
NEC

EXPRESSCLUSTER X for Linux
Quick Start Guide for Zimbra Mail Server

Version 3



Revision History

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1	9/13/2010	Created
2	3/27/2012	Added – Section 6.5: Configure Zimbra to connect with Active Directory
3	25/8/2014	Added updated steps for moving Zimbra data from default location to data partition mention in section 6.1. Added new section 6.4 regarding Host file modification.

**NEC EXPRESSCLUSTER X 3.0/3.1/3.2 for Linux
Quick Start Guide for Zimbra Mail Server 8.0.5**

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About this Guide

Using this guide

This guide provides a hands-on “Quick Start” set of instructions for the EXPRESSCLUSTER X (ECX) for Linux. The guide assumes its readers to have Linux system administration knowledge and skills with experience in installation and configuration of Cent operating systems, networks, Zimbra Mail Server. The guide includes step-by-step instructions to install and configure EXPRESSCLUSTER X with Zimbra.

This guide covers the following topics:

Chapter 1: [Overview](#) – describes the general steps of setup procedure.

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

Chapter 3: [Base System Setup](#) – describes the configurations required for each system before installing target application.

Chapter 4: [EXPRESSCLUSTER X Server Installation](#)– describes the installation of EXPRESSCLUSTER X on the Primary and Standby Servers.

Chapter 5: [Base Cluster Setup](#) – describes the process of generating a cluster, creating a failover group, and uploading a configuration.

Chapter 6: [Zimbra installation and configuration](#) – describes the installation & configuration of Zimbra.

Chapter 7: [Zimbra Cluster Configuration](#) – describes required configuration to enable full cluster functionality.

Chapter 8: [Final Deployment in a LAN Environment](#) – describes steps to verify basic LAN infrastructure functionality and how to move the standby server from a primary to standby site location.

Chapter 9: [Common Maintenance Tasks](#) – describes how to perform common maintenance tasks using the EXPRESSCLUSTER X Manager.

Where to go for more information

Refer to additional documentation under the “documentation” directory on the EXPRESSCLUSTER X distribution CD or archive file.

For any further information, please visit the EXPRESSCLUSTER X web-site at <http://www.nec.com/EXPRESSCLUSTER>

The following guides are available for instant support:

- **GettingStartedGuide.pdf** – This guide explains general cluster concepts and overview of EXPRESSCLUSTER X functionality.
- **InstallationGuide.pdf** – This guide explains EXPRESSCLUSTER X installation and configuration procedures in detail.
- **ReferenceGuide.pdf** – This is a reference of commands that can be put in EXPRESSCLUSTER X scripts and maintenance commands that can be executed from the server command prompt.

The above stated guides can also be found at:

<http://www.nec.com/global/prod/EXPRESSCLUSTER/en/support/manuals.html>

The EXPRESSCLUSTER X team can also be contacted via the following E-mail address:

info@EXPRESSCLUSTER.jp.nec.com

1 Overview

The general procedure to deploy Zimbra server with EXPRESSCLUSTER X on two server machines (Primary and Standby) for high availability of Zimbra consists of the following major steps:

1. Perform system planning to determine requirements and specify specific configuration settings prior to start of actual system installation and configuration.
2. Prepare the Primary and Standby Servers including OS installation, network configuration and other configuration if necessary
3. Install and configure EXPRESSCLUSTER X Server on the Primary and Standby Servers
4. Install, configure and verify Zimbra server on the Primary and Standby Servers respectively
5. Create and configure EXPRESSCLUSTER X failover group to enable continuous protection and automatic recovery for Zimbra server.
6. Upload the configuration file on the server and start the cluster to complete the deployment.

2 System Requirements and Planning

This section covers the pre-requisites to install and configure the Zimbra Mail Server with EXPRESSCLUSTER X.

2.1 Zimbra Mail Server Requirement

1. Zimbra Collaboration Suite 8.0.5
2. Stop and disable the sendmail & Postfix services on both the servers & disable it. Click on System tab on CentOS desktop. Point to **Administration** and click on **Services**. In the window, find the **Sendmail** service and click on **Stop**, also uncheck the check box next to the service name. Click on **File** and click on **Save**.
3. Create A records and MX records on the DNS server for primary server, secondary server and also for a name that will be used as a virtual name for Zimbra access. Bind the virtual name with the Floating IP.

System Requirements

Machine 1: Primary Server

Machine 2: Standby Server

Machine 3: DNS

	Machine 1 Primary Server	Machine 2 Standby Server	Machine 3 Management Console/Test Client system
CPU	3 GHz Pentium IV or better		1 GHz Pentium III or better
Memory	1GB or more		512MB or more
Disk	1 physical disks (having at least 3 partitions, one for OS, one for cluster partition and one for data partition) Data partition: Minimum 5GB space should be available Mirrored disk: 10MB partition available for EXPRESSCLUSTER management The same size for each server system		1 physical disk with 10 GB or more space available

OS	Cent OS version 6.5	Windows 7
Software	Java 1.5 enabled web browser	Java 1.5 enabled web browser
Network	2 100Mbit or faster Ethernet network interface cards	1 100Mbit or faster Ethernet network interface card

2.2 System Planning

Review the requirements from last section and then fill out the tables of the worksheet below. Use for reference in the following sections of this guide. See Appendix B for an example worksheet.

Machine 1 Primary Server

Machine 2 Standby Server

Machine 3 Management Console/Test Client system

Table 1: System Network Configuration

Machine	Host name	Network Connection	IP Address	Subnet Mask	Default Gateway	Preferred DNS Server
1		Public: Interconnect:				
2		Public: Interconnect:				
3						

Management IP address:

Floating IP (FIP) address:

Table 2: System OS and Disk Configuration

Machine	OS	Disk 0 (OS Disk)	Disk 1 (Data Disk)
1		Boot Partition: Partition Name: Size:	Cluster Partition: Partition Name: Size (>=10MB) :
2		Boot Partition: Partition Name: Size:	*Data Partition: Partition Name: Size:
3			

* The size must be large enough to store all the data of the Zimbra mail server.

Table 3: System Logins and Passwords

		Login	Password
Machine Administrator	1		
Machine Administrator	2		

3 Base System Setup

3.1 Setup the Primary Server (Machine 1)

1. If necessary, install required hardware components and a supported OS as specified in Chapter [2](#).
2. Verify basic system boot and root login functionality and availability of required hardware components as specified in Chapter [2](#).
3. Configure network interface names
 - a. Rename the network interface to be used for network communication with client systems to **Public**.
 - b. Rename the network interface to be used for internal EXPRESSCLUSTER X management and data mirroring network communication between servers to **Interconnect**.
4. Configure network interface Settings:
 - a. In the “System” tab go to “Administration” further go to “Network”.
 - b. In the Network Connections window, double-click **Public**.
 - c. In the dialog box, click the **statically set IP address:** option button.
 - d. Type the **IP address**, **Subnet mask**, and **Default gateway** values (see [Table 1](#)).
 - e. Go back to the Network Connections window. Double-click **Interconnect**.
 - f. In the dialog box, click the **statically set IP address:** option button.
 - g. Type the **IP address** and **Subnet mask** values (see [Table 1](#)). Click **OK**.
 - h. On the terminal, run the command “service network restart”.
5. Configure the Data Disk:
 - a. Make sure the disk device or LUN is initialized as a Linux Basic disk device
 - b. Create swap partition of 2*size of RAM.
 - c. Create a mirrored disk cluster partition on the disk with specified size in [Table 2](#) and make sure it is 10MB or greater. Assign partition name as specified in Table 2 to the partition but do NOT format it.
 - d. Create a mirrored disk data partition on the disk with specified size in [Table 2](#). Assign partition name as specified in Table 2 to the partition and format it.
 - e. Verify the mirrored disk cluster and data partitions are visible in command prompt using “fdisk” command under their respective assigned partition names.

3.2 Setup the Standby Server (Machine 2)

Perform steps 1-5 in [Section 3.1](#) on the Standby Server

4 EXPRESSCLUSTER X Server Installation

4.1 Install EXPRESSCLUSTER X on the Primary & Standby Server

Install the EXPRESSCLUSTER X Server RPM on all server(s) that constitute the cluster by following the procedures below.

Note: Log in as root user when installing the EXPRESSCLUSTER X Server RPM.

1. Mount the installation CD-ROM.
2. Run the rpm command to install the package file. The installation RPM varies depending on the products. Navigate to the folder, /Linux/3.0/en/server, in the CD-ROM and run the following:

```
rpm -i expresscls-[version].[architecture].rpm
```

Note: EXPRESSCLUSTER X will be installed in the following directory. You will not be able to uninstall the EXPRESSCLUSTER X if you change this directory.
Installation Directory: /opt/nec/clusterpro

3. When the installation is completed, unmount the installation CD-ROM.
4. **License Registration:** Log on to the master server as root user and run the following command:

```
clplcncs -i <filepath> -p <PRODUCT-ID>
```

When the command is successfully executed, the message "Command succeeded." is displayed in the console

Note: Here, specify the in file path to the license file by the -i option & the product ID by the -p option.

For Base License: Enter the product ID as BASE32. Here 3.2 is the EC version & this number will vary as per the EC deployed. Example for EC3.1 version, command param would become BASE31. The Base license required to be applied on only one server

For Replicator license: Enter the product ID as REPL32. This license should be registered on both the servers

For Internet Service Agent license: Enter the product ID as ISAG32. This license should be registered on both the servers

Note: For registering the license from the command line refer to EXPRESSCLUSTER X, Installation and Configuration Guide.

4.2 Restart the Primary and Standby Servers

First restart the Primary Server and then restart the Standby Server

5 Base Cluster Setup

This section describes the steps to create a cluster using EXPRESSCLUSTER X Manager running on the Management Console/DNS server (Machine 3).

5.1 Install Java Runtime Environment (JRE)

Verify JRE v.1.5.0.6 or newer is installed on the Domain Controller (Machine 3). If necessary, install JRE by performing the following steps:

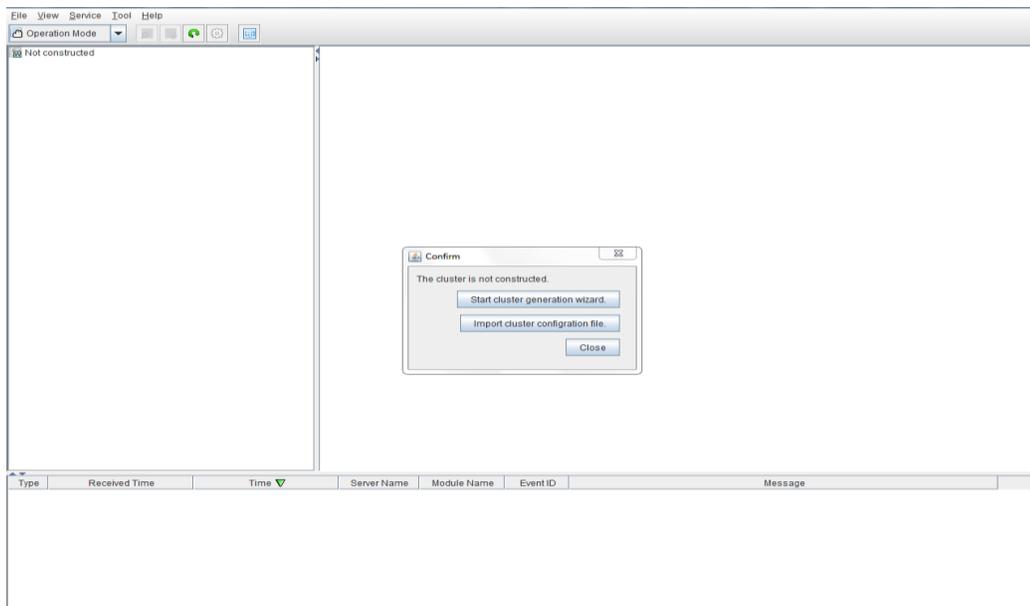
1. Run **jre-1_5_0 <build and platform version>.exe** (a compatible JRE distribution can be found in the jre folder on the EXPRESSCLUSTER X CD).
2. On the License Agreement screen, verify the default **typical setup** option button is selected. Click **Accept**.
3. On the Installation Completed screen, click **Finish**.

5.2 Start Cluster Manager

1. On the Management Console/Test Client (Machine 3), on the **Start** menu, point to **Programs** and click **Internet Explorer**.
2. Type the URL of the Primary Server: `http://%Public IP address of the Primary Server%:29003`
For the URL, see [Table 1](#). 29003 is the default port.

5.3 Start Cluster Generation Wizard (Config mode)

In the Cluster Manager window, a pop up window will open. (Refer below snapshot)



To create a fresh configuration, Click on “**Start Cluster Generation Wizard**” and follow the steps given below

5.4 Create a cluster

For all of the steps below, refer to Table 1 for the IP addresses and server names.

1. Type a cluster name and Management IP address for managing the cluster from client machine and click **Next**. (Default Cluster name): cluster
2. The first server’s name is already displayed in the Servers list. Now, click **ADD** button to add standby server, on the “**Add server**” pop up window, enter the hostname or IP address of the standby server and click **NEXT**.
3. In the next window the list of IP addresses is available for both the servers. For the interfaces select a unique MDC.
4. Click **NEXT** on NP resolution window. The Failover “Group” window will appear.

5.5 Create a failover group

For all of the steps below, refer to Table 1 for the IP addresses and server names.

1. In the “Group” window, click **Add** to start the **Group Definition**.
2. In the first Group Definition window, for **Type**, select **failover** and type a new name (example: Zimbra), and click **Next**.
3. Again click **NEXT**. On the “Group Attribute Settings” window, leave as default and click **NEXT**.

5.6 Adding Group Resources

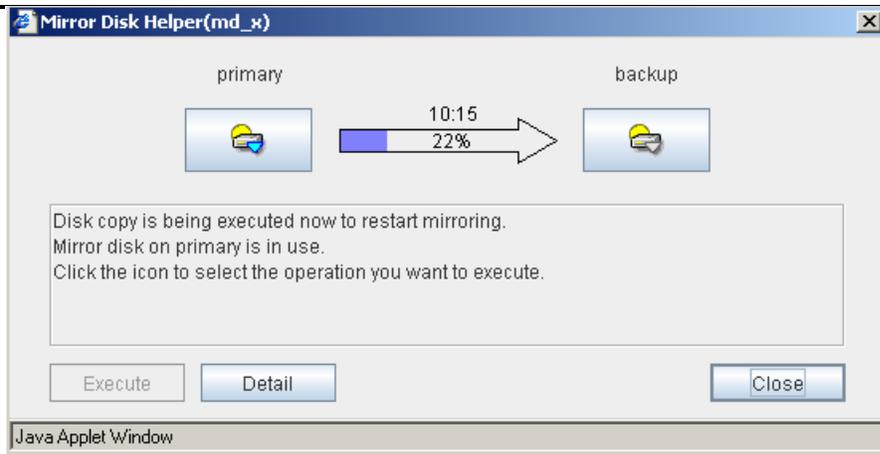
1. On the “**Group Resource**” window, click **ADD** to add a **Floating IP Resource (FIP)** and **mirror disk resource**.
2. In the “Group Resource Definition” window, for **Type**, select **floating IP resource** from the pull-down box. For **Name**, use the default (FIP). Click **Next**.
3. In the next window (Dependent Resources), click **NEXT**.
4. On the window for “**Recovery Operation at Deactivation Failure Detection**”, make the final action as “**No Operation (deactivate next resource)**” and click **NEXT**.
5. In the next window, type the Floating IP address and then click **Finish**. See Floating IP addresses for EXPRESSCLUSTER – **Floating IP (FIP) address** on [Table 2](#).
6. In the next window, click **Add** and for **Type**, select **Mirror disk resource** from the pull-down box. For **Name**, leave it to default and Click **Next**.

-
7. On next window, make sure that checkbox “Follow the default dependency” is checked and click **Next**.
 8. On next window for “**Recovery Operation at Deactivation Failure Detection**”, make the final action as “**No Operation (deactivate next resource)**” and click **Next**.
 9. In the next window, under **Mirror Partition Device Name**, leave it as default. (Eg: /dev/NMP1)
 10. Define a mount point for data of the zimbra server. The user mail is available at the following path: “**/opt/zimbra**”.
 11. Specify the **Data Partition Device Name** that will be used to store the data of the Zimbra mail server database. (Refer [Table 2](#))
 12. Specify the **Cluster Partition Device Name** that will be used for management of the mirror disk. See [Table 2](#) (Appendix B) for appropriate values
 13. Click **Finish**.
 14. On “Group Resource” window, click **Finish**.
 15. On “Group List” window, click **Next** and then click **Finish**.

5.7 Upload the cluster configuration and initialize the cluster

In the Cluster Builder window (Config Mode), to apply the configuration, click the **File** menu and then click “**Apply the Configuration File**”.

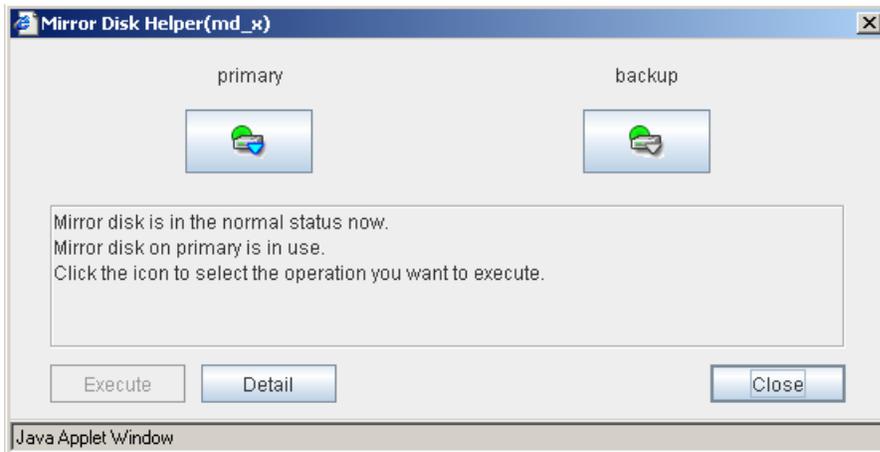
1. After the upload is completed, in the Cluster Builder (Config Mode) window “The upload was completed successfully” message is displayed. Click **OK**.
2. For moving to the manager view, from the drop down on top left corner, select “Operation Mode”.
3. From **Service** menu, click **Restart Cluster Manager**. In the **Confirmation** window, “Are you sure to restart the manager service?” is displayed. Click **OK**.
4. To start the cluster, on the **Service** menu, click **Start Cluster**. In the Confirmation window, “Are you sure to start the cluster?” is displayed. Click **OK**. Wait for the window to update.
5. In the Cluster Manager Window (Operation Mode), in the left pane, right-click **Servers** and then click **Mirror Disks**. Mirror disk copy starts automatically, but is not completed.
6. In the Mirror Disks window, click the **Details** button.
7. Clicking **Details** in the previous step brings up the Mirror Disk Helper window.



Note

This step may take a while depending on the size of the mirrored disk data partition. In the above snapshot, in place of primary, host name of the primary server will be displayed and in place of backup, host name of standby server will be displayed.

8. After the copy is completed, the following screen is displayed:



6 Zimbra installation and configuration

Existing Installation

Step 1: Install and configure Zimbra mail server on secondary server (ensure Zimbra service is in stop state on primary server) by following the procedure from [Section 6.2](#) to [Section 6.4](#). After the zimbra installation is complete, stop the zimbra service & delete the zimbra directory on secondary server & move the failover group from secondary to primary server.

Step 2: Follow the steps under [Section 6.1](#) on primary server where zimbra server is already installed.

New Installation

If it is a new environment and Zimbra server is not installed, please follow the installation procedure mentioned under [Section 6.2](#) to [Section 6.6](#).

6.1 Moving the existing Zimbra installation to the data partition (if Zimbra is already installed)

1. Access the Web Manager of EXPRESSCLUSTER X from Machine 3. Expand the Failover group and right click on the mirror disk resource and click on Stop.
2. Open the terminal on server where Zimbra was already installed.
3. Switch to root user and run the following command:

```
ps aux | grep zimbra
```

Make sure that all the Zimbra processes are stopped. If any of the Zimbra processes are running then use **kill** command to end the same.

4. Create a new folder in **/opt** directory say **zimbra_backup**.
5. Run the following command to copy the existing Zimbra files to this location:

```
rsync -avHK --delete --progress --stats --exclude 'data.mdb' /opt/zimbra /opt/zimbra_backup
```

6. After rsync run the **MDB_COPY** command (It's a Zimbra Command) to copy Zimbra LDAP data from default to this location

```
/opt/zimbra/openldap/bin/mdb_copy /opt/zimbra/data/ldap/mdb/db /opt/zimbra_backup/zimbra/data/ldap/mdb/db/
```

7. Once the copy has been successfully done, go to the cluster manager from Machine 3 and start the MD resource i.e. Right click on mirror disk and click on **Start**

8. From the Zimbra server again run the following command:

```
rsync -avHK --delete --progress --stats --exclude 'data.mdb' /opt/zimbra_backup/zimbra/ /opt/zimbra
```

9. After rsync run the **mdb_copy** command

/opt/zimbra/openldap/bin/mdb_copy

/opt/zimbra_backup/zimbra/data/ldap/mdb/db /opt/zimbra/data/ldap/mdb/db/

10. Run the bellow command to fix permission for all the files:--
/opt/zimbra/libexec/zmfixperms --extended --verbose
11. After the copy is successful, start the Zimbra services by running the following command to verify that the copy has been done successfully:
Service zimbra start
12. After moving the data from default partition to data partition perform the steps mention in section [6.4](#) on primary server.

6.2 Modifying the hosts file of both the servers.

1. Open the terminal on the desktop and run the following command:
"vi /etc/hosts"
2. Create an entry for the **IP address, Fully Qualified Domain Name** of the Primary server.
3. Save the hosts file and exit.
4. Verify the DNS server IP and DNS search path in the NIC card settings.

6.3 Installing Zimbra on Primary Server

1. Start the failover group on the Primary server.
2. Download "Zimbra collaboration suite" package. Open the web browser and go to the following URL. Choose Zimbra version 8.0.5 GA Release for Red Hat 6
<http://www.zimbra.com/downloads/os-downloads.html>
3. Copy the package to the **/tmp** directory.
4. Extract the installation files from the .tar file. Right click and click on **Extract here**.
5. Open terminal and change the directory to the extracted folder.
root@zimbra1 ~-> cd /tmp/zcs-8.0.5XXXXXXXXXX
6. Run the install.sh file from the zimbra extracted folder
./install.sh --platform-override
As we are using Cent OS we have to add the platform-override option with the install command.
7. Press Y and Enter to accept the terms of the license agreement
8. As this package is for RHEL so there will be a warning message. Press Y and Enter to continue.
9. Press Enter on all the packages with their default install options
10. Press Y and Enter to continue with installation.
11. Press Y and Enter on the "The system will be modified" prompt to begin the installation of the zimbra packages.

-
12. In the configuration main menu choose option 3-> then choose option 4 and set the admin password for zimbra mail server.
 13. Press "r" top return to the main menu
 14. Press "a" and Enter to apply the configuration
 15. Press Enter to save the configuration file.
 16. Press Enter to accept the default path for the configuration data or provide a custom path.
 17. Press Y and enter to continue the system modification
 18. Press N and Enter to cancel the notification of Zimbra installation
 19. Press Enter to complete the configuration.

6.4 Modify the Hosts file of Primary Server

1. Stop the Zimbra service
2. Change the Hostname of Primary Server
3. Add new Hostname entry in hosts file & consider the old Hostname as Virtual Computer name & bind the old hostname with FIP in the hosts file.
4. Save the hosts file & exit.
5. Start the Zimbra service & verify the Zimbra hostname should be shown as old hostname.

Version of the software's used for creating this Guide:

Cent operating systems -> 6.5 (2.6.32-431.20.3.el6.x86_64)

Zimbra mail server -> Zimbra Collaboration Suite 8.0.5 (for RHEL 6)

6.5 Installing and Configuring Zimbra Server on Standby Server

Stop the zimbra service on primary server & move the failover group from primary to secondary server & delete data contained in Zimbra directory, after that perform steps mentioned under Sections [06.1](#) to [6.4](#) on the standby server

6.6 Configuring Zimbra to connect with Active Directory (OPTIONAL)

1. Start the Zimbra services with the following command
root@zimbra1 ~->service zimbra start
2. Open the zimbra admin console at the following address:
<https://zimbavirtualhostname:7071>
Here zimbavirtualhostname is the name decided to be used as the virtual name to access zimbra mail server.
3. Click on **Configure Authentication** & choose the **Authentication mechanism** as **External Active Directory**.

-
4. In the **Authentication Settings** field provide domain name of the Active Directory in the LDAP URL field, provide the IP address and click **next**.
 5. Leave LDAP Bind option as unchecked.
 6. In the Authentication Configuration Summary page, provide the active directory administrator user credentials & Click on **Test**. To verify the authentication, click **Next**.
 7. Leave **External Group setting** as unchecked.
 8. Click **Next** and then click **Finish** to complete the Domain configuration.
 9. After the above configuration the only thing left is to create the users in the Zimbra similar as in Active Directory for verification of the AD authentication.
 10. Click on **Accounts**.
 11. Put in the account name same as in Active Directory and put in the Active Directory domain.
 12. In the **Last name** field put in the display name for the account.
 13. In the **External LDAP account for Authentication** put in the same account name. Example if john is to be added, provide the same address in this field as john@domainname.com.
 14. Click **Next** to put in further details, else, click **Finish**. Click **OK** on the pop-up box.

7 Zimbra Cluster Configuration

7.1 Configure the failover group scripts

7.1.1 Stop the failover group and start Cluster Builder

1. On the Management Console/ Client Machine, start the Cluster Manager. On the Windows desktop, on the Start menu, point to Programs and click Internet Explorer.
2. In the address bar, type the URL of the Management IP address, followed by the default port.
3. To start Cluster Builder, on Cluster Manager (Operation Mode), from the drop down box on top left corner, select "Config Mode".

7.2 Configuration of Resources involved in Zimbra cluster configuration

1. In Cluster Builder (Config Mode), in the tree view, under **Groups**, right-click **failover** and then click **Add Resource**.
2. In the "Group Resource Definitions" window, for Type, select execute resource from the pull-down box. For Name, use the default (exec). Click Next.
3. On next window, make sure "Follow the default dependency" check box is checked and click NEXT.
4. On next window "Recovery Operation at Deactivation Failure Detection", make the final action as "No Operation (deactivate next resource) and click NEXT.
5. In the next window edit the start.sh file and replace the source with source code shown at end of this document.
6. In the same window select the stop.sh file and edit the stop.sh file and replace the source with source code shown at end of this document and click **FINISH**.

7.3 Configuration of Deeper Monitor SMTP

1. On Cluster Builder (Config Mode), in the tree view, under **Groups**, right-click **monitors** and then click **Add Monitor**.
2. From the drop down select "**SMTP monitor**". Click **Next**
3. In the **Target resource** field. Click on **Browse**. Select the **exec** resource and click **OK** and also change the value of "**Wait Time To Start Monitoring**" is from 0 to 120. Click **Next**.
4. Put the FIP address like (10.0.3.13) in the IP Address and leave all other setting default .Click **Next**
5. In the **Recovery target** field, click **Browse**. Now click on Failover group and click **OK**.

-
6. Click **Finish** to add the SMTP monitor resource.

7.4 Activate new configuration

7.4.1 Suspend the cluster to enable configuration changes

1. From the top left drop down box, select “Operation Mode”
2. Right-click the **failover** group and click **Stop**, and then click **OK**.
3. In the Cluster Manager (Operation Mode), click **Service** and then **Suspend Cluster**.
4. In the Confirmation window, click **OK**.

7.4.2 Upload changed configuration

1. Again change back to the Cluster Builder (Config Mode), on the **File** menu, click **Apply the configuration file**.
2. In the Cluster Builder (Config Mode) window “The upload is completed successfully” is displayed. Click **OK**.

7.5 Verify script involved in resource functions

7.5.1 Start the failover group on the Primary Server

1. In the Cluster Manager (Operation Mode), click **Service**, and then **Resume Cluster**.
2. In the Confirmation window “Are you sure to resume the cluster” is displayed. Click **OK**.
3. Right-click **failover** (under groups), and click **Start**.
4. Select the **%machine name%** of the Primary Server (Machine 1) and click **OK**.

7.5.2 Stop the failover group on the Primary Server

1. Right-click **failover** (under groups), and click **Stop**.

7.5.3 Start the failover group on the Standby Server

1. Right-click **failover** (under groups), and click **Start**.
2. Select the **%machine name%** of the Standby Server (Machine 2) and click **OK**.

7.5.4 Stop the failover group on the Standby Server

1. Right-click **failover** (under groups), and click **Stop**.

7.5.5 Restore normal cluster operating condition

1. Right-click **failover** (under groups), and click **Start**.
2. Select the **%machine name%** of the Primary Server (Machine 1) and click **OK**.

Scripts

start.sh

```
/etc/init.d/zimbra start
```

stop.sh

```
/etc/init.d/zimbra stop
```

8 Final Deployment in a LAN Environment

This chapter describes the steps to verify a LAN infrastructure and to deploy the cluster configuration on the Primary and the Secondary servers

1. Configure and verify the connection between the Primary and Standby servers to meet the following requirements:
 - Two logically separate IP protocol networks: one for the Public Network and one for the Cluster Interconnect.
 - The Public Network must be a single IP subnet that spans the Primary and Standby servers to enable transparent redirection of the client connection to a single floating server IP address.
 - The Cluster Interconnect should be a single IP subnet that spans the Primary and Standby servers to simplify system setup.
 - A proper IP network between client and server machines on the Public Network on both the Primary and Standby servers.
2. Make sure that the Primary server is in active mode with a fully functional target application and the Standby Server is running in passive mode.
3. Ping both the Primary and Secondary servers from the test system and make sure the Secondary server has all the target services in manual and stopped mode.
4. Start the cluster and try accessing the application from the Primary server. Then move the cluster to the Secondary server. Check the availability of the application on the Secondary server after failover.
5. Deployment is completed.

9 Common Maintenance Tasks

This section describes how to perform common EXPRESSCLUSTER X maintenance tasks using the EXPRESSCLUSTER X Manager.

9.1 Start Cluster Manager

There are two methods to start/access Cluster Manager through a supported Java enabled web browser. The first method is through the IP address of the physical server running the cluster management server application. The second method is through the floating IP address for a cluster management server within a cluster.

The first method is typically used during initial cluster setup before the cluster management server floating IP address becomes effective:

1. Start **Internet Explorer** or another supported Java enabled Web browser.

Type the URL with the IP address of the active physical server followed by a colon and the cluster management server port number.

Example:

Assuming that the cluster management server is running on an active physical server with an IP address (e.g.: 10.1.1.1) on port number 29003, enter `http://10.1.1.1:29003/`.

2. The second method is more convenient and is typically used after initial cluster setup:

Start **Internet Explorer** or another supported Java enabled Web browser.

Type the URL with the cluster management server floating IP address followed by a colon and the cluster management server port number.

Example:

Assuming that the cluster management server is running with a floating IP address (10.1.1.3) on port 29003, enter `http://10.1.1.3:29003/`.

9.2 Reboot/shutdown one or all servers

9.2.1 Reboot all servers

1. Start Cluster Manager. (Section [9.1](#))
2. Right click the cluster name and choose **Reboot**.

9.2.2 Shutdown all servers

1. Same as “Reboot all servers,” except in step 2 click **Shutdown**.

9.2.3 Shutdown one server

1. Start Cluster Manager.(Section [9.1](#))
2. Right-click the **%machine name%** and click **Shutdown**.
3. In the Confirmation window, click **OK**.
4. Right-click the **%cluster name%** and click **Reboot**.
5. In the Confirmation window, click **OK**.

9.3 Startup/stop/move failover groups

1. Start Cluster Manager.(Section [9.1](#))
2. Under **Groups**, right-click the **Failover group** and then click **Start/Stop/Move**.
3. In the Confirmation window, click **OK**.

9.4 Isolate a server for maintenance

1. Start Cluster Manager. (Section [9.1](#))
2. In the Cluster Manager window, change to **Config Mode**.
3. Click the **%cluster name%** and then right-click **Properties**.
4. Click the **Auto Recovery** tab. To manually return the server to the cluster, select **Off** for the **Auto Return** option. Otherwise, leave it set to **On** for automatic recovery when the server is turned back on. Click **OK**.
5. If a change was made, upload the configuration file.
6. Shut down the server to be isolated for maintenance.
7. The server is now isolated and ready for maintenance tasks.

9.5 Return an isolated server to the cluster

Start with the server that was isolated in the steps listed above (“Isolate a server for maintenance”).

9.5.1 Automatic Recovery

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

9.5.2 Manual Recovery

1. Turn the machine back on and wait until the boot process has completed.
2. Start Cluster Manager.

-
3. In the Cluster Manager window, right click the name of the server which was isolated and select **Recover**. The server which was isolated will return to the cluster.

9.6 Rebuild a mirror disk

1. Start Cluster Manager. (Section [9.1](#))
2. In the left pane of the Cluster Manager window, right-click **Servers** and then click **Mirror Disks**.
3. In the Mirror Disks window, click the **Details** button.
4. In the next window, click the button below the **%machine name%** of the source server to copy files from [Primary Server (Machine 1)] and then click the button below the **%machine name%** of the machine name of the destination server to copy files to [Standby Server (Machine 2)].
5. Click the **Execute** button. In the **Confirmation** window, click **OK**.

10 Appendix A: EXPRESSCLUSTER X Server Uninstallation

Follow the steps below to uninstall EXPRESSCLUSTER X from each of the server systems.

1. On the Management Console/Test Client, in Cluster Manger (Operation Mode), under **Groups**, right-click **Failover** and then click **STOP**.
2. Close Cluster Manger window.
3. On the server system that you are starting the uninstall process for EXPRESSCLUSTER X, stop all EXPRESSCLUSTER X services. To stop all services, follow the steps below:
On the terminal stop the following services by running the below commands:
 - `service clusterpro stop`
 - `service clusterpro_md stop`
 - `service clusterpro_evt stop`
 - `service clusterpro_trn stop`
 - `service clusterpro_alertsync stop`
 - `service clusterpro_webmgr stop`
4. On the terminal run the below specified command:
 - `rpm -e expresscls-[version].[architecture]`
5. Restart the machine.

This completes the uninstall process for an individual server system.

Note

You must be logged on as a root or an account with administrator privileges to uninstall Express Cluster Server.

11 Appendix B: Example System Planning Worksheet

Machine 1: Primary Server

Machine 2: Standby Server

Machine 3: Domain Controller/Active Directory Server

Table 1: System Network Interfaces

Machine	Host name	Network Connection	IP Address	Subnet Mask	Default Gateway	Preferred DNS Server
1	Primary	Public	10.1.1.1	255.255.255.0	10.1.1.5	10.1.1.5
		Interconnect	192.168.1.1	255.255.255.0	-----	-----
2	Standby	Public	10.1.1.2	255.255.255.0	10.1.1.5	10.1.1.5
		Interconnect	192.168.1.2	255.255.255.0	-----	-----
3	Client		10.1.1.5	255.255.255.0	-----	10.1.1.5

Floating IP addresses for EXPRESSCLUSTER X (Public):

Management IP: (1) 10.1.1.3

Floating IP: (2) 10.1.1.4

Table 2: System OS and Disks

Machine	OS	Disk 0 (OS Disk)	Disk 1 (Data Disk)
1	Cent OS	OS Partition: Partition: /dev/hda1 Size: 8GB	* Cluster Partition: Partition: /dev/sdb1 Size: >10 MB Data Partition: Partition: /dev/sdb2 Size: 20GB (Depends on the size of the data to be replicated)
2	Cent OS	OS Partition: Partition: /dev/hda1 Size: 8GB	
3	Windows 7	C: 40 GB	-----

*** Must be a raw partition and larger than 20MB.**

Table 3: System Logins and Passwords

		Login	Password
Machine Administrator	1	root	admin1234
Machine Administrator	2	root	admin1234