
    ",CN=" & Server & ",CN=Servers,CN=" & AdminGroup &_
    ",CN=Administrative Groups,CN=" & Organization &_
    ",CN=Microsoft Exchange,CN=Services,CN=Configuration" &_
    "," & strDNSDomain)

    objBase.msExchPatchMDB = TRUE
    objBase.SetInfo
    WScript.echo "New mount setting: " & objBase.msExchPatchMDB
End Sub

' Changes routing master
Sub RoutingMaster(Organization,AdminGroup,RoutingGroup)
    Dim objBase, strRoutingMaster

    set objBase=GetObject("LDAP://CN=" & RoutingGroup &_
    ",CN=Routing Groups,CN=" & AdminGroup & ",CN=Administrative Groups" &_
    ",CN=" & Organization & ",CN=Microsoft Exchange,CN=Services" &_
    ",CN=Configuration" & "," & strDNSDomain)

    strRoutingMaster = objBase.msExchRoutingMasterDN
    If flagFailOver Then
        strRoutingMaster = Replace(strRoutingMaster, strPrimary, strBackup, 1,
-1, vbTextCompare)
    Else
        strRoutingMaster = Replace(strRoutingMaster, strBackup, strPrimary, 1,
-1, vbTextCompare)
    End If
    objBase.msExchRoutingMasterDN = strRoutingMaster
    objBase.SetInfo
    WScript.echo "Routing Master set to: " & objBase.msExchRoutingMasterDN
End Sub

' Changes RUS Server
Sub ChgRUSServer(Organization,RUStype)
    Dim objBase, strRUS
    set objBase=GetObject("LDAP://CN=" & RUStype &_
    ",CN=Recipient Update Services,CN=Address Lists Container" &_
    ",CN=" & Organization & ",CN=Microsoft Exchange,CN=Services" &_
    ",CN=Configuration" & "," & strDNSDomain)
```

```
    strRUS = objBase.msExchAddressListServiceLink
    If flagFailOver Then
        strRUS = Replace(strRUS, strPrimary, strBackup, 1, -1, vbTextCompare)
    Else
        strRUS = Replace(strRUS, strBackup, strPrimary, 1, -1, vbTextCompare)
    End If
    objBase.msExchAddressListServiceLink = strRUS
    objBase.SetInfo
    WScript.echo RUStype & " set to: " & objBase.msExchAddressListServiceLink
End Sub

' Changes Offline Address List Server
Sub OfflineAddress(Organization,OfflineAddressList)
    Dim objBase, strOABServer
    set objBase=GetObject("LDAP://CN=" & OfflineAddressList &_
    ",CN=Offline Address Lists,CN=Address Lists Container" &_
    ",CN=" & Organization & ",CN=Microsoft Exchange,CN=Services" &_
    ",CN=Configuration" & "," & strDNSDomain)

    strOABServer = objBase.offLineABServer
    If flagFailOver Then
        strOABServer = Replace(strOABServer, strPrimary, strBackup, 1, -1,
vbTextCompare)
    Else
        strOABServer = Replace(strOABServer, strBackup, strPrimary, 1, -1,
vbTextCompare)
    End If
    objBase.offLineABServer = strOABServer
    objBase.SetInfo
    WScript.echo "Offline Address List Server set to: " &
objBase.offLineABServer
End Sub


'=============================================================
' Create ldf file
'=============================================================
Sub CreateLdfFile
    Dim objFSO
    Dim objFile

    Set objFSO = CreateObject("Scripting.FileSystemObject")
    If objFSO.FileExists(strLdfFileName) Then
        WScript.echo strLdfFileName & " already exists."
    Else
        WScript.echo strLdfFileName & " does not exist. Create."

        Dim strLines(6)
        strLines(1) = "dn: " & strPrimaryCN & strComputerCN & strDNSDomain
        strLines(2) = "changetype: modify"
        strLines(3) = "add: servicePrincipalName"
        strLines(4) = "servicePrincipalName: HOST/" & strPrimaryDNSHostName
        strLines(5) = "servicePrincipalName: HOST/" & strPrimary
        strLines(6) = "-"

' For DEBUG
'        WScript.echo strLines(1)
'        WScript.echo strLines(2)
'        WScript.echo strLines(3)
'        WScript.echo strLines(4)
'        WScript.echo strLines(5)
'        WScript.echo strLines(6)
''''''''''''''''''''''''''''''''''

        set objFile = objFSO.CreateTextFile(strLdfFileName, ForWriting)
        objFile.WriteLine strLines(1)
```

```
        objFile.WriteLine strLines(2)
        objFile.WriteLine strLines(3)
        objFile.WriteLine strLines(4)
        objFile.WriteLine strLines(5)
        objFile.WriteLine strLines(6)
        objFile.Close
    End If
End Sub


'=============================================================
' Binding to Active Directory
'=============================================================

Set objRootDSE = GetObject("LDAP://RootDSE")
strDNSDomain = objRootDSE.Get("DefaultNamingContext")

Call ErrorCheck("Error while binding to AD.")

'=============================================================
' ADODB Connect
'=============================================================

Set conn = CreateObject("ADODB.Connection")
conn.Provider = "ADSDSOObject"
conn.Open "ADs Provider"

Call ErrorCheck("Error while connecting to ADODB.")

'=============================================================
' Set variables
'=============================================================

strOrg = GetObjectName(strDNSDomain,strOrgClass)
WScript.echo "Organization Name: " & strOrg

strAdminGrp = GetObjectName(strDNSDomain,strAdminGrpClass)
WScript.echo "Administration Group: " & strAdminGrp

strStrgGrp = GetObjectName(strDNSDomain,strStorageGrpClass)
WScript.echo "Storage Group: " & strStrgGrp

strMBStore = GetObjectName(strDNSDomain,strMBStorePrivClass)
WScript.echo "Private MB Store: " & strMBStore

strMBStorePub = GetObjectName(strDNSDomain,strMBStorePubClass)
WScript.echo "Public MB Store: " & strMBStorePub

strRoutingGrp = GetObjectName(strDNSDomain,strRoutingGrpClass)
WScript.echo "Routing Group: " & strRoutingGrp

strOfflineAddress = GetObjectName(strDNSDomain,strOfflineAddressClass)
WScript.echo "Routing Group: " & strOfflineAddress


Call ErrorCheck("Error while setting variables.")

'=============================================================
' Mount mailbox and public stores
'=============================================================

'changing store settings on Primary for a failback
If flagFailOver Then
    Call MountStores(strOrg, strAdminGrp, strBackup, strStrgGrp, strMBStore)
    Call MountStores(strOrg, strAdminGrp, strBackup, strStrgGrp,
strMBStorePub)
Else
```

```
    Call MountStores(strOrg, strAdminGrp, strPrimary, strStrgGrp, strMBStore)
    Call MountStores(strOrg, strAdminGrp, strPrimary, strStrgGrp,
strMBStorePub)
End If
Call ErrorCheck("Error while mounting stores.")
WScript.Echo "Mounting of stores completed."


'=============================================================
' Move ServicePrincipalName attributes in Active Directory to Primary machine
'=============================================================


' Binding to Primary in Active Directory

Set objPrimary = GetObject("LDAP://" & strPrimaryCN & strComputerCN &
strDNSDomain)

Call ErrorCheck("Error while binding to Primary in AD")


' Binding to Backup in Active Directory

Set objBackup = GetObject("LDAP://" & strBackupCN & strComputerCN &
strDNSDomain)

Call ErrorCheck("Error while binding to Backup in AD")

Dim doBackup,doPrimary
If flagFailOver Then
    doBackup = ADS_PROPERTY_APPEND
    doPrimary = ADS_PROPERTY_DELETE
Else
    doBackup = ADS_PROPERTY_DELETE
    doPrimary = ADS_PROPERTY_APPEND
End If

' Removing Primary SPN values from Backup

strPrimaryDNSHostName = objPrimary.DNSHostName

objBackup.PutEx doBackup, "servicePrincipalName", Array("HOST/" &
strPrimaryDNSHostName)
objBackup.SetInfo
objBackup.PutEx doBackup, "servicePrincipalName", Array("HOST/" & strPrimary)
objBackup.SetInfo
objBackup.PutEx doBackup, "servicePrincipalName", Array("exchangeMDB/" &
strPrimaryDNSHostName)
objBackup.SetInfo
objBackup.PutEx doBackup, "servicePrincipalName", Array("exchangeMDB/" &
strPrimary)
objBackup.SetInfo
objBackup.PutEx doBackup, "servicePrincipalName", Array("exchangeRFR/" &
strPrimaryDNSHostName)
objBackup.SetInfo
objBackup.PutEx doBackup, "servicePrincipalName", Array("exchangeRFR/" &
strPrimary)
objBackup.SetInfo

If flagFailOver Then
    Call ErrorCheck("Error while adding SPNs to Backup.")
Else
    Call ErrorCheck("Error while deleting SPNs from Backup.")
End If

' Re-adding Primary SPN values from Backup to Primary
```

```
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“HOST/” &
strPrimaryDNSHostName)
objPrimary.SetInfo
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“HOST/” &
strPrimary)
objPrimary.SetInfo
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“exchangeMDB/” &
strPrimaryDNSHostName)
objPrimary.SetInfo
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“exchangeMDB/” &
strPrimary)
objPrimary.SetInfo
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“exchangeRFR/” &
strPrimaryDNSHostName)
objPrimary.SetInfo
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“exchangeRFR/” &
strPrimary)
objPrimary.SetInfo

If flagFailOver Then
    Call ErrorCheck(“Error while deleting SPNs from Primary.”)
Else
    Call ErrorCheck(“Error while adding SPNs to Primary.”)
End If

‘FOR TESTING’’’’’’
Dim strAttributes
Dim strAttr
Dim strSet
strAttributes = objBackup.GetEx(“servicePrincipalName”)
For each strAttr in strAttributes
    strSet = strSet & strAttr & vbCRLF
Next
Wscript.echo “SPNs now in Backup:” & vbCrLf & strSet
’’’’’’’’’’’’’’’’’

‘FOR TESTING’’’’’’’’’
‘strAttributes = “”
strSet = “”
strAttributes = objPrimary.GetEx(“servicePrincipalName”)
For each strAttr in strAttributes
    strSet = strSet & strAttr & vbCRLF
Next
Wscript.echo “SPNs now in Primary:” & vbCrLf & strSet
’’’’’’’’’’’’’’’’’’’’’


‘============================================================
‘ Changing User Attributes
‘============================================================


‘ Binding to Active Directory

Set objUsers = GetObject(“LDAP://” & strUsersCN & strDNSDomain)

Call ErrorCheck(“Error while binding to Users container in AD.”)


‘ For each user with a “mail” address, change mailbox attributes back

intCounter = 0
For each objUser in objUsers
    Select Case objUser.Class
    Case “user”
    If objUser.mail <> “” Then
```

```
        strHomeMDB = objUser.homeMDB
        strAttribute = strHomeMDB

        If flagFailOver Then
            strHomeMDB = Replace(strAttribute, strPrimary, strBackup, 1, -1,
vbTextCompare)
        Else
            strHomeMDB = Replace(strAttribute, strBackup, strPrimary, 1, -1,
vbTextCompare)
        End If

        objUser.homeMDB = strHomeMDB
        objUser.SetInfo

        strHomeMTA = objUser.homeMTA
        strAttribute = strHomeMTA

        If flagFailOver Then
            strHomeMTA = Replace(strAttribute, strPrimary, strBackup, 1, -1,
vbTextCompare)
        Else
            strHomeMTA = Replace(strAttribute, strBackup, strPrimary, 1, -1,
vbTextCompare)
        End If

        objUser.homeMTA = strHomeMTA
        objUser.SetInfo

        strMsExchHomeServerName = objUser.msExchHomeServerName
        strAttribute = strMsExchHomeServerName

        If flagFailOver Then
            strMsExchHomeServerName = Replace(strAttribute, strPrimary,
strBackup, 1, -1, vbTextCompare)
        Else
            strMsExchHomeServerName = Replace(strAttribute, strBackup,
strPrimary, 1, -1, vbTextCompare)
        End If

        objUser.msExchHomeServerName = strMsExchHomeServerName
        objUser.SetInfo

        If flagFailOver Then
            WScript.echo "Changed mailbox attributes to " & strBackup & " for
" & objUser.cn
        Else
            WScript.echo "Changed mailbox attributes to " & strPrimary & " for
" & objUser.cn
        End If
    End If
    End Select

    intCounter = intCounter + 1

    Call ErrorCheck("Error while editing mailbox attributes.")
Next


'============================================================
' Change Routing Master
'============================================================


Call RoutingMaster(strOrg,strAdminGrp,strRoutingGrp)

Call ErrorCheck("Error while changing routing master.")
```

```
'=============================================================
' Change Recipient Update Service Server
'=============================================================


Call SetMultipleRUSEntries (strDNSDomain,strRUSClass)

Call ErrorCheck("Error while changing RUS Server.")


'=============================================================
' Change Offline Address List Server
'=============================================================


Call OfflineAddress(strOrg, strOfflineAddress)

Call ErrorCheck("Error while changing Offline Address List Server.")


'=============================================================
' Create Ldf File
'=============================================================
If flagFailOver=0 Then
    ' Activate on Primary
    Call CreateLdfFile
End If

'FOR TESTING'''''''''
WScript.echo "Done!"
''''''''''''''''''''

WScript.Quit
```

Notes

- A line error or other error might be reported to the client or sending or receiving an e-mail might fail depending on the the failover timing. In this case, it is possible to finish sending or receiving the e-mail by sending or receiving it after the failover.

- System shutdown might take five or more minutes when Exchange2003 is installed. It is recommended to connect an additional battery if a UPS is connected.

  - Specify a sufficient power disconnection grace period when using ESMPRO/PowerController or ESMPRO/AutomaticRunningController. (For details about this grace period, see the help for ESMPRO/PowerController or ESMPRO/AutomaticRunnningController or another reference.)

  - Specify a sufficient UPS stop delay period for ESMPRO/UPSController by taking the system shutdown time and UPS battery backup time into consideration. (For details about this delay period, see the help for ESMPRO/UPSController or another reference.)

- The logs below might be entered in the Windows Server 2003 event log when the ESMPRO/ServerAgent service is started or the Windows Server 2003 performance monitor is started on the standby server (the server where Exchange Server is not running).
  The cause is that the switching partition where Exchange Server is installed is not connected to the standby server. This is not an error.

(In fact, each Exchange service name is displayed for *MSExchangeXX* in the above dialog box and the path name of the DLL that provides performance data is displayed for *DLL file path*.)

- Make sure that the switching partition is not accessed when performing an online failover or failback (migrating the failover group). If an application is started from the switching partition or Windows Explorer or other software opens the switching partition, be sure to exit the application before performing an online failover or failback. (If the switching partition is accessed, the partition cannot be separated and the server is shut down.)

- Place the Active Directory server and Kerberos authentication server on the same server.

- Although the following error might be recorded in the event log during a failover, this does not affect operation:

Microsoft Exchange System Attendant has detected a discrepancy in the published security data for Exchange server '*virtual_computer_name*'. This server's encryption keys may have been modified illicitly.
Note There are also other error messages that are entered when Exchange is used in a cluster environment but do not affect operation. For details, see the Microsoft Knowledge Base or another resource.

- Although a function is added by Exchange2003 Service Pack 1 for renaming the domain name after setting up Exchange, this function is not supported yet.

The following notes are specific to ExpressCluster X.

- The Outlook client must be restarted after a failover or failback if the client (such as Outlook 2003) uses an MAPI connection.

- If an Internet mail client (such as Outlook Express) uses a POP3/SMTP or IMAP4 connection or uses OWA (Outlook Web Access) for access and the destination server is specified using the server name, the Exchange server is no longer accessible after a failover.
  Specify the floating IP address instead of the server name so the server remains accessible after a failover or failback.

- If you specify a server name for the OWA URL to start up after a failover from the active server (node 1) to the standby server (node 2), the public folder is opened at the node 2 URL.
  If the operation is failed back to node 1 as is, the public folder becomes inaccessible. To open the folder in this case, change the public folder URL to the node 1 URL, specify the floating IP address instead of the server name for the URL, or close the public folder and then restart or reload the browser executing OWA.

- After performing a failover while Exchange system Manager is running, accessing the public folder or system folder from the active Exchange System Manager results in an error.
  In this case, change the destination server of the public folder or system folder to the failover destination node or use Exchange System Manager on the failover destination node.

- When using the Message Tracking Center, specify the actual server name of the operating node as the server to search.

- When an Exchange server unit setting is changed after setting up the cluster environment, the change is not automatically applied to the other node. Therefore, it is necessary to make the same changes on both nodes.
  When settings are changed on an Exchange organization basis, the changes are shared by both nodes.

Chapter 2 Exchange Server 2007

Overview of Features

- The standby computer can provide services during a failover if data files (the transaction log and each store's database file) for Exchange Server 2007 Enterprise Edition (hereafter referred to as *Exchange2007/EE**) and Exchange Server 2007 Standard Edition (hereafter referred to as *Exchange2007/SE**) are placed in the switching partition.

* These are collectively referred to as *Exchange2007* in the description below unless there is a difference depending on the edition.

- The following Exchange2007 operation mode is supported:
  Two nodes: Active (active server)/Passive (standby server)

The active and passive operation for ExpressCluster is described below.

Active/passive configuration

If a server that provides services fails, the standby server takes over the server name and IP address of the active server and provides Exchange services by using the resources in the switching partition.

Figure 1 shows a configuration where server 1 and server 2 operate as the active server and the standby server, respectively, in an ExpressCluster environment.

A client establishes a connection by specifying the computer name of server 1.

The DNS assumes that the floating IP address (FIP) is assigned to server 1 in this configuration.

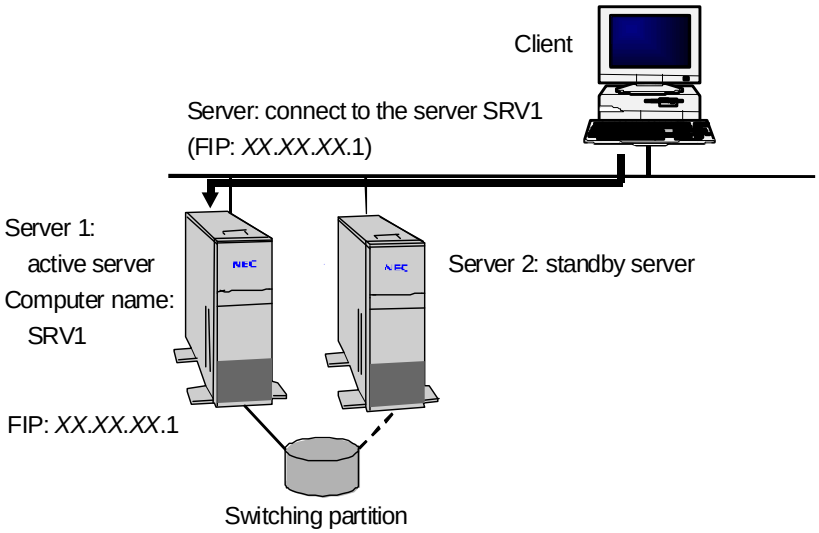


Figure 1 Normal Operation

When server 1 fails, the floating IP address moves as shown in Figure 2. When the failover is complete, Exchange services start on server 2 and the floating IP address and switching partition's resources move to server 2. Therefore, the client can establish a connection by using the same server name without having to know that the servers have been switched.

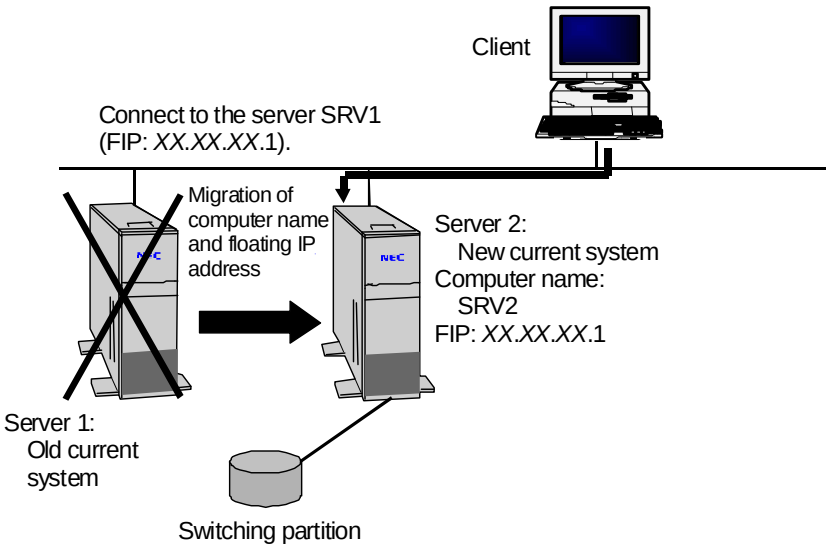


Figure 2 Failover

To move the failover group from server 1 to server 2 without shutting down the servers, (that is, to perform an online failover), use ExpressCluster Manager as shown in Figure 3. The floating IP address is also migrated.

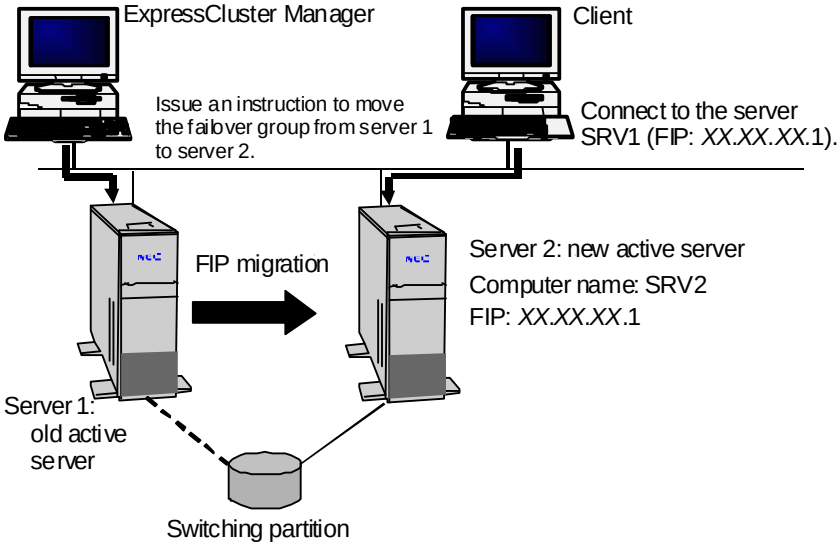


Figure 3 Online Failover

Functional Range

Exchange2007 supports the following functions in a cluster environment:

- Exchange e-mail
- Internet e-mail services (POP3, SMTP, and IMAP4)
- LDAP
- Hub Transport server role
- Client Access server role
- Mailbox server role

Exchange2007 does not support the following functions in a cluster environment:

- Active Directory connector
- Calendar connector
- Exchange event service
- Connector to an external e-mail system (such as NOTES or x.400)
- NNTP
- Site replication service
- Public folder
- Edge Transport server role
- Unified Messaging server role

Related information: For Exchange2007, a lot of functions available in the previous versions have been discontinued or de-emphasized.
For details, see the following Microsoft technical information.

- **Microsoft Exchange Server 2007**
  Discontinued Features and De-Emphasized Functionality
  http://technet.microsoft.com/ja-jp/library/aa998911.aspx
  (URL as of June 30th, 2008)

Usually, only the Mailbox server role can be installed in a cluster environment such as MSCS.
The Hub Transport server and client access server roles can also be installed in a cluster environment set up using ExpressCluster X.
The Edge Transport server role can be installed on a computer that does not participate in an Active Directory domain, but this role cannot be installed on a computer that has the same role as other servers.
The Unified Messaging server role can be installed on a server that has the same role as other servers. However, because this role consumes an extremely large amount of hardware resources, it cannot normally run in a cluster configuration.
Therefore, the Edge Transport server and Unified Messaging server roles are not supported for ExpressCluster X.
For details about each role in Exchange2007, see the following Microsoft technical information.

- **Microsoft Exchange Server 2007**
  Getting Started - Overview
  http://technet.microsoft.com/ja-jp/library/bb124937.aspx
  (URL as of June 30th, 2008)

Operating Environment

Exchange2007 runs in the following environments:

- Microsoft Windows Server 2003, Standard x64 Edition SP1 or later
- Microsoft Windows Server 2003, Enterprise x64 Edition SP1 or later
- Microsoft Windows Server 2008, Standard x64 Edition
- Microsoft Windows Server 2008, Enterprise x64 Edition

Exchange2007 runs only in x64 (EMT64T or AMD64) environments not in x86 or IA64 environments.

Exchange2007 runs only in native-mode Active Directory environments.

Exchange2007 SP1 or later runs only in Windows Server 2003 SP2 or later or Windows Server 2008 environments.

In Windows Server 2008 environments, only Exchange2007 SP1 or later can run.
An instance of Exchange2007 that does not include SP1 cannot be installed in Windows Server 2008 environments.

Installation Procedure

Install this software in the local partitions on all servers. Note that the installation procedure differs somewhat from the normal procedure. Follow the installation procedure below.

(1) Setting up the network

- Specifying the network adapter's binding order
  Specify the binding order so that the network adapter references LANs in the following order:
  1. Public LAN
  2. Interconnect LAN

- Registering the interconnect DNS and disabling NETBIOS
  Delete the DNS reference destinations and NETBIOS settings under the network properties for the interconnect LAN.

  Related information: For details about how to specify the above settings and other settings that must be considered, check the settings in *Planning for Single Copy Cluster*, which is in the *Microsoft Exchange Server 2007 help*

  Microsoft Exchange Server 2007 help
  http://www.microsoft.com/downloads/details.aspx?familyid=555F5974-9258-475A-B150-0399B133FEDE&displaylang=ja

  (URL as of June 30th, 2008)

- Disabling public DNS registration
  Disable DNS registration under the network properties for the public LAN as follows:
  1. Open the public LAN properties.
  2. Select [Advanced] in [TCP/IP Properties].

3. Clear the [Register this connection's Address with DNS] checkbox on the [DNS] tab.

(2) Creating failover groups
Create the following failover group for Exchange2007:
■ Resources

- Floating IP address (necessary to connect to an Outlook client or other Exchange Server)
- Switching partition (with enough capacity to store Exchange user data)
  In this guide, the switching partition is called the X: drive.
  Follow your configuration in an actual environment.

For details about how to create a failover group, see the *ExpressCluster X Install and Configuration Guide*.

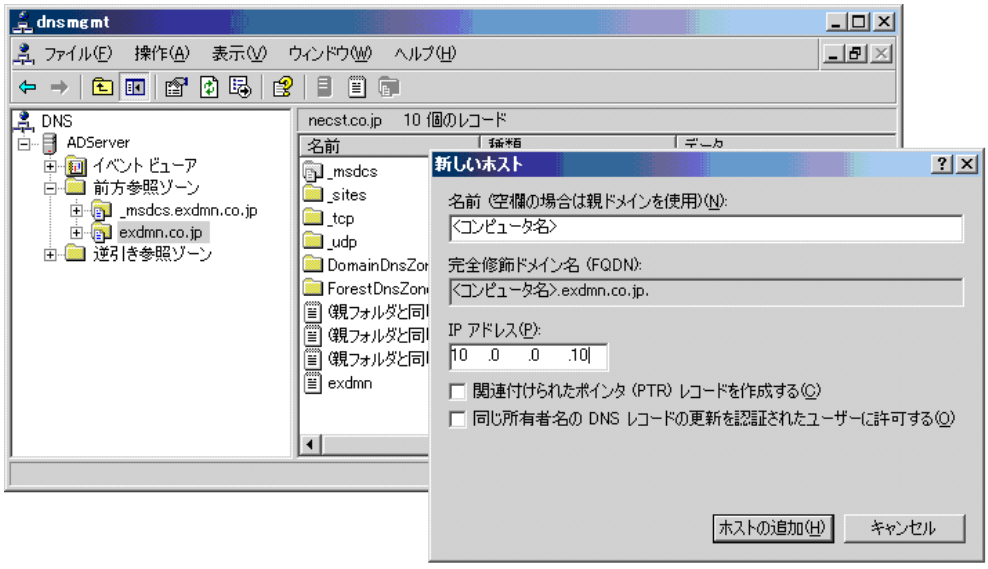
Important: The failover group for Exchange2007 needs exactly one floating IP Address. Do not specify multiple floating IP Addresses for this failover group. The failover group for Exchange2007 does not support virtual IP Addresses. Use a floating IP Address.

(3) Setting up the ExpressCluster account
Create an account for Exchange2007 in ExpressCluster.
■ Setting

- Open the [Account] tab under cluster properties in Cluster Builder.
  Specify the Domain Administrator's account as the account to add. (This is usually "*parent_Active_Directory_domain_name*\administrator".)

(4) Setting up the DNS
a) Adding the computer name and floating IP address entries to the DNS
Open the DNS management console on the DNS server and add the combination of the active server's computer name and floating IP address.
The figure below shows a setting example where the floating IP address is 10.0.0.10.
Enter the active server's computer name under [Name] and the floating IP address under [IP Address].

Important: You might not be able to properly set up Exchange without this setting.
If the combination of the actual server name and the actual IP Address for each node is already registered to the DNS, delete such combinations.



b) Canceling dynamic updates
Open the DNS management console on the DNS server and specify the following settings:

- Right-click “DNS*domain_controller*\Forward lookup zone*domain”*, and then open [Properties] from the shortcut menu that appears.
- Open the [General] tab and specify [No] for [Dynamic Update].
- Click [OK].

(5) Promote Active Directory to the Windows Server 2003 native mode.

(6) Requirements for Exchange2007 installation (the components and correction module) depend on the version of the OS on the installation destination server.
Perform the following steps on all servers and install the prerequisites.

6.1 When Windows Server 2003 SP2 or later is not applied
If the server is not connected to the Internet, obtain and install the modules below before installing Exchange2007.
If the server is connected to the Internet, they can be installed using the Exchange2007 installer.

- .NET FrameWork 2.0
- Microsoft management console (MMC) 3.0
- Microsoft Windows PoworShell
- Correction modules
  Correction module for .NET Framework 2.0 (KB: 917283, 926776)
  Correction module for Windows Server 2003 (KB: 898060, 918986)

6.2 When Windows Server 2003 SP2 or later is applied
If the server is not connected to the Internet, obtain and install the modules below before installing Exchange2007.
If the server is connected to the Internet, they can be installed using the Exchange2007 installer.

- .NET FrameWork 2.0

- Microsoft Windows PoworShell

- Correction modules
  .NET Framework 2.0 SP1
  Correction module for Windows Server 2003 (KB: 931836)

6.3 When installing Exchange2007 in Windows Server 2008
Open the command prompt and execute the commands below to install required modules.

- Execute the command below to install the remote management tool for the Active Directory domain service.
  It is necessary to join the Active Directory domain before executing this command.

```
ServerManagerCmd -i RSAT-ADDS
```

Important: It might be required to restart the server after executing the above command.
When performing this step while ExpressCluster is running, restart the server by rebooting the cluster after ensuring that the execution of the above command has been completed on both servers.

- Execute the following command to install Windows PowerShell:

```
ServerManagerCmd -i PowerShell
```

- Execute the following commands to install IIS prerequisites:

```
ServerManagerCmd -i Web-Server
ServerManagerCmd -i Web-ISAPI-Ext
ServerManagerCmd -i Web-Metabase
ServerManagerCmd -i Web-Lgcy-Mgmt-Console
ServerManagerCmd -i Web-Basic-Auth
ServerManagerCmd -i Web-Digest-Auth
ServerManagerCmd -i Web-Windows-Auth
ServerManagerCmd -i Web-Dyn-Compression
```

Related information: The prerequisites for installing Exchange2007 SP1 in Windows Server 2008 depend on the server role to be installed.
For details, see the following Microsoft technical information.

- How to Install Exchange2007 SP1 Prerequisites on Windows Server 2008
http://technet.microsoft.com/ja-jp/library/bb691354.aspx
(URL as of June 30th, 2008)

(7) Install Exchange2007 on all servers.
This step is the same as normal installation procedure.
Start the installer on the startup screen of Exchange2007 installation CD.

Important: Install Exchange2007 on each server.
Exchange2007 must be installed while ExpressCluster is running.
The Distributed Transaction Coordinator service must already be running. Make sure that this service is running (Status is Started) and that the Startup Type is Automatic by selecting [Administratrative tool]s and then [Services] in Windows.
Windows Server 2008 only supports a new installation of Exchange2007 SP1.
The server must be restarted after installing Exchange2007 SP1. Instead of restarting each server, restart all servers by rebooting the cluster after ensuring that Exchange2007 SP1 is installed on all servers.

(8) Create directories on the switching partition.
(Activate the failover group in the active server.)

- Select [Start], [Programs], [Accessories], and then Windows Explorer.
  - Create the X:\Exchsrv directory.
  - Create the X:\Exchsrv\Mailbox\ directory.
  - Create the X:\Exchsrv\Mailbox\First Storage Group directory.
  Note Create one storage group directory per storage group. Match each directory name with the corresponding storage group name.
  - Create the X:\Exchsrv\TransportRoles directory.
  - Create the X:\Exchsrv\TransportRoles\data directory.
  - Create the X:\Exchsrv\TransportRoles\data\Queue directory.
  - Apply the following access permissions to the X:\Exchsrv\TransportRoles\ directory.

  Administrator (Administrators): full control
  Network service (NETWORK SERVICE): full control
  System (SYSTEM): full control

(9) Fail over the Exchange group.
Move the Exchange group to the standby server.

A) Start Cluster Manager on a server other than Exchange (such as the domain controller).
B) Right-click the Exchange group, and then select [Move].
C) Select the standby server, and then click [OK].

(10) Change the store storage location on the standby server.

A) Start Exchange Management Console on the standby server.
B) Select [Server Configuration], and then select the standby server from the list.
C) In [Database Management], right-click [First Storage Group] and then [Mailbox Database].
D) Select [Move Database Path].
E) Click the [Database] tab.
F)Click [Browse] under [Database file path].
G) Change the storage location to X:\Exchsrv\Mailbox\First Storage Group, which was created in step (8).
H) Click [Move].
I) Move the path, and then click [Finish] to close the wizard screen.
J) If multiple storage groups exist, perform steps C through I for the store of each storage group.

(11) Change the locations of the transaction log and system path on the standby server.

A) Start Exchange Management Console on the standby server.
B) Select [Server Configuration], and then select the standby server from the list.

C) In [Database Management], right-click [First Storage Group].
D) Select [Move Storage Group Path].
E) Click [Browse] under [Log files path].
F) Change the storage location to X:\Exchsrv\Mailbox\First Storage Group, which was created in step (8).
G) Click [OK].
H) Click [Browse] under [System path location].
I) Change the storage location to X:\Exchsrv\Mailbox\First Storage Group, which was created in step (8).
J) Click [OK].
K) Click [Move].
L) Move the path, and then click [Finish] to close the wizard screen.
M) If multiple storage groups exist, perform steps C through L for each storage group.

(12) Change the queue storage location on the standby server.

A) Stop the Microsoft Exchange Transport service on the standby server.
B) Start Windows Explorer on the standby server and open the "*Exchange_2007_installation folder*\bin" folder.
C) Open the EdgeTransport.exe.config file by using Notepad.
D) Change the following path for the <appSettings> section to the queue storage destination created in (8).
<add key="QueueDatabasePath" value="*LocalPath*" />
<add key="QueueDatabaseLoggingPath" value = "*LocalPath*" />
E) Save and close the EdgeTransport.exe.config file.
F) Restart the Microsoft Exchange Transport service.
G) Confirm that the Mail.que and Trn.chk files have been created at the new location.
H) Delete these files from the original location.

(13) Specify the settings for Exchange services on the standby server.
Set the following services to [Manual] to stop them on the standby server:
Microsoft Exchange Active Directory Topology Service
Microsoft Exchange Anti-spam Update
Microsoft Exchange EdgeSync
Microsoft Exchange Information Store
Microsoft Exchange POP3
Microsoft Exchange Replication Service
Microsoft Exchange Search Indexer
Microsoft Exchange Service Host
Microsoft Exchange System Attendant
Microsoft Exchange Transport
Microsoft Exchange Transport Log Search
Microsoft Exchange File Distribution
Microsoft Exchange Mailbox Assistants
Microsoft Exchange Mail Submission
Microsoft Search (Exchange)

(14) Fail over the Exchange group.

A) Start Cluster Manager on a server other than Exchange (such as the domain controller).
B) Right-click the Exchange group, and then select [Move]
C) Select the active server, and then click [OK].

(15) Delete the following file in Windows Explorer:

- X:\Exchsrv\Mailbox\First Storage Group*
  X:\Exchsrv\TransportRoles\data\Queue*

* If multiple storage groups exist, delete the files in the directory corresponding to each storage group in the same way.

(16) Change the store storage location on the standby server.

A) Specify the settings in step (10) on the active server.

(17) Change the locations of the transaction log and system path on the active server.

A) Specify the settings in step (11) on the active server.

(18) Change the storage locations of queues on the active server.

A) Specify the settings in step (12) on the active server.

(19) Specify the settings for Exchange services on the active server.

A) Specify the settings in step (13) on the active server.

(20) Stop the Exchange group.

A) Start Cluster Manager on a server other than Exchange (such as the domain controller).
B) Right-click the Exchange group, and then select [Stop].
C) Click [OK].

(21) Creating Exchange resources
Create the following resources for Exchange2007:
■ Resources

- Prepare the following scripts:
  START.BAT: Start script
  STOP.BAT: Stop script
  W#EXCHG.BAT: Script for setting up environment variables
  Exch.vbs: Script for setting up Active Directory

For details about how to create a resource, see the *ExpressCluster X Install and Configuration Guide*.

(22) Start the Exchange group.

D) Start Cluster Manager on a server other than Exchange (such as the domain controller).
E) Right-click the Exchange group, and then select [Start].
F) Select the active server, and then click [OK].

Notes on Creating Scripts

Write scripts by following the samples below.
Otherwise, script execution might be interrupted when sharing or releasing a directory or stopping a service.

Sample Scripts

Start script (START.BAT)

```
Rem ************************************
rem * START.BAT *
rem * *
rem * Title : Exchange start option *
rem * Date : 2008  .06.23 *
rem * Version : 2.0 *
rem ************************************

rem ----------------------------------------
rem Set up environment variable used for batch processing.
rem ----------------------------------------
CALL W#EXCHG.BAT

rem ----------------------------------------
rem W# Environment variables specified in EXCHG.BAT
rem W#EXCHG1 : Domain administrator's account
rem W#EXCHG2 : Active directory server name
rem W#EXCHG3 : Primary server name
rem W#EXCHG4 : Backup server name
rem W#EXCHG5 : Flag indicating whether to output ARMLOG
rem          0-->No output
rem          1-->Output
rem W#EXCHG6 : Account used to update AD
rem W#EXCHG7 : Password of account used to update AD
rem W#EXCHG8 : Domain name used to update AD
rem ----------------------------------------


rem ----------------------------------------
rem Batch execution start processing
rem ----------------------------------------
IF "%W#EXCHG5%" == "0" GOTO NO_LOG_EXCHG1
ARMLOG "START START.BAT"

:NO_LOG_EXCHG1
rem ************************************
rem Change parameters to your environment
rem ************************************
SET DOMAIN_ADMIN_ACCOUNT=%W#EXCHG1%
SET AD_SERVER_NAME=%W#EXCHG2%
SET PRIMARY_SERVER_NAME=%W#EXCHG3%
SET BACKUP_SERVER_NAME=%W#EXCHG4%
SET AD_ADMIN=%W#EXCHG6%
SET AD_ADMIN_PWD=%W#EXCHG7%
SET AD_DOMAIN=%W#EXCHG8%


rem ************************************
rem Check startup attributes
rem ************************************
IF "%CLP_EVENT%" == "START" GOTO NORMAL
IF "%CLP_EVENT%" == "FAILOVER" GOTO FAILOVER
```

```
IF “%CLP_EVENT%” == “RECOVER” GOTO EXIT

rem Cluster Server is not started
GOTO no_arm


rem ************************************
rem Normal and Failover Startup process
rem ************************************
:NORMAL
:FAILOVER

rem Check Disk
IF “%CLP_DISK%” == “FAILURE” GOTO ERROR_DISK

IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG2
ARMLOG “cd %CLP_SCRIPT_PATH%”

:NO_LOG_EXCHG2

cd %CLP_SCRIPT_PATH%

IF “%CLP_SERVER%” == “OTHER” GOTO ON_SECONDARY_SERVER

IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG3
ARMLOG “IF EXIST spn.ldf (ldifde -i -f spn.ldf -s %AD_SERVER_NAME% -v -k
-b %AD_ADMIN% %AD_DOMAIN% ********)”

:NO_LOG_EXCHG3

IF EXIST spn.ldf (
ldifde -i -f spn.ldf -s %AD_SERVER_NAME% -v -k
-b %AD_ADMIN% %AD_DOMAIN% %AD_ADMIN_PWD%
)

:ON_SECONDARY_SERVER
IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG4
ARMLOG “ARMLOAD EXCHSCR /W /U %DOMAIN_ADMIN_ACCOUNT% cscript
exch.vbs %PRIMARY_SERVER_NAME% %BACKUP_SERVER_NAME% %CLP_PRIORITY%”

:NO_LOG_EXCHG4

ARMLOAD EXCHSCR /W /U %DOMAIN_ADMIN_ACCOUNT% cscript
exch.vbs %PRIMARY_SERVER_NAME% %BACKUP_SERVER_NAME% %CLP_PRIORITY%
IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG5
ARMLOG “ARMLOAD EXCHSA /S /A /R 1 MSEXCHANGESA”

:NO_LOG_EXCHG5

rem *** start exchange services ***
ARMLOAD EXCHSA /S /A /R 1 MSEXCHANGESA
ARMLOAD EXCHIS /S /A /R 1 MSEXCHANGEIS

ARMLOAD EXCHMSS /S /A /R 1 msftesql-EXCHANGE
ARMLOAD EXCHADT /S /A /R 1 MSEXCHANGEADTopology
ARMLOAD EXCHASU /S /A /R 1 MSEXCHANGEAntispamUpdate
ARMLOAD EXCHEDS /S /A /R 1 MSEXCHANGEEdgeSync
ARMLOAD EXCHPOP3 /S /A /R 1 MSEXCHANGEPOP3
ARMLOAD EXCHREPL /S /A /R 1 MSEXCHANGERepl
ARMLOAD EXCHSRC /S /A /R 1 MSEXCHANGESearch
ARMLOAD EXCHSVH /S /A /R 1 MSEXCHANGEServiceHost
ARMLOAD EXCHTRN /S /A /R 1 MSEXCHANGETransport
ARMLOAD EXCHTRNLS /S /A /R 1 MSEXCHANGETransportLogSearch
ARMLOAD EXCHFDS /S /A /R 1 MSEXCHANGEFDS
ARMLOAD EXCHMA /S /A /R 1 MSEXCHANGEMailboxAssistants
ARMLOAD EXCHMS /S /A /R 1 MSEXCHANGEMailSubmission
```

```
rem ** ARMLOAD EXCHMGMT /S /A /R 1 MSEXCHANGEMGMT
rem ** ARMLOAD RESVC /S /A /R 1 RESVC
rem ** ARMLOAD EXCHMTA /S /A /R 1 MSEXCHANGEMTA
rem ** ARMLOAD SMTP /S /A /R 1 SMTPSVC
rem ** ARMLOAD POP3 /S /A /R 1 POP3SVC


GOTO EXIT


rem ************************************
rem Irregular process
rem ************************************

rem Process for disk errors
:ERROR_DISK
ARMBCAST /MSG “Failed to connect the switched disk partition” /A
GOTO EXIT


rem Cluster Server is not started
:no_arm
ARMBCAST /MSG “Cluster Server is offline” /A


rem ************************************
rem End processing
rem ************************************
:EXIT
rem ----------------------------------------
rem Batch execution end processing
rem ----------------------------------------
IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG_EXIT
ARMLOG “END START.BAT”
:NO_LOG_EXCHG_EXIT
rem ----------------------------------------
rem End of batch
rem ----------------------------------------
```

Stop script (STOP.BAT)

```
rem ************************************
rem * STOP.BAT *
rem * *
rem * Title : Exchange stop option *
rem * Date : 2008.06.23 *
rem * Version : 2.0 *
rem ************************************

rem ----------------------------------------
rem Set up environment variable used for batch processing.
rem ----------------------------------------
CALL W#EXCHG.BAT

rem ----------------------------------------
rem W# Environment variables specified in EXCHG.BAT
rem W#EXCHG1 : Domain administrator’s account
rem W#EXCHG2 : Active directory server name
rem W#EXCHG3 : Primary server name
rem W#EXCHG4 : Backup server name
rem W#EXCHG5 : Flag indicating whether to output ARMLOG
rem          0-->No output
rem          1-->Output
rem W#EXCHG6 : Account used to update AD
rem W#EXCHG7 : Password of account used to update AD
rem W#EXCHG8 : Domain name used to update AD
```

```
rem ----------------------------------------


rem ----------------------------------------
rem Batch execution start processing
rem ----------------------------------------
IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG_START
ARMLOG “START STOP.BAT”


:NO_LOG_EXCHG_START
rem ************************************
rem Check startup attributes
rem ************************************
IF “%CLP_EVENT%” == “START” GOTO NORMAL
IF “%CLP_EVENT%” == “FAILOVER” GOTO FAILOVER

rem Cluster Server is not started
GOTO no_arm


rem ************************************
rem Normal and Failover Stop process
rem ************************************
:NORMAL
:FAILOVER

IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG1
ARMLOG “ARMKILL POP3”

:NO_LOG_EXCHG1

rem ** ARMKILL POP3
rem ** ARMKILL SMTP
rem ** ARMKILL EXCHMTA
rem ** ARMKILL RESVC
rem ** ARMKILL EXCHMGMT

ARMKILL EXCHMS
ARMKILL EXCHMA
ARMKILL EXCHFDS
ARMKILL EXCHTRNLS
ARMKILL EXCHTRN
ARMKILL EXCHSVH
ARMKILL EXCHSRC
ARMKILL EXCHREPL
ARMKILL EXCHPOP3
ARMKILL EXCHEDS
ARMKILL EXCHASU
ARMKILL EXCHADT
ARMKILL EXCHMSS

ARMKILL EXCHIS
ARMKILL EXCHSA


rem Check Disk
IF “%CLP_DISK%” == “FAILURE” GOTO ERROR_DISK


GOTO EXIT

rem ************************************
rem Irregular process
rem ************************************
```

```
rem Process for disk errors
:ERROR_DISK
ARMBCAST /MSG “Failed to connect the switched disk partition” /A
GOTO EXIT


rem Cluster Server is not started
:no_arm
ARMBCAST /MSG “Cluster Server is offline” /A


rem ************************************
rem End processing
rem ************************************
:EXIT
rem ----------------------------------------
rem Batch execution end processing
rem ----------------------------------------
IF “%W#EXCHG5%” == “0” GOTO NO_LOG_EXCHG_EXIT
ARMLOG “END STOP.BAT”
:NO_LOG_EXCHG_EXIT
rem ----------------------------------------
rem End of batch
rem ----------------------------------------
```

Script for setting up environment variables (W#EXCHG.BAT)

```
rem ************************************
rem * W#EXCHG.BAT *
rem * *
rem * Title : Exchange setting option *
rem * Date : 2008.06.23 *
rem * Version : 2.0 *
rem ************************************

rem ----------------------------------------
rem W# Environment variables specified in EXCHG.BAT
rem W#EXCHG1 : Domain administrator’s account
rem W#EXCHG2 : Active directory server name
rem W#EXCHG3 : Primary server name
rem W#EXCHG4 : Backup server name
rem W#EXCHG5 : Flag indicating whether to output ARMLOG
rem          0-->No output
rem          1-->Output
rem W#EXCHG6 : Account used to update AD
rem W#EXCHG7 : Password of account used to update AD
rem W#EXCHG8 : Domain name used to update AD
rem ----------------------------------------

SET W#EXCHG1=NEC\administrator
SET W#EXCHG2=AD-SERVER
SET W#EXCHG3=SERVER1
SET W#EXCHG4=SERVER2
SET W#EXCHG5=1
SET W#EXCHG6=administrator
SET W#EXCHG7=password
SET W#EXCHG8=NEC
```

Script for setting up Active Directory (exch.vbs)

```
'=================================================================
' Purpose:      Execute all tasks required to failover Exchange server
' Authors:      Gary Pope and Jennifer Ricketts
' Date:         October 6, 2006
' Revised Date: June 23, 2008
'=================================================================

Option explicit
'On Error Resume Next
Err.number = 0


'=================================================================
' Variables and Constants
'=================================================================


' Declare variables
Dim strDNSDomain
Dim strPrimary, strBackup
Dim strOrg, strAdminGrp, strStrgGrp, strMBStorePub, strMBStore
Dim strRoutingGrp, strOfflineAddress
Dim strComputerCN, strPrimaryCN, strBackupCN, strUsersCN
Dim strPrimaryDNSHostName
Dim strOrgClass, strAdminGrpClass, strStorageGrpClass
Dim strRoutingGrpClass, strOfflineAddressClass
Dim strMBStorePrivClass, strMBStorePubClass, strRUSClass
Dim objRootDSE
Dim objPrimary, objBackup
Dim conn
Dim flagFailOver
Dim strLdfFileName


' Declare Constants
Const ADS_PROPERTY_APPEND = 3
Const ADS_PROPERTY_DELETE = 4

Const ForReading = 1
Const ForWriting = 2

If WScript.Arguments.Count <> 3 Then
    WScript.echo "Invalid parameters."
    WScript.Quit
End If

strPrimary = WScript.Arguments(0)
strBackup = WScript.Arguments(1)
WScript.echo "Primary Server:" & strPrimary
WScript.echo "Backup Server:" & strBackup
If WScript.Arguments(2) = "1" Then
    flagFailOver = 0
    WScript.echo "failback"
Else
    flagFailOver = 1
    WScript.echo "failover"
End If


' Set Active Directory variables
strComputerCN = "CN=Computers,"
strUsersCN = "CN=Users,"
strPrimaryCN = "CN=" & strPrimary & ","
strBackupCN = "CN=" & strBackup & ","
```

```
‘ Variables set automatically in script
strOrgClass = “msExchOrganizationContainer”
strAdminGrpClass = “msExchAdminGroup”
strStorageGrpClass = “msExchStorageGroup”
strMBStorePrivClass = “msExchPrivateMDB”
strMBStorePubClass = “msExchPublicMDB”
strRUSClass = “msExchAddressListService”
strRoutingGrpClass = “msExchRoutingGroup”
strOfflineAddressClass = “msExchOAB”

strLdfFileName = “spn.ldf”


‘=================================================================
‘ Subroutines and Functions
‘=================================================================

‘ Error handling
Sub ErrorCheck(strError)
    If Err.Number <> 0 Then
  Wscript.Echo strError & vbCrLf _
            & “Error number: “ & Err.Number & “ “ & VbCrLf _
            & “Error source: “ & Err.Source & “ “ & vbCrLf _
            & “Error description: “ & Err.Description & vbCrLf _
            & VbCrLf & “Cancelling script now.”
  Err.Clear
  Wscript.Quit
    End If
End Sub

‘ Sets variables
Function GetObjectName (DNSDomainName,Attribute)
    Dim strLdapstring, rs1, objVar
    strLdapstring = “<LDAP://CN=Configuration,” & DNSDomainName &
“>;(&(objectClass=“ & Attribute & “));adspath;subtree”
    Set rs1 = conn.Execute(strLdapstring)
    Set objVar = GetObject(rs1.Fields(0).Value)
    GetObjectName = objVar.cn
End Function

‘ Sets multiple RUS entries
Sub SetMultipleRUSEntries (DNSDomainName,Attribute)
    Dim strLdapstring, rs1, objVar
    strLdapstring = “<LDAP://CN=Configuration,” & DNSDomainName &
“>;(&(objectClass=“ & Attribute & “));adspath;subtree”
    Set rs1 = conn.Execute(strLdapstring)
‘    Set objVar = GetObject(rs1.Fields(0).Value)
    While Not rs1.EOF
     Set objVar = GetObject(rs1.Fields(0).Value)
  Call ChgRUSServer(strOrg,objVar.cn)
  Call ErrorCheck(“Error while setting RUS variable string.”)
       rs1.MoveNext
    Wend
End Sub

‘ Mounts public stores
Sub MountStores(Organization, AdminGroup, Server, StorageGroup, MailboxStore)
    Dim objBase
‘ cahnge set to Set
    Set objBase=GetObject(“LDAP://CN=“ & MailboxStore &_
    “,CN=“ & StorageGroup & “,CN=InformationStore” &_
    “,CN=“ & Server & “,CN=Servers,CN=“ & AdminGroup &_
    “,CN=Administrative Groups,CN=“ & Organization &_
    “,CN=Microsoft Exchange,CN=Services,CN=Configuration” &_
    “,” & strDNSDomain)
```

```
    objBase.msExchPatchMDB = TRUE
    objBase.SetInfo
    WScript.echo “New mount setting: “ & objBase.msExchPatchMDB
End Sub

‘ Changes routing master
Sub RoutingMaster(Organization,AdminGroup,RoutingGroup)
    Dim objBase, strRoutingMaster

    set objBase=GetObject(“LDAP://CN=“ & RoutingGroup &_
    “,CN=Routing Groups,CN=“ & AdminGroup & “,CN=Administrative Groups” &_
    “,CN=“ & Organization & “,CN=Microsoft Exchange,CN=Services” &_
    “,CN=Configuration” & “,” & strDNSDomain)

    strRoutingMaster = objBase.msExchRoutingMasterDN
    If flagFailOver Then
        strRoutingMaster = Replace(strRoutingMaster, strPrimary, strBackup, 1,
-1, vbTextCompare)
    Else
        strRoutingMaster = Replace(strRoutingMaster, strBackup, strPrimary, 1,
-1, vbTextCompare)
    End If
    objBase.msExchRoutingMasterDN = strRoutingMaster
    objBase.SetInfo
    WScript.echo “Routing Master set to: “ & objBase.msExchRoutingMasterDN
End Sub

‘ Changes RUS Server
Sub ChgRUSServer(Organization,RUStype)
    Dim objBase, strRUS
    set objBase=GetObject(“LDAP://CN=“ & RUStype &_
    “,CN=Recipient Update Services,CN=Address Lists Container” &_
    “,CN=“ & Organization & “,CN=Microsoft Exchange,CN=Services” &_
    “,CN=Configuration” & “,” & strDNSDomain)

    strRUS = objBase.msExchAddressListServiceLink
    If flagFailOver Then
        strRUS = Replace(strRUS, strPrimary, strBackup, 1, -1, vbTextCompare)
    Else
        strRUS = Replace(strRUS, strBackup, strPrimary, 1, -1, vbTextCompare)
    End If
    objBase.msExchAddressListServiceLink = strRUS
    objBase.SetInfo
    WScript.echo RUStype & “ set to: “ & objBase.msExchAddressListServiceLink
End Sub

‘ Changes Offline Address List Server
Sub OfflineAddress(Organization,OfflineAddressList)
    Dim objBase, strOABServer
    set objBase=GetObject(“LDAP://CN=“ & OfflineAddressList &_
    “,CN=Offline Address Lists,CN=Address Lists Container” &_
    “,CN=“ & Organization & “,CN=Microsoft Exchange,CN=Services” &_
    “,CN=Configuration” & “,” & strDNSDomain)

    strOABServer = objBase.offLineABServer
    If flagFailOver Then
        strOABServer = Replace(strOABServer, strPrimary, strBackup, 1, -1,
vbTextCompare)
    Else
        strOABServer = Replace(strOABServer, strBackup, strPrimary, 1, -1,
vbTextCompare)
    End If
    objBase.offLineABServer = strOABServer
    objBase.SetInfo
    WScript.echo “Offline Address List Server set to: “ &
objBase.offLineABServer
```

```
End Sub

‘ Changes User Attributes
Sub ChangeUsers(PrimaryName,BackupName,Container)
  Dim objUsers, objUser
  Dim intCounter
  Dim strHomeMDB, strHomeMTA, strMsExchHomeServerName
  Dim strAttribute

  ‘ Binding to Active Directory
  Set objUsers = GetObject(“LDAP://” & Container & strDNSDomain)

  Call ErrorCheck(“Error while binding to Users container in AD.”)

  ‘ For each user with a “mail” address, change mailbox attributes back

  intCounter = 0                    ‘Count mailboxes
  For each objUser in objUsers
    Select Case objUser.Class
    Case “user”
    If objUser.mail <> “” Then

        strHomeMDB = objUser.homeMDB
        strAttribute = strHomeMDB

        If flagFailOver Then
            strHomeMDB = Replace(strAttribute, PrimaryName, BackupName, 1, -1,
vbTextCompare)
        Else
            strHomeMDB = Replace(strAttribute, BackupName, PrimaryName, 1, -1,
vbTextCompare)
        End If

        objUser.homeMDB = strHomeMDB
        objUser.SetInfo

        strHomeMTA = objUser.homeMTA
        strAttribute = strHomeMTA

        If flagFailOver Then
            strHomeMTA = Replace(strAttribute, PrimaryName, BackupName, 1, -1,
vbTextCompare)
        Else
            strHomeMTA = Replace(strAttribute, BackupName, PrimaryName, 1, -1,
vbTextCompare)
        End If

        objUser.homeMTA = strHomeMTA
        objUser.SetInfo

        strMsExchHomeServerName = objUser.msExchHomeServerName
        strAttribute = strMsExchHomeServerName

        If flagFailOver Then
            strMsExchHomeServerName = Replace(strAttribute, PrimaryName,
BackupName, 1, -1, vbTextCompare)
        Else
            strMsExchHomeServerName = Replace(strAttribute, BackupName,
PrimaryName, 1, -1, vbTextCompare)
        End If

        objUser.msExchHomeServerName = strMsExchHomeServerName
        objUser.SetInfo

        If flagFailOver Then
            WScript.echo “Changed mailbox attributes to “ & BackupName & “ for
“ & objUser.cn
```

```
        Else
            WScript.echo “Changed mailbox attributes to “ & PrimaryName & “ for
“ & objUser.cn
        End If
    End If
    End Select

    intCounter = intCounter + 1

    Call ErrorCheck(“Error while editing mailbox attributes.”)
  Next
End Sub



‘=============================================================
‘ Create ldf file
‘=============================================================
Sub CreateLdfFile
    Dim objFSO
    Dim objFile

    Set objFSO = CreateObject(“Scripting.FileSystemObject”)
    If objFSO.FileExists(strLdfFileName) Then
        WScript.echo strLdfFileName & “ already exists.”
    Else
        WScript.echo strLdfFileName & “ does not exist. Create.”

        Dim strLines(13)
        strLines(1) = “dn: “ & strPrimaryCN & strComputerCN & strDNSDomain
        strLines(2) = “changetype: modify”
        strLines(3) = “add: servicePrincipalName”
        strLines(4) = “servicePrincipalName: HOST/” & strPrimaryDNSHostName
        strLines(5) = “servicePrincipalName: HOST/” & strPrimary
        strLines(6) = “-”
        strLines(7) = “”
        strLines(8) = “dn: “ & strBackupCN & strComputerCN & strDNSDomain
        strLines(9) = “changetype: modify”
        strLines(10) = “delete: servicePrincipalName”
        strLines(11) = “servicePrincipalName: HOST/” & strPrimaryDNSHostName
        strLines(12) = “servicePrincipalName: HOST/” & strPrimary
        strLines(13) = “-”

‘ For DEBUG
‘        WScript.echo strLines(1)
‘        WScript.echo strLines(2)
‘        WScript.echo strLines(3)
‘        WScript.echo strLines(4)
‘        WScript.echo strLines(5)
‘        WScript.echo strLines(6)
‘        WScript.echo strLines(7)
‘        WScript.echo strLines(8)
‘        WScript.echo strLines(9)
‘        WScript.echo strLines(10)
‘        WScript.echo strLines(11)
‘        WScript.echo strLines(12)
‘        WScript.echo strLines(13)
’’’’’’’’’’’’’’’’’’’’’’’’’’’’’’’’

        set objFile = objFSO.CreateTextFile(strLdfFileName, ForWriting)
        objFile.WriteLine strLines(1)
        objFile.WriteLine strLines(2)
        objFile.WriteLine strLines(3)
        objFile.WriteLine strLines(4)
        objFile.WriteLine strLines(5)
        objFile.WriteLine strLines(6)
```

```
        objFile.WriteLine strLines(7)
        objFile.WriteLine strLines(8)
        objFile.WriteLine strLines(9)
        objFile.WriteLine strLines(10)
        objFile.WriteLine strLines(11)
        objFile.WriteLine strLines(12)
        objFile.WriteLine strLines(13)
        objFile.Close
    End If
End Sub


'=====================================================================
' Binding to Active Directory
'=====================================================================

Set objRootDSE = GetObject("LDAP://RootDSE")
strDNSDomain = objRootDSE.Get("DefaultNamingContext")

Call ErrorCheck("Error while binding to AD.")

'=====================================================================
' ADODB Connect
'=====================================================================

Set conn = CreateObject("ADODB.Connection")
conn.Provider = "ADSDSOObject"
conn.Open "ADs Provider"

Call ErrorCheck("Error while connecting to ADODB.")

'=====================================================================
' Set variables
'=====================================================================

strOrg = GetObjectName(strDNSDomain,strOrgClass)
WScript.echo "Organization Name: " & strOrg

strAdminGrp = GetObjectName(strDNSDomain,strAdminGrpClass)
WScript.echo "Administration Group: " & strAdminGrp

strStrgGrp = GetObjectName(strDNSDomain,strStorageGrpClass)
WScript.echo "Storage Group: " & strStrgGrp

strMBStore = GetObjectName(strDNSDomain,strMBStorePrivClass)
WScript.echo "Private MB Store: " & strMBStore

' strMBStorePub = GetObjectName(strDNSDomain,strMBStorePubClass)
' WScript.echo "Public MB Store: " & strMBStorePub

strRoutingGrp = GetObjectName(strDNSDomain,strRoutingGrpClass)
WScript.echo "Routing Group: " & strRoutingGrp

strOfflineAddress = GetObjectName(strDNSDomain,strOfflineAddressClass)
WScript.echo "Routing Group: " & strOfflineAddress


Call ErrorCheck("Error while setting variables.")

'=====================================================================
' Mount mailbox and public stores
'=====================================================================

'changing store settings on Primary for a failback
If flagFailOver Then
    Call MountStores(strOrg, strAdminGrp, strBackup, strStrgGrp, strMBStore)
' Comment out
```

```
'   Call MountStores(strOrg, strAdminGrp, strBackup, strStrgGrp, strMBStorePub)
Else
    Call MountStores(strOrg, strAdminGrp, strPrimary, strStrgGrp, strMBStore)
' Comment out
'    Call MountStores(strOrg, strAdminGrp, strPrimary, strStrgGrp,
strMBStorePub)
End If
Call ErrorCheck("Error while mounting stores.")
WScript.Echo "Mounting of stores completed."


'=============================================================
' Move ServicePrincipalName attributes in Active Directory to Primary machine
'=============================================================


' Binding to Primary in Active Directory

Set objPrimary = GetObject("LDAP://" & strPrimaryCN & strComputerCN &
strDNSDomain)

Call ErrorCheck("Error while binding to Primary in AD")


' Binding to Backup in Active Directory

Set objBackup = GetObject("LDAP://" & strBackupCN & strComputerCN &
strDNSDomain)

Call ErrorCheck("Error while binding to Backup in AD")

Dim doBackup,doPrimary
If flagFailOver Then
    doBackup = ADS_PROPERTY_APPEND
    doPrimary = ADS_PROPERTY_DELETE
Else
    doBackup = ADS_PROPERTY_DELETE
    doPrimary = ADS_PROPERTY_APPEND
End If

' Removing Primary SPN values from Backup

strPrimaryDNSHostName = objPrimary.DNSHostName

objBackup.PutEx doBackup, "servicePrincipalName", Array("HOST/" &
strPrimaryDNSHostName)
objBackup.SetInfo
objBackup.PutEx doBackup, "servicePrincipalName", Array("HOST/" & strPrimary)
objBackup.SetInfo
objBackup.PutEx doBackup, "servicePrincipalName", Array("exchangeMDB/" &
strPrimaryDNSHostName)
objBackup.SetInfo
objBackup.PutEx doBackup, "servicePrincipalName", Array("exchangeMDB/" &
strPrimary)
objBackup.SetInfo
objBackup.PutEx doBackup, "servicePrincipalName", Array("exchangeRFR/" &
strPrimaryDNSHostName)
objBackup.SetInfo
objBackup.PutEx doBackup, "servicePrincipalName", Array("exchangeRFR/" &
strPrimary)
objBackup.SetInfo

If flagFailOver Then
    Call ErrorCheck("Error while adding SPNs to Backup.")
Else
    Call ErrorCheck("Error while deleting SPNs from Backup.")
```

```
End If

‘ Re-adding Primary SPN values from Backup to Primary

objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“HOST/” &
strPrimaryDNSHostName)
objPrimary.SetInfo
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“HOST/” &
strPrimary)
objPrimary.SetInfo
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“exchangeMDB/” &
strPrimaryDNSHostName)
objPrimary.SetInfo
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“exchangeMDB/” &
strPrimary)
objPrimary.SetInfo
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“exchangeRFR/” &
strPrimaryDNSHostName)
objPrimary.SetInfo
objPrimary.PutEx doPrimary, “servicePrincipalName”, Array(“exchangeRFR/” &
strPrimary)
objPrimary.SetInfo

If flagFailOver Then
    Call ErrorCheck(“Error while deleting SPNs from Primary.”)
Else
    Call ErrorCheck(“Error while adding SPNs to Primary.”)
End If

‘FOR TESTING’’’’’’
Dim strAttributes
Dim strAttr
Dim strSet
strAttributes = objBackup.GetEx(“servicePrincipalName”)
For each strAttr in strAttributes
    strSet = strSet & strAttr & vbCRLF
Next
Wscript.echo “SPNs now in Backup:” & vbCrLf & strSet
’’’’’’’’’’’’’’’’’

‘FOR TESTING’’’’’’’’’
‘strAttributes = “”
strSet = “”
strAttributes = objPrimary.GetEx(“servicePrincipalName”)
For each strAttr in strAttributes
    strSet = strSet & strAttr & vbCRLF
Next
Wscript.echo “SPNs now in Primary:” & vbCrLf & strSet
’’’’’’’’’’’’’’’’’’’’’


‘=================================================================
‘ Changing User Attributes
‘=================================================================


Call ChangeUsers(strPrimary,strBackup,strUsersCN)
‘’====================== For LoadSim Users ========================
‘Call ChangeUsers(strPrimary,strBackup,”OU=MACHINE1,OU=LOADSIM USERS,”)



‘=================================================================
‘ Change Routing Master
‘=================================================================
```

```
Call RoutingMaster(strOrg,strAdminGrp,strRoutingGrp)

Call ErrorCheck(“Error while changing routing master.”)


‘=================================================================
‘ Change Recipient Update Service Server
‘=================================================================


Call SetMultipleRUSEntries (strDNSDomain,strRUSClass)

Call ErrorCheck(“Error while changing RUS Server.”)


‘=================================================================
‘ Change Offline Address List Server
‘=================================================================


Call OfflineAddress(strOrg, strOfflineAddress)

Call ErrorCheck(“Error while changing Offline Address List Server.”)


‘=================================================================
‘ Create Ldf File
‘=================================================================
If flagFailOver=0 Then
    ‘ Activate on Primary
    Call CreateLdfFile
End If

‘FOR TESTING’’’’’’’’’
WScript.echo “Done!”
’’’’’’’’’’’’’’’’’’’

WScript.Quit
```

Installation Procedure for Exchange2007 Service Pack

Even if Exchange2007 is not installed, installing an Exchange2007 service pack installs all the Exchange2007 functions.
To install a service pack on a server where Exchange2007 has not been installed, see the above installation procedure.

To install a service pack on a server where Exchange2007 is already installed, install the service pack to the local partitions on both servers by performing the steps below.

Related information: As of July 18th, 2008, the latest version is Service Pack 1. For details about Exchange2007 service packs, see the following Microsoft Web site.

- **Exchange Server 2007 Service Pack 1**
  http://www.microsoft.com/downloads/details.aspx?FamilyId=44C66AD6-F185-4A1D-A9AB-473C1188954C&displaylang=ja
  (URL as of July 18th, 2008)

(1) Make sure that the cluster group is running on the active server.
Move to the active server if the cluster group is running on the standby server.

(2) Start the installer for the Exchange2007 service pack on the standby server and start the installation.
If the following error occurs during the prerequisite confirmation phase, log out of the standby server, log in again, and then restart the installation:

Errors that could occur during the prerequisite confirmation phase

"You must be a member of the Exchange Organization Administrators group to upgrade the first Hub Transport server role in your organization to Exchange Server 2007 Service Pack 1."

"You must be a member of the Exchange Organization Administrators group to upgrade the first Client Access server role in your organization to Exchange Server 2007 Service Pack 1."

"You must be a member of the Exchange Organization Administrators group to upgrade the first Mailbox server role to Exchange Server 2007 Service Pack 1."

(3) After installing the service pack on the standby server, move the cluster group to the standby server.

(4) Start the installer for the Exchange2007 service pack on the active server and start the installation.
If one of the above errors occurs during the prerequisite confirmation phase, log out of the active server, log in again, and then restart the installation.

(5) After installing the service pack on the active server, move the cluster group to the active server.

Notes

- A line error or other error might be reported to the client or sending or receiving an e-mail might fail depending on the the failover timing. In this case, it is possible to finish sending or receiving the e-mail by sending or receiving it after the failover.

- System shutdown might take five or more minutes when Exchange2007 is installed. It is recommended to connect an additional battery if a UPS is connected.
  - Specify a sufficient power disconnection grace period when using ESMPRO/PowerController or ESMPRO/AutomaticRunningController. (For details about this grace period, see the help for ESMPRO/PowerController or ESMPRO/AutomaticRunnningController or another reference.)
  - Specify a sufficient UPS stop delay period for ESMPRO/UPSController by taking the system shutdown time and UPS battery backup time into consideration. (For details about this delay period, see the help for ESMPRO/UPSController or another reference.)

- The logs below might be entered in the Windows Server 2003 event log when the ESMPRO/ServerAgent service is started or the Windows Server 2003 performance monitor is started on the standby server (the server where Exchange Server is not running).
  The cause is that the switching partition where Exchange Server is installed is not connected to the standby server. This is not an error.

(In fact, each Exchange service name is displayed for ***MSExchangeXX*** in the above dialog box and the path name of the DLL that provides performance data is displayed for ***DLL file path***.)

- Make sure that the switching partition is not accessed when performing an online failover or failback (migrating the failover group). If an application is started from the switching partition or Windows Explorer or other software opens the switching partition, be sure to exit the application before performing an online failover or failback. (If the switching partition is accessed, the partition cannot be separated and the server is shut down.)

- Place the Active Directory server and Kerberos authentication server on the same server.

- Although the following error might be recorded in the event log during a failover, this

does not affect operation:
Microsoft Exchange System Attendant has detected a discrepancy in the published security data for Exchange server '*virtual_computer_name*'. This server's encryption keys may have been modified illicitly.
Note There are also other error messages that are entered when Exchange is used in a cluster environment but do not affect operation. For details, see the Microsoft Knowledge Base or another resource.

The following notes are specific to ExpressCluster X.

- The Outlook client must be restarted after a failover or failback if the client (such as Outlook 2003) uses an MAPI connection.

- If an Internet mail client (such as Outlook Express) uses a POP3/SMTP or IMAP4 connection or uses OWA (Outlook Web Access) for access and the destination server is specified using the server name, the Exchange server is no longer accessible after a failover.
  Specify the floating IP address instead of the server name so the server remains accessible after a failover or failback.

- The logon session with the Exchange server is disconnected during a failover or failback. Therefore, logon authentication might be requested again when you try to access the system after a failover or failback depending on the authentication settings for an OWA, POP3/SMTP, or IMAP4 connection.

- When using the Message Tracking Center, run the Message Tracking Center on the operating node and specify the actual server name of the operating node as the server to search.

- When an Exchange server unit setting is changed after setting up the cluster environment, the change is not automatically applied to the other node. Therefore, it is necessary to make the same changes on both nodes.
  When settings are changed on an Exchange organization basis, the changes are shared by both nodes.